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PAPS Handbook

Walmea Canyon, Kaua‘i
Dear Friends & Colleagues,

I am grateful for the trust that you and the Executive Board of the Pacific Association of Pediatric Surgeons (PAPS) have bestowed on me in electing me as the President for 2016.

PAPS is now 49 years old and like fine wine, simply gets better with age. Not simply because of the skill and vision of those on the board, but because our members (currently 530 surgeons residing in 23 countries) have remained faithful to the ideals of its founders and founding objectives, and that is to promote both educational as well as social bonds among PAPS members.

I have been to many, many PAPS meetings and I can honestly say that no other Pediatric Annual Congress is as informal (the ‘no ties’ rule is always in full effect) as PAPS, or parties as hard as PAPS. This is what I believe makes PAPS truly unique and special; that serious and frank discussions regarding the latest happenings in Pediatric Surgery can openly take place between members with everyone on the same playing field. You will not find dogmatic, narrow and rigid views of Pediatric Surgery at PAPS or any of its annual meetings, but instead a larger, broader view in which you can educate yourself on as you seek to become a better, more complete and wise physician.

I extend a warm hand of friendship to you to invite you to this 49th Annual Meeting of PAPS here on the beautiful and tranquil island of Kaua’i.

Mr. Charles Nainoa Thompson will deliver the 2016 PAPS GANS Lecture. He is an internationally recognized native Hawaiian navigator, the President of the Polynesian Voyaging Society and is best known for achieving the daunting feat of navigating two double-hulled canoes from Hawaii to other island nations in Polynesia without the aid of western instruments.

Professor Prem Puri from Dublin, Ireland will give the 2016 PAPS Keynote Lecture. Professor Prem Puri is known all over the world for his outstanding contribution to the development of pediatric surgery and research and he will give an interesting and informative talk on pediatric surgeons who have crossed boundaries and have made significant contributions to other fields in medicine such as angiogenesis and tissue engineering.

Dr. Devin Puapong, our Local Organizing Chair, and Dr. Mark Holterman, Program Chair, have worked hard to ensure that the 49th Annual PAPS meeting will be the best and biggest one yet, filled with much learning and laughter.

I am very much looking forward to seeing (and drinking with) you all over the next few days. Fun times at Hawaii PAPS await us.

Warmest best regards,

Atsuyuki Yamataka, MD, PhD
President of the Pacific Association of Pediatric Surgeons
WELCOME FROM LOCAL ORGANIZING AND SCIENTIFIC PROGRAM COMMITTEES

Dear Colleagues,

On behalf of the local organizing committee and the scientific program committee, we would like to extend a warm Aloha and welcome you to the 49th Annual Meeting of the Pacific Association of Pediatric Surgeons here on the beautiful Garden Isle of Kaua‘i.

With the generous help of Hawai‘i Pacific Health’s Conference Planning Services, we have put together what promises to be an exciting and meaningful scientific and social program. As mentioned by Professor Yamataka, we are honored to welcome Professor Prem Puri, as our invited keynote speaker and Hawai‘i’s own, Nainoa Thompson as our special Gans Lecturer. We are also excited to introduce our visiting GAP lecturers, Dr. Thanh Dinh from Vietnam and Dr. Basil Leodoro from Vanuatu.

No PAPS conference would be complete without our annual conference tour, which this year, will take us from the Koke‘e Mountains of Waimea to the shores of Lihue and looks to immerse you in the beauty of Hawai‘i’s nature, culture, and people.

PAPS has a great history of fostering not only learning, but also collegiality and friendships between pediatric surgeons across the globe, and we certainly hope this meeting will contribute to that rich tradition.

Aloha and welcome to Kaua‘i!

Mark J. Holterman, MD, PhD
Scientific Program Chair

Devin P. Puapong MD, FACS, FAAP
Local Program Chair
## PAPS OFFICERS

### PRESIDENT
**Atsuyuki Yamataka, MD**  
Department of Pediatric Surgery  
Juntendo University School of Medicine  
yama@juntendo.ac.jp

### SECRETARY
**James C.Y. Dunn, MD, PhD**  
Professor of Surgery and Bioengineering  
UCLA School of Medicine  
jdunn@mednet.ucla.edu

### PRESIDENT-ELECT
**Walter Chwals, MD**  
Department of Pediatric Surgery  
Tufts Medical Center  
wichwals@tuftsmedicalcenter.org

### TREASURER
**David Tuggle, MD**  
Austin Pediatric Surgery  
davidtuggle@gmail.com

### BOARD OF DIRECTORS
<table>
<thead>
<tr>
<th>Name</th>
<th>Country</th>
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<tr>
<td>Andrew Holland</td>
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### PAST OFFICERS

#### Presidents

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Secretaries
Jens G. Rosenkrantz 1969-71
John R. Campbell 1971-73
Edward A Free 1973-75
George A Hyde 1975-77
Walton K.T. Shim 1977-79
Pieter A De Vries 1979-82
William C. Bailey 1982-85
Dale G. Johnson 1985-88
John C. German 1988-91
Marshall Z. Schwartz 1991-95
Marvin W. Harrison 1995-99
Stephen G. Jolley 1999-2001
Robert S. Sawin 2001-04
Harry Applebaum 2004-09
Walter J. Chwals 2009-2014
James C.Y. Dunn 2014-present

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Eric W. Fonkalsrud 1969-70
Alfred A de Lorimer 1970-72
Daniel M. Hays 1972-74
David L. Collins 1974-77
Ernest B. Haws 1977-84
David Hodge 1984-85
Ann M. Kosloske 1985-90
Marvin W. Harrison 1990-95
Dale G. Hall 1995-99
James B. Atkinson 1999-01
Richard E. Black 2001-07
Kevin P Lally 2007-12
David Tuggle 2012-present

Archivists
Nate A Myers 1987-1992
Alan Woodward 1992-2011
Marilyn Butler 2011-Present

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M. James Warden 1987-1999
Philip A. King 1999-2004
Cynthia Reyes 2004-2014
Marilyn Butler (Co-Chair) 2014-Present
Sherif Emil (Co-Chair)

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Sir Kenneth Fraser
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Ovar Swenson
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Toshihiko Watanabe
Corey Iqbal
Koji Fukumoto
Jun Fujishiro
Mark Molitor

Future Meetings
2017 Seattle, Washington, USA May 28 – June 1, 2017
2018 Sapporo, Japan May 13 – May 17, 2018
2019 Christchurch, New Zealand TBA
### Past Meetings and Local Organizing Chairs

<table>
<thead>
<tr>
<th>Year</th>
<th>Location</th>
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<tr>
<td>1968</td>
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### M. James Warden Guest Assistance Program Participants

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<td>Sandra Montedonico-Rimassa</td>
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<td>2005</td>
<td>Alejandro Ayon</td>
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<td>2007</td>
<td>Safwat Andrawes</td>
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<td>2008</td>
<td>Daniel Acosta Farina</td>
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<td>Jitoko K. Cama</td>
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<td>2011</td>
<td>Jose Moledo</td>
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<td>Julian Luna Montalvan</td>
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<td>2012</td>
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<td>Ben Yapo</td>
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<td>Josese Turagava</td>
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<td>2014</td>
<td>Marcus Lester Suntay</td>
<td>Philippines</td>
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<td>2015</td>
<td>Juan Francisco Campos</td>
<td>El Salvador</td>
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<td></td>
<td>Leecarlo Millano</td>
<td>Indonesia</td>
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<td>2016</td>
<td>Thanh Dinh</td>
<td>Vietnam</td>
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<tr>
<td></td>
<td>Basil Leodoro</td>
<td>Vanuatu</td>
</tr>
</tbody>
</table>

### GANS Memorial Lecture

This lecture is given in memory of Stephen L. Gans, MD, the founder and first President of the Pacific Association of Pediatric Surgeons (PAPS). Under the terms of the bequest that funds this lecture, the lecture should be given on a topic that does not relate to Pediatric Surgery and the Lecturer should be an authority on the Lecture Material and reside in the same area as the Annual Meeting location.

The Gans lecturer for 2016 is Mr. Nainoa Thompson, the President of the Polynesian Voyaging Society and a master in the traditional Polynesian art of non-instrument navigating.
PAPS 2016 Local Organizing Committee Chair and Committee Members
Program Chair Devin Puapong, USA

Members
Sidney Johnson, USA
Russell Woo, USA

PAPS 2016 Scientific Program Committee
Chair Mark Holterman, USA

Members
Mark Holterman
Bill Chiu
Kevin Pringle
Sunghoon Kim
Russell Woo
Satoshi Ieiri
Eric Webber
Devin Puapong
Hideyuki Sasaki
Sidney Johnson
Rajendra Kumar
Tran Ngoc Son
Shan Zheng
Tatsuro Tajiri
Hiroaki Kitagawa
Aixuan Holterman
Shigeru Ono
David Tuggle
Steven Rothenberg
Taiwai Chin
Yunli Bi
Jeong-meen Seo
Yun Chen
David Partrick
Akiko Yokoi
John Meehan

Publication Committee
Chair Kenneth Wong, PR China

Deputy Chair Eric Scaife

Members
Chinsu Liu
Mary Brindle
KuoJen Tsao
Arturo Aranda-Gracia
Osamu Kimura
Roman Sydorak
Dave Bliss
Kai Li
Ralph Cohen
Andrew Holland
Kouji Masumoto
Tatsuo Kuroda
Eric Webber
David Patrick
Masayuki Kubota
Patrick Chung
Wen-Ming Hsu
Don Moores
PAPS Artifacts
Artifact – a simple object produced by human workmanship

• The Presidential Badge
• The Past Presidential Badge
• The Flag
• The COE Medal
• The Gavel

The Presidential Badge
This badge was presented by the British Association of Pediatric Surgeons to their colleagues in the Pacific in 1972. It was handed over to the incoming President each year at the Annual Meeting, usually in a presentation at the Annual Banquet.

The Past Presidential Badge
Douglas Cohen suggested to the Board of Directors that it would be appropriate for Past Presidents to wear a badge identifying them at Annual Scientific Meetings and included the concept of a brooch for wives of Past Presidents.

Having approval of the Board, he selected a design for the badges, copied from the PAPS flag, which had been designed by Peter Jones. Armor Metal Makers in Sydney produced the badges. Douglas Cohen then presented the first badges in Mexico in 1979 when he assumed the role of President. An additional supply of badges was obtained for the Secretary in 1984 when Durham Smith was President.

The Flag
Foundation Member Peter Jones designed the PAPS flag in collaboration with Miss Vivienne James, Medical Artist at Royal Children’s Hospital in Melbourne, Australia. It was made by Evan Evans Flags of 680 Elizabeth Street, Melbourne, and flew for the first time at the 3rd Annual Meeting of PAPS in Melbourne in 1970.

Each year the flag adorns the meeting site and moves round the Pacific Ocean with successive Meeting Organizing Committees.

The COE Medal
The COE medal was initially conceived to honor the memory of Herbert E. Coe, MD. Based in Seattle, he was a founding father of pediatric surgery on the Pacific shore of the United States. It is the highest honor presented by PAPS, and is awarded to someone who has practiced on the Pacific Rim and who has made outstanding contributions to Pediatric Surgery.

In 1984, John Stevenson was placed in charge of plans to develop a Medal of Honor bearing the likeness of Herbert Coe, with $1,800 being allocated for the first fifty medals. Dr. Stevenson also convened a Committee of Alexander Bill, Douglas Cohen, Morio Kasai and Murray Kilman to establish criteria for the awarding of the medal. It was decided in 1985 that the first medal, cast in pewter with antique gold finish, would be presented to Mrs. Coe. In 1986, the Board of Directors approved the following guidelines for selection of future recipients:

1. The recipients would be recognized as having made outstanding contributions to pediatric surgery.

2. Contributions should be considered in any related field of pediatric surgery, any of the pediatric surgical specialties, pediatric surgical research, or anything that is considered to have raised the status of pediatric surgery. Service to PAPS per se, however meritorious, should not be considered an appropriate contribution unless the nominee was considered to have contributed in some additional appropriate way.

3. Except in most special circumstances, the medal would be awarded to those individuals who are working or have worked in the area covered by PAPS.

4. In order to enhance the value of the award, not more than one medal should be given in any one year. It should also not be necessary to make the award every year. A candidate for the award could be nominated by any PAPS member in good standing.
5. The nomination should be forwarded to the secretary and should include enough information for members of the Board to formally review and, if appropriate, second the nomination. The final selection of the recipient for the Coe Medal will be made by vote of the Board of Directors.

6. The selection should be made 4 months in advance of the annual meeting of the Association to allow the recipient, if possible, to plan to attend that meeting to receive the medal.

The addition of two more guidelines followed:

7. Although no limitation is placed on the nomination of any candidate, special consideration would be given to nominees who are or have been working in the Pacific Basin or whose work is seen as having particular relevance for pediatric surgeons working in the area.

8. A list of previous recipients will be sent out each time the selection committee guidelines are promulgated to avoid the problem of possibly recommending somebody who is already a recipient.

In 1987, the Board of Directors voted to make an exception to the rule of awarding a single medal in one year and awarded medals to both Alexander Bill and Morio Kasai to mark the 20th Anniversary of PAPS in 1998 in Seattle, the home of Dr. Coe.

**List of Recipients**

<table>
<thead>
<tr>
<th>Year</th>
<th>Recipient</th>
</tr>
</thead>
<tbody>
<tr>
<td>1985</td>
<td>Mrs. Herbert E. Coe</td>
</tr>
<tr>
<td>1987</td>
<td>Alexander H. Bill Jr.</td>
</tr>
<tr>
<td>1987</td>
<td>Morio Kasai</td>
</tr>
<tr>
<td>1988</td>
<td>Keijiro Suruga</td>
</tr>
<tr>
<td>1989</td>
<td>Nate Myers</td>
</tr>
<tr>
<td>1990</td>
<td>Stephen L. Gans</td>
</tr>
<tr>
<td>1992</td>
<td>Morton M. Woolley</td>
</tr>
<tr>
<td>1993</td>
<td>Durham Smith</td>
</tr>
<tr>
<td>1994</td>
<td>Takashi Ueda</td>
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<tr>
<td>1995</td>
<td>Daniel M. Hays</td>
</tr>
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<td>1998</td>
<td>Eric W. Fonkalsrud</td>
</tr>
<tr>
<td>2001</td>
<td>Justin H. Kelly</td>
</tr>
<tr>
<td>2002</td>
<td>Alberta Pena</td>
</tr>
<tr>
<td>2003</td>
<td>Ken Kimura</td>
</tr>
<tr>
<td>2007</td>
<td>John Hutson</td>
</tr>
<tr>
<td>2008</td>
<td>Keiichi Ikeda</td>
</tr>
<tr>
<td>2010</td>
<td>Takeshi Miyano</td>
</tr>
<tr>
<td>2014</td>
<td>Marshall Schwartz</td>
</tr>
</tbody>
</table>

**The Gavel**

In May 1971, John Stevenson presented a gavel to PAPS. The head of the gavel was fashioned from hawthorn wood, which flowers in May in the Northern hemisphere. May 1967 was the birthday of our Association. The handle was made from holly, a holly tree used on special occasions in ancient times to represent goodness and purity.

It is significant that the wood was obtained from trees felled by Herbert Coe in the year before his death and stored in his basement for future woodworking. The trees had originally been brought by Dr. Coe’s parents from England and planted when they settled in Seattle in 1888. The timber was later obtained from his widow. It is fitting that the Association has a gavel used at Annual Meetings made from wood belonging to one of our esteemed honorary members who was instrumental in beginning the specialty of Pediatric Surgery.
Program at a glance
<table>
<thead>
<tr>
<th>SUNDAY [ 24 April ]</th>
<th>MONDAY [ 25 April ]</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PAPS Publications Committee Meeting</strong>&lt;br&gt;08:00-12:00 Kauai Ballroom</td>
<td><strong>Poster Presentations- Session 1</strong>&lt;br&gt;6:45 - 7:30&lt;br&gt;Kauai Ballroom&lt;br&gt;(Breakfast Included)</td>
</tr>
<tr>
<td><strong>Registration</strong>&lt;br&gt;15:00-19:00 Grand Promenade</td>
<td><strong>Scientific Session 1</strong>&lt;br&gt;7:30 - 9:00&lt;br&gt;Grand Ballroom</td>
</tr>
<tr>
<td><strong>PAPS Board Meeting</strong>&lt;br&gt;12:00-17:00 Kauai Ballroom</td>
<td><strong>GAP Lectures</strong>&lt;br&gt;9:00 - 9:15</td>
</tr>
<tr>
<td><strong>Welcome Reception</strong>&lt;br&gt;19:00-21:00 Shipwreck Lagoon</td>
<td><strong>Break / Exhibits Open</strong>&lt;br&gt;9:15 - 9:30</td>
</tr>
<tr>
<td><strong>Scientific Session 2</strong>&lt;br&gt;9:30 - 11:15</td>
<td><strong>Keynote: Prem Puri, MD</strong>&lt;br&gt;11:15 - 11:45</td>
</tr>
<tr>
<td><strong>Poster Presentations- Session 1</strong>&lt;br&gt;6:45 - 7:30&lt;br&gt;Kauai Ballroom&lt;br&gt;(Breakfast Included)</td>
<td><strong>COE Medal Presentation</strong>&lt;br&gt;11:45 - 12:00</td>
</tr>
<tr>
<td><strong>GANS Lecture: Nainoa Thompson</strong>&lt;br&gt;12:00 - 13:00</td>
<td><strong>LUNCH ON OWN</strong></td>
</tr>
<tr>
<td>TUESDAY [ 26 April ]</td>
<td>WEDNESDAY [ 27 April ]</td>
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<td><strong>Poster Presentations - Session 2</strong>&lt;br&gt;6:45 - 7:30&lt;br&gt;Kauai Ballroom (Breakfast Included)</td>
<td><strong>Poster Presentations - Session 3</strong>&lt;br&gt;6:45 - 7:30&lt;br&gt;Kauai Ballroom (Breakfast Included)</td>
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<td><strong>Scientific Session 3</strong>&lt;br&gt;7:30 - 8:30&lt;br&gt;Grand Ballroom</td>
<td><strong>Scientific Session 7</strong>&lt;br&gt;7:30 - 8:30&lt;br&gt;Grand Ballroom</td>
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<td><strong>Scientific Session 4</strong>&lt;br&gt;8:30 - 9:30</td>
<td><strong>Scientific Session 8</strong>&lt;br&gt;8:30 - 9:30</td>
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<td><strong>Break / Exhibits Open</strong>&lt;br&gt;9:30 - 9:45</td>
<td><strong>Break / Exhibits Open</strong>&lt;br&gt;9:30 - 9:45</td>
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<tr>
<td><strong>Scientific Session 5</strong>&lt;br&gt;9:45 - 11:00</td>
<td><strong>Scientific Session 9</strong>&lt;br&gt;9:45 - 11:15</td>
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<td><strong>Scientific Session 6</strong>&lt;br&gt;11:00 - 12:00</td>
<td><strong>Break / Exhibits Open</strong>&lt;br&gt;11:15 - 11:30</td>
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<td><strong>PAPS Member's Meeting</strong>&lt;br&gt;13:30 - 14:30&lt;br&gt;Kaua‘i Ballroom</td>
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<td><strong>Poster Presentations - Session 3</strong>&lt;br&gt;6:45 - 7:30&lt;br&gt;Kauai Ballroom (Breakfast Included)</td>
<td><strong>Poster Presentations - Session 4</strong>&lt;br&gt;6:45 - 7:30&lt;br&gt;Kauai Ballroom (Breakfast Included)</td>
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<td><strong>Scientific Session 7</strong>&lt;br&gt;7:30 - 8:30&lt;br&gt;Grand Ballroom</td>
<td><strong>Scientific Session 11</strong>&lt;br&gt;7:30 - 9:30&lt;br&gt;Grand Ballroom</td>
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<td><strong>Break / Exhibits Open</strong>&lt;br&gt;9:30 - 9:45</td>
<td><strong>Video Session</strong>&lt;br&gt;10:00 - 11:00</td>
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<td><strong>Scientific Session 9</strong>&lt;br&gt;9:45 - 11:15</td>
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<td><strong>Break / Exhibits Open</strong>&lt;br&gt;11:15 - 11:30</td>
<td><strong>Scientific Session 12</strong>&lt;br&gt;11:00 - 12:00</td>
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<td><strong>Conference Adjourn</strong>&lt;br&gt;12:00</td>
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<tr>
<td><strong>Conference Tour</strong>&lt;br&gt;12:30 - 22:00&lt;br&gt;(Lunch Included)</td>
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<td><strong>Board Exit Meeting</strong>&lt;br&gt;14:30 - 15:30&lt;br&gt;Kaua‘i Ballroom</td>
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<td><strong>Aloha Banquet</strong>&lt;br&gt;17:30 - 21:45&lt;br&gt;Ilima Garden</td>
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<td><strong>LUNCH ON OWN</strong></td>
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Scientific Program
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<tr>
<th>ABSTRACT NO.</th>
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<th>PRESENTING AUTHOR</th>
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<tbody>
<tr>
<td>SS1.1</td>
<td>Expression of Prx1 and Tcf4 is decreased in diaphragmatic muscle connective tissue of nitrofen-induced congenital diaphragmatic hernia</td>
<td>Toshiaki Takahashi</td>
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<tr>
<td>SS1.2</td>
<td>Antibody blockade of Alpha4Beta7 Integrin ameliorates ischemia and reperfusion induced intestinal injury and systemic inflammatory response</td>
<td>Jixin Yang</td>
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<tr>
<td>SS1.3</td>
<td>The role of T cell costimulating pathway in necrotizing enterocolitis</td>
<td>Sophia Hsiao-Huei Chao</td>
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<tr>
<td>SS1.4</td>
<td>Molecular hydrogen ameliorates necrotizing enterocolitis by decreasing oxidative stress via Nrf2 signaling pathway in rats</td>
<td>Shi Jingyi</td>
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<tr>
<td>SS1.5</td>
<td>Intra-Tumoral Implantation of Vincristine-Loaded Sustained Release Silk Platform Increases Intra-Tumoral Drug Concentration and Decreases Tumor Growth While Minimizes Plasma Drug Concentration</td>
<td>Jamie Harris</td>
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<td>SS1.6</td>
<td>Pattern of YAP-CCNE2-TJP2 as a unique signature in pediatric hepatocellular carcinoma</td>
<td>Michael J. LaQuaglia</td>
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<tr>
<td>SS1.7</td>
<td>A potent chemotherapeutic strategy in Neuroblastoma (S-trityl-L-cysteine) a novel Eg5 inhibitor</td>
<td>Wu Wei</td>
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<td>SS1.8</td>
<td>VS-5584, a novel PI3K/mTOR dual inhibitor, exhibited tumor-suppressing effects in human neuroblastoma cells</td>
<td>Huang-Wen Tsai</td>
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<tr>
<td>SS1.9</td>
<td>Donor Mesenchymal Stem Cell Trafficking after Trans-Amniotic Stem Cell Therapy (TRASCET) in a Normal Rodent Model</td>
<td>Christopher Graham</td>
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<tr>
<td>SS1.10</td>
<td>Transplanted Neural Crest Cells Survived and Improved Gastrointestinal Motility in a Mouse Model of Aganglionosis</td>
<td>Takumi Fujimura</td>
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<tr>
<td>SS1.11</td>
<td>New treatment strategy using a biodegradable polydioxanone stent for tracheal stenosis in a rabbit model</td>
<td>Insu Kawahara</td>
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<tr>
<td>SS1.12</td>
<td>Ghrelin Improves Intestinal Mucosal Atrophy during Parenteral Nutrition: An Experimental Study</td>
<td>Waka Yamada</td>
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<tr>
<td>SS1.13</td>
<td>Kampo medicine: Daikenchuto (TU-100) prevents bacterial translocation and hepatic fibrosis in biliary atresia rat model.</td>
<td>Keigo Yada</td>
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**MONDAY, APRIL 25, 2016**

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Moderator</th>
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<tbody>
<tr>
<td>9:00</td>
<td><strong>GAP LECTURES</strong></td>
<td><strong>Moderator:</strong> Marilyn Butler</td>
</tr>
<tr>
<td></td>
<td>Pediatric Surgery in Children’s Hospital #1, Vietnam</td>
<td>Thanh Dinh</td>
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<tr>
<td></td>
<td>Addressing the 3 delays: Paediatric Surgical case studies from Vanuatu</td>
<td>Basil Leodoro</td>
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<tr>
<td>9:15</td>
<td><strong>BREAK AND EXHIBITS OPEN</strong></td>
<td></td>
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<tr>
<td>9:30</td>
<td><strong>PAPS PRIZE CLINICAL ABSTRACTS</strong></td>
<td><strong>Moderators:</strong> Hiroaki Kitagawa, Walter Chwals</td>
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<table>
<thead>
<tr>
<th>ABSTRACT NO.</th>
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<tbody>
<tr>
<td>SS2.1</td>
<td>Do We Need a Prophylactic Removal of Urachal Sinus to Prevent Infection and Carcinoma? Findings from a Retrospective Analysis of 24 Consecutive Patients</td>
<td>Kazuki Tanimoto</td>
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<tr>
<td>SS2.2</td>
<td>Malrotation with Obstruction: Reliability of Physical and Laboratory Examinations to Identify Volvulus</td>
<td>Kathy A. Schall</td>
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<tr>
<td>SS2.3</td>
<td>In Vivo Continuous Measurement of Pressures and Flow Rates in Pneumatic Reduction of Pediatric Intussusception: How High Do We Go?</td>
<td>Mohammadali Khorasani</td>
</tr>
<tr>
<td>SS2.4</td>
<td>Outcomes of laparoscopic cholecystectomy for biliary dyskinesia in children</td>
<td>Sarah Lai</td>
</tr>
<tr>
<td>SS2.5</td>
<td>The Effect of Thoracoscopy upon the Repair of Pectus Excavatum: A large single-centre experience</td>
<td>Nicole Lai</td>
</tr>
<tr>
<td>SS2.6</td>
<td>AORN Wound Classification May Not Apply to Contemporary Operations in Children</td>
<td>Katherine W. Gonzalez</td>
</tr>
<tr>
<td>SS2.7</td>
<td>Intercostal Nerve Cryoablation for Pectus Excavatum Repair: Preliminary Outcomes in Twenty-Five Patients</td>
<td>Benjamin A. Keller</td>
</tr>
<tr>
<td>SS2.8</td>
<td>Mesenteric Lymphadenitis: an Essential Diagnosis in Patients Suspected of Appendicitis</td>
<td>Kyoko Nakamura</td>
</tr>
<tr>
<td>SS2.9</td>
<td>Don’t forget the dose: improving computed tomography dosing for pediatric appendicitis</td>
<td>K. Tinsley Anderson</td>
</tr>
<tr>
<td>SS2.10</td>
<td>Increased Morbidity and Mortality in Cardiac Patients Undergoing Nissen Fundoplication: Evidence from NSQIP-P</td>
<td>Heather L. Short</td>
</tr>
<tr>
<td>SS2.11</td>
<td>The Impact of Cardiac Risk Factors on Outcomes for Children Undergoing a Ladd Procedure</td>
<td>Luke R. Putnam</td>
</tr>
<tr>
<td>SS2.12</td>
<td>Same day discharge protocol implementation trends in laparoscopic cholecystectomy in pediatric patients</td>
<td>Joanna Gould</td>
</tr>
<tr>
<td>SS2.13</td>
<td>Time-Driven Activity-Based Costing to Identify Opportunities for Cost Reduction in Pediatric Appendectomy</td>
<td>Yangyang R. Yu</td>
</tr>
<tr>
<td>SS2.14</td>
<td>Beneficial effects of mucous fistula refeeding in necrotizing enterocolitis neonates with enterostomies</td>
<td>Lau CT</td>
</tr>
<tr>
<td>SS2.15</td>
<td>Long-term outcome of bowel function for 109 consecutive cases of Hirschsprung’s disease: Comparison of the abdominal approach and transanal approach over 30 years of experience at a single institution</td>
<td>Shun Onishi</td>
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</tbody>
</table>
### MONDAY, APRIL 25, 2016

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Presenter/Institution</th>
</tr>
</thead>
<tbody>
<tr>
<td>11:15</td>
<td>PRESIDENT’S INVITED SPEAKER INTRODUCTION</td>
<td>Atsuyuki Yamataka</td>
</tr>
<tr>
<td></td>
<td>Outstanding Contributions of Pediatric Surgeons to Other Disciplines in Medicine</td>
<td>Prem Puri</td>
</tr>
<tr>
<td>11:45</td>
<td>COE MEDAL PRESENTATION</td>
<td>Atsuyuki Yamataka</td>
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<tr>
<td>12:00</td>
<td>GANS LECTURE</td>
<td>Devin Puapong</td>
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<tr>
<td></td>
<td>Polynesian Voyaging Society</td>
<td>Nainoa Thompson</td>
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### TUESDAY, APRIL 26, 2015

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Moderator</th>
</tr>
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<tbody>
<tr>
<td>6:45 - 7:30</td>
<td>POSTER PRESENTATION - SESSION 2</td>
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<td>Russell Woo</td>
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9:30        BREAK AND EXHIBITS OPEN

9:45        GASTROINTESTINAL-2

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**PAPS PRIZE - BASIC SCIENCE**

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**12:30**

**CONFERENCE TOUR**
### 6:45 - 7:30 POSTER PRESENTATION - SESSION 3 MODERATOR

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- John Meehan
- Satoshi Ieiri

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<td>Risk factors for long-term morbidity in patients with esophageal atresia.</td>
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### 8:30 THORACIC MODERATORS

- Steven Rothenberg
- Akiko Yokoi

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SS8.11 | Use of Transthoracic Cryoanalgesia during a Nuss Procedure | Sunghoon Kim |
SS8.12 | Slipping Rib Syndrome in Children: Surgical Cartilage Excision | Joanna Gould |

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9:45 | **NEONATAL** | **MODERATORS**
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| | Devin Puapong |
| | Rajendra Kumar |

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SS9.3 | Developmental Outcomes Following Surgery for Small Bowel Atresia | Andrew Holland |
SS9.4 | Diagnosis and management of postoperative complications in esophageal atresia patients | Haitao Zhu |
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**BREAK AND EXHIBITS OPEN**

**11:30**
**HEPATOBILIARY**

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**BREAK**

**13:30**
**PAPS MEMBERS MEETING**

**14:30**
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11:00 UROLOGY

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12:00 CONFERENCE ADJOURN
Conference Information
CONFERENCE INFORMATION

PAPS 2016 CONFERENCE SECRETARIAT
Hawai‘i Pacific Health
Conference Services
1100 Ward Avenue, Suite 1045
Honolulu HI 96814

Tel: 808-522-3469
Fax: 808-522-4455
Email: paps2016@hawaiipacifichealth.org

REGISTRATION
Registration will be held in the Grand Promenade.
Sunday April 24, 1500-1900
Monday April 25, 6:45
Tuesday April 26, 6:45
Wednesday April 27, 6:45
Thursday April 28, 6:45

NAME BADGE
Name badges will be provided to all delegates and participants when you check in at the PAPS 2016 registration desk. Please wear your name badge at all times. It is your admission pass to scientific meetings and all social program events.

TRANSPORTATION
Ground transportation can be arranged with Aloha Holidays. Contact Ms. Pat Coughlin for shuttle services.

Telephone: 808-943-0999
Fax: 808-942-4573
Email: alohahol@aol.com

ACCOMMODATION
The Grand Hyatt Kaua‘i Resort & Spa is the official conference hotel.

Grand Hyatt Kaua‘i Resort & Spa
1571 Poipu Road
Koloa, Hawai‘i 96756
Telephone: 808-742-1234

INTERNET
Wifi internet is available within the Grand Hyatt Kaua‘i Resort & Spa.

CERTIFICATE OF ATTENDANCE
All persons registered for the conference will receive a certificate of attendance.
GENERAL INFORMATION

CLIMATE
The average climate in Kaua‘i during the April months is fairly warm at 23.3 °C (73.94 °F) with afternoon temperatures reaching 26.4 °C (79.5 °F). Overnight temperatures have an average low of 20.3 °C (68.5 °F).

US CURRENCY – BANK INFORMATION
US Dollars and major credit cards are accepted. Banks are typically open from 8:00 – 17:00 on weekdays. Currency exchange services are available onsite at the Grand Hyatt Kaua‘i Resort & Spa.

STATE & RESORT TAXES
Hawai‘i has a 4.166 percent general excise tax (4.712% on O‘ahu) for most business activities and a 9.25 percent hotel tax.

ELECTRICITY
Electrical current is 110 – 125 volts AC (Alternating Current). If you are traveling with an electrical appliance, it is likely you will need an adapter, converter or transformer.

TIME ZONE
Hawai‘i is in the Hawai‘i-Aleutian time zone (HST). Hawai‘i does not observe daylight savings time. Coordinated Universal Time (UTC) /Greenwich Mean Time (GMT) for Hawai‘i is 10 hours standard time.

TIPPING AND GRATUITY
Tipping or gratuity are a gift of money for a service received. It is a customary practice in the United States.

QUARANTINE
Various state and federal agencies regulate the movement of plant materials and animals to and from Hawai‘i. The federal U.S. Department of Agriculture (USDA) inspection stations are located in front of the airline check-in counters.

For more information, see the “Travel and Shipping Information” at http://hdoa.hawaii.gov/pi/pq/travel-shipping-information/ or USDA “Traveler Information” at https://www.aphis.usda.gov/aphis/resources/travelers-int/
EDUCATIONAL OBJECTIVES
The PAPS Annual Meeting is designed to provide comprehensive continuing education in the field of pediatric surgery. It is PAPS’ intent to bring together the world’s leading authorities to present and discuss the most recent clinical and research efforts.

Our organization is focused on clinical pediatric surgery and the international, cross cultural sharing or clinically innovative surgical techniques. Surgeons at our meeting concentrate on learning the newest surgical techniques which may have initially been developed and popularized in one country and can now be applied on an international scale.

ORAL PRESENTATIONS
Presenters will have 5 minute presentations and 3 minute discussion in Full Oral papers, or 3 minute presentation and 2 minute discussion in Short Oral papers as indicated in the program. PAPS Prize presenters will have 5 minute presentations and 2 minute discussions. No time extension or dual projection will be permitted.

Oral presentations should be made in Windows PowerPoint and submitted to the technician in the speaker preparation room one day before your session. Please see below for speaker preparation room days and hours.

POSTER SESSIONS
Oral poster sessions will begin promptly at 6:45AM each morning. Please arrive early to ensure adequate time to transition to the Scientific Sessions in the main auditorium.

Oral poster presenters will have 2 minute presentations and 1 minute for questions. Please make sure your poster is in portrait orientation (90cm wide x 150cm tall) and hung in your assigned room and position by 7pm the day prior to your presentation.

Due to poster board constraints, posters will need to be taken down between 6pm and 7pm on the day of your presentation. Unclaimed posters will be discarded.

On Tuesday, April 26th, the conference tour will conflict with poster change times, so please take down and put up your posters immediately upon return to the Grand Hyatt that evening.

ORAL POSTER SUMMARIES
3 minutes for summary and discussion.
VIDEOS SESSIONS
Video presentations should be 3 minutes in duration with 2 additional minutes allotted for questions and discussion. All video presentations should be in MP4 format. Please test your presentations in the speaker ready room prior to your session.

SPEAKER PREPARATION ROOM
The Garden Isle Conference Room located next to the Grand Promenade has been allocated for the speaker preparation room and will be open during the following hours:

Sunday, April 24 1500-1800
Monday, April 25 630-1200
Tuesday, April 26 630-1200
Wednesday, April 27 630-1200
Thursday, April 28 630-730
GRAND HYATT KAUA‘I FLOORPLAN
SOCIAL PROGRAM INFORMATION

WELCOME RECEPTION

Sunday 24 April
Time: 1900-2100
Venue: Shipwreck Lagoon (on the beach)
Dress: Casual attire, beach footwear recommended

As a welcome to the PAPS 2016 Conference enjoy some drinks and “pupus” (Hawaiian word for appetizers) while networking with colleagues.
SOCIAL PROGRAM INFORMATION

ALOHA BANQUET (CONFERENCE DINNER)

Wednesday 27 April
Time: 1730-2145
Venue: Ilima Gardens
Dress: Casual attire
**CONFERENCE TOUR**

**Waimea Canyon**

**Wednesday 28 April**
- **Time:** 1730-2300
- **Venue:** Aloha Lane, Waikiki
- **Dress:** Casual Attire

Tour the “Grand Canyon of the Pacific” located on the west side of Kaua‘i with spectacular views of Waimea Canyon and great photo opportunities at the lookout. See Kaua‘i’s natural beauty and quaint towns.
Smith’s Tropical Paradise

This lush 30-acre botanical and cultural garden provides an idyllic escape to enjoy Mother Nature’s creations. See bamboo and fruit forests, flowering tropical areas and a Japanese-themed garden, live peacocks and birds.

Hawaiian Luau Dinner. Family-run for four generations, this luau features a great buffet dinner, imu ceremony and music. Enjoy traditional island flavors like kalua pork, beef teriyaki, chicken adobo, and sweet’n’sour mahimahi, and many other items.

The Rhythm of Aloha Show follows the luau feast. A cast of more than 25 beautifully-costumed singers, dancers, and musicians perform in an open-air torch-lit “Pele Amphitheater.” The show features authentic performances from Hawai’i, Tahiti, Samoa, Philippines, New Zealand, China and Japan.
Abstracts

Lighting of the torches, Grand Hyatt Kauaʻi
Expression of Prx1 and Tcf4 is decreased in diaphragmatic muscle connective tissue of nitrofen-induced congenital diaphragmatic hernia

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Background/Purpose
Recent evidence confirms that pleuroperitoneal folds (PPFs) and muscle connective tissue (MCT) are critical for the development of the fetal diaphragm. The protein paired-related homeobox 1 (Prx1) labels migrating PPF cells and stimulates expression of transcription factor 4 (Tcf4), a novel MCT marker, which regulates diaphragmatic morphogenesis. We designed this study to investigate the hypothesis that the diaphragmatic expression of Prx1 and Tcf4 is decreased in the nitrofen induced congenital diaphragmatic hernia (CDH).

Methods
Timed-pregnant rats were exposed to either nitrofen or vehicle on gestational day 9 (D9). Fetal diaphragms were microdissected on D13, D15 and D18, and divided into control and nitrofen-exposed specimens. Gene expression levels of Prx1 and Tcf4 were analyzed by qRT-PCR. Immunofluorescence-double-staining was performed to evaluate Prx1 and Tcf4 protein expression and tissue distribution.

Results
Relative mRNA expression of Prx1 and Tcf4 was significantly reduced in PPFs (D13), developing diaphragms (D15) and fully muscularized diaphragms (D18) of nitrofen-exposed fetuses compared to controls (Figure 1a). Confocal-laser-scanning-microscopy revealed markedly diminished Prx1 and Tcf4 expression in diaphragmatic MCT of nitrofen-exposed fetuses on D13, D15 and D18 compared to controls (Figure 1b-d).

Conclusions
Decreased expression of Prx1 and Tcf4 in the fetal diaphragm may cause defects in the PPF-derived MCT resulting in CDH in the nitrofen model.
SS1.2

Antibody blockade of Alpha4Beta7 Integrin ameliorates ischemia and reperfusion induced intestinal injury and systemic inflammatory response

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Background/Purpose
The current study was designed to determine the effects of antibody blockade of alpha4beta7 Integrin (LPAM-1) on the intestinal injury and systemic inflammatory response after intestinal ischemia and reperfusion injury (IR).

Methods
Mice were subjected to IR, with or without treatment with LPAM-1 monoclonal antibody. The intestinal injury and systemic inflammatory response in mice was determined by examining lymphocyte infiltration, intestinal permeability, intestinal lactate levels, lung myeloperoxidase activity, lung vascular permeability and serum cytokine levels. Survival of the mice was determined over a one week time period.

Results
Mice subjected to IR had increased lymphocyte infiltration in intestine. Antibody blockade of LPAM-1 attenuated the increased lymphocyte infiltration after IR (p < 0.05). Intestinal IR injury significantly increased mortality accompanied by increases in gut permeability, intestinal lactate levels, lung myeloperoxidase activity, lung vascular permeability and serum levels of IL-1beta, IL-6, TNF-alpha, IL-10 and TGF-beta (all with p < 0.05). Antibody blockade of LPAM-1 in mice attenuated IR-induced increases in mortality, gut permeability, intestinal lactate levels, lung MPO activity, lung vascular permeability and serum levels of IL-1beta, IL-6, and TNF-alpha (all with p < 0.05).

Conclusions
These findings demonstrate that antibody blockade of LPAM-1 attenuates intestinal injury and systemic inflammatory response after IR injury.

SS1.3

The role of T cell costimulating pathway in necrotizing enterocolitis

AUTHORS
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Department of Pediatric Nephrology

Background/Purpose
The pathogenesis of necrotizing enterocolitis (NEC) remains incompletely understood. Hypoxia-ischemia injury and bacterial colonization have been assumed to play an important role in the development of NEC. The role of T cell costimulating pathway is critical in immune response to ischemia/reperfusion injury (IRI) in hepatic and renal IRI model. We hypothesize that T cell costimulating pathway may be involved in the pathogenesis of NEC.
Conclusions
T cell costimulating pathway may play a critical role in the pathogenesis of NEC. Exploiting T cell costimulating pathway could lead to the development of new therapeutic agents to treat NEC.

SS1.4

Molecular hydrogen ameliorates necrotizing enterocolitis by decreasing oxidative stress via Nrf2 signaling pathway in rats

AUTHORS
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Background/Purpose
Necrotizing enterocolitis (NEC) is most common acquired gastrointestinal and surgical emergency and acts as a leading cause of death among preterm infants. Hypoxia/reoxygenation injury causes serious intestine complications. Molecular hydrogen (H2) has been shown to be effective in protecting various cells and organs against oxidative stress injury.

Methods
In vitro studies were carried out in an antimycin A or menadione stimulated cell model treated with or without H2, to determine the potential protective effects of hydrogen against oxidative injury and explore the underlying mechanisms.
In vivo study, NEC was induced in newborn rats, and hydrogen saturated formula was used as a therapeutic way to treat NEC pups.

Results
Our study revealed that H2 activated Nrf2 and downstream cytoprotective protein expression. H2 inhibited antimycin A induced cell apoptosis. Also, H2 increased Nrf2 activation and Nrf2 shRNA abolished the protective effect of H2 on antimycin A-induced cellular ROS production. A rat model of NEC indicated that H2 significantly attenuates ischemia/reperfusion intestine injury in vivo.

Conclusions
In conclusion, the inhibitory effects of H2 on the apoptosis and cytotoxicity of oxidative-stimuli cells, which take effect by activating the Nrf2 antioxidant pathway, might lead to an improvement in the prevention and treatment of NEC.

SS1.5

Intra-Tumoral Implantation of Vincristine-Loaded Sustained Release Silk Platform Increases Intra-Tumoral Drug Concentration and Decreases Tumor Growth While Minimizes Plasma Drug Concentration

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**Background/Purpose**
Neuroblastoma, most common pediatric extracranial solid tumor, is treated with systemic chemotherapy, which has significant morbidity. We hypothesized that intra-tumoral sustained-release delivery of vincristine can treat neuroblastoma with less systemic toxicity.

**Methods**
Human neuroblastoma cells KELLY were injected into mouse adrenal glands to create orthotopic tumors. At tumor volume >250mm3 on ultrasound, intra-tumoral application of silk foam with vincristine 50g (Vin50F), silk gel with no drug (ContG), vincristine 50g (Vin50G) or intravenous vincristine 50g (Vin50IV) was performed. End-point was tumor volume >1000mm3. Plasma and tumor drug concentrations of animals treated with Vin50F and Vin50IV were measured at 1, 3, 6, 12, 24 hours, 1, 2, 3 weeks post implantation. Kaplan Meier and Welch’s T-test were performed; p<0.05 was significant.

**Results**
Vin50G survived 24.78±8.64 days post injection, significantly longer than ContG, 5.6±2.37 days (p<0.0001) and Vin50IV, 13.25±0.96 days (p=0.002). Vin50F demonstrated superior suppression than Vin50G (p=0.02). Vincristine concentration in tumor was higher than serum throughout time with Vin50F: 7704.73ng/g vs. 5.5ng/mL at 6 hours, 3824.54ng/g vs. 6.12ng/mL at 24 hours, and 2054.05ng/g vs. 0.9ng/mL at 1 week (p<0.001). The tumor/plasma drug ratio was significantly higher with Vin50F compared to Vin50IV: 3361.68 vs. 384.63 at 1 hr and 4883.83 vs. 364.30 at 24 hrs (p<0.001).

**Conclusions**
Intra-tumoral sustained-release vincristine can decrease neuroblastoma tumor growth. Local application resulted in high tumor concentration with significantly less systemic absorption.
cofactor, and 2) gene expression of known Hpo components, in pediatric HCC.

Methods
Tumor tissue and non-neoplastic liver from 6 pediatric HCC patients (5 male, 1 female, mean age 11.08 years) was examined. YAP nuclear localization was assessed using immunofluorescence and quantified as a percentage of all nuclei. Expression of 84 Hpo-related genes was measured using a microarray (Qiagen) and real-time quantitative PCR.

Results
YAP nuclear localization was significantly increased in tumor cells (Table 1). Hierarchical clustering was performed using microarray expression (Figure 1). Six genes demonstrated significant changes across all tumors (Table 1). Cyclin E2 (CCNE2), a cell-cycle regulator and downstream YAP target, is significantly upregulated, in contrast to its paralog CCNE1. Tumor suppressor gene TJP2 is significantly downregulated.

Conclusions
YAP nuclear localization is significantly increased, implicating a role for Hpo in HCC. Imbalance between CCNE1 and CCNE2 has been implicated in cell-cycle dysregulation. The combination of positive nuclear YAP-high CCNE2-low TJP2 may be a unique signature of a subset of pediatric HCC.

SS1.7

A potent chemotherapeutic strategy in Neuroblastoma (S-trityl-L-cysteine) a novel Eg5 inhibitor

AUTHORS
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Children’s Hospital of Shanghai
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Children’s Hospital of Shanghai

Background/Purpose
Eg5 is a microtubule motor of the kinesin-5 family and has been shown to be crucial for mitosis, which is emerging as a new target for cancer chemotherapy. However, the anti-cancer activity of Eg5 inhibitor in Neuroblastoma remains an uncertain issue.

Methods
Immunohistochemistry; Immunofluorescence; WB; mRNA expression profile; Flow Cytometry

Results
Eg5 is a good target for Neuroblastoma chemotherapy, and STLC is a potent promising anticancer agent in NB. Eg5 expression was examined both in human NB cell lines and specimens from NB patients by Immunofluorescence, Western Blot and immunohistochemistry respectively. STLC could promote cell apoptotic and regulated the cell cycle progression at G2/M phase. Besides, we analyzed the involved pathway during this process by mRNA microarray and found the anti-tumor activity via MAPK and NF-KB signaling pathway.

Conclusions
We show for the first time in Neuroblastoma cells lines that dynein antagonizes Eg5 by STLC during bipolar spindle assembly induced cell apoptotic and cell cycle arrest, during this process, the involved signaling and associated molecules were detected. The identification of these signaling path ways sheds light on the mechanisms by which Eg5 inhibitor STLC mediated anti-tumor activity and will allow for the development of therapeutics that can target specific biomarker in the Neuroblastoma.
VS-5584, a novel PI3K/mTOR dual inhibitor, exhibited tumor-suppressing effects in human neuroblastoma cells

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Background/Purpose
The PI3K/ Akt/ mTOR pathway is closely related to oncogenesis of cancers including neuroblastoma. Since conventional mTOR inhibitors have the disadvantage of acquiring drug resistance through a feedback loop-activation on PI3K/AKT, new PI3K/mTOR dual inhibitors are developed. VS-5584 is one of such kind and has been proved to induce antitumor effects in several kinds of malignancies. In this study, we aim to study about the effect of VS-5584 on neuroblastoma cells since there is no report yet.

Methods
The effect of VS-5584 on proliferation and cell cycle was examined by MTT assay and flow cytometry, respectively. The expressions and activities of apoptotic pathway-related molecules were analyzed with western blotting.

Results
VS-5584 significantly inhibited the proliferation of neuroblastoma cells in a dose-dependent manner. With a 48-hour treatment duration, 5 micro-Molar VS-5584 inhibited the proliferation to 41.5% relative to control. VS-5584-treated cells also showed G1-arrest in their cell cycle (G1-proportion 48% vs. 25% for control). The targeting effect of VS-5584 was revealed by a completely block of AKT phosphorylation after treatment. The activation of apoptosis signaling was observed with elevated Bax and cleaved caspase proteins.

Conclusions
VS-5584 is a potential targeting therapeutic by comprehensive block on PI3K/ AKT/ mTOR pathway in neuroblastoma cells.

Donor Mesenchymal Stem Cell Trafficking after Trans-Amniotic Stem Cell Therapy (TRASCET) in a Normal Rodent Model

AUTHORS
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Department of Surgery, Children’s Hospital Boston
Trans-amniotic stem cell therapy (TRASCET) has emerged as a potential treatment for different congenital anomalies. We sought to examine normal donor cell kinetics after TRASCET.

Methods
Sprague-Dawley rat fetuses (n=65) were divided into three groups based on the content of volume-matched intra-amniotic injections on gestational day 17 - either a concentrated suspension of amniotic mesenchymal stem cells (afMSCs) labeled with a highly traceable firefly luciferase reporter gene (n=36); the luciferase protein alone (n=18); or saline (n=11). Infused afMSCs consisted of syngeneic rat cells phenotyped by flow cytometry. Tissue from ten organ systems from each fetus (total n=650) were screened via microplate luminometry at term (21-22 days). Statistical analysis was by Fisher's exact test and the Kolmogorov-Smirnov goodness-of-fit test (P<0.05).

Results
Donor afMSCs were identified in all fetuses, 97% (35/36) of which had cells in the placenta. In 8.3% (3/36) of the animals donor afMSCs were detected also in other organ systems. Luminometry was negative in all fetuses that received luciferase alone, or saline (P<0.001 vs. the afMSC group).

Conclusions
Amniotic mesenchymal stem cells home to the placenta after concentrated intra-amniotic injection. A hematogenous route via the placenta expands potential therapeutic applications of TRASCET beyond only exposed congenital anomalies.

Transplanted Neural Crest Cells Survived and Improved Gastrointestinal Motility in a Mouse Model of Aganglionosis

AUTHORS
Takumi Fujimura <fujitaku3@gmail.com>
Keio University

Background/Purpose
Gastrointestinal motility disorders caused by the disease of enteric nervous system has been remained as a field of therapeutic challenge. Hirschsprung disease (HD) is one of them. Most of the patients were recovered by surgical operation with satisfied bowel function; however some were not fully recovered because of the long aganglionic segment. For the future stem cell therapy, the neural crest derived cells (NCCs) is one of the best candidates which can give rise to the neural cells.

Methods
The genetically labelled mouse NCCs were cultured and transplanted in the aganglionic colon in the chemically induced aganglionosis mice (n=17). The transplanted cells were traced by in vivo imaging system and evaluated by immunohistochemistry that include some neural markers. The functional recovery was evaluated with the body weight and
with the stool weight change.

**Results**
The transplanted cells were survived in the aganglionic colon for several months and they differentiate into the neural lineage. Only the model mice of transplanted group showed decreasing of the residual stool in the colon (p = 0.000754).

**Conclusions**
Transplanted NCCs survived and facilitated the improvement of the gastrointestinal motility in the aganglionosis model. These results encourage the feasibility of the stem cell therapy for future treatment against HD.

**SS1.11**

**New treatment strategy using a biodegradable polydioxanone stent for tracheal stenosis in a rabbit model**

**AUTHORS**
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**Background/Purpose**
Congenital tracheal stenosis (CTS) is a rare condition and difficult to treat. Slide tracheoplasty is unsatisfactory for sever neonatal symptomatic CTS. This study aimed to evaluate biodegradable polydioxanone stents for tracheal stenosis in a rabbit model.

**Methods**
Female Japanese white rabbits, 9-10 weeks old, were used. A biodegradable polydioxanone stent (15 mm long and 5 mm diameter) was used. We scraped tracheal mucosa directly with a nylon brush following semicircular incision of the trachea. After scraping, tracheal stenosis was induced (control group, n=4). After 7 days of scraping, we incised the trachea again and inserted a stent into the trachea (stent group, n=4). Arterial blood gas analysis was monitored twice weekly for 1 month after the operation.

**Results**
In the control group, respiratory acidosis due to ventilatory failure was observed on postoperative days 7-10. Rabbits were killed at 11.5 days after scraping. Sever tracheal stenosis due to inflammatory granulation was detected at scraped areas in all rabbits. In the stent group, arterial blood gas analysis was normal at 28 days after stent insertion. The biodegradable stent maintained patency of the tracheal lumen and prolonged survival for 1 month.

**Conclusions**
The bildegradable stent is a promising new treatment method for tracheal stenosis.

**SS1.12**

**Ghrelin Improves Intestinal Mucosal Atrophy during Parenteral Nutrition: An Experimental Study**

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Background/Purpose
Total parenteral nutrition (TPN) induces mucosal atrophy of the small intestine. Ghrelin has hormonal, orexigenic, and metabolic activities. We investigated whether ghrelin improved intestinal mucosal atrophy using a TPN-supported rat model.

Methods
Sprague-Dawley rats underwent jugular vein catheterization, and were divided into four groups: oral feeding with normal chow ad libitum (OF), TPN alone (TPN), TPN plus high dose ghrelin (TPNHG) and TPN plus low dose ghrelin (TPNLG). Ghrelin was administered continuously at dosages of 50 or 10 g/kg/day. On day 6, the rats were euthanized and the small intestine was harvested and divided into the proximal jejunum and distal ileum, then the villus height (VH) and crypt depth (CD) were evaluated.

Results
TPN induced significant mucosal atrophy of VH and CD in the jejunum (Fig. 1a&b, Fig. 3a&b) and of CD in the ileum (Fig. 2a&b, Fig. 4b). TPNHG improved only VH of the jejunum (Fig. 1c, Fig. 3a). TPNLG improved VH and CD of the jejunum (Fig. 1d, Fig. 3a&b) and CD of the ileum (Fig. 2d, Fig. 4b). The improvement of TPNLG was significantly stronger than that in CD of the jejunum (Fig. 3b) and ileum (Fig. 4b).

Conclusions
TPN more strongly induced mucosal atrophy in the jejunum than in the ileum. Low dose intravenous administration of ghrelin improved the intestinal mucosal atrophy induced by TPN more effectively than high dose administration.
Background/Purpose
It is known that bile duct ligation (BDL, one of the commonly used BA animal models) contributes to liver fibrosis via bacterial translocation (BT) and toll-like receptor 4 (TLR4) signaling of hepatic stellate cells (HSCs). We have previously reported that Kampo-medicine “Dai-kenchu-to (TU-100)” prevents BT in rats with the stress of fasting. The aim of this study was to clarify the effect of TU-100 on BDL rat model.

Methods
BDL and subsequent daily oral administration of TU-100 was performed in rats. The rats were sacrificed at 3, 7 or 14 days after BDL for evaluating the liver injury, BT occurrence and hepatic fibrosis. As in-vitro experiment, TU-100 and its three component herbs (e.g. processed ginger, ginseng radix and Japanese pepper) were added to the freshly isolated HSCs. After 48h, the expressions of alpha smooth muscle actin (SMA), Alpha-1 type I collagen (colla1), and tissue inhibitor of metalloproteinase 1 (timp1) were analyzed.

Results

Conclusions
TU-100 prevented BT, activation of HSCs and subsequent hepatic fibrosis in BA rat model.

Do We Need a Prophylactic Removal of Urachal Sinus to Prevent Infection and Carcinoma? Findings from a Retrospective Analysis of 24 Consecutive Patients

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Background/Purpose
Symptomatic urachal sinus is frequently removed. However, it is not well-established whether asymptomatic urachal sinuses after infection should be removed by surgery.

Methods
We retrospectively reviewed the patients with urachal sinus experienced from 2008 to 2015. Urachal sinus was diagnosed by ultrasonography. Twenty-four consecutive patients (21 males and 3 females) aged 5-31 years were investigated.

Results
All patients presented with lower abdominal pain, redness and swelling of the umbilicus. 20 patients presented with discharge of pus. The length of sinuses was 14-75mm. All patients were treated with antibiotics. Umbilical granulation was improved using betamethasone valerate and gentamicin sulfate ointment in 9 patients. Abscess under the muscle layer was drained using a Nelaton catheter in 12 patients. Incision of abscess was required in 9 patients. Removal of urachal sinus was performed in 4 patients after possibility of infection and carcinoma had been explained. Urachal carcinoma usually occurs as adenocarcinoma just near the urinary bladder, but histological studies in 4 patients showed no adenocyte. No recurrence of infection or carcinoma was observed in all patients during the 38-months’ mean follow-up period.

Conclusions
Taken together, our retrospective survey may indicate that the prophylactic removal of urachal sinus should be reconsidered.

SS2.2

Malrotation with Obstruction: Reliability of Physical and Laboratory Examinations to Identify Volvulus

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Background/Purpose
We hypothesized that physical findings and laboratory values do not predict volvulus or intestinal compromise in children with malrotation.

Methods
With IRB approval, a 21-year retrospective review (1991-2012) was conducted at a tertiary children’s hospital. All patients with malrotation were identified and separated into three groups; uncomplicated malrotation, malrotation with volvulus, volvulus with intestinal ischemia. Vital signs, physical exam findings and laboratory values at initial presentation were collected and compared to the operative findings.
Results
Two-hundred-fifty-two patients were identified. 166 had uncomplicated malrotation, 80 had malrotation with volvulus and 6 had volvulus with intestinal ischemia. All presentations occurred most commonly in children <1 year of age (81%, 76%, 66%, respectively). In volvulus without intestinal ischemia, 90% were afebrile with normal heart rate, and an unremarkable abdominal exam; half had normal WBC, lactate and blood pH. Of those with intestinal ischemia, 83% had normal vital signs, nonspecific abdominal pain with an otherwise unremarkable exam, and half had a leukocytosis.

Conclusions
The diagnosis of symptomatic malrotation occurs most frequently in patients <1 year and the presence of normal vital signs, physical exam and laboratory values does not exclude volvulus or intestinal compromise. Therefore normal examination and laboratories are not reassuring and should not delay treatment.

SS2.3
In Vivo Continuous Measurement of Pressures and Flow Rates in Pneumatic Reduction of Pediatric Intussusception: How High Do We Go?

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Background/Purpose
Safety and efficacy of pneumatic intussusception reduction are dependent on management of intra-colonic pressures. We measure pressures and airflow rates during the procedure to assess operator’s control over these parameters. We also analyze the graphs and pattern associations with procedure outcomes.

Methods
A novel data logger was used to prospectively measure pressures and airflow rates during intussusception reduction at a tertiary pediatric hospital between January 2015-January 2016.

Results
Twenty cases had initial diagnosis of intussusception, 4 of which had no intussusception at the time of fluoroscopy. In 100% of the procedures, maximum intended pressure of 120 mmHg was exceeded, 75% of which went unrecognized by the radiologist. Twelve patients (80%) were successfully reduced at first attempt but 4 were not; two out of 4 reduced with a second attempt, 2 required surgery. Mean pressure for successful and unsuccessful attempts ranged from 44 to 81 and 45 to 100 mmHg respectively. Pressures above 120 mmHg occupied 4% to 53% and 10% to 38% of area under the time pressure graph for successful and unsuccessful attempts respectively.
Conclusions
Intra-colonic pressures during pneumatic intussusception reduction exceed intended thresholds more frequently than expected. Current means of intra-colonic pressure monitoring and control should be reassessed and optimized.

SS2.4

Outcomes of laparoscopic cholecystectomy for biliary dyskinesia in children

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Background/Purpose
To determine outcomes of laparoscopic cholecystectomy for pediatric biliary dyskinesia.

Methods
A retrospective review was performed on children (<21yrs) with biliary dyskinesia (gallbladder ejection fraction [EF]<35% or pain with cholecystokinin [CCK] on cholescintigraphy) treated with laparoscopic cholecystectomy between February 2010 to September 2015. Demographic, diagnostic imaging, pathology, and outcome data were collected, and relative risks calculated for the effect of body mass index (BMI), EF, and pain with CCK on symptom resolution.

Results
Laparoscopic cholecystectomy was performed in 221 children (71% female, mean age 13.9yrs, mean BMI 22.1). 85% had EF<35%, with CCK reproducing symptoms in 83%. 43% were lost to follow-up. Mean follow-up was 1 year; 67% had complete resolution of pain. Chronic cholecystitis was found in 87% and unexpected cholelithiasis in 3%. Post-operatively, 2% had wound infections and 3% required common bile duct stents (6 for sphincter of Oddi dysfunction/hypertrophy, 1 stricture). Pain with CCK predicted symptom resolution (RR1.9, 95%CI 1.2-2.9, P=0.004), while no differences were seen with BMI or EF.

Conclusions
Laparoscopic cholecystectomy for biliary dyskinesia is safe, with a moderate efficacy for symptom resolution. Outcomes may be improved in patients who have pain with CCK. Prospective studies examining outcomes of non-operative and surgical management of biliary dyskinesia are required.

SS2.5

The Effect of Thoracoscopy upon the Repair of Pectus Excavatum: a large single-centre experience

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**Background/Purpose**
The Nuss procedure is the most commonly performed operation to correct pectus excavatum (PE). Thoracoscopic visualisation has enhanced the operative approach. This study aimed to compare complications and clinical outcomes prior to, and following, the introduction of thoracoscopy.

**Methods**
An ethically-approved, retrospective review of all PE patients managed at a tertiary centre over an 11-year period (2005-2015) was performed. We studied operative and post-operative outcomes for all patients.

**Results**
A total of 217 Nuss procedures were performed (122 open, 95 thoracoscopic). Median patient age was 14.9 years, with the majority male (185/217, 85.3%). Patient demographics (age, gender, defect severity) in the two groups were comparable. The overall major complication rate was low (16/217, 7.4%). Major complications included cardiac arrest requiring internal cardiac massage, haemothorax, pneumothorax, empyema, bar displacement and infection. There was a significant reduction in major complications in the thoracoscopic group (11.5% vs 2.1%, p=0.009). Post-operative recovery was comparable between the two groups (duration of epidural, opioid analgesia, time to ambulation, length of stay). Of those assessed following Nuss bar removal, 90% had ‘good’ to ‘excellent’ cosmesis, with most unsatisfactory outcomes related to residual asymmetry.

**Conclusions**
Thoracoscopic vision during the Nuss procedure reduces the risk of major complications.

**SS2.6**

**AORN Wound Classification May Not Apply to Contemporary Operations in Children**

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**Background/Purpose**
Wound classification has catapulted to the forefront of surgical literature and quality care discussions. However, it has not been validated in laparoscopy or children. We analyzed pediatric infection rates based on wound classification and reviewed the most
common non-infectious complications which could be a more appropriate measure for quality assessment.

**Methods**

We performed a retrospective review of 800 patients from 2011-2014 undergoing 8 common procedures at a tertiary pediatric hospital. Demographics, procedure, wound classification and complications were analyzed using descriptive statistics.

**Results**

Infection rates were in the expected low range for clean procedures (Table). However, 5% of pyloromyotomy patients required readmission and 10% of circumcision patients developed penile adhesions, 2% required reoperation. Ostomy reversal, a clean contaminated case, had 17% wound infections, whereas acute appendicitis, a contaminated case had only a 4% infection rate. Laparoscopic cholecystectomy (clean-contaminated or contaminated depending on inflammation) had no postoperative infections. Perforated appendicitis, a dirty procedure had an 18% infection rate, below the expected >27% for dirty cases in adults (Table).

**Conclusions**

Current wound classifications do not accurately approximate the risk of surgical site infections in children, particularly for laparoscopic procedures. It would be more appropriate to grade hospitals based on disease and procedure specific complications.

**SS2.7**

**Intercostal Nerve Cryoablation for Pectus Excavatum Repair: Preliminary Outcomes in Twenty-Five Patients**

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**Background/Purpose**

Multimodal pain management strategies are used to control pain following pectus excavatum repair, however the optimal regimen has not been identified. In this study, we describe our early experience with intercostal cryoablation as a novel technique for pain management in children undergoing the Nuss Procedure.

**Methods**

A multi-institutional retrospective review of patients undergoing Nuss bar placement with intercostal cryoablation was conducted. The primary outcome was hospital length of stay (LOS). Secondary outcomes included operative time, ICU LOS, duration of intravenous narcotic use, and complications related to cryoablation.
Results
Twenty-five patients were identified. Nineteen were male (76%). Average age at repair was 15.6 years. Average Haller index was 4.3. All patients were also managed with on-demand intravenous narcotics and 23 patients had local infusion catheters. No epidurals were used. Average operative time was 110 minutes (54±166). Average hospital LOS was 3.4 days (2.0-4.4). Median ICU LOS was 1.5 days. 88% were weaned from intravenous narcotics by POD#2. No complications related to cryoablation were identified.

Conclusions
Intercostal cryoablation is a promising technique for postoperative pain management in children undergoing pectus repair. This therapy results in reduced time to hospital discharge, shorter ICU stays, decreased intravenous narcotic utilization, and has eliminated thoracic epidurals from our practice.

Mesenteric Lymphadenitis: an Essential Diagnosis in Patients Suspected of Appendicitis

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Background/Purpose
Appendicitis is one of common diseases consulted to pediatric surgeons. Mesenteric lymphadenitis, on the other hand, is not primarily recognized as differential diagnosis of acute abdomen. We investigated whether patients of suspected appendicitis were diagnosed as appendicitis, mesenteric lymphadenitis, or others.
Methods
A retrospective investigation was performed on patients under 15 of age presented to our department as suspected appendicitis. Diagnoses were made by clinical manifestations, physical examinations, blood tests, and imaging procedures as ultrasonography (US) and computed tomography scan. US findings mainly differentiated appendicitis and mesenteric lymphadenitis; the former diagnosed with appendix of its maximum diameter over 6mm, and the latter with one or more lymph nodes with the shortest diameter of over 4mm and/or the longest diameter of over 10mm.

Results
From 2009 to 2015, we experienced 213 patients of suspected appendicitis. Their definitive diagnoses included 88 (41%) of mesenteric lymphadenitis, 78 (37%) of appendicitis, 23 (11%) of constipation, 20 (9%) of enteritis. Patients diagnosed as mesenteric lymphadenitis were all successfully treated without surgical intervention.

Conclusions
Mesenteric lymphadenitis was the definitive diagnosis primarily made for the patients of suspected appendicitis, followed by appendicitis. Those diagnosed as mesenteric lymphadenitis can be treated conservatively.

SS2.9

Don’t forget the dose: improving computed tomography dosing for pediatric appendicitis

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Background/Purpose
A pediatric computed tomography (CT) radiation dose reduction program was implemented throughout our children’s associated hospital system in 2011. We hypothesized that the CT dose received for evaluation of appendicitis in children would be significantly higher among the 40 referral, non-member hospitals (NMH) than the 9 member hospitals (MH).
Methods
Pre-operative CTs of pediatric (<18 years) appendectomy patients between April 2012-April 2015 were reviewed. Size specific dose estimate (SSDE), an approximation of absorbed dose incorporating patient diameter, was calculated for each scan.

Results
1230 (71%) of 1736 appendectomy patients underwent pre-operative CT. Of the 989 patients seen at MH, 71% underwent CT; 83% of the 241 children evaluated at NMH received CT scans. 1130 CTs had dosing and patient diameter data for analysis. SSDE was significantly higher with greater variance at NMH across all ages (all p<0.05, Figure). In the most common age group, 10 year olds, mean SSDE was 11.3 mGy (95% CI 10.8-11.8) at MH compared to 15.6 mGy (95% CI 12.9-18.3) at NMH, p<.001.

Conclusions
Radiation exposure in CT scans for evaluation of pediatric appendicitis is significantly higher and more variable in NMH. A proactive approach to reduce frequency and dose of CT scans in pediatric patients is essential.

SS2.10
Increased Morbidity and Mortality in Cardiac Patients Undergoing Nissen Fundoplication: Evidence from NSQIP-P

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Background/Purpose
Infants with congenital cardiac disease (CCD) often require gastrostomy tube placement (GT) and may need an antireflux procedure such as a fundoplication. Our purpose was to evaluate risk factors and compare morbidity/mortality rates among infants with CCD undergoing GT, fundoplication, or both.

Methods
Using NSQIP-P, we identified 4070 patients <1 year old who underwent GT and/or fundoplication from 2012-2014. 2346 infants had CCD and were categorized as minor, major or severe as defined by NSQIP-P. Regression models were used to estimate the association of cardiac comorbidities with morbidity/mortality rates among infants with CCD undergoing GT, fundoplication, or both.

Results
Among patients undergoing fundoplication, there was an increased risk of morbidity/mortality among CCD patients compared to non-CCD patients (OR 2.15;p<0.001). Additionally, risk decreased when procedures were performed later in the first year of life and when performed laparoscopically. Using GT alone as a reference, fundoplication alone and GT with fundoplication had twice the odds of morbidity/mortality among cardiac patients (Figure). Increased risk persisted after stratification by severity of CCD and after accounting for surgical approach.
Conclusions
Fundoplication is associated with increased odds of morbidity in infants with CCD compared to GT alone. Risks are lower with laparoscopic approach and if surgery is delayed. Timing and surgical approach for patients with CCD requires further investigation.

The Impact of Cardiac Risk Factors on Outcomes for Children Undergoing a Ladd Procedure

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Background/Purpose
The purpose of this study was to describe the outcomes of children with and without congenital heart disease who undergo a Ladd procedure.

Methods
The 2012-2014 National Surgical Quality Improvement Program Pediatric (NSQIP-P) data were queried for patients undergoing a Ladd procedure. Utilizing NSQIP-P definitions, patients were categorized into four cardiac risk groups (none, minor, major, severe) taking into account severity of cardiac anomalies, previous cardiac procedure(s), and ongoing cardiac dysfunction. Ladd procedures were either elective or non-elective. Primary outcomes included 30-day mortality and any adverse event.

Results
878 patients underwent a Ladd procedure, of which 633 (72%) had no cardiac risk factors and 84 (10%), 109 (12%), and 52 (6%) had minor, major, and severe cardiac risk factors, respectively. Higher cardiac risk patients experienced increased mortality (p=0.054) and adverse events (p<0.001, Figure 1). Patients undergoing elective surgery had similar mortality rates but fewer adverse events (p=0.004) than patients undergoing non-elective surgery. Delayed elective repair was associated with decreased adverse events (Figure 2).

Conclusions
Although the overall mortality remains low, children with higher risk cardiac disease experience increased morbidity and mortality when undergoing a Ladd procedure. Delayed elective repairs may lead to fewer adverse events in children with and without cardiac risk factors.
**SS2.12**

**Same day discharge protocol implementation trends in laparoscopic cholecystectomy in pediatric patients**

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**Background/Purpose**
After investigating barriers for same day discharge (SDD) after laparoscopic cholecystectomy (LC), we employed a protocol we have followed with a prospective, observational study.

**Methods**
A single institution, prospective observational study was performed from July 2014-2015 (2nd period). This data was compared to our initial experience with a SDD protocol from January 2013 to July 2014 (1st period).

**Results**
A total of 203 LC were analyzed, 125 in the 1st period and 78 in the second period. In the 1st period, 46% were discharged the same day compared to 77% in the 2nd period (P<0.001). There was no difference in post-operative complications or readmissions between those discharged and those who spent the night. Additionally, there was no difference between admitted and SDD patients in age, BMI or gender. Reasons for admission included pain (11%), emesis (11%) and 1 patient had a syncopal event, however the majority stayed with no identifiable patient factor.

**Conclusions**
SDD after LC is safe and effective and implementing and revising a standardized clinical protocol can substantially improve the success of SDD.

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**SS2.13**

**Time-Driven Activity-Based Costing to Identify Opportunities for Cost Reduction in Pediatric Appendectomy**

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Background/Purpose
As reimbursement programs shift to value-based payment models that emphasize quality and efficient healthcare delivery, we hypothesize time-driven activity-based costing (TDABC) will reflect costs based on time providing care and identify cost-reduction opportunities in the management of simple appendicitis.

Methods
Hospital course mapping was performed using electronic medical record time stamps. Labor capacity cost rates were calculated using national median physician salaries, weighted nurse-patient ratios, and fiscal year 2014 hospital cost data. Consumable costs for supplies, pharmacy, laboratory, and food were derived from the hospital general ledger.

Results
Figure 1 shows the durations and costs of the seven phases of care for a hospital episode. The operating room (OR), hospital floor, and emergency department (ED) incurred the highest costs. Major contributors to length of stay were ED evaluation, OR availability, and post-operative monitoring. The TDABC model led to $1712.16 in personnel costs and $1041.23 in consumable costs for a total of $2753.39. Direct variable costs derived using traditional hospital accounting for all patients and inpatients only are 20% higher ($3303) and 46.3% higher ($4335), respectively.

Conclusions
Inefficiencies in healthcare delivery can be identified through TDABC. Triage-based standing delegation orders, early surgical consultation, and same day discharge protocols are proposed cost-reducing interventions to optimize value-based care for simple appendicitis.

Beneficial effects of mucous fistula refeeding in necrotizing enterocolitis neonates with enterostomies

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Background/Purpose
Fulminant necrotizing enterocolitis in premature neonates often results in bowel resection and stoma formation. One way to promote bowel adaptation before stoma closure is to introduce proximal loop effluents into the mucous fistula. In this study, we reviewed our experience with distal loop refeeding and compare its effect with the control group.

Methods
All patients with necrotizing enterocolitis between 2000 and 2014 necessitating initial diverting enterostomies and subsequent stoma closure in a tertiary referral centre were
included. Medical records were retrospectively reviewed. Demographic data, surgical procedures, and post-operative outcomes were analyzed.

**Results**

92 patients were identified in the study period. 77 patients received mucous fistula refeeding. The refeeding group showed less size discrepancy between the bowel ends (25 vs 53%, p=0.034) and less post-operative anastomotic complications (2.6 vs 20.0%, p=0.029). Less refeeding group patients developed parenteral nutrition related cholestasis (42 vs 73%, p=0.045) and required shorter parenteral nutrition support (47 vs 135 days, p=0.001). The peak bilirubin level was comparable between the two groups. No major complication was associated with refeeding.

**Conclusions**

Mucous fistula refeeding is safe, can decrease risk of anastomotic complication and parenteral nutrition related cholestasis. It provides both diagnostic and therapeutic value pre-operatively and its use should be advocated.

**SS2.15**

Long-term outcome of bowel function for 109 consecutive cases of Hirschsprung's disease: Comparison of the abdominal approach and transanal approach over 30 years of experience at a single institution

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**Background/Purpose**

Hirschsprung’s disease (HD) is considered to be curable, however, the postoperative long-term outcome is not always satisfactory. We analyzed the bowel function of these patients in our institution.

**Methods**

Patient data were collected from 1984-2015; 109 HD patients received definitive diagnoses and operations at Kagoshima University. Follow-up data of patients over 5 years were retrospectively analyzed. Bowel function was evaluated according to the
evacuation score (ES, defecation urgency, constipation, soiling, incontinence) of the Japan Society of Ano-Rectal Malformation Study Group at 3, 5, 7, 9 and 11 years of age.

Results
The extent of aganglionosis was short segment (ultra-short/recto-sigmoid): 87(79.8%), long segment: 19(17.4%), and total colon aganglionosis with/ without small intestine involvement: 3(2.8%). Operative procedures included Soave-Denda (SD:open approach, modified Soave): 70(64.2%), transanal endorectal pull-through (TA, including laparoscopy-assisted): 38(34.9%), and Duhamel: 1(0.9%). We compared SD with TA(Figure 1). The average ES score at each age was 3 y.o.(SD5.37 vs TA4.44, p=0.158), 5 y.o.(SD6.30 vs TA6.05, p=0.591), 7 y.o.(SD6.45 vs TA6.15, p=0.648), 9 y.o.(SD6.97 vs TA5.71, p=0.258), and 11 y.o.(SD7.35 vs TA6.20, p=0.306).

Conclusions
The ES of HD patients improves with age and all patients experience satisfactory bowel function for at least 10 years after operation, with no significant differences between the surgical approaches.

TUESDAY, APRIL 26, 2016
SCIENTIFIC SESSION 3 – CRITICAL CARE AND TRAUMA

SS3.1
Changing Profile of Safe Techniques for Inserting a Central Venous Catheter in Pediatric Patients - Improvement in Outcomes with the Experience of 500 Insertions in a Single Institution

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Background/Purpose
The ability to safely insert a central venous catheter (CVC) is critical to avoid associated complications. The aim of this study was to explore appropriate techniques to maintain the safety of pediatric patients during CVC insertion.

Methods
We reviewed surgical records of CVC insertion techniques and associated complications of 503 tunneled CVC insertion procedures performed from 2000 to 2015.
Results
Two hundred thirty CVCs (45.7%) were inserted into the subclavian vein using the landmark technique for 10 years. Only two pneumothoraces (0.4%) were experienced. In 2009, we adopted ultrasound-guided central venous catheterization from the internal jugular vein and 103 CVCs (20.5%) were inserted. This procedure led to penetration into the right innominate vein (0.2%) by the dilater sheath. Patient underwent repair of the penetrated vessel. After this serious complication, 170 CVCs (33.8%) were inserted using the venous cutdown procedure except two catheters. Because the number of accessible veins for cutdown was decreased due to frequent catheterization, two catheters were inserted using the landmark technique. No mechanical complications were experienced.

Conclusions
The venous cutdown method is the safest technique for inserting a tunneled CVC in pediatric patients. However, multiple vein occlusions due to repeated catheterization by venous cutdown lead to exhaustion of accessible vessels.

SS3.2

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Background/Purpose
Injuries and medical emergencies associated with snow shovel injuries are common in North America. The extent within the pediatric population has not been analyzed.

Methods
This is a retrospective analysis of data from the National Electronic Injury Surveillance System, analyzing the epidemiologic features of snow shovel-related injuries and medical emergencies in pediatric patients treated in US emergency departments (EDs) from 2005 to 2014.

Results
An estimated 16000 pediatric patients (95% CI 8500-24000) were treated in US EDs for snow-shovel-related incidents during the 10-year study period, averaging 1600 individuals annually. The average annual rate of snow-shovel-related injuries was 1.5 per 100,000 children. The most common diagnosis were soft tissue injuries (66%) - lacerations (55%), contusions (11%). Injuries to the head and face accounted for the majority of injuries encompassing 10% and 32% of cases respectively. The most common cause of injury was being struck by the snow shovel (61%). Patients required hospitalization in 3.1% of cases. Most snow shovel-related incidents (92%) occurred at home.

Conclusions
This is the first study to examine snow-shovel-related injuries in pediatric patients. In contrast to adults, the most common injuries involved being struck in the head or face - it may be that helmets are indicated for snow-shovelling children.
SS3.3

The clinical and epidemiological characteristics of simply traumatic spleen injury in children in China-- Single institute analysis

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Background/Purpose
This article is aimed to analyze imaging classification, clinical and epidemiological characteristics of closed traumatic spleen injury (CTSI) in children in China, to discuss the importance of imaging classification and feasibility of conservative treatment.

Methods
We retrospectively analyzed CTSI patients information (including age, gender, time and cause of injury and severity based on radiological findings, treatment, and clinical outcome).

Results
Between 2008 and 2014, 57 patients with CTSI were treated in our institution. Mean age was 7.25 years. Forty (70.18%) were male. Most patients were 6-10-year-old (43.86%). Thirty minutes to 2h after injury, they came to our hospital. The injury peak time was 15:00-20:00. The injuries were primarily caused by transportation accidents (43.86%), stumbling/falling from a height (40.35%). Twenty-six patients were grade II (45.61%), and 21 grade III (36.84%). The major clinical symptom was abdominal pain with or without vomiting. All patients were underwent conservative treatment. Only 1 was transferred to operation during the treatment. They all recovered well.

Conclusions
First of all we should make imaging classification universal in China. Conservative treatment is feasible for CTSI in children. Trauma epidemiology can guide children safety education.

SS3.4

Is football dangerous for children? A retrospective national database analysis of Emergency Department presentations

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**Background/Purpose**
There is increasing concern for pediatric football injuries, particularly concussions and cardiac arrests. We describe the epidemiology of youth sporting injuries, comparing four popular contact sports (football, basketball, hockey and wrestling) using a nationally representative database.

**Methods**
This study uses data from the National Electronic Injury Surveillance System to analyze the epidemiology of sports injuries in pediatric patients treated in US EDs. Data is presented as percentages of ED presentations related to individual sports.

**Results**
The mean age of patients injured at football was lower than basketball, hockey or wrestling. The highest proportion of concussions were in the hockey subset (36%) rather than football (20%, p<0.001). The highest proportion of cardiac compromise happened during wrestling (13%) rather than football (9.4%, p<0.001). Football players had the most internal abdominal organ injuries (0.3%) and were more likely to need admission to hospital.

Incidence of football injuries did not change between 2005-2014, approximately 340,000 per year (figure 1), during which the number of mortalities on sports fields/halls remained low across various sports (figure 2).

**Conclusions**
Football-players had smaller proportions of concussions than hockey and fewer cardiac incidents, but were more likely to need admission and had more internal abdominal injuries than basketball, hockey or wrestling.

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**The Burden of Pediatric Emergency Surgery: Delineating National Estimates & Predictors of Surgical Outcomes**

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Background/Purpose
Non-traumatic pediatric surgical emergencies comprise a significant portion of the surgical case-load of pediatric surgeons. This study aims to delineate national predictors of surgical outcomes among pediatric emergency surgery patients.

Methods
The Kids' Inpatient Database (2006-2009) was queried for patients(<18y) admitted emergently, who underwent a major-surgical intervention within 48h of admission. Primary procedure-codes were queried to identify the most common operations. Outcomes included major-complications (pneumonia, urinary tract infections, renal failure, cardiac arrest, acute respiratory distress, & sepsis/septic shock), in-hospital mortality, LOS and hospital-cost (2015 USD). Multivariable logistic-regression analyses were used to identify risk-factors from patient demographics, pediatric surgical-risk score, and hospital-level factors.

Results
A total of 244,627 records were included, weighted to represent 378,605 patients nationally. The majority were White(45.4%), had private insurance(50.2%), and were treated at teaching hospitals(62.7%). Crude-rates of mortality and major-complications were 0.9% and 3.7%, respectively. Median LOS and cost were 2(IQR:1-4)days and $8,804(IQR:5,781-14,938), with an estimated total national cost, of $1,666,619,210 per year. The most common procedures performed were appendectomies(38.9%), pyloromyotomies(4.7%), and laparoscopic-cholecystectomies(2.7%). Younger, minority(non-White), lower-income, and teaching hospital-presenting patients experienced consistently worse outcomes for both morbidity and mortality (p<0.05)(Table).

Conclusions
This study takes an important first step towards benchmarking emergency surgery needs in children, utilizing a nationally-representative sample.

A closer look at non-accidental trauma: caregiver assault compared to non-caregiver assault

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Background/Purpose
The purpose of this study was to examine the outcomes of non-accidental trauma (NAT) patients compared to accidental trauma (AT) patients at a children’s hospital and across the state. In addition, NAT and AT patients with a mechanism of injury of assault were further compared.
Methods
Institutional (2007-2012) and statewide databases (2009-2014) were reviewed for patients aged 0-18 years who presented following trauma. Patients were sorted by admitting diagnosis into two groups: rule out NAT and all other diagnoses. Patients with a mechanism of assault were analyzed and outcomes were compared.

Results
There were 4,039 patients in the institutional database and 46,557 patients in the state database. NAT patients were younger, had more severe injuries and a higher mortality rate compared to AT patients (Table 1). Assault was the mechanism of injury in 100% of NAT patients in the institution and 95% of NAT patients in the state. NAT assault patients were younger, required more intensive care unit (ICU) resources, and had a higher mortality rate compared to other assault patients (Table 2).

Conclusions
Non-accidental trauma patients require more resources and have a higher mortality rate compared to accidental trauma patients, and these differences remain even when controlling for the mechanism of injury.

SS3.7

The Influence of Insurance Status on the Probability of Transfer for Pediatric Trauma Patients

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Background/Purpose
To evaluate the association of insurance status on the probability of transfer of pediatric trauma patients to level I/II centers after initial evaluation at lower level emergency departments.

Methods
Retrospective review of all pediatric trauma patients (age < 16 years) registered in the 2007-2012 National Trauma Data Bank. Regression techniques controlling for clustering at the hospital level were used to determine the impact of insurance status on the probability of transfer to level I/II trauma centers.
Results
Of 38,205 patients, 33% of patients (12,432) were transferred from lower level centers to level I/II trauma centers. Adjusting for injury characteristics and demographics, children with no insurance had a higher likelihood of transfer than children with private insurance (Table 1). Children with public or unknown insurance status were no more likely to be transferred than privately insured children. There were no variable interactions with insurance status.

Conclusions
Among pediatric trauma patients, lack of insurance is an independent predictor for transfer to a major trauma center. While burns, severely injured, and younger patients remain the most likely to be transferred, these findings suggest a triage bias influenced by insurance status. Additional policies may be needed to avoid unnecessary transfer of uninsured pediatric trauma patients.

SS3.8

Effects of Pre-hospital variables on Pediatric Trauma Outcomes

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Background/Purpose
The purpose of this study is to understand the impact pre-hospital and emergency department (ED) variables on the outcomes of pediatric trauma.

Methods
All traumatically injured pediatric patients (age ≤ 14) with either blunt or penetrating mechanisms were extracted from the 2008-2015 Southwest Texas Regional Advisory Council for Trauma (STRAC) database. Demographics, injury codes, transport times, vitals, and outcomes were evaluated. Standard descriptive statistical methods were used; p values <0.05 were considered significant.

Results
8,004 patients met inclusion criteria; Caucasian (26%), Hispanic (67%), African-American (4.7%); 5±4 (0-13) years of age and 62% male. Mechanism of injury included blunt (n=5684, 71%), penetrating (n=604, 7.5%), and thermal (n=1692, 21%). Composite mortality was 2% (n=164/8004). Mean ISS was significantly higher in the non-survivor group (30 [25,43] v 4 [1,9], p<0.0001). Patients who died had significantly lower GCS, systolic blood pressure, and heart rate at initial transport and at the ED (p<0.0001). Only 2,530 patients had reported transport times and did not differ in patients who died.

Conclusions
We conclude pre-hospital variables do predict the outcomes in pediatric trauma patients, with those arriving hypotensive and tachycardic at higher risk for mortality. Further pediatric research must include en-route care data in order to improve over-all outcomes in patients.
SS3.9

Application of a Low Risk Decision Rule for Blunt Abdominal Injuries in Children with Moderate to Severe Head Injuries

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Background/Purpose
A prediction rule of 7 findings, including Glasgow Coma Scale (GCS) >13, identified children at low risk for clinically important intra-abdominal injury (IAI) in whom CT scan could be avoided. We applied this rule, except GCS > 13, to evaluate the performance of the rule in children with moderate to severe head injuries.

Methods
Retrospective review of pediatric patients with blunt abdominal trauma and GCS < 14 from 2006-2013. Patients were stratified as low risk if there was no seat belt sign, abdominal tenderness, thoracic tenderness, abdominal pain, decreased breath sounds or vomiting. Clinically important interventions included laparotomy, angiographic embolization, blood transfusion for intra-abdominal hemorrhage or IVF for 2 or more nights for pancreatic/GI injuries.

Results
51/89 (57%) met the low risk criteria. Gender, age, GCS at presentation and ISS (Injury Severity Score) did not differ between the low risk and at risk groups. 3/51 (6%; 95%CI: 0, 12%) met low risk criteria requiring intervention for IAI (3 laparotomies; 2 transfused).

Conclusions
We were unable to low risk stratify children with moderate to severe head injury using the low risk decision rule without GCS. GCS appears to be an important variable for risk stratification to identify clinically important injuries in children with blunt abdominal trauma.

SS3.10

Cardiac Ultrasonographic Predictors of Poor Prognosis in Congenital Diaphragmatic Hernia

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Background/Purpose
To investigate cardiac ultrasonographic parameters in relation to the outcomes of isolated left-sided congenital diaphragmatic hernia (CDH).

Methods
This retrospective study was conducted by the national survey of CDH patients between 2006 and 2010. Patients in this study did not have severe cardiac malformations and chromosomal aberrations. The patients who had incomplete cardiac ultrasonographic parameters were excluded. 84 patients with left-sided isolated CDH were included in this study. The prognostic parameters were selected from postnatal cardiac ultrasonographic parameters after birth within 24 hours.

Results
8,004 patients met inclusion criteria; Caucasian (26%), Hispanic (67%), African-American (4.7%); 5±4 (0-13) years of age and 62% male. Mechanism of injury included blunt (n=5684, 71%), penetrating (n=604, 7.5%), and thermal (n=1692, 21%). Composite mortality was 2% (n=164/8004). Mean ISS was significantly higher in the non-survivor group (30 [25,43] v 4 [1,9], p<0.0001). Patients who died had significantly lower GCS, systolic blood pressure, and heart rate at initial transport and at the ED (p<0.0001). Only 2,530 patients had reported transport times and did not differ in patients who died.

Conclusions
This study showed the factor to predict the poor prognosis was smaller diameter of right pulmonary artery and smaller left ventricular diastolic diameter.

TUESDAY, APRIL 26, 2016
SCIENTIFIC SESSION 4 – GI-1

SS4.1
A Pain in the Butt: ND:YAG Laser Therapy for Rectal and Vaginal Venous Malformations

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Background/Purpose
Limited therapeutic options exist for rectal and vaginal venous malformations (VM). We describe our center’s experience using ND:YAG laser for targeted ablation of abnormal veins to treat mucosally involved pelvic VM.

Methods
Records of patients undergoing non-contact ND:YAG laser therapy of pelvic VM at a tertiary children’s hospital were reviewed. Symptoms, operative findings/details, complications, and outcomes were evaluated.

Results
Eight patients (ages 0-24) underwent ND:YAG laser therapy of rectal (Figure) and/or vaginal VM. Rectal bleeding was present in all patients, and vaginal bleeding in all females (5/8). 5/6 patients had extensive pelvic involvement on MRI. Typical settings were 30 watts (rectum) and 20-25 watts (vagina), with 0.5-1.0 sec pulse duration. No adverse events occurred and all patients underwent same-day discharge. Treatment intervals ranged from 14 to 127 (average=55) weeks, with 5.6-year mean follow-up. 4/8 patients experienced symptom relief with a single treatment. Serial treatments managed recurrent bleeding successfully in all patients, with complete resolution of vaginal lesions in 44% of cases.

Conclusions
ND:YAG laser treatment of rectal and vaginal VM results in substantial improvement in lesions and symptom control, with low complication risk. Given the high morbidity of surgical resection, ND:YAG laser treatment of pelvic VM should be considered as first line therapy.

SS4.2

Nation-wide survey of pediatric surgery in Japan: The first report on pediatric surgery from National Clinical Database

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Background/Purpose
The National Clinical Database (NCD), a nation-wide surgical registry linked to the board certification system in Japan, was initiated in 2011 and covers 95% of all surgical procedures. We firstly report on the status of Japanese pediatric surgical practices from NCD data.

Methods
All pediatric surgical procedures performed between 2011 and 2012 in pediatric surgical institutions were enrolled. Patient, surgeon, and institutional data, including 30-day mortality, were analyzed.

Results
During the study period, 96,571 pediatric surgical procedures were registered. Board-certified pediatric surgeons participated in 81.9% of these procedures. The numbers of neonatal and infantile procedures were 5,012 and 19,807, respectively. Major procedures included inguinal hernia repair ($n = 38,377$), appendectomy ($n = 9,224$), operation for Hirschsprung disease ($n = 470$), biliary atresia ($n = 317$), neonatal esophageal atresia ($n = 260$), and congenital diaphragmatic hernia ($n = 181$). The 30-day all-cause mortality in neonates, infants (1-11 months), and children (1-15 years) was 4.11%, 0.73%, and 0.14%, respectively.
Conclusions
This study revealed the nationwide actual numbers of procedures and the low mortality in pediatric surgical patients in Japan. The upgraded version, NCD-Pediatric, has launched in 2015 to evaluate risk-adjusted outcomes, and will provide international comparison and quality improvement in pediatric surgery.

SS4.3

Screening for associated anomalies in anorectal malformations: the need for a standardised approach

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Background/Purpose
Anorectal malformations (ARM) are common congenital abnormalities of the terminal hindgut. The high incidence of associated anomalies necessitates systematic screening. Screening investigations should include renal and spinal ultrasonography, spinal radiography and an echocardiogram. This study aimed to determine the incidence of associated anomalies in ARM, and whether screening protocols were appropriately applied.

Methods
A retrospective review was performed of all ARM patients managed at a tertiary centre over a 15-year period (2000-2014). Data collected included ARM type, presence of associated anomalies, as well as utilisation of renal and spinal ultrasonography, spinal radiography and echocardiography.

Results
A total of 243 patients (male - 146/243, 60%) were reviewed. The most frequent ARM types were perineal fistula (83/243, 34%) and rectovestibular fistula (40/243, 16%). Full screening was performed in 153/243 (63%), while 18/243 (7%) received no screening. In fully screened patients, associated anomalies were diagnosed in 143/153 (93%), with cardiovascular, renal and musculoskeletal anomalies being most frequent.

Conclusions
The high incidence of associated anomalies identified in fully screened ARM patients highlights the importance of systematic screening. Clinically significant anomalies may have been overlooked in the 37% of ARM patients, in whom screening was incomplete or absent. Standardised screening protocols for ARM patients have now been implemented.
The Operative Management of Children with Complex Perianal Crohn’s Disease

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Background/Purpose
Initial operative management of perianal Crohn’s disease (PCD) requires adequate abscess drainage during medical therapy. However, more invasive surgical intervention may be required in children with inadequate response or extensive disease. We reviewed our institutional experience with this complex group of patients.

Methods
We performed an IRB-approved retrospective review of all 57 children undergoing operative intervention for PCD at a tertiary pediatric hospital (2002-2014).

Results
Fourteen of 57 PCD children were considered to be complex as they failed medical therapy and simple operative interventions (abscess drainage +/- Seton placement). These 14 children were significantly younger at diagnosis of PCD. All 14 underwent a diverting stoma. Seven patients required further extensive operations (subtotal colectomy - 4, anus-sparing proctocolectomy - 1, proctocolectomy including anus - 4). Plastic surgery provided multi-staged reconstruction for four children. After a median of 72 months (range 36-116), only 2/14 children had undergone stoma reversal. No patient had ongoing perianal sepsis or non-healing perineal wounds.

Conclusions
Major surgical intervention and long-term diversion are necessary in a small subset of children with severe and medically refractory perianal Crohn’s disease. Plastic surgery intervention may be required for the successful management of this population.

Longitudinal time-course changes of postoperative pain following single-incision laparoscopic appendectomy in children: a prospective case control study

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Background/Purpose
It is uncertain if single-incision laparoscopic surgery (SLA) can effectively reduce postoperative pain. We sought to evaluate time-course changes of pain following SLA compared to conventional laparoscopic appendectomy (CLA).

Methods
Two hundred and seventy children underwent SLA or CLA from 2013/08 to 2015/11. Pain was measured by 10-visual analog scale (VAS) at resting, walking and coughing. Changes of pain were assessed by a series of delta-pain scores (VAS post-op day 1, 2, 3 - preoperative day). Differences of those were compared between two groups by mixed model analysis. Subgroup analyses were also performed in patients with simple or complicated appendicitis separately.

Results
A series of delta-pain scores were significantly higher in SLA at coughing and walking (p=0.01), whereas those were not different at resting. SLA for both simple and complicated appendicitis showed a higher series of delta-pain scores compared to CLA (p=0.01 and 0.03, respectively). The delta-pain score of SLA at coughing increased on post-operative day 1 (0.60±2.90, p=0.02). Contrary to CLA, SLA did not significantly reduce delta-pain score at walking on post-operative day 1 (-0.81±2.9, p=0.00 and -0.32±3.1, p=0.25, respectively).

Conclusions
Recovery from postoperative pain after SLA may be slower than CLA. SLA could temporarily aggravate postoperative pain on activity in children.

SS4.6

Recto-bulbar fistula is better outcome than recto-prostatic fistula in male with imperforate anus, irrespective of surgical procedures: First report

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Background/Purpose
There is no report comparing the outcome between recto-bukbar fistuka (RBF) and recto-prostatic fistuka (RPF) in male imperforate anus (MIA).

Methods
A retrospective review of patients with ileocolic intussusception from December 2011-December 2014 was performed at a children’s hospital. Patients were categorized into admitted or outpatient groups.

Results
Both RBF and RPF groups were similar for mean age at repair, mean weight at repair, and sacral status. Postoperatively, mean MRI scores, mean RAA were also similar. RBF cases had consistently higher FCE comparing RPF in both LAARP and PSARP, respectively (Figure 1), although not significant in both procedures. There were no significant differences between RBF and RPF regarding minor wound infections, rectal mucosal prolapse, C-reactive protein and requirement for postoperative analgesia (Table1).

Conclusions
We first showed the data indicating the RBF has better outcome than RPF, irrespective of surgical procedures.

SS4.7
A 40-year Nationwide Survey of 4939 patients of Hirschsprung’s disease in Japan

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Background/Purpose
To study the changing profile of Hirschsprung’s disease (HD) in Japan, a retrospective nationwide survey was carried out.

Methods
Patient data were collected in 4 phases: group 1, between 1978 and 1982, group 2, between 1988 and 1992, group 3, between 1998 and 2002, and group 4, between 2008 and 2012, respectively.

Results
The incidence and the male/female ratio were almost same over time (1/4895 newborn and 2.9:1 in group 4). The patients with family history increased to 7.1% in group 4, comparing to 2.8-6.0% in other groups. The Extent of aganglionosis was almost the same in each group (Fig.1). Regarding the definitive operation, transanal endorectal pull-through (TAEPT) was the most popular operation in group 4 (49.6%, Fig.2). In addition, laparoscopy-assisted operations had increased up to 46.9% in group 4, comparing to 29.7% in group 3 (Fig.2). The incidence of preoperative enterocolitis and the mortality rate in group 4 were 17.2% and 2.4%, respectively, markedly decreasing compared to group 1 (29.2% and 6.5%, respectively).

Conclusions
A primary operation without laparotomy, including TAEPT and laparoscopy-assisted operations, has become the first choice for a definitive operation of HD in Japan. The mortality rate has decreased over time.

SS4.8

Acquired Hypoganglionosis in Japan; Based on a Nationwide Survey in 10 Years

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Background/Purpose
Hypoganglionosis (HG) has been proposed to be one of the allied disorders of Hirschsprung’s disease (ADHD). This study aimed to investigate the incidence and treatment of acquired HG in Japan.

Methods
As a nationwide retrospective cohort study, the questionnaires asking the number of each disorder from 2001 to 2010 and the clinical and pathological data, were sent to the major institutes of pediatric surgery or gastroenterology in Japan. Of 355 ADHD cases collected, 5 definitive acquired HG were extracted.

Results
The onset was at 13-17 years of age (n=3), 4 years of age (n=1), and 4 months of age (n=1). The symptoms included abdominal distension/chronic constipation...
(n=4) and intestinal perforation (n=1). The involved segments showed dilatation and the extents of dilatation varied in each case. All five cases underwent multiple operations (average: 4.6 times), such as enterostomy, resection of dilated intestines, and/or pull-through. All five cases showed the degeneration and decrease of ganglion cells in the resected intestine, whereas the plexus size was normal. Currently, all five cases were alive.

Conclusions
Acquired HG is rare but distinct entity, characterized as the degeneration and decrease of ganglion cells. The outcome is considered to be favorable, whereas requiring multiple operations.

SS4.9

Hirschsprung disease associated enterocolitis: the impact of long-segment disease

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Background/Purpose
Hirschsprung disease (HD) is a congenital anomaly characterised by aganglionosis of the distal intestine. Hirschsprung disease associated enterocolitis (HAEC) is the most significant cause of morbidity and mortality in affected patients. This study aimed to determine the incidence of HAEC in our HD cohort, and the association between the extent of aganglionosis and recurrent episodes of HAEC.

Methods
A retrospective review was performed of all HD patients managed at a tertiary centre over a 20-year period (1995-2014). Episodes of HAEC were identified using admission histories, radiological investigations, and treatment regimens. Recurrent HAEC was defined as ‘three or more episodes’.

Results
210 patients (male - 169/210, 80%) were reviewed. The majority (79%) of patients had rectosigmoid aganglionosis, whilst 9% of patients had total colonic aganglionosis. The Soave pull-through was the predominant form of definitive repair (83%). HAEC occurred in 48/210 (23%), with a minority (8/48, 17%) affected prior to definitive repair. Those affected had a median of 1 admission (range 1 - 9). Recurrent episodes of HAEC were statistically less common in those with rectosigmoid disease (p < 0.05).

Conclusions
Hirschsprung disease associated enterocolitis affected almost one-quarter of patients. Those with rectosigmoid disease were less likely to be affected by recurrent enterocolitis.
SS4.10

Radiological transition zone in the diagnosis and determine the dysganglion bowel range in Hirschsprung’s disease

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Background/Purpose
The purpose of this study was to investigate the diagnose value of radiological transition zone (RTZ) in patients with Hirschsprung’s disease (HD).

Methods
A retrospective observational study of children who had undergone contrast enema (CE) and primary pull-through operations were performed. The RTZ were carefully recorded and analyzed. Two pieces of full-thickness bowel wall which above 5 cm of RTZ and below 5 cm of RTZ were obtained, and used for hematoxylin and eosin stain (HE) to test ganglion cells. The pathological TZ in this study was defined as present of ganglion cells in the bowel above 5 cm of radiological TZ and absence of ganglion cells in the bowel below 5 cm of radiological TZ.

Results
Total 226 patients were enrolled in this study. Sensitivity and specificity for a RTZ in CE were 86.9% and 92.1%. The positive predictive value (PPV) of this test was 91.7 % and the negative predictive value (NPV) was 87.6 %. Youden index was 79.0 %. Consistency check Kappa value=0.804, P<0.001.

Conclusions
RTZ has a high predictive value for diagnosis of HD. It also has the potential value to judge the length of resected bowel in patients with HD.

SS4.11

Diagnostic value of rectal suction biopsies using calretinin immunochemical staining in hirschsprung’s disease

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Background/Purpose
The study aims to investigate the diagnostic value of calretinin immunochemical staining (CIS) on rectal suction biopsies (RSB) in Hirschsprung's disease (HD).

Methods
A prospective study was conducted at Children's Hospital from January to June 2015. Patients suspected of HD during this period were submitted to RSB and followed up to 6 months in order to assess the accuracy of the diagnostic test with CIS and to compare this with conventional histology (H&E).

Results
Eighty-six children with RSB were investigated. Median age was 6.6 (range 0.2 - 159) months with 62% of boys. HD was confirmed in 31 (36%) children. There was 1 false positive and no false negative case. The sensitivity and specificity was 100% (31/31) and 98.2% (54/55) for CIS and 100% and 89.1% for H&E, respectively. Cohen's Kappa concordance coefficient was 0.9756 for CIS and 0.9234 for H&E, with a diagnostic accuracy of 99% and 93% for CIS and H&E, respectively. There was no serious complication related to the RSB.

Conclusions
Rectal suction biopsy with CIS is a simple, useful diagnostic method for HD; no need of cryostat and easy interpretation. Importantly, CIS has a greater diagnostic accuracy, and could be the first choice in the diagnosis of HD.

SS4.12

Outcomes in Children with Hirschsprung Disease and Trisomy 21

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Background/Purpose
We sought to compare enterocolitis rates and bowel function between children with Hirschsprung Disease (HD) alone and those with HD and Trisomy 21 (T21).

Methods
A retrospective cohort study of all patients with HD treated at our pediatric colorectal center (2011-2015).

Results
11 out of 55 patients (20%) had HD and T21. Median follow up was 57 months. One or more episodes of enterocolitis occurred in 25 (57%) with HD compared to 4 (36%) HD+ T21 (p=0.20). Median time to first episode of enterocolitis (figure), hospitalizations for enterocolitis and total episodes of enterocolitis were similar between the groups. 32 patients were old enough (4 years old) to assess toilet training (25 HD, 7 HD+T21). One child with HD+ T21 was toilet trained by age 4
years compared to 12 with HD (p=0.2). Laxative or enema therapy was required for constipation management in 57% HD compared to 64% HD+ T21.

Conclusions
Outcomes in children with Hirschsprung disease and Trisomy 21 are similar to children with Hirschsprung’s alone. A significant number of patients in each group had constipation requiring laxative or enema therapy and those with Trisomy 21 tended toward delayed toilet training. The initial enterocolitis episode did not occur after 25 months post operatively.

TUESDAY, APRIL 26, 2016
SCIENTIFIC SESSION 5 – GI-2

SS5.1

Predictors for bowel resection and the presence of a pathological lead point for operated childhood intussusception: A multi-centre study

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Background/Purpose
Intussusception may require bowel resection. Here, we aim to define factors that predict the need of bowel resection and the presence of pathological lead point.

Methods
A retrospective review was taken from three tertiary centres for all operated intussusception patients from January 2010 to December 2014. Patient demographics were recorded. Statistical analysis was performed and risk factors were derived by binary logistic regression.

Results
5,096 patients were treated for intussusception with 73 (57 male, 16 female) operated. The median age was 23.2 months and median duration of symptoms was 2 days. 28 patients (38.4%) required bowel resection. Logistic regression demonstrated that older age (p=0.018) and longer duration of symptoms (p=0.009) were associated with bowel resection. Furthermore, older age was a predictive factor for the presence of a pathological lead point (p=0.01). A palpable abdominal mass was also found to be associated with the need of bowel resection (risk ratio 2.3) and the presence of pathological lead point (risk ratio 2.3) independently.

Conclusions
Older age at presentation and a longer duration of symptoms are positive predictors for the need of bowel resection in intussusception. The presence of a pathological lead point is more likely in older children.
**Outpatient management of ileocolic intussusception after successful enema reduction**

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**Background/Purpose**
The purpose of this study was to determine the outcomes of patients with ileocolic intussusception managed on an outpatient basis compared to those treated with hospital admission.

**Methods**
A retrospective review of patients with ileocolic intussusception from December 2011-December 2014 was performed at a children’s hospital. Patients were categorized into admitted or outpatient groups.

**Results**
Fifty four patients were identified; 31 admitted and 23 outpatient. There were no significant differences in age, gender, or length of symptoms. The admitted group had more enema reductions (1.87 vs 1.22, p<0.05), a higher rate of surgical consultation (45.2% vs 13.0%, p<0.05), a longer time from reduction to discharge (44.2 hours vs 15.8 hours, p<0.05), and a longer total length of stay (2.4 days vs 0.8 days, p<0.05). None in the outpatient group and 10 in the admitted group required operative intervention. The outpatient group had no significant differences in 30 day recurrence rates (8.7% vs 16.1%, p=0.685) or visits to the emergency department (34.8% vs 16.1%, p=0.197). There were no complications in either group.

**Conclusions**
Pediatric patients who undergo successful enema reduction for ileocolic intussusception can be discharged home without higher rates of complications or recurrence. Instituting a fast track protocol may improve resource utilization.

**Immediate Attempted Primary Gastroschisis Repair: A 16 Year Review Of Our Clinical Pathway With Improved Results**

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Background/Purpose
Our multidisciplinary clinical pathway for management of gastroschisis, which involves immediate attempted abdominal closure, was reviewed over a 16 year period.

Methods
A retrospective review of all neonates that underwent GS repair at our institution was performed. Our protocol includes prenatal counseling, fetal ultrasounds, scheduled cesarean section between 36-38 weeks, and attempted complete reduction of GS defect within 90 minutes of birth. Primary Repair was defined as complete abdominal reduction with closure via the original defect. Complicated GS was defined as intestinal atresia, stenosis, and/or perforation.

Results
138 consecutive neonates underwent GS repair at our institution over a 16 year period. C-Section was performed in 95% of mothers; 66% were elective. There was a primary repair rate of 72% (n=100) and a 9% rate of complicated GS. For the entire series (n=138), the results were a median of 3 days to extubation, 13 days to initiate feeds, and 26 days to discharge, with an overall mortality rate of 5%. Our immediate closure cohort (n=100) had 2 days to extubation, 12 days to initiate feeds, and 23 days to discharge.

Conclusions
In this large series we conclude that our multidisciplinary team-based approach yields markedly improved time to initiate feeds and total LOS.

The Impact of Oesophageal Atresia on Fundoplication for Gastro-Oesophageal Reflux

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Background/Purpose
Gastro-oesophageal reflux is a significant cause of morbidity in oesophageal atresia (OA). Patients with reflux which is refractory or complicated by life-threatening events are candidates for fundoplication. This study aimed to determine the impact of OA on need for fundoplication, timing of fundoplication, and requirement for a redo operation.

Methods
A single-centre retrospective review of all patients undergoing fundoplication over a 20-year period was performed. Patients were categorised into 2 groups:
OA and non-oesophageal atresia (non-OA).

**Results**
A total of 767 patients underwent fundoplication during the study period (OA: 85 vs non-OA: 682). Median age (months) at primary fundoplication was reduced in OA patients (7.2 vs 23.3; p<0.001). Redo fundoplication rates between groups were not significantly different (11/85 vs 53/682; p=0.14). Median time (months) between primary and redo fundoplication was greater in OA patients (36.2 vs 11.7; p=0.03).

**Conclusions**
Children with OA undergo fundoplication at younger ages, which may be related to early life-threatening events in these patients. Contrary to popular belief, redo operations were not significantly increased in the OA group. However, need for redo operations in OA patients.

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**SS5.5**

**Validated Quality of Life Scores and Maternal, Fetal and Neonatal Characteristics in Pediatric Patients with Simple versus Complex Gastroschisis**

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**Background/Purpose**
While numerous studies have discussed outcomes in gastroschisis, they often combine all abdominal wall defects or rely on interviews. We report long term outcomes of patients with gastroschisis using a validated pediatric quality of life (QoL) model.

**Methods**
Gastroschisis patients prospectively consented to participate in an Institutional Clinical Outcomes Registry (COR) from 2002 to 2014 were stratified as simple or complex. Pediatric Quality of Life (PedsQL) Inventory™ multidimensional, summary and total scores were calculated.

**Results**
Seventy-six patients were identified and 34 (44.7%) participated in PedsQL. The majority had simple gastroschisis (74.3%) and underwent primary closure (58.7%). Patients with complex gastroschisis were significantly more likely to have staged closure (68.4% vs 33.3%, p=0.0139), require more operations (3.75 vs 0.54, p<0.00001), and a longer length of stay (72.7 vs 30.5 days, p<0.0001). See Table 1 for PedsQL data.

**Conclusions**
The prognosis and QoL for gastroschisis are excellent with a survival rate of 99.9% and overall QoL scores similar to healthy subjects. However, detailed analysis demonstrated emotional scores similar to patients with chronic diseases. Furthermore, complex gastroschisis patients have social and cognitive
functioning scores similar to ECMO survivors. This data can be helpful for prenatal counseling and setting expectations.

SS5.6

The Use of Ketorolac and Anastomotic Complications in Pediatric Gastrointestinal Surgery

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Background/Purpose
To examine the relationship between post-operative ketorolac administration and anastomotic complications in pediatric gastrointestinal surgery.

Methods
Retrospective cohort study of 20,339 patients undergoing gastrointestinal anastomosis procedures, using the PHIS database (2009-2014). The main exposure variable was ketorolac administration within three post-operative days. Multivariable logistic regression was used to measure adjusted odds ratios (OR) for 30-day emergency department visits, hospital readmissions and operative re-interventions.

Results
Of the 20,339 patients (mean age 6.6 years), 8,415 (41.4%) received ketorolac post-operatively. Within 30 days of index operation, 753 patients (3.7%) underwent operative re-intervention suggestive of an anastomotic leak. There was wide inter-hospital variability in re-intervention rates, ranging from 1.2% to 7.9%. After risk adjustment, the peri-operative administration of ketorolac was associated with an increased risk of emergency department visits (OR 1.14, 95% CI 1.02-1.28), hospital readmissions (OR 1.10, 95% CI 1.01-1.20), and operative re-interventions (OR 1.90, 95% CI 1.57-2.30).

Conclusions
Peri-operative administration of ketorolac in pediatric patients undergoing a gastrointestinal anastomosis operation is associated with significantly increased odds of operative re-intervention, likely due to anastomotic complications. Future studies are necessary to determine whether a causative effect is present and to further examine the influence of operative indications on the risk of ketorolac-associated morbidity.

SS5.7

Intestinal Obstruction due to Enteric Duplication can present with at any age

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Background/Purpose
Abdominal enteric duplication cysts are rare, with majority diagnosed currently antenatally; intestinal obstruction is an uncommon presentation. This study aims to evaluate the spectrum of enteric duplication cysts presenting with intestinal obstruction.

Methods
A retrospective analysis of all patients with enteric duplication presenting to a tertiary hospital between 1999 and 2015 was performed. All specimens were reviewed by a single histopathologist and were correlated with the clinical findings. Follow up ranged from 1 month-16 years with a median of 4.6 years.

Results
During the study period, 15 children and 3 adults with duplication cysts were identified. Six children were diagnosed antenatally, and the remaining postnatally. Intestinal obstruction was the presenting feature in 9 cases (7 children and 2 adults); including two of the antenatally diagnosed cysts. This presentation occurred in children at a median age of 2 months. The 2 adults presented at the ages of 36 and 48 years; Intussusception was noted in 3 of 7 children.

Conclusions
Intestinal obstruction is an important presentation of the duplication cysts in children especially those under 3 months of age, despite the increasing antenatal diagnosis. It is not uncommon in older age with 2 adults presenting with intestinal obstruction.

Benchmarking the value of ultrasound for acute appendicitis in children

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Background/Purpose
This study appraises the diagnostic quality of ultrasound for acute appendicitis in children and consequently challenges the perception of inferior accuracy and suitability compared to computed tomography (CT).
Methods
Radiologist reports for consecutive “query appendicitis” ultrasound studies were retrieved from a hospital database for the study period 2009-2014. Children who subsequently underwent appendicectomy were identified. Corresponding operative and histopathology findings were evaluated. Diagnostic accuracy of ultrasound was determined by analyzing overall accuracy, sensitivity, specificity, predictivity and likelihood ratios.

Results
A total of 3799 ultrasound examinations were evaluated. Mean age was 11.5 ± 3.8 years. The proportion of patients investigated with ultrasound prior to appendicectomy was 59.8% (1103/1840). Appendix visualization rate was 91.7%. Overall diagnostic accuracy was 95.5%. Sensitivity and specificity values were 97.1% (95.9–98.1; 95% CI) and 94.8% (93.9–95.6; 95% CI) respectively. Separate analysis of only ultrasound positive and negative examinations (i.e. excluding non-diagnostic examinations) confirmed sensitivity and specificity values of 98.8% and 98.3%.

Conclusions
In this largest reported single institution series of ultrasound examinations for acute appendicitis in children, we report benchmark standard quality of diagnostic accuracy and visualization rates. Given the radiation and cost implications of CT, there is a strong argument to recommend ultrasound as the primary imaging modality.

SS5.9
Is Doppler ultrasonography performed by pediatricians safe and effective for triaging acute appendicitis for interval appendectomy?

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Background/Purpose
To examine whether acute appendicitis (AA) can be safely triaged by pediatricians for interval appendectomy (IA) using Doppler ultrasonography (DU).

Methods
75 cases of AA assessed by pediatricians with DU (2013-2015) were reviewed. DU grading of AA was: I: slightly irregular wall/normal blood flow; II: irregular wall/increased blood flow; III: irregular wall/decreased blood flow; and IV:
disappearance of wall/blood flow. Grades I/II were managed conservatively with intravenous antibiotics then encouraged to book for interval appendectomy (IA). Grades III/IV were reviewed for emergency appendectomy (EA) by a surgeon.

**Results**
DU grade was I (n=26), II (n=36), III (n=9), and IV (n=4) (Figure 1). EA was required for 5 cases; one grade III and four grade IV cases. One grade IV case was treated conservatively after surgical review but EA was unavoidable. Of the remaining 70 cases discharged well after a mean of 5.7 days hospitalization, 25/70 had IA with chronic inflammation on histology; 6/70 had recurrence of AA treated successfully by EA, and 39/70 remain asymptomatic at least 6 months after declining IA. Overall, DU triaging with conservative management was cheaper than surgery.

**Conclusions**
DU performed by pediatricians appears to be safe and effective for triaging acute appendicitis.

**SS5.10**

**Effect of hospital type on the treatment of acute appendicitis in adolescents**

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**Background/Purpose**
Although adolescents may receive treatment for acute appendicitis in adult hospitals, they are often referred to pediatric hospitals. The purpose of this study was to determine if there is an outcome or cost advantage to this practice.

**Methods**
Patients aged 13-17 years with acute appendicitis who were discharged from acute care hospitals from 2009-2014 were identified using a statewide discharge dataset. There were 9,497 patients included. Hospitals were classified as pediatric only, adult and pediatric (mixed), and adult only. Outcome data was collected and analyzed. Statistical significance was set at <0.05.

**Results**
Outcomes are summarized in Table 1. Of the 9,497 patients, 59% were treated in adult hospitals, 24% in mixed hospitals, and 17% in pediatric hospitals. Complicated appendicitis was significantly more common in pediatric hospitals compared to other hospital types. Open appendectomy occurred significantly less often in pediatric hospitals. Postoperative complication rates did not significantly differ among hospital types. Patient charges were significantly lower at pediatric hospitals compared to other hospital types.

**Conclusions**
Adolescents who are treated at pediatric hospitals are less likely to undergo open appendectomy and incur lower patient charges. Although the incidence of complicated appendicitis is higher in children’s hospitals, the complication rates are similar to other hospital types.
More than one-third of successfully nonoperatively treated patients with complicated appendicitis experienced recurrent appendicitis

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Background/Purpose
Although nonoperative treatment for complicated appendicitis is now widely performed, the clinical course after the treatment needs to be examined. Therefore, we investigated their long-term outcomes.

Methods
Between April 2007 and December 2013, all appendicitis patients with a well-circumscribed abscess or phlegmon were asked to select either laparoscopic surgery or nonoperative treatment with optional interval appendectomy (IA) on admission. For nonoperative treatment, intravenous injection of antibiotics was continued until the serum C-reactive protein concentration decreased to <0.5 mg/dL and drainage of abscesses was done when necessary.

Results
Thirty-three patients chose operative treatment and 55 chose nonoperative treatment. The success rate of nonoperative treatment was 98.2%. There was no difference in the hospital length of stay (LOS) between the two groups. Recurrence occurred in 14 of 39 (35.9%) nonoperatively-treated patients without IA by 2015. Although these patients came to the hospital earlier after onset at recurrence, seven patients already had complicated appendicitis. Two of them chose another nonoperative treatment, and the others underwent laparoscopic appendectomy. The LOS for recurrent appendicitis was significantly longer than that for IA (P=0.0025).

Conclusions
Although the success rate of nonoperative treatment was very high, a considerable number of patients experienced recurrence, and IA might be a good option.
**SS5.12**

**Injection of botulinum toxin into the internal anal sphincter for the management of idiopathic constipation**

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**Background/Purpose**
Idiopathic constipation is a common presentation to pediatric surgeons. We aimed to investigate the efficacy of internal anal sphincter (IAS) botulinum toxin (BTX) injection in a large cohort of children with idiopathic constipation.

**Methods**
An IRB-approved retrospective review was performed of all patients with idiopathic constipation managed with circumferential IAS injection of BTX at a tertiary pediatric center.

**Results**
Thirty-three patients (14 male, median age 4.3 years, range 0.4 - 13.9 years) were treated between 1999 and 2014. Pre-operative contrast enema was performed in 32/33 (transition zone - 3, reversed rectosigmoid ratio - 4, moderate/severe fecal loading - 25, segmental dilatation - 17). Hirschsprung disease was excluded in all patients by open rectal biopsy. The majority of patients (22/33) had one BTX injection (median 1, range 1-10) of 100 IU. Follow-up was documented in 26/33. Symptoms greatly improved in 15, somewhat improved in 7, and were largely unchanged in 4. There were no adverse events. Improvement lasted a median of 12 weeks (range 1-26). Only 1 patient developed recurrent constipation after successful BTX injection.

**Conclusions**
Botulinum toxin injection into the internal anal sphincter is safe, may be combined with open rectal biopsy, and typically leads to symptomatic improvement in children with idiopathic constipation.

**SS5.13**

**The experience of Malone’s continent appendicostomy**

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**Background/Purpose**
The Malone’s appendicostomy offers convenient enema administration for incontinent patients. We present our experience and technical modifications to reduce the complications.
Methods
Twenty-eight patients underwent Malone’s appendicostomy procedures. The cecum was plicated around the native appendix in 18 patients (64.3%). Ten patients (35.7%) underwent appendico-colostomy to ensure adequate length of cecal-wrapping and avoid kinking of the appendix. We reviewed the diagnosis underlying the fecal incontinence, operative techniques, duration of surgery, length of hospital stay, and postoperative complications.

Results
The mean age at surgery was 8.9 ± 3.1 years. The diagnoses included anorectal malformations (22), Hirschsprung’s disease (4), and others (2). The median follow-up was 37 months (range: 8-70 months). Four complications were recorded in 6 patients (21.4%): stomal stenosis in 3 (10.7%), peristomal granuloma in 2 (7.1%), leakage in 4 (14.3%), and difficulty in catheterization in 5 (17.9%). As compared with native appendix group, appendico-colostomy group was associated with a lower incidence in leakage (0/10 vs 4/18; p=0.04) and difficult catheterization (0/10 vs 5/18; p=0.02). Strictures and granulomas were managed with minor operative revision. All patients were consistently clean following their Malone’s procedures.

Conclusions
The modified appendico-colostomy in Malone’s antegrade enema procedure significantly reduced the incidence of leakage and difficulty catheterization.

SS5.14
Utility of circumumbilical incisions in surgery for congenital duodenal atresia

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Background/Purpose
The aim of this study was to analyze the utility of circumumbilical incisions in surgery for congenital duodenal atresia (CDA).

Methods
From March 2001 to December 2015, 22 neonates underwent surgery for CDA at our hospital. Patients were divided into 2 groups according to the abdominal incision: Group A, abdominal transverse incision (n=10); and Group B, circumumbilical omega-shaped incision (n=12). No significant differences in preoperative conditions were apparent between the groups. We retrospectively
compared several parameters related to the surgery and clinical outcomes between the groups.

Results
Thirty-three patients (14 male, median age 4.3 years, range 0.4 – 13.9 years) were treated between 1999 and 2014. Pre-operative contrast enema was performed in 32/33 (transition zone 3, reversed rectosigmoid ratio 4, moderate/severe fecal loading 25, segmental dilatation 17). Hirschsprung disease was excluded in all patients by open rectal biopsy.

The majority of patients (22/33) had one BTX injection (median 1, range 1–10) of 100 IU. Follow-up was documented in 26/33. Symptoms greatly improved in 15, somewhat improved in 7, and were largely unchanged in 4. There were no adverse events. Improvement lasted a median of 12 weeks (range 1–26). Only 1 patient developed recurrent constipation after successful BTX injection.

Conclusions
Surgery for CDA using a circumumbilical incision was performed safely and without undue difficulty. Cosmetically, Group B was superior to Group A.

TUESDAY, APRIL 26, 2016
SCIENTIFIC SESSION 6 – PAPS PRIZE (BASIC SCIENCE)

SS6.1

MEK inhibitors as a novel therapy for neuroblastoma: Their in vitro effects and predicting their efficacy

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Background/Purpose
Recent study reported that relapsed neuroblastomas had frequent RAS/MAPK pathway mutations. We investigated the effects of MEK inhibitors, which inhibit the RAS/MAPK pathway, as a new treatment for refractory neuroblastomas.

Methods
Five neuroblastoma cell lines were administered trametinib (MEK inhibitor) or CH5126766 (Raf/MEK inhibitor). Growth inhibition was analyzed by a cell viability assay. ERK phosphorylation and the MYCN expression were analyzed by
immunoblotting or immunohistochemistry. RAS/Raf mutations were identified by direct sequencing or through the COSMIC database.

**Results**

Both MEK inhibitors, especially CH5126766, showed notable growth inhibition effects on cells with ERK phosphorylation, but almost no effect on cells without. In immunoblotting analyses, ERK phosphorylation and MYCN expression were remarkably suppressed in ERK active cells by these drugs. Furthermore, phosphorylated-ERK immunohistochemistry corresponded to the drug responses. Regarding the relationship between RAS/Raf mutations and ERK phosphorylation, ERK was phosphorylated in one cell line (NLF) without RAS/Raf mutations.

**Conclusions**

MEK inhibitors are a promising treatment option for ERK active neuroblastomas. However, the efficacy of MEK inhibitors may not correspond to RAS/Raf mutations, although they strongly correspond to ERK phosphorylation itself. Phosphorylated-ERK immunohistochemistry is thus a useful and reliable method to analyze ERK activity and predict the therapeutic effects of MEK inhibitors.

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**SS6.2**

**Telomere biology including TERT rearrangement in neuroblastoma: a useful indicator for surgical treatments**

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**Background/Purpose**

Our telomere biology study in neuroblastoma (NBL) revealed that unfavorable NBLs acquired telomere stabilization by telomerase activation or ALT (alternative lengthening of telomere). Recently, genomic rearrangements in a region proximal of the telomerase reverse transcriptase (TERT) gene was discovered in the NBLs. In this study, TERT rearrangement was examined in NBLs.

**Methods**

In 121 NBLs including 67 mass-screening detected cases whose telomere length, telomerase activity, ALT with ATRX/DAXX alterations, MYCN amplification and ALK mutation were already examined, TERT rearrangements were examined using Affymetrix GeneChip SNP 6.0 arrays.

**Results**

The 11 ATRX/DAXX mutated ALT cases and 29 cases with high telomerase activity showed poor prognosis. MYCN amplification and TERT rearrangements were independently detected in 16 and 13 cases, respectively and these alterations were significantly correlated with high telomerase activity (Figure). In 81 infant cases, MYCN amplification, TERT rearrangement, and ATRX mutations were detected in 3, 2, and 3 cases, respectively. Among them, 5 cases showed progression or recurrences.
Conclusions
In NBLs, heterogeneous biological characteristics mainly depend on telomere biology. Telomere stabilization are acquired by telomerase activation thorough MYCN amplification or TERT rearrangement or by ALT. Since these tumors usually show progression and recurrence, complete resection should be considered even if infant cases.

Usefulness of autologous tubular collagenous tissue, BIOTUBE, as a novel tracheal scaffold: a pilot study in a rat orthotopic tracheal transplantation model

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Background/Purpose
Although many approaches for tracheal replacement have been investigated, they have been met with only limited success. This study aimed to investigate the usefulness of autologous tubular collagenous tissue, also called BIOTUBE, as a tracheal scaffold.

Methods
BIOTUBE was prepared by embedding a rod-like mold (diameter, 3 mm; length, 20 mm) covered with a slitting tube, in a rat’s dorsal subcutaneous pouch for 1 month. After histological and mechanical evaluations, 5-mm long sections of BIOTUBEs were implanted orthotopically. At 1 month after implantation, endoscopic evaluation was performed and tracheas including BIOTUBEs were harvested for histological evaluation.

Results
BIOTUBE strength corresponded to half of that of the native rat trachea. An endoscopic study conducted at 1 month after implantation revealed that the anastomotic part and internal surface of the BIOTUBE were smooth, suggesting that enough re-epithelialization had occurred. Histological analysis after implantation demonstrated that ciliated columnar epithelia were regenerated on BIOTUBE internal surface. Interestingly, tracheal glands were found in the tela submucosa of the BIOTUBE.

Conclusions
Ciliated columnar epithelium and tracheal glands were well regenerated in the BIOTUBEs; however, the BIOTUBE strength was insufficient to maintain its patency. Therefore, methods to enhance BIOTUBE strength shall be studied.
Improved Survival in a Murine Orthotopic Sarcoma Model by Delivering Vincristine through a Controlled Release Silk Platform

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Background/Purpose
Sarcoma accounts for 20% of solid tumors in children. Curative surgical excision can be highly morbid. We hypothesized that delivering chemotherapy directly into tumors through controlled release silk platforms could slow tumor growth and potentially lead to a limited excision.

Methods
Human Ewing sarcoma cells A673 were injected into mouse hind legs to create orthotopic tumors. Tumor volumes were measured using ultrasound. When tumor volume reached >250mm³ interventions included: implantation of drug-free silk foam (ContF), vincristine 50g foam (Vin50F), drug-free silk gel (ContG), vincristine 50g gel (Vin50G), or single dose intravenous vincristine 50g (Vin50IV). End-points were volume >1000mm³ or weight loss >20%. Kaplan Meier and ANOVA were used when appropriate; p<0.05 was significant.

Results
In vitro release profile of Vin50F showed 38% of drug released day1 and 100% by 25 days; Vin50G had 27-29% released day1 and 100% by 2 weeks. Tumors treated with Vin50F (12.4±3.51 days to end point (DTEP)) had slower growth compared to those treated with ContF (5±1.31 DTEP) (P<0.001). There was no difference in tumor growth between the ContG (7.75±1.39 DTEP), Vin50IV (14±0 DTEP), and Vin50F. Tumor growth was slowest with Vin50G, 28±10.26 (DTEP), compared to ContF, ContG, Vin50IV, and Vin50F (p<0.05).

Conclusions
Vincristine-loaded controlled release silk gel decreased sarcoma tumor growth. Applying this intra-tumoral treatment strategy can potentially decrease the extent of surgical excision.

Intestinal Barrier Dysfunction in Human Necrotizing Enterocolitis

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Background/Purpose
An intestinal barrier defect is suspected for development of necrotizing enterocolitis (NEC). However, intestinal barrier assessment has not been reported in human NEC. Hypothesis: Intestinal barrier function is impaired in human NEC.

Methods
Intestinal specimens removed during surgery on infants for NEC and non-NEC conditions were mounted in an Ussing chamber to measure trans-epithelial resistance (TER) and flux of paracellular markers (3H-mannitol). Messenger RNA (mRNA) was analyzed for expression of tight junction proteins by RT-PCR.

Results
Twenty-two infants were studied; 6 had NEC and 16 had non-NEC diagnoses. On histology, significant inflammation was observed at sites of perforation and minimal at healthy resection margins.

Average TER of NEC specimens at the site of NEC perforation was lower than NEC resection margins and control tissues (p<0.05)(Fig. 1). Average flux of radiolabeled mannitol was higher at NEC perforation than NEC resection margins and control tissues (p<0.05)(Fig 2). RT-PCR analysis showed significant loss of mRNA expression tight junction protein occludin at NEC perforation and margin versus controls (p<0.03).

Conclusions
Intestinal barrier function is abnormal in human NEC. Intestinal permeability is increased and occludin is lower in NEC affected intestines and grossly normal margins. Intestinal barrier dysfunction may be a key factor in the pathogenesis of NEC.

MicroRNA-142-5p is associated with the hypomethylation of IFN-gamma gene in biliary atresia

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Background/Purpose
Biliary atresia (BA) is a life-threatening cholestatic disease and IFN-gamma overexpression has been found to play a vital role in the pathogenesis. Our microRNA microarray study found miR-142-5p was up-regulated in BA. It could regulate DNMT1. The aim of this study was to verify the relationship between overexpression of miR-142-5p and IFN-gamma in BA.
Methods
Liver tissues were collected from 55 BA and 16 choledochal cyst patients. Jurkat cells were transfected with miR-142-5p mimic and inhibitor. Taqman probe-based quantitative methylation-specific polymerase chain reaction (PCR), bisulphate sequencing PCR, the methylight assay, quantitative real-time PCR and western-blot were performed to examine IFN-gamma mRNA, promoter methylation and protein expression levels.

Results
MiR-142-5p, IFN-gamma mRNA and protein expressions were elevated in BA liver tissues, and associated with the lower expression of DNMT1 (p<0.01). Moreover, the DNA hypomethylation of IFN-gamma was correlated with mRNA and protein expression in BA tissues and Jurkat cell (p<0.01). The correlation was further validated by treating with 5-aza-CdR, a demethylation agent.

Conclusions
The miR-142-5p downregulated the expression of DNMT1, and induced the DNA hypomethylation in the promoter region of IFN-gamma gene, which may be a new mechanism of pathogenesis for BA.

 Scalability of an Endoluminal Spring for Distraction Enterogenesis

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Background/Purpose
Techniques of distraction enterogenesis have been explored to provide increased intestinal length to treat short bowel syndrome (SBS). Self-expanding, polycaprolactone (PCL) springs have been shown to lengthen bowel in small animal models. Their feasibility in larger animal models is a critical step before clinical use.

Methods
Juvenile mini-Yucatan pigs underwent jejunal isolation or blind ending Roux-en-y jejunojenunostomy with insertion of either a PCL spring or a sham PCL tube. Extrapolated from our spring characteristics in rodents, proportional increases in spring constant and size were made for porcine intestine.

Results
Jejunal segments with 7 mm springs with k between 9 and 15 N/m demonstrated significantly increased lengthening, 2.5-fold in the isolated segment model, and 2-fold in the Roux limb [Figure 1]. Complication was noted in only two animals, both using high spring constant k>17 N/m. Histologically, lengthened segments in the isolated and Roux models demonstrated significantly increased muscularis thickness.
and crypt depth. Restoration of lengthened, isolated segments back into continuity was technically feasible after 6 weeks.

**Conclusions**
Self-expanding, endoluminal PCL springs, which exert up to 0.6 N force, safely achieve significant intestinal lengthening in a translatable, large-animal model. These spring characteristics may provide a scalable model for the treatment of SBS in children.

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**Spring Mediated Distraction Enterogenesis In-continuity**

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**Background/Purpose**

Distraction enterogenesis has been investigated as a novel treatment for patients with short bowel syndrome (SBS) but has been limited by loss of intestinal length during restoration and need for multiple bowel surgeries. The feasibility of in-continuity, spring-mediated intestinal lengthening has yet to be demonstrated.

**Methods**

Juvenile mini-Yucatan pigs underwent in-continuity placement of polycaprolactone (PCL) degradable springs within in-continuity jejunum (N=10). Methods used to anchor the spring ends to the intestine included full-thickness sutures and a high-friction surface spring [Figure]. Spring constant (k) was 6-15 N/m. Bowel was examined for length and presence of spring at 6 and 29 days.

**Results**

Animals tolerated in-continuity lengthening without bowel obstruction (N=10) for up to 29 days. In-continuity jejunum with springs demonstrated intestinal lengthening by 1.47-fold ± 0.11 (N=5). Five springs had migrated and lengthening could not be assessed. Histologically, in-continuity jejunum showed significantly increased crypt depth and muscularis thickness in comparison to normal jejunum.

**Conclusions**

Self-expanding PCL springs placed in continuity demonstrate intestinal lengthening without obstruction or other complications in a porcine model. Full-thickness suture anchoring and high-friction surface facilitates lengthening without compromising luminal flow. This technique avoids multiple surgeries to restore intestinal continuity. It is safe, effective, and demonstrates the therapeutic potential in SBS.
Does a large abdominal wall defect affect lung growth?

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Background/Purpose

Respiratory distress in babies with large abdominal wall defects suggests a relationship to decreased diaphragmatic movement. We evaluated pulmonary development in a fetal lamb gastroschisis model.

Methods

We created gastroschisis in 25 fetal lambs at 60 days’ gestation (Group A). Controls were 14 non-operated lambs. (Group B), all delivered at term. Lung weight, histology and Type 1 (AT1) / Type 2 (AT2) cell ratios were determined. We subdivided Group A, comparing lambs with a large defect and scoliosis (Group C) with the remainder (Group D).

Results

Twenty two lambs survived. Lung volume in Group C was less than in Group D (p<0.05). The AT1/AT2 ratio in Group A was lower than in Group B (p<0.01), without any difference in radial alveolar counts (RAC) or alveolar growth, and no association between scoliosis and alveolar differentiation.

Conclusions

Gastroschisis in a sheep model reduces the AT1/AT2 ratio but not RAC. Severe
scoliosis affects lung volume but not AT1/AT2 ratio, suggesting reduced diaphragmatic movement in fetuses with large abdominal defects.

**SS6.10**

**Biliary Atresia in Twins: a Single Center Experience and Literature Review**

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**Background/Purpose**
Although the pathogenesis of biliary atresia (BA) remains elusive, the occurrence of this disorder in twins provides a unique research opportunity. Our experience with BA in twins is described herein.

**Methods**
From Jan to Jun 2015, 152 infants with BA underwent Kasai procedure in our medical center, among whom there were 6 sets of twins showing discordance that only one member had BA. We investigated their characteristics and outcomes in clinical practice.

**Results**
Of all these 6 twin patients, four were dizygotic (two males and two females) and two were monozygotic (both males). Median age at Kasai procedure was on day of life 70.5 (range from 49 to 92). The proportion of jaundice clearance (total bilirubin < 25 μmol/L) was 4/6 (66.67%), and the transplant-free survival rate was 5/6 (83.33%) at 6 months post-Kasai procedure (one of them received successful liver transplantation on post-operation day 160).

**Conclusions**
This lack of concordance in both dizygotic and monozygotic twins indicates epigenetic basis or postnatal events could be involved. Twin patients with BA do not seem to present earlier just because they have healthy sibling controls, nor do they demonstrate a better prognosis. Finally, we have a brief overview of reported cases in twins.

**WEDNESDAY, APRIL 27, 2016**

**SCIENTIFIC SESSION 7 – MIS/ROBOTIC**

**SS7.1**

**Variation in the application of minimally invasive surgery in pediatric patients in the United States**

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Background/Purpose
To determine variation in utilization of minimally invasive surgery (MIS) in pediatric patients.

Methods
Retrospective cohort study using the Kids’ Inpatient Database, 2012. We included six typical pediatric surgical operations that carried procedure codes for both open and MIS approaches: appendectomy (nest=76,851), partial colectomy (nest=2,285), total abdominal colectomy (nest=494), enterolysis (nest=8,035), lung lobectomy (nest=761) and fundoplication (nest=6,073). Odds ratios of undergoing an MIS compared to open operation were calculated after adjustment for patient demographic and hospital-level variables, as well as the proportion of MIS operations done by each hospital.

Results
For most operations, adjusting for individual hospital’s operation-specific MIS frequencies removed disparities seen in accessing MIS operations by patient race and income. Wide variation in MIS proportions by U.S. geographic region were noted for appendectomy. Patients operated on at free-standing children’s hospitals were more likely to undergo an MIS rather than an open operation when compared to those operated on at other types of hospitals.

Conclusions
Wide variation in the application of MIS exists in U.S. pediatric surgical patients. A significant proportion of this variation is likely attributable to mutable, hospital-level characteristics. Diffusion of training in MIS techniques and selective regionalization may help blunt this variation and decrease pediatric surgical care disparities.

SS7.2
Application of anchoring stitch prevents rectal prolapse in laparoscopic assisted anorectal pullthrough

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Background/Purpose
We study the application of an anchoring stitch to tack the rectum to the presacral fascia and the occurrence of rectal prolapse after laparoscopic assisted anorectal pullthrough (LAARP).

Methods
Retrospective review of all children who had undergone LAARP from 2000 was performed. Patients were divided into group I with anchoring stitch and group II without anchoring stitch.

Results
Thirty-four patients ( group I, n = 20; group II, n = 14 ) were identified. The mean operative time was significantly shorter in group I ( 193 ± 63 minutes vs 242 ± 49 minutes, p = 0.048 ). Rectal prolapse occurred less in group I, 4 ( 20% ) vs 9 ( 64% ) patients in group II and was statistically significant ( p = 0.008 ). Soiling occurred
less in group I (55% vs 79%, p = 0.167). Voluntary bowel control (85% vs 93%, p = 0.499) and constipation (55% vs 64%, p = 0.601) were comparable.

**Conclusions**
Our study showed application of anchoring stitch reduces rectal prolapse and soiling in LAARP.

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**SS7.3**

**The preliminary application of robotic-assisted-3-dimention-high-definition laparoscopic surgery in children**

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**Background/Purpose**
To review the preliminary experience and clinical assessment of 3-dimention-high-definition (3D-HD) laparoscopic surgery in children.

**Methods**
From February 2014 to September 2015, the clinical data from series of 23 children operated by laparoscopy with Aesculap 3D-HD Einstein Vision system were analyzed, including choledochocyst (5 cases), hiatal hernia (1 case), ovary cyst (2 cases), splenomegaly (3 case), Hirschsprung’s disease (3 cases), inguinal hernia (4 cases), duodenum ulcer perforation (1 case) and acute appendicitis (4 cases). All the procedure performed by one surgeon.

**Results**
All the laparoscopic procedure was completed successfully with no conversions. The operation time and intra-operative bleeding were same to those performed by the conventional 2D laparoscopic system. The 3D-HD visualization improves surgeons’ hand-to-eye coordination, intracorporeal suturing and fine dissection. The combination of 3D-HD visualization with the robotic camera arm results in very high image quality and stability. And all the patients were followed up till October 2014 without any complications.

**Conclusions**
3D-HD laparoscopic system provides three-dimensional perception, especially for precise depth perception, spatial location, movement velocity and improvement of surgical performance. With the improved quality of vision, laparoscopic surgeons may benefit from 3D imaging and perform precise operation in children.

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**SS7.4**

**Pneumoperitoneum and hemodynamic stability during pediatric laparoscopic appendectomy**

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Background/Purpose
Conventional pneumoperitoneum (CP) and automatically maintained pneumoperitoneum using AirSeal Intelligent Flow System (AiFS) were compared during pediatric laparoscopic appendectomy (LA) using intraperitoneal pressure (IPP) and hemodynamic parameters.

Methods
A prospective review of 39 children aged 3-14 years who had standard 3 trocar LA was performed. Pneumoperitoneum was either AiFS (n=18) or CP (n=21) according to the surgeon’s preference. IPP during insertion of trocars in all subjects was initially 8-10mmHg which was reduced to 5mmHg then maintained until LA was completed. Data were collected 5 minutely during pneumoperitoneum.

Results
Subject demographics were similar for both groups. During pneumoperitoneum, average IPP (AiFS: 7.9; CP: 9.0mmHg), average systolic blood pressure (AiFS: 100.4; CP: 106.9mmHg), and average end-tidal CO2 (EtCO2; AiFS: 35.7; CP: 38.5mmHg) were significantly different (p<.05, respectively), while pulse (AiFS: 92.1; CP: 96.4bpm), oxygen saturation (AiFS: 98.8; CP: 98.8%), body temperature (AiFS: 37.2; CP: 37.4?), urine output (AiFS: 2.7; CP: 2.4mL/kg/h), operative time (AiFS: 72.2; CP: 76.2mins), blood loss (AiFS: 3.6; CP: 3.5mL), recommencement of oral intake (AiFS: 1.3; CP: 1.4 days), and postoperative hospitalization (AiFS: 4.3; CP: 3.8 days) were not.

Conclusions
Because IPP was significantly lower during LA with AiFS, EtCO2 and BP were significantly lower.

Comparison of Open versus Laparoscopic Approach to Gastric Fundoplication in Children with Cardiac Risk Factors: A Pediatric NSQIP Analysis

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Background/Purpose
Gastric fundoplication is most common non-cardiac operation in children with congenital cardiac disease. While prior studies validated safety of laparoscopy in this population, we hypothesize that children with cardiac risk factors (CRFs) are likelier to undergo open fundoplication (OF) but experience greater morbidity than after laparoscopic fundoplication (LF).

Methods
Utilizing 2013 NSQIP-P Public-Use-File, pediatric patients undergoing LF and OF were stratified to none, minor, major, or severe CRFs. Multivariate logistic regression determined pre-operative variables and post-operative outcomes associated with LF or OF.

Results
1501 fundoplication patients were identified with 92% undergoing LF. OF patients were likelier to have minor (Odds Ratio:2.27, p=0.002), major (OR:2.09, p=0.012) and severe CRFs (OR:3.55, p<0.001). Children <1 year (OR:3.38, p=0.048), and those with tracheostomy were likelier to have OF (OR:2.3, p=0.006). Overall, the OF group had higher post-operative morbidity (OR:2.41, p<0.001). Specifically, children with minor or major CRF’s experienced more complications following OF compared to LF. (Table 1).

Conclusions
Open fundoplication is more common in patients < 1 year old, patients with minor, major, or severe CRFs, and those with tracheostomy. Laparoscopic fundoplication should be considered in children with minor and major CRFs, as open fundoplication in those patients results in greater pulmonary, infectious, and hematological sequelae.
Background/Purpose
We assessed the quality of life (QOL) of esophageal atresia (EA) with tracheoesophageal fistula (TEF), comparing open with thoracoscopic repair.

Methods
A retrospective review of consecutive EA/TEF repairs (2001-2014) was performed, excluding cases with birth weight less than 2000g and severe cardiac/chromosomal anomalies. Of 37 cases, 13 had thoracoscopic repair (TR) and 24 had open repair (OR) according to the surgeon’s preference. QOL was scored regularly with a standard questionnaire that assessed nutrition, vomiting, bougienage, coughing, growth retardation, schooling, and thoracic deformity. Lower scores reflected poorer outcome. QOL data one year postoperatively (POQ) was compared with QOL data at the time of starting elementary school (ScQ).

Results
Subject demographics were similar. There were 2 anastomotic leaks that resolved spontaneously in TR, otherwise no intraoperative complications or recurrence of TEF. Laparoscopic fundoplication was required for gastroesophageal reflux in 4 cases (OR: 1; TR: 3) (p=NS). Progression in QOL scores (POQ ---> ScQ) was 6.5 --> 11.5 in OR and 4.6--> 11.3 in TR, respectively. ScQ scores were similar but POQ was significantly higher in OR (p< .05).

Conclusions
QOL was significantly lower after TR initially but were similar by school age.

Comparing single-incision versus standard laparoscopic gastrostomy in paediatric patients --- A single centre study

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Background/Purpose
The objective of this study is to evaluate the outcomes of single-incision laparoscopic gastrostomy (SILG) and compare with standard laparoscopic gastrostomy (LG).

Methods
Paediatric patients (age <18 years) with gastrostomy placement (+/-concomitant fundoplication) in the past 3 years were reviewed. Demographic data, intra-operative and post-operative events (minor/major complications, initiation of feeding) were compared.

Results
Thirty-eight patients were identified (LG : SILG = 25 : 13). There was no significant differences between (LG vs SILG) age (5.7 vs 4.2 years, p=0.45) and body size at operation (15.3 vs 12.4 kg, p=0.36). The median operative durations for LG group (after excluding concomitant fundoplication if necessary) and SILG group were 38 mins vs 45 mins, p=0.21. There was one major complication in the LG group but none was reported in the SILG group. Seven patients (28%) in the LG group suffered from minor complications while 2 (15.4%) in the SILG group did. Gastrostomy feeding was initiated on POD 1 in majority of patients in both groups (LG: 92% vs SILG: 100%, p=0.18).
Conclusions
SILG is technically feasible in paediatric patients and outcomes were comparable to LG. This approach should be considered when concomitant procedure is not required to minimize surgical trauma.

SS7.8

Single Incision Laparoscopic Splenectomy in Children: Improved Pain Control with Rectus Sheath Block

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Background/Purpose
This study compared outcomes between single incision laparoscopic splenectomy (SS) and traditional laparoscopic splenectomy (LS) and analyzed the effect of rectus sheath block (RSB) when used with SS.

Methods
A retrospective review of prospectively collected data for patients who underwent LS and SS at our institution from 2008 through 2015 was performed. Outcome measures evaluated included postoperative morphine, pain scores and length of stay. Student t-test was used to analyze the data.

Results
23 SS and 5 LS were performed in children (mean age 9 years). 10 patients with SS received RSB. There was a trend towards increased postoperative morphine, pain scores and length of stay with LS compared to SS. LS and SS operative time was not significantly different. SS with RSB had decreased postoperative morphine requirements compared to SS with no block (2.3 vs 5.6 doses morphine (0.1mg/kg) p-value 0.0010) with no significant difference in postoperative pain scores. SS with RSB had decreased length of stay compared to SS with no block (3.3 vs 4.5 days, p-value 0.0543).

Conclusions
Single incision laparoscopic splenectomy is a safe and feasible option for children that provides improved cosmesis. Rectus sheath block performed with single incision splenectomy significantly improves postoperative pain and length of stay.

SS7.9

Operative technique in total proctocolectomy: a comparison among open, multiport laparoscopic, and single-incision laparoscopic techniques

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**Background/Purpose**
Single-incision laparoscopic surgery for pediatric colorectal disease has been shown to be feasible and safe. The purpose of this study was to compare outcomes of total proctocolectomy (TPC) using open, multiport laparoscopic (ML-TPC), or single incision laparoscopic (SIL-TPC) techniques.

**Methods**
A retrospective review of patients who underwent TPC for ulcerative colitis (UC), familial adenomatous polyposis (FAP), or colonic dysmotility from November 2008 - November 2015 was performed. General admission, demographic, and outcome data were collected and analyzed. Statistical significance was set at p<0.05.

**Results**
Ten patients were included: 2 underwent open TPC, 5 underwent ML-TPC, and 3 underwent SIL-TPC. Table 1 shows demographic and outcome data by operative technique. Patients did not differ in age or body mass index (BMI) percentile. Operative time was shortest for the open group and longest for the ML-TPC group. There was no significant difference in postoperative pain scores or doses of pain medicine. There was a trend towards shorter length of stay (LOS) in SIL-TPC patients, though this did not reach statistical significance. There were no 30 day complications.

**Conclusions**
SIL-TPC offers improved cosmesis, shorter operative time, and a trend towards shorter LOS compared to ML-TPC without increasing postoperative pain or complications.

**WEDNESDAY, APRIL 27, 2016**
**SCIENTIFIC SESSION 8 – THORACIC**

**SS8.1**

**Recurrent congenital diaphragmatic hernia: A challenging issue in the long term surgical management**

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**Background/Purpose**
Congenital diaphragmatic hernia (CDH) is a potentially life-threatening birth defect with an incidence of 1 in 2500 to 4000 live births. Long term studies reported recurrence rates from 10-30%. This study aims to identify and document recurrent CDH cases in a tertiary paediatric institution between 1996-2015.
Methods
Patient information on recurrent and nonrecurrent CDH patients is reviewed retrospectively. Exclusion criteria includes late presenters, Morgagni hernias, individuals deceased before surgical interventions, and in-utero terminations.

Results
69 cases were identified with the diagnosis. 33 cases were excluded, and 36 neonates were further analyzed. Ten children (28%) had recurrent CDH. The median time for recurrence after surgery was 4 months. Antenatal diagnosis was made in 42% nonrecurrent patients and 70% recurrent patients. Autologous repair was performed in 77% of nonrecurrent patients and 40% of recurrent patients. Second recurrences were noted in 3 patients with one fatality.

Conclusions
Recurrence in CDH seems to occur within first two years of life in about 28% of patients in this institution; and high incidence is noted in those with antenatal diagnoses and patch repair. Identifying risk factors can aid decision making on initial management of CDH patients and their follow up care.

SS8.2
Management and outcomes of scoliosis in children with congenital diaphragmatic hernia (CDH)

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Background/Purpose
To evaluate the clinical and radiological outcomes of CDH patients with scoliosis.

Methods
From 1996-2015, 25 of 378 (7%) CDH patients were diagnosed with scoliosis. Five (20%) were prenatally diagnosed by ultrasound and 9 (36%) were diagnosed postnatally. The remaining 11 (44%) developed scoliosis after discharge. Mean follow-up was 6.6 years.
Results
Among the 14 patients with congenital scoliosis, there were 2 (14%) perinatal deaths. Five of the 12 (42%) survivors required orthopedic surgery and 2 have required bracing. There were 3 vertical expandable prosthetic titanium rib placements, 1 growing rod placement, and 1 spinal fusion. The mean age at initial surgery was 5.4 years. On average, each child underwent an additional 2.8 operations (range 1-7) for expansion or revision. All surgical patients had bronchopulmonary dysplasia at 28 days of life and 1 required a tracheostomy. None of the 11 patients who developed scoliosis later in life required surgery but 3 have required bracing. Six of the 11 (55%) required a patch repair for CDH compared to 156 of 277 (56%) CDH patients without scoliosis (p=0.91).

Conclusions
Early diagnosis of scoliosis is associated with a high rate of surgery. There was not a higher incidence of patch repair among patients who developed scoliosis.

Risk factors for long-term morbidity in patients with esophageal atresia

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Background/Purpose
Esophageal atresia (EA) often leads to persistent symptoms in adulthood. This study aimed to describe the long-term outcomes of EA and identify predictive factors of morbidity.

Methods
From 1996-2015, 25 of 378 (7%) CDH patients were diagnosed with scoliosis. Five (20%) were prenatally diagnosed by ultrasound and 9 (36%) were diagnosed postnatally. The remaining 11 (44%) developed scoliosis after discharge. Mean follow-up was 6.6 years.

Results
All patients (6 type A, 77 type C) underwent esophageal anastomosis without esophageal replacement. Cardiac anomalies and long gap were present in 23% and 19%. Esophageal dilatation, fundoplication and aortopexy were performed in 37%, 30% and 7%. Long-term morbidities included mental/physical growth retardation (11%/30%), digestive/respiratory symptoms (11%/3%), scoliosis (40%), and elevated
scapula (32%). Factors related to long-term morbidity were cardiac anomalies (related to undernourishment), long gap (related to scoliosis) and fundoplication (related to mental retardation, and digestive/respiratory symptoms).

Conclusions
The incidence of long-term morbidities remains high in patients with EA. Cardiac anomalies, long gap, and fundoplication are related to the late sequelae. Improving the treatment strategy is discussed based on the long-term results of patients with EA.

SS8.4

Determinants of Early and Late Mortality in Children born with Oesophageal Atresia

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Background/Purpose
Oesophageal atresia (OA) is a congenital interruption of the oesophagus. Despite advances in care, a significant proportion of patients still die. Incidents of late mortality (deaths following initial discharge) have not been analysed comprehensively. This study aimed to examine the rates and associations of early and late mortality amongst patients with OA.

Methods
A retrospective review was performed of all OA patients managed at a tertiary centre over a 35-year period (1980-2014). Patients were catagorised into cases of early mortality (death before discharge), late mortality, and survivors. Data collected included demographics and associated anomalies.

Results
A total of 589 patients were identified, of whom 83 (14%) had died. Almost a quarter of total deaths were cases of late mortality (19/83, 23%). Early mortality was most often the result of palliation for trisomy 18. Late mortality was most frequently the result of respiratory compromise, sudden unexplained deaths at home, and Fanconi’s anaemia. The VACTERL association was significantly more common in both the early and late mortality group compared with survivors.

Conclusions
These results demonstrate that there are clear predictors of early and late mortality in oesophageal atresia. These predictors may allow clinicians to more accurately counsel parents regarding survival prospects of their affected child.
SS8.5

Thoracoscopic repair on the congenital diaphragmatic eventration in children: Continuous or interrupted suture for plication?

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Background/Purpose
To compare the results of continuous or interrupted suture on congenital diaphragmatic eventration (CDE) in children by thoracoscopic repair.

Methods
From Jan 2010 to May 2014, 21 children with CDE were repaired by thoracoscopic repair in Shanghai Children’s Hospital and Children’s Hospital of Fudan University. All the patients were randomized divided into 2 groups according to the different suture by thoracoscopic repair. Group 1, the diaphragm was repaired by interrupted suture, 9 cases. Group 2, the repair on the diaphragm was treated by continuous suture, 12 cases. The following factors such as average operation time, volume of bleeding, drainage, and postoperative hospital stay or complications were analyzed.

Results
The clinical data of the 2 groups was no difference. The average operation time in group 1 and group 2 was different (75±21 vs. 33±17min, P < 0.01). The other factors in the 2 groups were nearly same. All the patients were followed up from 1.2 to 4.7 years, and only 1 case of recurrence was found in group 1.

Conclusions
Thoracoscopic repair on CDE by continuous suture is a safe, reliable, convenient and effective procedure for plication, which can take the place of interrupted suture.

SS8.6

Is congenital pulmonary airway malformation really a rare disease? Result of a prospective registry with universal antenatal screening program

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Background/Purpose
Congenital pulmonary airway malformation (CPAM) is an increasingly recognized disease with potential mortality. Owing to limited published studies the true incidence is yet to be determined. Therefore we carried out this study with the aim to estimate its true incidence on a population basis in a prospective manner.

Methods
An antenatal ultrasonography program was implemented since 2009. Fetuses with suspected intra-thoracic lesions were monitored by regular follow-ups. Antenatal
course, post-natal outcomes and other demographics were compared to those of patients with CPAM in the previous decades (1989-2008). The incidence of CPAM was calculated in different periods.

**Results**

66 CPAM patients were identified between 2009 and 2014 with 60 patients being detected by antenatal scan. In contrast, 45 patients were identified between 1989 and 2008 with 27 patients being detected antenatally. The incidence rate during the past and recent period was estimated as ~1 in 26000 and ~1 in 7200 live births respectively (p=0.029).

**Conclusions**

With the increasing awareness of clinicians and the universal use of latest ultrasound technology, it is likely that more CPAM cases will be detected in the future. Here we presented our best estimated incidence rate of CPAM, yet only a larger scale study can reveal its true incidence.

**SS8.7**

**Thoracoscopic Lobectomy in infants and children utilizing a 5 mm stapling device**

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**Background/Purpose**

Thoracoscopic lobectomy is an accepted technique but the technical challenges are many. Endoscopic staplers (12mm) used commonly in adults are too large for use in infants. This study evaluates the use a 5 mm stapling device in infants.

**Methods**

From July 2014 to December 2015, 20 patients age 6 weeks to 13 months underwent thoracoscopic lobectomy for CPAM or sequestration. Weights ranged from 3.2 to 11.4 Kg. There were 4 upper, 2 middle, and 16 lower lobectomies. The 5 mm stapler (Justright Surgical) was the primary device for vessel and bronchial sealing and division.

**Results**

All procedures were accomplished successfully thoracoscopically. The stapler was used on the main lobar artery cases and vein in 18 cases, a large systemic sequestration vessel in 4 cases, and the bronchus in all 20. A total of 72 staple loads were fired. Operative times ranged from 50 min to 135. There was no significant bleeding or air leak in any stump.

**Conclusions**

The use of a 5mm stapling device appears to be safe and effective in thoracoscopic lobectomy in infants. It allows for safe management of major pulmonary vessels and bronchi in the confined chest of an infant through a single 5 mm port.

**SS8.8**

**Magnetic Mini-Mover Procedure (3MP) for Pectus Excavatum: Update on Phase II Clinical Trial**

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**Background/Purpose**
The Magnetic Mini-Mover Procedure (3MP) is a minimally invasive treatment for prepubertal patients with Pectus Excavatum. We report interim analysis of a phase II multicenter trial of safety and efficacy.

**Methods**
Fifteen patients with severe Pectus Excavatum (age 8-14 years, Haller Index > 3.5) had a titanium-enclosed magnet implanted on the sternum. Externally, patients wore a custom-fitted brace to correct the deformity using magnetic force. After 2 years of treatment, the implant was removed.

**Results**
The magnet was implanted in all patients without adverse events. Of the 8 explanted patients to date, 5 had improvement in Haller Index and 3 did not. Six patients had asymptomatic breakage of the implant’s titanium cables on X-ray. Metallurgic analysis of the cables revealed fatigue fracture, likely due to chest wall movement. Of the 7 patients who have completed post-explant survey, 5 were satisfied or very satisfied with the treatment, and 2 were not satisfied or unsure. All 7 patients would recommend the treatment to others.

**Conclusions**
Interim analysis shows the 3MP to be a safe, minimally invasive, outpatient treatment for prepubertal patients with Pectus Excavatum. However, we have identified a technical failure in fatigue fracture of titanium cables, and we are now redesigning a cable-free implant.

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**SS8.9**

The Efficacy and Benefits of the Vacuum Bell for Conservative Treatment of Pectus Excavatum

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Background/Purpose
We report outcomes of treatment with a Vacuum Bell (VB) performed for patients with pectus excavatum (PE).

Methods
Thirty-two patients (24 males and 8 females) undergoing treatment with a VB during the last 6-years, aged 1.5-40 years (mean: 16 years). We reviewed the following items recorded in their medical records: 1) changes in maximum depth of depression and CT index; 2) satisfaction rating; 3) duration of treatment and any changes.

Results
The maximum depth of depression reduced in all patients. Minimal change occurred in the CT index (7.6%), but subcutaneous fat thickened (84.6%). 95.5% were satisfied. Specific patients’ outcomes are as follows: 3 patients were satisfactorily completed; 13 patients are still continuing; 1 patient was partially completed due to no change and blister formation; 2 patients were changed to surgery; 12 patients stopped attending appointments.

Conclusions
The maximum depth of depression receded in all patients as a result of thickening of subcutaneous fat. Only two patients changed their treatment to surgery. VB is a viable treatment option for PE. It takes time but is less invasive and patient satisfaction is high.

SS8.10
Local anesthetic infusion via On-Q pump versus epidural for pain management following the Nuss procedure

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Background/Purpose
To compare the effects of local anesthetic via On-Q pump versus epidural analgesia following the Nuss procedure for pectus excavatum.

Methods
A multicenter retrospective chart review compared patients with epidural analgesia
(n=19), epidural plus On-Q pump (n=7), and On-Q pump (n=12) following the Nuss procedure in 2013 and 2014. The analysis of variance test with Bonferroni correction was used comparing total intravenous (IV) narcotic, average pain scores, total operating room (OR) time, and hospital length of stay (LOS).

Results
There were no significant differences in mean pain scores or in IV narcotic use between the epidural (+/- On-Q pump) and the On-Q only groups (149.17±75.65 mg). There were no significant differences in mean hospital LOS (5.8±0.8, 5.1±0.8, and 5.8±1.3 days in epidural only, On-Q only, and patients with both, respectively). Mean OR time was significantly longer for the epidural only group (146.58±28.30 minutes) than for the On-Q only group (121.42±21.98 minutes, p=0.04), but was not significantly different between the epidural and epidural plus On-Q groups (151.43±27.10 minutes, p= 0.06).

Conclusions
On-Q pump provides pain control similar to epidural analgesia following the Nuss procedure, with similar hospital length of stay. Placement of epidural catheter significantly increases time in the operating room.

SS8.11

Use of Transthoracic Cryoanalgesia during a Nuss Procedure

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Background/Purpose
A Nuss procedure is a surgical procedure which causes significant post-operative and long-term pain during the recovery phase. Cryoanalgesia is an alternate pain relief method that is used for thoracotomy operations. Its analgesic effect lasts for more than a month. We describe a thoracoscopic transthoracic cryoanalgesia technique applied during a Nuss procedure.

Methods
A thoracoscope is placed into the chest contralateral to the chest side that is to be examined. The patient’s anterior mediastinum is dissected to allow passage of the scope and a cryoprobe across the mediastinum. Prior to the passage of the instruments across the anterior mediastinum, the anterior chest wall is elevated using a T-fastener suture technique. Four to five intercostal nerves are treated on each side of chest for 2 minutes at -60 degree C.

Results
Four patients aged between 13 and 18 were treated with cryoanalgesia. Average Haller index was 4.9. Average length of post operative hospital length of stay was 1.8 days. Average pain score on the discharge day was 2.2 out of 10. Average pain score one week after operation was 1.3 out of 10.

Conclusions
The analgesic effect of cryoanalgesia decreases the morbidity of pain for patients recovering from a Nuss procedure.
Slipping Rib Syndrome in Children: Surgical Cartilage Excision

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Background/Purpose
Slipping rib syndrome (SRS) is an elusive diagnosis. Previous reports have been single cases or small series. We previously reported a multicenter review of 7 patients with encouraging early results. We now describe our matured experience.

Methods
This is a follow up study of patients with symptoms of SRS from 2006-2015. Included are the 5 previously analyzed patients and 25 new patients. Patients were called to review current symptoms, course and satisfaction.

Results
From 2006-2015, 30 patients underwent 38 operations. Four had re-operation at a different level; one that recurred twice, and 3 had contralateral resection. All had reproducible pain localized to the costal margin, 55% had a popping sensation and 18% were bilateral. 86% were female. Mean age of symptom onset was 13.6 years while mean age at diagnosis was 15.4 years. Contact was possible with 18/30 patients with mean time to follow up of 1.3 years. 72% of those felt they were cured, 44% rated satisfaction a 10 (mean 7.84). Of those not cured (5), all reported significant improvement.

Conclusions
Costal cartilage excision is an effective treatment for SRS and should be considered early in the workup of costal margin pain in a normally active population.

Delayed diagnosis in anorectal malformations: incidence and potential for complications

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Background/Purpose
Anorectal malformations (ARM) are common congenital abnormalities of the terminal hindgut. Ideally, ARM should be diagnosed at, or shortly following, birth by careful physical examination of the perineum. Delayed diagnosis has been implicated as a risk factor for complications, including intestinal perforation. This study aimed to determine the rate and complications of delayed diagnosis in ARM.

Methods
A retrospective review was performed of all ARM patients managed at a tertiary centre over a 15-year period (2000-2014). Data collected included ARM type and timing of diagnosis. Consistent with literature, ‘delayed diagnosis’ was defined as being at more than 24 hours of age.

Results
A total of 243 ARM patients (male-146/243, 60%) were included. The most frequent ARM types were perineal fistula (83/243, 34%) and rectovestibular fistula (40/243, 16%). Diagnosis was delayed beyond 24 hours of age in 93/243 (38%) patients. The ARM type most commonly delayed in diagnosis was anal stenosis (17/25, 68%). Two patients in whom diagnosis was delayed suffered an intestinal perforation, one of whom subsequently died.

Conclusions
Delayed diagnosis in ARM patients remains a common, and potentially fatal, occurrence. Improved assessment of newborns is required to ensure timely diagnosis of ARM, and avoidance of complications associated with delayed diagnosis.

SS9.2

Failing to Rescue? Pre-operative Characteristics Contribute More to Mortality in Pediatric Surgical Patients

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Background/Purpose
Failure to rescue (FTR), mortality after in-hospital treatable adverse events (AE), is considered an indicator of patient safety. As pediatric surgical patients have less...
post-operative mortality than adults, we hypothesized that pre-operative patient characteristics contribute more to mortality than AEs.

**Methods**
The National Surgical Quality Improvement Program-Pediatrics database (2012-2014) was queried for defined pre-operative characteristics and AE. Stepwise multivariate regression and area under receiver operating characteristics curve (AUROC) were used to evaluate pre-operative characteristics and AE associated with 30 day mortality. To create parsimonious models minimizing type 1 error, stepwise selection was used to choose variables for the models.

**Results**
The 30 day mortality rate for pediatric patients (183,233 operations) was 0.003%. There were 11 pre-operative characteristics associated with a greater than 20 fold increase in mortality (Table): AUROC 0.94, 95%CI 0.92-0.95 (Figure). 411 of 621 deaths (66%) had documented in-hospital post-operative AE preceding death. 9 AEs were associated with a 10 fold increase in mortality (Table). A multivariate model of AEs was less predictive of mortality: AUROC 0.76, 95%CI 0.73-0.78 (Figure).

**Conclusions**
Pre-operative characteristics, compared to AE, contributed more to mortality in children. AEs may not accurately reflect increased risk. FTR should be scrutinized as a patient safety metric in pediatric surgery.

**Developmental Outcomes Following Surgery for Small Bowel Atresia**

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**Background/Purpose**
Infants having early neonatal surgery are known to be at risk of developmental delay. The developmental outcomes for infants with small bowel atresia (SBA) have not been specifically reported.

**Methods**
Infants were enrolled between 2009 and 2014 and assessed at one year of age using the Bayley Scales of Infant and Toddler Development Version III. Cognition, receptive and expressive language, fine motor and gross motor skills scores were compared with the standardized norms of the assessment.

**Results**
Fourteen of thirty-one possible infants were assessed, as infants with SBA have only been routinely followed up in our clinic since 2013. Four infants were term. The mean birth weight was 2370g and mean gestation 36 weeks. There was no significant difference between the Bayley scores of the infants with SBA and the standardized
norms of the tests in four of the subsets: cognition, receptive and expressive language and fine motor, although both language scores were trending towards significance. Preterm infants with SBA did score lower than the normative values on the gross motor scale ($p = 0.008$).

**Conclusions**

These findings confirm concerns regarding the impact of surgery such as for SBA, especially in preterm infants, and support enrolment in neonatal developmental follow-up clinics.

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**SS9.4**

**Diagnosis and management of postoperative complications in esophageal atresia patients**

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**Background/Purpose**

To review our experience in diagnosis and management of postoperative complications (PCs) following esophageal atresia (EA) primary repairs, and to assess outcomes among EA patients with PCs.

**Methods**

We retrospectively reviewed all of EA patients at our institution from 2010 to 2015. Demographics, types of PCs, PC diagnosis, treatment and outcomes were recorded.

**Results**

150 EA patients were identified. EA repairs were performed in 136 patients. 41 cases were performed thoracoscopically, whereas 95 cases were performed open. The mortality rate was 8.8% and PCs were observed in 63 cases (46.3%). There was no significant difference in PC rate among EA patients with different surgical approaches. The frequent PCs were anastomotic stricture (AS, 44.4%), anastomotic leakage (AL, 27%), and recurrent tracheoesophageal fistulas (RTEF, 11.1%). All of AS and AL were confirmed by esophagography. RTEF was identified with esophagoscopy. All of AS cases underwent esophageal dilatation. Conservative treatment was performed in AL cases successfully. All of RTEF cases afforded reoperation.

**Conclusions**

AS, AL, and RTEF are the most common postoperative complications of EA. Esophagography is the best option for AS and AL diagnosis. RTEF diagnosis is depended on esophagoscopy. RTEF is a significant indication for reoperation. Outcomes is optimistic in patients with PCs.
**SS9.5**

**Infant Gastrostomy Outcomes: The “Cost” of Complications**

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**Background/Purpose**
Comparative outcomes of enhanced percutaneous endoscopic gastrostomy (PEG) and laparoscopic gastrostomy (LG) have not been elucidated in infants. We describe the outcomes and episodic healthcare expenditure of PEG versus LG in this high-risk population.

**Methods**
183 gastrostomies in children under 1 year were reviewed from Children’s Hospital of Wisconsin spanning 1/2011- 6/2015. Pertinent demographics and 3-month complications (mortality, gastrocolic fistula, reoperation, cellulitis, granulation, pneumonia, and tube dislodgement < 6 weeks) were collected. Charge and cost analysis of procedure-specific complications incorporating professional and facility fees was performed to measure financial impact across modalities.

**Results**
78 PEG and 105 LG infants were compared. LG infants were significantly younger, had higher ASA class, and increased frequency of cardiopulmonary disease. Significant major complications included a 3.8% incidence of gastrocolic fistula among PEGs (3.8% vs 0%, p=0.04) and 7.6% tube dislodgements among LG infants (0 vs. 7.6%, p=0.01), resulting in $86,896 of additional charges with the PEG complication. Incorporating complication frequency, charges and variable cost per case were $8,924 and $175 greater using PEG.

**Conclusions**
Despite a healthier cohort, infants undergoing enhanced PEG have more morbid and costly complications. LG may be the less burdensome approach to gastrostomy in infants.

**SS9.6**

**Specialty-Based Variation In Applying Prenatal Surgery Trial Evidence: Findings From A National Survey**

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Background/Purpose
The Management of Myelomeningocele Study (MOMS) was a multi-center, randomized controlled trial that compared prenatal repair with postnatal repair for fetal MMC. We were interested in understanding how obstetric and pediatric specialists interpreted the results of the trial and whether their practice has changed.

Methods
Cross-sectional mailed survey of 1,200 MFMs, neonatologists, and pediatric surgeons randomly selected from respective society member lists.

Results
Of 1176 eligible physicians, 670 (57%) responded. Comparing prenatal to postnatal repair, 33% saw it as “very favorable,” 60% as “somewhat favorable.” Sixty-nine percent reported being more likely to recommend open prenatal surgery. Twenty-eight percent were less likely to recommend pregnancy termination. In multivariable analysis, neonatologists, compared to other specialists, were more likely to report prenatal repair as ‘very favorable’ (OR 1.6 [95% CI: 1.03-2.5]). In separate multivariable models, pediatric surgeons and neonatologists, compared to MFMs, were less likely to recommend termination (OR 3.8 [95% CI: 2.2-6.7] and 4.7 [95% CI: 2.7-8.1], respectively) and more likely to recommend prenatal repair (OR 2.1 [95% CI: 1.3-3.3] and 2.9 [95% CI: 1.8-4.6], respectively).

Conclusions
In light of the MOMS trial results, the vast majority of pediatric and obstetric specialists view prenatal MMC repair favorably. This enthusiasm varies by specialty.

Clinical features of congenital cystic lung disease with a focus on the definitive diagnosis

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Background/Purpose
Congenital cystic lung disease comprises a spectrum of disease entities, including congenital cystic adenomatoid malformation (CCAM), bronchial atresia (BA), and intra- and extralobar sequestration (ILS, ELS). However, the clinical features of each disease have not yet been clearly described.

Methods
We retrospectively reviewed 145 patients who underwent pulmonary resection, with a focus on the definitive diagnosis determined by image findings and pathology.

Results
Among the patients, 79 were diagnosed prenatally and 66 postnatally (Table 1). Diagnosis breakdown was statistically different between the two groups. In the prenatal group, hydrops fetalis and fetal intervention in CCAM were higher compared with those of other diseases. There was a significant increase in the number of infants with CCAM requiring emergency operation in the neonatal period due to respiratory distress, compared with those with BA or ILS. In the postnatal group, the incidence of pneumonia as initial symptom in BA was markedly higher than that in CCAM. BA had statistically later age at diagnosis.

Conclusions
Each disease has distinct clinical features. In particular, CCAM and BA were considered to be different clinical entities in terms of their initial symptoms, onset age and prognosis.

SS9.8

Evaluation of the time of surgery for prenatally diagnosed congenital pulmonary airway malformation

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**Background/Purpose**
Clarifying the relationship between ultrasound findings, pathology, congenital pulmonary airway malformation volume ratio (CVR) and the time of surgery.

**Methods**
We retrospectively analyzed data for 36 cases of the bronchial atresia (BA) and congenital cystic adenomatoid malformations (CCAM), diagnosed prenatally from 2009 through 2014.

**Results**
Within two hours after birth, 12 patients underwent emergent lobectomy (emergent). In 5 cases, lobectomy was performed from 12 hours to 48 hours after birth (urgent). In 4 cases, lobectomy was required within 30 days after birth (early). We performed lobectomy in another 15 patients 11 months after birth (late). Of 12 emergent cases, 11 were macro-type CCAM (maximal CVR > 2.0), and 4 of 5 urgent cases were micro-type CCAM (CVR > 2.0). As for the early cases, 3 of 4 were macro-type CCAM and had a CVR < 1.5. 13 of 15 late cases were BA and showed a CVR 0.13-3.0 (median 0.78). The CVR of the cases operated on within 48 hours after birth was significantly larger than the CVR of the cases operated on after 2 weeks (p = 0.001).

**Conclusions**
Emergent or urgent lobectomy were usually required after birth in the CCAM, indicating a CVR > 2.0. On the other hand, elective surgery was performed in most cases of BA.
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Background/Purpose
Emergency rescue lung resection in a neonate causing by congenital lung cysts (CLC) is rare. Many reports have been described about fetal treatment for CLC; however, we have insufficient knowledge of the prenatal predictors for postnatal respiratory failure. We hypothesized that fetal images are useful predictors for emergency surgery.

Methods
CLC patients who underwent lung surgery during the neonatal period in our hospital between January, 2001 and December, 2015 were included. Demographic data, fetal image findings, and intra-and post-operative courses were compared between patients who underwent emergency surgery (EM group) or those who received elective surgery (NE group).

Results
The EM group and the NE group included 8 and 11 patients, respectively. The fetal images of both groups showed no significant difference in the volumes of lesions and the maximum diameters of cysts. Mediastinal shift was recognized more significantly frequent in the EM group (8/8) than in the NE group (6/11). The volumes of normal lung were significantly smaller in the EM group than in the NE group.

Conclusions
In the patients with CLC, mediastinal shift and significant decreases in volumes of normal lung during the fetal stages are good prenatal predictors of postnatal emergency lung resection.

SS9.10

Acute Intestinal Compromise in Neonates with Congenital Diaphragmatic Hernia: key presenting features and surgical management

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Background/Purpose
Congenital diaphragmatic hernia (CDH) affects 1 in 3000 live-births. Modern management strategies include delayed repair to permit pre-operative optimisation of cardio-respiratory status. We describe a cohort of neonates in whom emergency operative intervention was required for potentially fatal intestinal compromise.

Methods
A retrospective review was performed of all CDH patients managed at a tertiary centre over an 8-year period (2005-2012).

Results
A total of 115 CDH patients were managed during the 8-year period. Five neonates (male-1; gestation 37+3-39+5; birth weight 2.9-3.7kg; left CDH-5) required emergency operative intervention for presumed intestinal compromise. All five neonates demonstrated systemic hypotension despite inotropic support, raised serum lactate (>2mmol/L) and abnormal radiographic findings (prominent gastric bubble, dilated
intestinal loops, pneumatosis and/or pneumothorax). Operative intervention occurred within 53 hours post-birth (10-53 hours). Findings included gastric volvulus, jejunal volvulus, and perforated caecum. All patients underwent primary diaphragmatic repair without a patch. Temporary ileostomy was required in 1 patient. All patients remain alive.

Conclusions
Intestinal compromise is a rare, but potentially catastrophic, complication of CDH. Emergency operative intervention may be required in a select cohort of patients. Early deterioration following birth should alert clinicians to the possibility of significant intestinal pathology.

SS9.11

Pitfalls in prenatal prognostication of congenital diaphragmatic hernia: the growing pains of a new fetal medicine program

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Background/Purpose
Ultrasound-calculated observed-to-expected (O/E) lung-to-head ratios (LHR) and MRI-calculated O/E fetal lung volume (FLV) are often cited for prognostication in CDH, but may not be accurate. Pediatric surgeons must be versed in the pitfalls of these measurements to determine their utility in prenatal consultation.

Methods
This is a case series performed as a quality improvement measure wherein O/E LHR and O/E FLV were compared for prognosis for survival and need for ECMO.

Results
Ten prenatal diagnosed CDH patients underwent fetal MRI from 12/31/2012 to 5/14/2015. Eight fetuses survived to delivery and 3 (O/E FLV 17%, 48% and 70%) to repair and discharge. One required repair on ECMO (O/E FLV 17%). LHR was inaccurate in 7 instances. In 5 of those cases (71.4%), the measurement was not taken at a level with a four-chamber view of the heart.

Conclusions
MR O/E FLV more accurately predicted survival in our study and in the literature. LHR is operator dependent and associated with a steep learning curve. Our study demonstrates that the most common inaccuracy of LHR is due to a lack of four-chamber view of the heart. Thus, a pediatric surgeon can quickly look at the prenatal ultrasound images and assess for accuracy prior to counseling parents.
SS9.12

Acceptability of in utero hematopoietic cell transplantation (IUHCT) for sickle cell disease (SCD)

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Background/Purpose
IUHCT has curative potential for SCD but carries a risk of fetal demise. Using a reference-gamble paradigm, we assessed what conditions parents of children with SCD and young adults (YA) with SCD would consider IUHCT.

Methods
After IUHCT was described, given a 5% fixed risk of fetal demise, participants were randomized to start at a hypothetical cure rate (20%, 40%, or 70%). Subsequently, cure rate was either increased or decreased by set increments depending on the previous answer to reveal the lowest acceptable cure rate. Participants also completed the Pediatric Research Participation Questionnaire (PRPQ) to assess attitudes toward clinical trials.

Results
Overall, 74 of 79 (94%) participants were willing to consider IUHCT, and 52 (66%) participants accepted IUHCT a cure rate of 40%, the estimated rate of therapeutic mixed chimerism. There were no significant differences between parents and YA. Participants with higher scores on the PRPQ perceived benefits scale were more likely to participate at lower cure rates (OR 1.08, p=0.004). Demographics and SCD severity were not significantly associated with acceptability of IUHCT.

Conclusions
At estimated rates of therapeutic mixed chimerism, and a 5% fixed risk of fetal demise, the majority of parents and YA would consent to IUHCT in a future pregnancy.

SS9.13

Fecal beta-defensin concentrations and diagnosis of necrotizing enterocolitis

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Background/Purpose
Necrotizing enterocolitis (NEC) acts as a leading cause of death among preterm infants and early detection is difficult. The aim of this study was to evaluate the usefulness of fecal beta-defensin in the diagnosis of NEC.

Methods
Preterm infants were recruited from Shanghai children’s Hospital neonatal intensive care unit between April 2014 and May 2015. Meconium and stool samples were collected prospectively on alternate days for at least 28 days. The stool samples were collected after birth and stored in -80 degrees and the fecal beta-defensin 1-3 level and fecal calprotein level was measured with the ELISA kit.

Results
Fecal beta-defensin1-2 just show a slight raise in the NEC group than in the non-NEC group (P=0.12, P=0.21), but beta-defensin3 levels were significantly higher in the NEC group than in the non-NEC group (P<0.001). There was a significant positive linear relationship between the fecal beta-defensin3 level and Bell stages of NEC (P<0.001).

Conclusions
Fecal beta-defensin levels were significantly increased in premature infants with NEC. The fecal beta-defensin test might be a noninvasive, easy, and useful tool for the diagnosis of NEC.

SS9.14

Inguinal Hernia of Preterms: The Necessity of Contralateral Explorations and Timing of Repair

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Background/Purpose
The purpose of this study is to find out the need for routine contralateral exploration in inguinal hernia (IH) repair of preterms and the optimal timing of the surgery for preterms in neonatal intensive care units (NICU).

Methods
Medical records of the pediatric patients were reviewed who underwent IH repair between January 1998 and December 2009. Surgery was done on the affected side only, with telephone interviews performed to check long-term outcomes. Early and delayed repair were defined as herniorrhaphy before or after discharging from NICU.

Results
3690 patients received IH repair, and 211 preterms and 1900 full-terms were included. Mean follow-up was 91.0 months. The rates of bilateral IH and metachronous IH were observed higher in preterms than full-terms respectively (46.0% vs. 22.1%, p<0.001 and 10.9% vs. 6.3%, p<0.001). 90 preterms were diagnosed in NICU with 18 and 72 receiving
early and delayed repairs respectively. Preoperative incarceration, postoperative complication, recurrence rates were not different in both groups.

Conclusions
For preterms, bilateral exploration should be considered even the number of patients in this series is not large enough and further study is required. IH repair of preterms can be done before or after discharging from NICU depending on the patients’ medical conditions.

WEDNESDAY, APRIL 27, 2016
SCIENTIFIC SESSION 10 – HEPATOBILIARY

SS10.1

Saturation of stool color in HSV model is a promising objective parameter for screening biliary atresia

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Background/Purpose
Stool color card is used in screening program for biliary atresia (BA) to help parents determine acholic stools. However, it is not reliable when made by parents and inexperienced care-providers. Mobile APP is a potential tool like PoopMD. More sensitive objective parameters should be explored to design such APPs. We aimed to study the effectiveness of Saturation in HSV color model in stool color screening.

Methods
Saturation of the colors in published stool color cards (Taiwan, Japan, England) was read using PHOTOSHOP. Stool from 40 BA patients and 40 in-hospital neonates with pneumonia and oral feeding were photographed using Nikon-D7000. Pictures were judged as normal, abnormal or indeterminate by 2 pediatric gastroenterologists.

Results
Saturation of normal colors in published cards were >50%(67%-99%, median 85%), while were <50%(7-47%, median 25%) for abnormal colors. Thus we set saturation<50% as abnormal, >65% as normal and 50-64% as indeterminate. Saturation were normal in 37 and abnormal in 3 non-BA patients(specificity, 92.5%). Saturation was abnormal in 35, normal in 2 and indeterminate in 3 BA patients(sensitivity, 87.5%). Using the consensus of gastroenterologist as golden standard, sensitivity/specificity were 94.6%/92.5%.

Conclusions
Saturation of stool color in HSV model is a promising objective parameter and could be utilized in designing mobile APPs for screening BA.
Anicteric survival with the native liver after redo Kasai. Long-term follow-up. A first report

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Background/Purpose
We present a first report of the long-term follow-up of biliary atresia (BA) patients who became anicteric with the native liver (ANL; total bilirubin<1.5mg/dL) after redo Kasai.

Methods
Data for age at Kasai (initial/redo), anicteric ratio, requirement for liver transplantation (LTx), ANL ratio, and post-redo morbidity were collated from 46 redo-Kasai cases (1984-2015). ANL ratio was determined using the Kaplan-Meier estimate.

Results
BA type was I (n=3), II (n=1), and III (n=42). Mean ages at Kasai were 60.5 (initial) and 245.0 (redo) days. Jaundice persisted after the initial Kasai in 24/46 cases. Redo was indicated in the 22 initially anicteric cases for recurrence of jaundice. After redo, 5/24 of the persistently jaundiced cases and 14/22 of the initially anicteric cases became anicteric (p<.05). Of these 19, only 7 (one type I, six type III) are ANL and the remaining 12 had LTx or died. Over a mean of 15.8 years (range: 9.1-30.2) follow-up, post-redo morbidity recorded for ANL included cholangitis (n=4), portal hypertension (n=3), esophageal varices (n=4), splenomegaly (n=3), splenectomy (n=1), and thrombocytopenia (n=3). [Fig 1]

Conclusions
We are the first to report that the ANL ratio after redo-Kasai is low 7/46 (15.2%) and that ANL are prone to multiple morbidity.
Classification of biliary atresia in the laparoscopic era. Suggested modifications for type III

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Background/Purpose
In Kasai’s classification of biliary atresia (BA), type III is diagnosed when micro bile ducts (MBD) cannot be identified macroscopically on the surface of the biliary remnant transected at the porta hepatis. However, magnification during laparoscopic Kasai (lapK) with a 30° 10mm scope at a focal length of 5cm is x38 and x100 when zooming, enabling more MBD to be identified. Thus, the relevance of Kasai’s original classification in the laparoscopic era is questionable.

Methods
Intraoperative video recordings of 36 consecutive lapK cases (2009-2015) were reviewed to confirm MBD visibility. 85 consecutive open Kasai cases examined macroscopically served as controls.

Results
MBD were not visible under laparoscopic magnification during lapK in only 6/36 (16.7%) cases, but were visible in 30/36 (Fig 1). Thus, the incidence of type III BA using laparoscopy was 16.7%. However, in open cases, MBD could not be identified in 77/85 (90.6%), a typical result reported internationally. Ratios for jaundice disappearance (26/30=86.7% versus 4/6=66.7%) and survival with the native liver (23/30=76.7% versus 4/6=66.7%) were lower when MBD could not be identified compared with when MBD could be identified.

Conclusions
BA classification, in particular type III should be redefined in the laparoscopic era.
Current status of primary liver transplantation for biliary atresia in Japan

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Background/Purpose
Kasai procedure is the standard as the primary treatment for biliary atresia in the world. However, although very limited in number, primary liver transplantation (LT) has been done in Japan. The aim is to recognize the reality of primary LT in Japan.

Methods
From the Japanese Biliary Atresia Registry, patients who underwent LT or exploratory laparotomy (EL) as the primary procedure were picked up, questionnaire sent to the institutions of them were analyzed.

Results
26 patients with primary LT (15) or EL (11) were included. All the EL patients underwent LT later without following Kasai. Primary LT was done 198 days old in median (119-484 days), and EL was 107 days (27-246 days). Post-transplant survival of 26 patients was comparable to that of the LT after Kasai in our institution. Most common reason of choosing the primary LT was the older age of the patients, followed by findings that suggested advanced liver damage. However, no institution had definitive criteria for the selection.
Conclusions
For choosing the primary LT, patient’s age was a key in decision, but the condition of the patient was added in consideration. Further study is necessary to make criteria for primary LT in biliary atresia in Japan.
(Acknowledgement: to the Japanese Biliary Atresia Registry)

SS10.5
Surgical strategy based on the anatomical types of congenital portosystemic shunts in children

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Background/Purpose
Congenital portosystemic shunts (CPSS) with portal venous hypoplasia (HPV) or absence of the portal vein (APV) causes encephalopathy or portopulmonary hypertension. Acute shunt closure may result in postoperative severe portal hypertension. The aim of this study was to propose surgical strategy based on the anatomical types of CPSS from our experiences.

Methods
Twenty patients with CPSS diagnosed at our institute from 1990 to 2015 were retrospectively reviewed. All patients were evaluated by computed tomography, angiography, and measurement of PV pressure after a shunt occlusion test.

Results
The median age at diagnosis was 5.3 years old. Patent ductus venous (PDV) was detected in 11 patients, including 7 cases with APV and 1 case with HPV. Three PDV cases with normal PV were treated with surgical ligation or interventional embolization. Two of 7 APV cases were successfully performed liver transplantation. In total of 5 HPV cases, one case with end-to-side portacaval shunt was successfully performed one-stage surgical ligation based on an intraoperative PV pressure monitoring. After surgery, the intrahepatic PV dilated and had sufficient PV inflow without portal hypertension.

Conclusions
A precise anatomical evaluation of CPSS and intrahepatic PV patency are important for the selection of surgical treatment.
Technical Standardization of Kasai Portoenterostomy in Biliary Atresia

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Background/Purpose
To assess the clinical outcome of the current Kasai procedure (KP) compared with previous procedures.

Methods
We assessed the outcomes of 255 patients who underwent KP between 1972 and 2014 in our hospital. They were divided into four groups: Group 1 (1972-1981, double Roux-en Y (RY), n = 91), Group 2 (1982-1991, Suruga II, n = 80), Group 3 (1992-2001, double-valve RY, n = 46), and Group 4 (2001-2014, RY with a spur valve, n = 39). Clinical outcomes were compared between the four groups. Components of the current procedure included total removal of the extrahepatic biliary remnants at the level of the surrounding hepatic capsule and RY reconstruction with a spur valve.

Results
In groups 1, 2, 3, and 4, the jaundice clearance rate was 65.9%, 77.5%, 63.0%, and 87.2% (p = 0.0242); the incidence of early cholangitis was 60.4%, 53.8%, 37.0%, and 23.1% (p = 0.000272); the requirement for repeat KP was 15.4%, 37.5%, 17.4%, and 5.1% (p = 0.000128); and the 10-year native liver survival rate was 53.8%, 60.9%, 44.1%, and 75.6% (p = 0.0480), respectively.

Conclusions
The current standardized KP was associated with favorable outcomes, although long-term follow-up results need to be evaluated to infer a final conclusion.

Laparoscopic versus open Kasai procedure for biliary atresia: a randomized clinical trial

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Background/Purpose
The aim of this study is to evaluate the results of laparoscopic Kasai procedure (LKP) in comparison to open Kasai procedure (OKP).
Methods
A randomized clinical trial was carried out from October 2009 to May 2013. All the surgical procedures (LKP and OKP) were performed by the same surgeon with the same technical principle.

Results
One hundred patients were enrolled in the study with a median aged at surgery of 78 days. Forty nine patients underwent LKP and 51 patients OKP. There were no significant differences between the two groups regarding patient’s preoperative characteristics. Mean operative time of LKP was longer than OKP (216 vs. 135 minutes, p < 0.001). Follow up was available in 89 patients with a median time of 32 months (range: 1 month to 72 months). The jaundice clearance rate was 55.8% for LKP and 52.2% for OKP (p>0.05). The 1 and 5 years cumulative survival rates with native liver were respectively 74.0% and 55.4% after LKP vs. 75.9%, and 66.6% after OKP (p>0.05).

Conclusions
In this first randomized trial of LKP and OKP to date, the operative time of LKP was longer than OKP, the early and intermediate results of LKP were insignificantly different from OKP.

SS10.8
The role of splenectomy before liver transplantation in biliary atresia patients

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Background/Purpose
There is not yet any unified view regarding whether liver transplantation or splenectomy should be performed for hypersplenism before liver transplantation in Biliary Atresia (BA) patients. We herein describe the efficacy of splenectomy before liver transplantation.

Methods
Splenectomy was performed in ten patients with hypersplenism associated with BA. We retrospectively reviewed their perioperative and postoperative courses, the number of leukocytes and thrombocytes, and the MELD score.

Results
The mean age was 17.5±7.0 years (range 11-31 years), and the male-to-female ratio was 1:1. The platelet and leukocyte levels increased after splenectomy and returned to normal levels one month postoperatively. The mean MELD score after splenectomy was significantly decreased after splenectomy:10±2.1 vs 7.6±1.8. Especially, the prothrombin time improved. Five patients underwent liver transplantation because of hepatopulmonary syndrome and repeated bouts of cholangitis, but another five cases could avoid liver transplantation (the mean follow-up period was fifty-six months). The postoperative complications included portal vein thrombosis and intestinal perforation, but the patient survival rates remained at 100%.
Conclusions
After splenectomy, both pancytopenia and the liver function clearly improved. Splenectomy should therefore be a treatment option for patients with hypersplenism before liver transplantation.

SS10.9

Improvement in Hepatic Artery Thrombosis in pediatric liver transplant with introduction of microvascular techniques and customized anticoagulation protocol

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Background/Purpose
To assess the incidence of hepatic artery thrombosis over 3 eras following implementation of microvascular techniques and a customized anticoagulation protocol in a predominantly cadaveric in situ split pediatric liver transplant program.

Methods
Retrospective review of paediatric liver transplants performed at our centre between April 1986 and October 2015. Incidence of hepatic artery thrombosis (HAT) over 3 eras was analysed. 1986-2008 - first era, 2008-2012 - second era (when microvascular techniques were introduced) and 2012-2016 - third era, when in addition, a customized anticoagulation protocol was introduced which included replacement of Antithrombin 3, Protien C and S and early heparization.

Results
311 liver transplants were completed during the study period, with a median age of 32 months. 22% of grafts were cadaveric in situ split grafts in the first era and 73% in the last 2 eras. HAT occurred in 13.5% first era, 11.02% (p = 0.613) in the second era and dropped to 2.04% in the third era (p= 0.022).

Conclusions
The combination of microvascular techniques and anti-coagulation protocols have significantly reduced the incidence of HAT post liver transplantation in children in a predominantly cadaveric in-situ split liver transplant program.
Early outcome and safety of glucocorticoids in biliary atresia: single surgeon, single center, randomized controlled trial

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Background/Purpose
Our aim is to investigate early response of postoperative glucocorticoids therapy for biliary atresia (BA).

Methods
Our single-center and open-labeled randomized controlled study recruited 200 type 3 BA infants who underwent Kasai portoenterostomy (KP) from Jan. to Sep. 2015. As opposed to 100 blank-controlled infants, 100 infants in steroids group received post-KP methylprednisolone (4mg/kg/day from day 5 to day 7, tapering within 10-12 weeks). Early outcome and safety were evaluated by jaundice clearance (total bilirubin < 25 μmol/L) at 3 months and serious adverse events within 1 month post-KP.

Results
Both groups were comparable for basic characteristics such as gender (p=0.7765) and age at KP (p=0.1874). At 3 months post-KP, there was a significant increase of jaundice clearance in the steroids group (48.98% of the steroids group vs. 22.00% of the control group, p<0.0001). 3-month survival rate was 90.82% in the steroids group and 93.00% in the control group (p=0.6115). The incidence of serious adverse events demonstrated no significance between the two groups within 1 month post-KP (17.35% of the steroids group vs. 17.00% of the control group, p>0.9999).

Conclusions
Adjuvant glucocorticoids therapy post-KP in BA has early stage benefits in terms of jaundice clearance without increasing risk of serious adverse events.

Kasai Procedure improves nutritional status and decreases liver-transplantation associated complications in children with biliary atresia - a multi-center investigation

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Background/Purpose
The aim of this study was to retrospectively investigate whether Kasai Procedure(KP) improves nutritional status and decreases liver-transplantation(LT) associated complications in children with biliary atresia(BA).

Methods
From March 1st 2014 to February 28th 2015, 120 patients with BA, from 3 medical centers, were involved in this study. One-hundred and three patients received LT, the other 17 without prior KP died during waiting period(Group C). In 103 patients receiving LT, 58 patients received KP previously(Group A), and 45 received LT without KP(Group B). The nutritional status, parameters of liver function and complications before and after LT were analyzed.

Results
Compared to Group B/C, patients in Group A had significantly increased age when receiving LT (both,p<0.05). The bodyweight, albumin and hemoglobin in Group A were significantly increased compared to Group B before receiving LT and at 1 and 3 months after LT (all,p<0.0001). The bilirubin and ALT/AST were all decreased compared to Group B(P<0.05) before LT. The incidences of post-LT severe infection and hypoalbuminemia in Group A were significantly lower than Group B(p<0.05).

Conclusions
KP prior to LT increases the age of patients during waiting period, improves the nutritional status, liver function before patients receive LT, and decreases the incidence post-LT severe infection and hypoalbuminemia.

SS10.12

Hepatic volume changes after Kasai operation

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Background/Purpose
Biliary atresia (BA) is the end result of a destructive, inflammatory at any point form the porta hepatis to the duodenum. Undergone the kasai operation the number of long term survivors was increas that also has complication even lead life threatening. In this study we objective Hepatic volume change after successful Kasai operation between disease prognoses.

Methods
Review medical records of 167 patients treated Kasai operation performed for biliary atresia between march 2005 and December 2015. Patient division by three group: Group A(66 cases): good prognosis after kasai operation, Group B(53 cases) has complication group and Group C(48 cases) there have required or already liver transplantation. Hepatic volume change measured by ultrasononography exam.
Results
Hepatic volume change (Atrophic change) have 13.6% in group A, 47.2% in group B, 18.8% in group C (p<0.001). Each group have intra-hepatic cyst 15.5%, 47.2% and 35.4% (p=0.003), recurrent cholangitis 37.8%, 71.7% and 70.8% (p<0.001), esophageal varices bleeding 0%, 28.3% and 33.3% (p<0.001) there were have statistically significant different.

Conclusions
Total hepatic volume reflects the outcome of liver cirrhosis measurements of change of hepatic volume in biliary atresia patients could provide useful information regarding total liver function and disease prognosis.

SS10.13

Resection of hepatic tumors with central venous and right atrial extension using cardiopulmonary bypass

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Background/Purpose
Pediatric liver tumors occasionally present with extensive vascular invasion. Standard anatomic liver resections are typically used; however, the presence of direct tumor extension into the inferior vena cava (IVC) and right atrium (RA) requires additional surgical considerations. Here we present our surgical experience with primary liver tumors directly extending into the IVC and RA, using cardiopulmonary bypass (CPB).

Methods
A retrospective analysis of patients undergoing hepatic resection with the assistance of CPB for primary liver tumors from 1/2013-4/2015 was performed.

Results
Three patients were identified (Table 1). All patients presented with tumors arising from the left hepatic lobe, with extension into the suprahepatic IVC and RA. Patients 1 and 3 underwent in-situ hepatectomy followed by CPB for en-bloc resection of the intra-atrial tumor. Patient 2 had Budd-Chiari physiology due to outflow obstruction of the right lobe thereby requiring total hepatectomy, en-bloc intra-caval tumor excision, ex-situ left hepatectomy and re-implantation of right lobe. All patients required partial IVC or atrial resection and reconstruction. Overall survival after 9 months was 66.6% (Table 2).

Conclusions
CPB provides a controlled approach for en-bloc resection of hepatic tumors extending into the IVC and RA. When in-situ hepatectomy is not feasible, CPB is a critical component for successful resection.
FACTORS ASSOCIATED WITH COMPlications DURING REMOVAL OF LONG TERM VENOUS ACCESS DEVICES

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Background/Purpose
Compared to complications during insertion of long-term venous access devices, complications during removal are less well studied. We reviewed our experience.

Methods
Records of 235 pediatric port removals performed at NYU Medical Center from 2007-2013 were reviewed. Data was analyzed for gender, age, diagnosis, removal reason, insertion site, brand, and implant duration. Records were classified as with or without complications, features of these groups were compared using the Mann-Whitney U test and χ² analysis. Multivariate logistic regression was used to identify factors associated with complications controlling for patient, disease, and catheter features. Statistical significance was defined at <0.05.

Results
Thirty-three (14%) port removals were classified as complicated. Factors associated with complications included leukemia diagnosis, Boston-Scientific device, and long catheter dwell-time (Table 1). These same features, younger age, and male gender were associated with complications when controlling for patient, disease, and catheter features (Table 2). Among complicated removals, 21 (64%) were surgically extracted, 11 (33%) required interventional radiology and one was left in place.

Conclusions
The potential for retained catheters should be anticipated during removal of catheters. These problems may be avoided by careful choice of manufacturer and prompt removal. Younger patients, males, and leukemia patients may have higher risk for complications during removal.
Surgical Feeding Tubes in Pediatric and Adolescent Cancer Patients - A Necessary Evil?

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Background/Purpose
To evaluate surgical enteric access in pediatric cancer patients to determine factors associated with postoperative complications.

Methods
We reviewed the records of all patients<21 years old with a primary cancer diagnosis who underwent surgical procedures for enteral access at our institution between 2004-2014. Multivariate logistic regression was performed to determine independent predictors of postoperative complications.

Results
157 surgical procedures were performed in 121 patients during the study period. Approximately 1/3 of patients were underweight at operation, and 50% were performed in conjunction with hyperthermic intraperitoneal chemotherapy procedures. The distribution of all complications is shown in Figure 1. Following the first operation for enteric access, 58% patients developed one or more complication(s) and 17% experienced a major complication. No single factor was significantly associated with any or major complications but several trends were noted including increased complications associated with perioperative steroid use and abdominal radiation (Table 1).

Conclusions
Surgically placed enteric access in pediatric and adolescent cancer patients is associated with an astonishingly high complication rate emphasizing the importance of careful evaluation of these patients prior to embarking on surgical feeding access. Future work should evaluate mechanisms to decrease complications and/or explore alternative methods to provide supplemental nutrition in children and adolescents with cancer.
**Health-related quality of life for pediatric patients receiving cancer chemotherapy: a longitudinal study**

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**Background/Purpose**
The aim of this study was to longitudinally characterize health-related quality of life (HRQOL) in children receiving cancer chemotherapy.

**Methods**
Children with newly diagnosed cancer were included in the study. Parents reported HRQOL on behalf of their children. Outcomes were the Pediatric Quality of Life Inventory (PedsQL) 4.0 Genetic Core Scales and the PedsQL 3.0 Cancer Module. Parents completed the questionnaires for a total of 6 months. The questionnaires started at the initiation of chemotherapy protocol treatment cycle, and again 1, 3 and 6 months during treatment. For comparison, a survey on a demographically groupmatched sample of the general population was conducted with the PedsQL 4.0 Genetic Core Scales.

**Results**
Ninety-six parents of children participated. Compared with control subjects, children receiving cancer chemotherapy displayed worse HRQOL at all time points as determined by PedsQL 4.0 Genetic Core Scales. Reduction in PedsQL total scores and different subscale scores was observed from the initial to the follow-up assessment during chemotherapy. Children with leukemia/lymphoma have worse HRQOL compared with those with solid tumors after 6 months of treatment.

**Conclusions**
These results demonstrated that children with cancer had poor HRQOL during chemotherapy. Intervention and effects aimed at improving HRQOL in these children are required.

**Adrenal Cortical Tumors in Children**

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Background/Purpose
Adrenal cortical tumours are rare & their clinical features, pathology & management are discussed & the literature reviewed.

Methods
11 cases of adrenal cortical tumours were treated over 18 years. Age range: 7 months to 15 years. 10 were females. Two presented with Cushing’s syndrome (CS) and 6 presented with features of virilization. The duration of symptoms varied from 1 to 3 months. 5 children had adenoma & 4 had carcinomas, Child with CS had Bilateral Macronodular hyperplasia & one had Conn’s syndrome. 7/12 old, had Li-Fraumeni syndrome (LFS). All children with virilization had increased levels of 17-ketosteroids and 24 hour urinary DHEA. All had complete excision (two by laparoscopy). CS child had bilateral adrenalectomy. LFS child developed 2 secondaries in right lung, and secondaries in the abdomen. After excision, She received a modified chemotherapy regime. Conn’s syndrome child had excision & chemotherapy with DDD.

Results
2 children with Carcinoma died. One was lost to follow up after 5 years, the others are doing well, and are under careful follow up.

Conclusions
Adrenal cortical tumours have a better prognosis in children. It is felt, in children, probably they behave like blastomas. Careful long term follow-up is essential even in adenomas. Chemotherapy not effective.

SS11.5

Tumor – homing effect of human mesenchymal stem cells in a TH-MYCN mouse model of neuroblastoma

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**Background/Purpose**
Human mesenchymal stem cells (hMSCs) are multipotent stem-like cells that are reported to have tumor-suppression effects and migration ability toward damaged tissues or tumors. The aim of this study was to analyze the tumor-homing ability of hMSCs and antitumor potency in a transgenic TH-MYCN mouse model of neuroblastoma (NB).

**Methods**
hMSCs (3x10⁶) labeled with DiR, a lipophilic near-infrared dye, were intraperitoneally (i.p.) or intravenously (i.v.) administered into TH-MYCN mice. hMSC in vivo kinetics were assayed using the IVIS® imaging system for 24 hours after injection. Immunohistochemistry using human CD90 antibody was also performed to confirm the location of hMSCs in various organs and tumors. Furthermore, the survival curve of TH-MYCN mice treated with hMSCs was compared to a control group administered PBS.

**Results**
I.p. hMSCs were recognized in the tumors of TH-MYCN mouse by IVIS. hMSCs were also located inside the tumor tissue. Conversely, most of the i.v. hMSCs were captured by the lungs and migration into the tumors was not noted. There was no significant difference in the survival between the hMSC and control groups.

**Conclusions**
The present study suggests that hMSCs may be potential tumor-specific therapeutic delivery vehicles in NB according to their homing potential to tumors.

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**Reduction of miR-21 induces SK-N-SH cell apoptosis and inhibits proliferation via PTEN/PDCD4**

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**Background/Purpose**
miRNAs function as key regulators of gene expression in various cancers. We had found that miR-21 was upregulated in NB tissues, compared with embryonic adrenal and normal adrenal. In this study, we aim to explore the roles and regulation mechanism of miR-21 in neuroblastoma (NB) cells.
Methods
A lentivirus, carrying anti-miR-21, was used to stably knockdown miR-21 expression in neuroblastoma SK-N-SH cells for assessing tumor cell apoptosis and proliferation. The expression of miR-21, PTEN, PDCD4 was detected by qRT-PCR; the protein level of PTEN, PDCD4, and caspase-3 was detected by western blotting.

Results
Levels of miR-21 expression were markedly decreased in SK-N-SH cells. The expression levels of PTEN and PDCD4 in the SK-N-SH cell line transfected with miR-21 inhibitor were significantly increased. Cell proliferation was inhibited and the apoptotic ratio was significantly increased (p<0.05). Western blot analysis revealed a significant increase in caspase-3 expression.

Conclusions
The data indicated that miR-21 may play an oncogenic role in the cellular processes leading to NB. Moreover, our results suggested that miR-21 may serve as an important therapeutic target for NB patients, which initiates a signaling pathway involving miR-21/PDCD4/caspase-3 axis.

Identification of hsa-miR-21 as a target gene of tumorigenesis in neuroblastoma

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Background/Purpose
miRNAs play an important role in the pathogenesis of various tumors by acting as oncogenes or tumor suppressor genes. The purpose of this study is to examine the different expressions of miRNAs in neuroblastoma (NB), fetal adrenal tissues and normal adrenal tissues in order to explore the potential roles of these miRNAs in the tumorigenesis of NB.

Methods
Genome-wide analysis of miRNA expression in NB, fetal adrenal, and normal adrenal tissues was conducted using a miRNAs microarray. The different expressions of miRNAs were identified through fold-change filtering. Gene ontology and pathway analyses were performed using the standard enrichment computation method. Target miRNA correlated to embryonic development and tumorigenesis of NB was screened through bioinformatics. qRT-PCR was performed to confirm the results.

Results
We found 30 miRNAs that were upregulated > 2-fold in the order NB > embryonic adrenal tissues > normal adrenal tissues. The predicted target genes of miRNAs involved in embryonic and tumorigenic related signal pathways were selected, including has-miR-21, -153, -155 and -24. The expression of has-miR-21 in NB tissues was significantly higher (P < 0.05) compared to fetal and normal adrenal tissues.
Conclusions
Has-miR-21 is an important miRNAs related to embryonic development and the pathogenesis of NB.

SS11.8

A preliminary study of the TGF-beta1-induced epithelial-mesenchymal transition in neuroblastoma cells

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Background/Purpose
To investigate the TGF-beta1-induced epithelial-mesenchymal transition (EMT) in SK-N-SH cells and its impact on the Sonic Hedgehog signaling pathway.

Methods
Cellular immunofluorescence was used to detect the expression of TGF-beta receptor. TGF-beta1 was applied to SK-N-SH, and changes in cell morphology were observed. A scratch test and migration assay were performed to verify that the EMT could alter the SK-N-SH cell migration capacity. RT-qPCR assays and Western blots were used to detect EMT-related genes and proteins. Gli1, Gli2 and Gli3 were also determined.

Results
Immunofluorescence detection revealed that SK-N-SH cells expressed the TGF-beta I and TGF beta II receptors. After 14 days of TGF-beta1 treatment, most of the cells exhibited a pronounced spindle shape. Real-time PCR assays and Western blots showed that E-cad were significantly decreased, while alpha-SMA were significantly increased. And a scratch test and Transwell migration assay revealed that cell migration was increased significantly with increasingly higher concentrations of TGF-beta1. Gli1, Gli2 and Gli3 protein, which were significantly increased after the cells were treated with TGF-beta1 for three days.

Conclusions
TGF-beta1 can induce the EMT in SK-N-SH cells to increase SK-N-SH migration. SK-N-SH cells also express the Gli1, Gli2 and Gli3 protein, and TGF-beta1 may induce the EMT to modulate the Sonic Hedgehog signaling pathway.

SS11.9

Clinical features of focal nodular hyperplasia of the liver in children

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Background/Purpose
The aim of this study was to review the clinical features of children with focal nodular hyperplasia and our institution’s experience in the management of this rare disease.

Methods
A review of the medical records of children diagnosed with FNH between 1999 and 2013 at West China Hospital of Sichuan University was undertaken.

Results
Seventy-nine patients with FNH were identified: 68 patients without a history of malignancy and 11 patients with a history of malignancy. Patients with a history of malignancy had smaller FNH lesions and were less likely to have a central scar in FNH than patients without a history of malignancy. Forty-seven patients underwent liver resection due to concern for malignancy, symptoms and/or large lesions. Three patients were treated by embolization because of compression of the adjacent organs. There was no operative death or severe postoperative complications. Fourteen patients underwent liver biopsy to rule out malignant masses. The remaining 15 patients were managed expectantly with imaging surveillance.

Conclusions
Our data emphasizes the therapeutic approach that active management is indicated in symptomatic or progressive FNH and in children with diagnostic difficulties, whereas observation management is recommended in asymptomatic children with a definitive diagnosis.

SS11.10

The Expression and Significance of Epidermal Growth Factor Receptor in Neuroblastoma Cell lines and Tumor Tissues

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Background/Purpose
Advanced neuroblastoma has poor outcome. Immune toxin(IT), which targets tumor cell surface receptor EGFR, is a new supplementary therapy. The purpose of this study is to detect the expressions of EGFR in neuroblastoma, and to make sure if IT can be used in refractory neuroblastoma.

Methods
The EGFR expression level of 5 neuroblastoma cell lines was measured, and its expression in human neuroblastoma tissue samples was detected. Tumor samples and clinical data were obtained from 25 children admitted between 2008.8 and 2014.4 in our center.
Results
The expression of EGFR was higher in KP-N-NS cell line and BE(2)-C cell line. The positive rate of EGFR expression in neuroblastoma tissue was 81.0% (17/21), and 50% (2/4) in gangliocytoma, without statistical significance (P>0.05). The positive rate in favorable type and unfavorable type was 62.5% (5/8) and 92.3% (12/13) respectively, with no significant statistical difference, as well (P>0.05). Comparing the scores of 10 pre- and post-chemotherapy samples, the EGFR expression of these two had no significant statistical difference (P=0.3865 > 0.05).

Conclusions
The study confirmed the consistent and wide expressions of EGFR protein in neuroblastoma tissues and cell lines, which is the basis for the treatment of neuroblastoma cells by targeting this protein.

SS11.11
Resectability and tumor response after preoperative chemotherapy in hepatoblastoma treated by Japanese Study Group for Pediatric Liver Tumor (JPLT)-2 protocol

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Background/Purpose
In this study, we aimed to clarify whether surgical resectability and tumor response after preoperative chemotherapy (preCTx) represents prognostic factors for hepatoblastoma (HBL) patients treated by JPLT-2 study (1999-2012).
Methods
In 342 HBLs who underwent preCTXs, PRETEXT, CHIC risk stratification (standard (SR), intermediate (IR) and high risk (HR)) at diagnosis, POST-TEXT, and tumor resectability were evaluated by imaging and tumor response was also classified into responder (CR or PR) and nonresponders (NC or PD) according to RECIST criteria.

Results
There were 7 PRETEXT I, 106 II, 143 III, and 86 IV, including 71 metastatic HBLs. In POST-TEXT, 12 PRETEXT II, 42 III, and 58 IV were down-staged. The 5-year EFS/OS of 196 SR, 73 IR, and 71 HR-HBLs were 82/94%, 49/64%, and 28/34%, respectively. In 198 SR, all 160 responders without 6 cases survived event-free (Table, P<0.01). In 73 IR, 12 of 24 whose tumors remained as unresectable recurred and 9 of them were unresponder (P<0.01). In 71 HR, chemoresponder with resectable tumors after preCTx correlated with favorable outcomes (P<0.05).

Conclusions
Evaluation of response and tumor resectability after preCTx is useful for predicting prognosis in HBLs. To improve outcome of HBLs, we should reconsider the beneficial surgical procedures according to resectability and chemoresponsiveness.

Liver Transplantation for Hepatoblastoma: Single-Center Long-Term Outcomes

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Background/Purpose
Hepatoblastoma is the most common liver malignancy in children. Liver transplantation, with chemotherapy, has become standard treatment of unresectable hepatoblastoma. We present our 14-year single-institution experience with liver transplantation for hepatoblastoma.

Methods
A retrospective analysis of all patients who underwent liver transplantation for hepatoblastoma from 01/2001-09/2015 was performed.

Results
Twenty-five patients were identified and classified as: 1) primary liver transplant without initial pulmonary metastases (pLT); 2) primary transplant with metastases (pLTm); and 3) salvage liver transplant following previous liver resection (sLT). Survival and recurrence rates are listed (Table 1). Allografts included whole organ (13/25), split deceased donor (9/25), and living donor (3/25) grafts. In pLTm group, pulmonary metastases were addressed prior to transplant by surgical resection in three patients, and chemotherapy alone in one - this patient died from pulmonary relapse. There were 4 deaths in the entire cohort (pLT=2, pLTm=1, sLT=1) (Figure 1). The 2 deaths in pLT were secondary to recurrence of a transitional cell tumor, and complications of pulmonary hypertension postop.
Conclusions
Overall long-term outcome of liver transplantation for hepatoblastoma is excellent. Recurrence was highest with transitional cell histology or in sLT group; despite this, overall survival appears quite acceptable and therefore liver transplantation should be considered in these patients.

SS11.13

The Clinical Differences between Patients with Multifocal and Diffuse Hepatic Hemangiomas

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Background/Purpose
This study wants to find the similarities and differences between multifocal and diffuse types, and to identify the subgroup in the multifocal type which needs treatment in a timely manner.

Methods
Twenty-four cases during 1/2000-7/2015, all of which were multifocal and diffuse hepatic hemangiomas. Multifocal type patients were divided into two subgroups of countable (MC) and uncountable (MU). The medical data was analyzed retrospectively.

Results
There were 5 diffuse type and 19 multifocal type patients (6 MC and 13 MU). Significant differences were found between multifocal and diffuse types in clinical presentations of hepatomegaly, heart failure, dyspnea and hypothyroidism, however, no difference between MU and diffuse type. A majority of multifocal type patients were only observed clinically, with no treatment, and survival rate was higher when compared with diffuse type. Both MU and diffuse type needed treatment, but MC did not. Complete remission rate was highest in the MC, both the MU and diffuse type had the same remission rate, but lower than the MC. The diffuse type was more likely to die.

Conclusions
Diffuse type is a high-risk hepatic hemangioma, and needs active treatment. MU in multifocal type is unique, and has similarities in clinical presentation and treatment with diffuse type.
A clinical trial of low-dose mTOR inhibitor therapy for the treatment of children with refractory lymphatic anomaly

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Background/Purpose
The aim was to assess the effect and safety of low-dose mTOR inhibitor therapy for refractory lymphatic anomaly (RLA).

Methods
We performed a clinical trial of low-dose everolimus (trough level: 1.5-6.5 ng/ml) administered to 3 children with RLA after failing many previous therapies, and the effect and safety of the protocol were retrospectively reviewed.

Results
The first case was a 1-year-old boy with Gorham-Stout disease. He had a lymphatic anomaly which spanned from the left shoulder to the back and osteolysis of the scapula and the left rib bones. He subsequently developed a life-threatening condition due to massive hemothorax. With interferon treatment and radiotherapy, the lesion temporarily decreased in size, however, the lesion gradually increased in size 10 months after completion of the treatments. However, the lesion significantly decreased in size after the everolimus therapy.

Two teenage cases exhibited bleeding from a mucosal lesion of the rectosigmoid colon and a glossal lesion in a lymphatic anomaly, respectively. No bleeding developed after everolimus therapy. None of the patients had any severe side effects.

Conclusions
The administration of low-dose everolimus therapy was found to be safe and effective for children with RLA and it may be an important alternative method to avoid life-threatening conditions.

Oral atenolol therapy for proliferating infantile hemangioma

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Background/Purpose
The aim of this study was to evaluate the efficacy and safety of atenolol in the treatment of proliferating IHs.

Methods
A study of 76 infants between the ages of 5 to 20 weeks with superficial or mixed IH was conducted between August 2013 and March 2015. Oral atenolol was administered in a progressive schedule to 1 mg/kg per day in a single dose. Efficacy was assessed using the Hemangioma Activity Score (HAS) at weeks 0, 1, 4, 12 and 24. Safety was evaluated at weeks 0, 1, 4, 8, 12, 16, 20 and 24.

Results
Seventy patients completed 24 weeks of treatment. IH growth abruptly stopped for 93.4% of patients within the fourth week of treatment with atenolol. In ulcerated IHs, complete healing of the ulcerations occurred in an average treatment time of 5.5 weeks. Atenolol treatment promoted dramatic decreases in HAS scores after week 1. An ‘excellent’ treatment response was observed in 56.5% of patients at week 24. The most common adverse event was diarrhea, followed by agitation and sleep disturbance.

Conclusions
This study demonstrated that atenolol was effective and safe at a dose of 1 mg/kg per day for 24 weeks in the treatment of proliferating IHs.

SS11.16

Treatment Outcomes in Pediatric Melanoma - Are There Benefits to Specialized Care?

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Background/Purpose
To evaluate the impact of hospital specialization on survival in pediatric melanoma.

Methods
We reviewed all patients<18 years old with cutaneous melanoma and evaluated at our center from 2000-2015. We compared overall survival (OS) and disease-free survival (DFS) between patients who underwent surgical treatment at a National Cancer Institute (NCI)-designated comprehensive cancer center (Group A, n=146) to those who underwent initial surgical treatment at a non-NCI center (Group B, n=58). Comparisons were made using Fisher’s exact test or Wilcoxon rank sums test as appropriate. Kaplan-Meier survival curves were compared using log-rank test.

Results
Group A patients were more likely White, family history of skin cancer, thinner primaries, and earlier stage disease (all p<0.05). Group B patients were more likely to receive adjuvant therapy (50% versus 32%, p<0.05). Group A had significantly better OS and DFS (both p<0.001). The survival differences were most notable
in Stage 3 and 4 patients (Figure 1). Other factors associated with a higher risk of death included Non-white race/ethnicity, ulceration, lymphovascular invasion, Breslow thickness>4mm, stage 3/4 disease, unknown primary, older age, and adjuvant therapy (all p<0.05).

Conclusions
Surgical treatment at a comprehensive cancer center may improve outcomes for pediatric melanoma especially for patients presenting with later stage disease.

THURSDAY, APRIL 28, 2016
VIDEO PRESENTATIONS

V1

Robotic assisted Heller Myotomy for Esophageal Achalasia in Children

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Background/Purpose
Achalasia in an uncommon primary esophageal disorder characterized by failure of lower esophageal sphincter (LES) relaxation and is rare in children. Medical management often fails resulting in recurrent symptoms therefore the ultimate definitive treatment is surgical. We report our case which underwent successful Robotic assisted Heller Myotomy for Esophageal Achalasia in Children.

Methods
A 3-years 8 months old Russian female patient have frequent pneumonia attack, gaiter reflux symptom, and failure to thrive. Diagnosis to esophageal achalasia and operation (Heller myotomy) was decided by Robotic assisted system. Patient body weight was 12.7kg at the operation time.

Results
The surgery was successful we had fallow up Esophagography that show brid-beak sign disappearance and no complication until now.

Conclusions
Dissection of the esophagus should extend well into the thorax in order to complete the myotomy, and this is difficult to achieve using conventional laparoscopic instruments. Robotic surgery system has three-dimensional visualization and end-wristed instruments offering greater maneuverability that very helpful for during esophageal myotomy and identifying residual circular muscle fibers can prevent esophageal mucosa perforation. Our experience the robotic assisted Heller’s myotomy is feasible and safe surgery it should become the standard of care for the treatment of pediatric Esophageal Achalasia.
Pediatric Laparoscopic Left Adrenalectomy for Neuroblastoma

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Background/Purpose
A twelve month old male was diagnosed with neuroblastoma. The patient’s primary tumor was in the left adrenal and he had metastases to his liver, brain and subcutaneous tissue at the time of diagnosis. Given his age and favorable histology, he was staged as 4S and initially managed with close observation. He developed a frontal bone lesion which converted him from stage 4S to stage 4. He underwent 4 cycles of cyclophosphamide and topoteca with mixed response. During disease reevaluation, a cauda equina lesion was diagnosed which required a laminectomy for the nerve root lesion. He was then scheduled for resection of his primary tumor.

Methods
The patient underwent a laparoscopic left adrenalectomy.

Results
The surgery resulted in complete resection of the tumor.

Conclusions
The patient did well postoperatively and was discharged home on postoperative day three. His final pathology showed neuroblastoma with treatment effect measuring 4.3 x 3.0 x 2.0 cm. The margins were negative and the capsule was intact. The histology was favorable and was not N-Myc amplified. https://youtu.be/lc-X-Ex_LmQ (the video was shared with papssecy@gmail.com)

PAPS Latino: breaking worldwide frontiers in education for the hispanic/latino pediatric surgeon

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Background/Purpose
PAPS was concerned for the low attendace of hispanic pediatric surgeons in the association’s yearly meeting. To address this fact, we proposed to create a virtual interface with monthly high-yield video conferences from experts on a particular field of Pediatric Surgery, in Spanish. At the beginning of every webinar we start with a PAPS introduction and finish with an invitation to become a member and attend the upcoming meeting. Also, we encourage our colleagues to submit abstracts to future conferences.
Methods
PAPS was concerned for the low attendance of hispanic pediatric surgeons in the association's yearly meeting. To address this fact, we proposed to create a virtual interface with monthly high-yield video conferences from experts on a particular field of Pediatric Surgery, in Spanish. At the beginning of every webinar we start with a PAPS introduction and finish with an invitation to become a member and attend the upcoming meeting. Also, we encourage our colleagues to submit abstracts to future conferences.

Results
The first PAPS Latino event was on the 18th of December of 2014. So far, we've had 12 webinars with diverse interesting topics. The speakers have been from 7 different countries. We have an email database over 2000 Latin American Pediatric Surgeons from 14 countries and an average assistant rate of 85%. All of our conferences have been recorded and we have 1920 reproductions. We have not experienced significant technical difficulties. We continue to have great feedback.

Conclusions
PAPS Latino has started a new way to share high-yield education with a great impact in the pediatric population.

Breaking the mold: Instant messaging and social media for continuing medical education

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Background/Purpose
CME has traditionally been assisting to congress, courses and reading journals. Currently, Instant messaging and social media have launched a new way to obtain this.

Methods
In the last 3 years we have created 2 Facebook groups where surgical case presentations are posted for diagnostic and treatment discussion with participation of surgeons from different countries. We have also participated on 4 other international groups that have the same characteristics. This groups also have Journal article discussion. Similarly, we have used Whats app group to have instat opinions on challenging surgical cases.

Results
We have evaluated over 40 cases in Facebook and over 85 cases on Whatsapp. X-rays, Ct scans and video image quality is good.

Conclusions
We are in a new era of fast, cheap and accesible methods for continuing medical education. The challenge is to evaluate its value for certification requirements per contry.
Laparoscopy in Uncommon Pediatric Duodenal Pathology

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Background/Purpose
Minimally invasive surgery is a widely accepted technique in neonatal surgery for congenital duodenal pathology. We present three cases of uncommon duodenal pathology beyond the neonatal period, that were successfully corrected with laparoscopy.

Methods
Patient #1 is a 19 year old male, 41kg, with chromosome 3 microdeletion, CP, previous Nissen and G-tube. He presented with massive GI bleeding from a previously diagnosed duodenal diverticulum. He underwent laparoscopic duodenal diverticulectomy with on-table EGD. Patient #2 is a 6 kg 1 year old female with Down syndrome and a history of failure to thrive. She was found to have a significant narrowing of the second portion of the duodenum and underwent a laparoscopic duodenoduodenostomy. Patient #3 is a 4 year old male with 3 weeks of emesis 4 times/day with 2kg weight loss. Treated medically initially and when an upper endoscopy was performed, Jodhpur Syndrome was diagnosed. Duodenopyloroplasty was performed.

Results
Patient #1 bleeding episodes resolved and on follow-up his hemoglobin has remained above 12. Patient #2 had no further episodes of emesis after feeds. Patient #3 was discharged postoperative day 5 on a regular diet.

Conclusions
Minimally invasive surgery is a viable option for the repair of uncommon pediatric duodenal pathology.

Extracorporeal Membrane Oxygenation for Severe Pediatric Tracheobronchial Injuries

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Background/Purpose
Severe traumatic tracheobronchial injuries in children are rare, life-threatening injuries that require prompt diagnosis and surgical intervention. Extracorporeal membrane oxygenation (ECMO) can be a beneficial supportive therapy in these patients. This video demonstrates the presentation and management of a severe tracheobronchial injury.

Methods
We report the case of a 9 year old girl who presented to our emergency department with a severe tracheobronchial injury.

Results
The patient is a 9 year old girl who sustained blunt chest injury. Computed tomography chest demonstrated massive pneumomediastinum, multiple rib fractures and bilateral pulmonary contusions. The patient was taken urgently to the operating room for flexible bronchoscopy which revealed a 6cm linear tear involving both the anterior and posterior walls of the trachea with complete disruption of the left main bronchus and carina. Veno-venous ECMO was initiated allowing for rapid patient stabilization and ventilator support. Primary repair of the tracheobronchial injury was performed within 48 hours. Her post-operative course was complicated by bleeding requiring reopening of her thoracotomy. She also had evolution of a spinal epidural hematoma resulting in paraplegia.

Conclusions
Although bleeding remains a potential severe complication, ECMO can be a lifesaving supportive therapy for major tracheobronchial injuries associated with severe thoracic trauma.

https://youtu.be/Za9WjAT0Gjk

Rectal Duplication Cyst - A Novel Operative Approach

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Background/Purpose
Gastrointestinal duplications cysts are rare with rectal duplication cysts comprising 5% of these congenital anomalies. This case is a 2 month old male presenting with bilious emesis due to bowel obstruction and a prolapsing rectal mass which was found to be a rectal duplication cyst.

Methods
The patient had a soft mass protruding from the anus posteriorly when straining to defecate, then presented with bilious emesis and obstipation. Imaging showed a filling defect in the rectum with an intrinsic mass arising along the posterior wall causing severe luminal stenosis. Decompression was performed, the patient was resuscitated, and we began our operative planning.

Results
https://vimeo.com/152164535
Diagnostic laparoscopy showed the cyst within rectum. We mobilized the upper rectum distally to the levators. At the perineum an incision was made at the dentate line, a submucosal becoming extrarectal plane was developed leaving the cyst intact within the rectal wall. The colon was pulled through then transected proximal to the cyst and anastomosed to the distal rectal cuff. The end to end anastomosis was performed between the pull-thru and rectal mucosa.

Conclusions
For rectal duplication cysts within the rectal wall a laparoscopic proctectomy and Swensen type pull-thru with colo-anal anastomosis can be performed for successful cyst excision.

V8
Thoracoscopic placement of diaphragmatic pacemaker leads for phrenic nerve pacing

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(Abstract not available)

V9
Thoracoscopic division of Vascular rings

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Background/Purpose
Vascular rings often require surgical treatment due to tracheal or esophageal compression. Management in infants and children has traditionally required an open thoracotomy. However, given the known advantages of the thoracoscopic approach, the minimally invasive technique to repair these thoracic vascular anomalies has grown in popularity. The most common types that are amenable to a thoracoscopic approach are a right aortic arch with an aberrant Left subclavian artery with the ligamentum arteriosum causing compression, and a double arch with an atretic left arch. This video deomonstrates the treatment of these 2 defects.

Methods
18 patients with these 2 anomalies have been approached thoracoscopically The patients under go a right mainstem intubation to allow for complete lung collapse and then are placed in a modified right lateral decubitus position tilted forward
approximately 30 degrees. A three port technique is used with a 4mm thirty degree scope, a 3mm instruments, and 5 mm endoscopic clips or stapler. All patients had proximal and distal pulse oximetry to insure there was no compromise to distal flow.

**Results**
All cases were completed successfully thoracoscopically. Operative times ranged from 25-65 minutes. The lung was re-inflated on the table and no chest tubes were left except in the 2 patients who also underwent repair of a type 3 TEF. Average hospital stay in the 16 without TEF was 1.2 days.

**Conclusions**
Thoracoscopic division of a vascular ring is a safe and effective procedure in those cases were vascular re-implantation is not required.

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**V10**

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**It was a dark and stormy night- A simple technique for infant hernia reduction**

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**Background/Purpose**
Babies presenting with incarcerated inguinal hernias can be daunting to parents and inexperienced doctors. When geography, time of day or weather are complicating factors in transporting infants to a pediatric centre with an irreducible hernia it would be good to offer a simple and effective technique for inexperienced health care workers or parents to attempt reduction before sending the infant in.

**Methods**
In the past twenty years the author has offered telephone advice to many parents and doctors dealing with an irreducible inguinal hernia. The technique described is to carefully fully invert the baby holding the child by the ankles. This extreme Trendelenburg positioning, aided at times by a partner gently pushing on the hernia, allows gravity to achieve reduction. The author’s Pediatric surgery centre covers a wide geography including remote areas that has, at times extreme weather making transport difficult, dangerous and occasionally impossible.

**Results**
This technique has been administered by novice personnel, either parents or doctors over the previous decade. In all instances it has been successful, unless the child is older than a year or the diagnosis has proven to be incorrect.

**Conclusions**
This lift and inversion technique for reduction of infant hernias is simple and effective.

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**THURSDAY, APRIL 28, 2016**

**SCIENTIFIC SESSION 12 – UROLOGY**

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**SS12.1**

**Modified PATIO Repair for Urethrocutaneos fistula post hypospadias repair: Operative technique and outcomes**

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**Background/Purpose**
To describe operative technique of modified PATIO repair for urethrocutaneous fistula repair and to evaluate its outcome.

**Methods**
We studied 15 boys who underwent modified PATIO repair (operative technique will be described in detail during presentation) from Jan 2010 to Sept 2015. Parameters studied included age, type of hypospadias, age at first urethroplasty, hypospadias repair technique, number of urethroplasties done, location of fistula, time gap between urethroplasty and fistula repair, method of fistula repair and outcome of fistula repair.

**Results**
Mean age of the studied patients was 67.6 months (38-139 months). Type of hypospadias was Coronal=3, subcoronal=8, midpenile=2, prominall penile and penoscrotal one each. Average age at urethroplasty was 43.4 months (18-110 months). Previous urethroplasty was Snodgrass repair=12, Mathieu = 1, Therisch-Duplay repair in 1 patient. Previous operation details were not available in 1 patient. Location of fistula was coronal in 9 patients and subcoronal in 6 patients. Average operative time was 47.2 minutes (30-68 mins). On follow up 2 patients had recurrent fistula, one of which was successfully treated by redo modified PATIO method.

**Conclusions**
Modified PATIO method is technically easy method for urethrocultaneous fistula repair, with less operating time and good post operative outcomes.

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**SS12.2**
Correction of severe penile curvature using a pedicled tunica vaginalis flap after tunica albuginea incision in hypospadias

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**Background/Purpose**
Inadequate correction and post-adequate correction recurrence of severe penile curvature (SPC) in hypospadias is problematic. We evaluated our new technique for SPC correction.

**Methods**
23 hypospadias patients with SPC treated by a single surgeon from 2005-2015 were reviewed. SPC was corrected by incising the tunica albuginea (TA) at the most curved part of the penis ventrally then patching the TA defect with a “pedicled”, i.e., vascularized tunica vaginalis flap (P-TVF). Correction of SPC was confirmed by artificial erection upon completion of surgery. Urethroplasty was performed 9-12 months later. Parents were asked to rate their satisfaction with SPC correction postoperatively.

**Results**
Types of hypospadias were distal (n=9), mid-shaft (n=6), penoscrotal (n=6) and scrotal (n=2). Mean age at urethroplasty was 2.5±1.8 years. Two cases (8.7%) required fistula repairs. Three cases (13.0%) had mild urethral stenosis treated
by bougienage. At mean follow-up of 6.0±2.8 years, no curvature was present in any case. Parents reported penile cosmesis as good (21/23=91.3%) or acceptable (2/13=8.7%).

Conclusions
Our technique appears to be effective for treating SPC in hypospadias and overcomes the risk for recurrence due to necrosis of the graft when the TA defect is patched with a non-vascularized “free” tunica/dermal graft.

SS12.3

Reinforcing the ventral penile shaft with pedicled fat/connective tissues before urethroplasty lowers the risk for post-urethroplasty complications in hypospadias

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Background/Purpose
We termed reinforcement of the ventral penile shaft with pedicled pericordial fat, pedicled scrotal fat, pedicled peri-meatal connective tissue, or a combination of these at the time of initial hypospadias surgery (IHS), CHARGE (Figure 1), because the pedicle “charges” tissue vascularity before urethroplasty and thus decreased post-urethroplasty complications (post-UPC).

Methods
We reviewed post-UPC in 120 staged hypospadias repair patients (1997-2015). CHARGE, commenced in 2010, was used in 36 cases (C group), not indicated in 4 cases because of thick ventral connective tissue, and not used in 80 cases (NC group). IHS included foreskin degloving, foreskin degloving with chordectomy, dorsal plication, tunica albuginea incision or a combination of these.
Results
Subject demographics were similar. In NC, there were significantly more post-UPC (n=20) including stenosis (n=14), fistula (n=4), diverticulum (n=2) and wound infection (n=2), than in C (n=0) (p<.01). Operative time (minutes) was significantly longer in C but the difference was less than 20 minutes (155.8±40.4 versus 136.9±35.3) (p<.05). Post-UPC took a mean of 0.7±0.2 years (range: 0-3) to develop after urethroplasty. Mean follow-up after urethroplasty was significantly shorter in C, but close to double the time taken to develop post-UPC (1.3±1.0 versus 5.5±3.8) (p<.05).

Conclusions
CHARGE would appear to prevent post-UPC.

SS12.4
Free end ureteral in situ reimplantation method for managing infant primary obstructive megaureter

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Background/Purpose
Conventional management of primary obstructive megaureter (POM) involved ureteric reimplantation with tapering. To avoid a potentially difficult operation in a small infant bladder, a modified free end ureteral in situ reimplantation has been proposed.

Methods
From January 2012 to January 2014, 13 children with POM, ranged 1 month to 7 months, underwent modified transvesical ureteral implantation surgery. Treatment consists of transecting the ureter proximal to the obstruction and performing an in situ anastomosis with the bladder in an end freely fashion, providing a ureteral diameter:free length in bladder ratio of 1:2. Voiding cystourethrography and cystoscopy were conducted in patients at 6 months and 12 months after surgery.

Results
The mean operating time was 40 min. There were one redo reimplants for recurrent obstructions and one cohen reimplantation for Grade 5 VUR. Other eleven patients demonstrated improved drainage of the affected kidney(s) following surgery. At the time of cystoscopy, long papillary ureteric ori?ce was found to be peristalsis and spray urine discontinuously.

Conclusions
The proposed ‘free end ureteral in situ reimplantation' for POM in infants is a safe, feasible, and less invasive procedure. Further larger studies are required to support or negate the usefulness of this technique.

SS12.5
Pediatric gonadal tumors: a retrospective review from Auckland, New Zealand

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Background/Purpose
This is a 12-year, single-centre, retrospective review of pediatric testicular lesions. Comparisons were made between its findings and those from a matching review of ovarian lesions to determine if there is any similarity in pathological patterns. In the first study 99 out of 244 ovarian masses were neoplastic, 19 (19%) were malignant with 55.6% of neoplasms being mature cystic teratomas. Neoplastic lesions were more likely palpable and less likely to be painful.

Methods
Our tertiary hospital’s pathology database was searched for all ‘testicular lesions’. Patients younger than 16 years of age during the 12 year study period (January 2000 to December 2011) were identified and a retrospective review of clinical records completed.

Results
Over 1000 samples of testicular tissue were processed. 33 of these were tumors and 22 (66.7%) were malignant. 27 patients presented with unilateral scrotal or testicular swelling. Pain was a presenting symptom in only one patient. When measured, alpha-fetoprotein was higher in the malignant cases.

Conclusions
Testicular tumors appear to be less common than ovarian tumors, but the rate of malignancy is higher. Consistent with neoplastic ovarian lesions, those with a testicular origin do not commonly present with pain. A high alpha-fetoprotein with testicular growths was associated with malignancy.

SS12.6
A new understanding about spina bifida occulta and enuresis in children

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Background/Purpose
Is spina bifida occulta(SBO) really related with enuresis? Is it necessary for children with enuresis to undertake X-ray film for finding SBO? How about the SBO incidence in non enuresis children. This study will give us a new understanding of SBO and enuresis.

Methods
2200 patients were retrospectively reviewed on CT (due to abdominal symptoms, other than spinal abnormalities). For evaluating SBO, 1940 cases below 18y, divided into 18 groups at 12 months age interval, SBO incidence in each group were calculated and compared.

Results
SBO were 94.7%-100% in 8 groups of 0-8y, 46.8%-52.2% in 6 groups within 8y-14y, 19.0%-20.7% in 4 groups of 14y-18y;no statistic difference among them respectively; 3 parts at 0-8y,8y-14y,14y-18y were considered statistic difference. No statistic difference for 14y-18y and above 18y.

Conclusions
SBO is common in non enuretic childen, can not be considered a cause of enuresis. Vertebral arches developing after birth can be divided into 3 period: open period for 0-8y, transition period for 8y-14y, closed period for above 14y and adults. X-ray film for SBO are no longer recommended. Patient’s age should be taken into a account for SBO related of incidence comparison.
eGFR in long-term survivors who underwent unilateral nephrectomy for malignancy during childhood

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Background/Purpose
To assess long-term residual renal function in patients who underwent unilateral nephrectomy for pediatric malignancy.

Methods
Twenty-one patients who underwent unilateral nephrectomy (median age at last follow-up, 13 years [range, 1-21 years]) were enrolled in this study. Fifteen patients had Wilms’ tumor, 2 had congenital mesoblastic nephroma, and 4 had neuroblastomas. The age-adjusted estimated glomerular filtration rate (eGFR) was evaluated using the equation of Japanese Society for Pediatric Nephrology (for age 2-18 years) or Japanese Society of Nephrology (for the age > 20 years). An eGFR > 90 ml/min/1.73m2 was considered normal.

Results
Average eGFR after unilateral nephrectomy was 105.2 ml/min/1.73m2 in 2-year old children, 95.9 ml/min/1.73m2 for age 3-4 years, 97.3 ml/min/1.73m2 for 5-6 years, 97.7 ml/min/1.73m2 for 7-8 years, 106.8 ml/min/1.73m2 for 9-10 years, 105.5 ml/min/1.73m2 for 11-12 years, 94.6 ml/min/1.73m2 for 13-15 years, and 94.5 ml/min/1.73m2 for 16-22 years (Fig).

Conclusions
eGFR following unilateral nephrectomy remained at the lowest end of the normal range during childhood and adolescence. In middle and old age, renal insufficiency may increase as renal function declines. Long-term close follow-up of renal function is indispensable in such patients.
SS12.8

The Incidence and Risk Factors of Pediatric Metachronous Contralateral Inguinal Hernia: Analysis of 15-year Comprehensive Nationwide Database in Taiwan

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Background/Purpose
To identify the impact of laparoscopic hernia repair (LIHR) on prevention metachronous contralateral inguinal hernia (MCIH) in pediatric patients.

Methods
This large cohort retrospective study used the Taiwan National Health Insurance Research Database. All pediatric patients with primary unilateral inguinal hernia repair who were born after 1996/01/01 were collected through ICD-9 diagnostic and procedure codes.

Results
From 1996 to 2010 a total of 49863 pediatric patients underwent unilateral inguinal hernia repair with 90.4 months median follow-up. The overall rate of MCIH was 11.7%. After mutivariate analysis, LIHR showed significantly lower risk of MCIH [Open inguinal hernia repair (OIHR) : LIHR = 12.9% : 3.9%, HR= 0.293, 95% CI: 0.158 â€” 0.545 p value < 0.001]. Age less than 6 years is a risk factor while male gender is a protective factor for subsequent MCIH. Complicated hernia, type of hernia, preterm, and VP shunt had no influence on developing MCIH.

Conclusions
After long term followed-up, LIHR showed significantly lower risk of MCIH repair than OIHR. Age < 6 y/o is a risk factor and male gender is a protective factor for MCIH. If patients with risk factor, LIHR could be considered to prevent subsequent secondary surgery for MCIH.

SS12.9

STING versus HIT techniques in the Endoscopic Treatment of Vesico-ureteral Reflux: A systematic review and Meta-analysis

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Background/Purpose
Our study aimed to compare the efficacy of two endoscopic techniques used for correction of vesico-ureteral reflux (VUR): Subureteral transurethral injection (STING) and Hydrodistension implantation technique (HIT).
Methods
We searched for articles fulfilling our inclusion criteria published from 2004-2015 using MEDLINE, Google scholar and Cochrane databases. Meta-analysis of selected studies was performed to compare reflux resolution following both techniques.

Results
Six observational studies met the inclusion criteria for content. These included 632 ureters treated by STING and 895 ureters treated by HIT procedure. All included studies utilized dextranomer/hyaluronic acid (Deflux) as the bulking agent. Resolution of VUR was determined by micturating cystourethrogram (MCU) at least 3 months after injection. The overall resolution of VUR was significantly higher in HIT (82.5%) compared to STING group (71.4%) [Pooled odds ratio (OR)=0.54; 95% confidence interval (CI) 0.42-0.69; P<0.0001; I²=8%]. Subgroup analysis showed that HIT procedure had better outcome than STING for both low grade (I-III) [OR=0.43; 95%CI 0.23-0.82; P=0.01; I²=0%] and high grade (IV-V) VUR [OR=0.43; 95%CI 0.20-0.91; P=0.03; I²=0%]. However, there was no significant difference in terms of indication for repeated injection between the two groups.

Conclusions
HIT is superior to STING technique for the correction of all grades of VUR using Deflux. Nonetheless, additional RCTs with longer follow-up are needed to reaffirm this.
vas deferens without epididymis. Each undescended testis was nearly normal sized and located around the inner ring, and had both epididymis and testicular vessels but had no vas deferens. Orchidopexy was done for undescended testis expecting potential benefit of the hormonal functions.

Three cases of the polyorchidism are summarized table 1.

**Conclusions**
The management of polyorchidism may be feasible depending on the location, size and anatomical connection of the testicular drainage system of the patient.

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**SS12.11**

**Persistent urogenital sinus assessment by genitography; An accurate approach**

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**Background/Purpose**
Persistent UGS due to congenital adrenal hyperplasia (CAH) represents the most common form of female disorders of sexual development. The anomaly is external virilization resembling male genitalia due to prenatal exposure to increasing levels of androgen.

**Methods**
We performed combined genitography and endoscopy for 5 cases, 8 months-30 months old, over period from April 2015 to July 2015. Cases were prospectively studied by genitography & cysto-urethroscopy prior to single-stage feminizing genitoplasty. External virilization was assessed by Prader’s classification. Internal anatomy was studied by measuring length of preconfluence urethra, length of UGS and vertical depth of vaginal-urethral confluence using water soluble contrast injected in dead lateral position under fluoroscopy.

**Results**
The mean age of cases was 19 months, mean length of proximal urethra was 15mm, mean vertical depth of vaginal urethral confluence from perineum was 9mm and mean UGS length was 14mm.

**Conclusions**
Direct vertical depth of vaginal-urethral confluence is an important indicator for required mobilization.
Proximal urethral length is important indicator of urinary function outcome.
Genitography is as important as distal lopogram in anorectal malformation.
Genitography using our method is highly accurate method for assessment giving an excellent idea about anatomical variations of these cases and helps in setting surgical plan.
Diagnosis and treatment of congenital prepubic sinus in female infants: Experience with 3 cases

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Background/Purpose
Congenital prepubic sinus is a rare congenital malformation. Here we report our experience with 3 female infants with congenital prepubic sinus.

Methods
Three cases presented between November 2011 and March 2014. Description of the sinus opening, imaging, histology and outcomes are summarized.

Results
The 3 females were 3 to 24 months old, all with a persistent mucoid discharge from the sinus opening. A preoperative contrast sinogram was used to delineate the anatomy of the tract. Intraoperatively, methylene blue was injected to indentify the sinus tract, which was found to be crucial for complete resection. The sinus passed inferior to the pubic symphysis, and extended to, but did not enter the anterior wall of the urine bladder. The sinus lengths were 6.0±0.5cm. All tracts were lined by stratified squamous epithelium. Patients were followed up for 3 to 30 months with satisfactory cosmetic outcomes and no recurrences.

Conclusions
Complete resection is the effective treatment for congenital prepubic sinus in children. Sinogram was performed preoperatively to delineate the tract anatomy. Intraoperative methylene blue instillation can simplify the surgical exploration and help to achieve a complete resection. The anatomy and histologic appearance suggests that they arise embryologically from a variant of dorsal urethral duplication.

Role of Anticholinergics and Gabapentin in Management of Neurogenic bladder after repair of Spina bifida - A Randomised Controlled Study

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Background/Purpose
Anticholinergics are well established in management of neurogenic bladders, however some patients do have sub optimal response or severe side effects. This study is designed to assess and compare efficacy of Gabapentin with oxybutynin in neurogenic bladders after surgery for spina bifida.

Methods
Patients were randomized into three groups after urodynamic studies and started on oxybutynin, gabapentin and combination of both respectively. A thorough clinical and urodynamic reassessment was done at 6 months and one year after starting treatment.

Results
Forty four patients (3 -19 years ) were included in study. Improvement was noted in symptoms as well as urodynamic parameters in all groups. Maximal improvement
of symptom score was with combination of drugs at 1 year. In urodynamic studies, the compliance, pressures and capacity showed improvement which was significant between the groups at both six months and 1 year for bladder pressures and volume. Improvement in compliance though marked was not statistically significant. Best response was seen in group receiving both drugs. Gabapentin was better tolerated than oxybutynin.

**Conclusions**

Gabapentin is a good alternative to oxybutynin for management neurogenic bladder both as monotherapy and as an add-on therapy. It has potential application in patients with inadequate response to anticholinergics.

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**SS12.14**

**Testicle-sparing surgery in children with Leydig cell tumors: single center experience**

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**Background/Purpose**

To retrospectively review children with Leydig cell tumors (LCT) treated by testicle-sparing surgery (TSS) in our center.

**Methods**

Since 2010, 5 boys with testicular LCTs have been identified in our center, 4 cases were in right side and one in left. All the patients accepted TSS. Mean age at surgery was 7.39 years (4.86-10.79). Mean follow-up time was 2.58 years (1.38-5.38). Mean volume of tumor was 2.58 ml (0.17-9.76).

**Results**

3 patients complained of testicular mass or enlargement, while the other two complained of penis enlargement. 4 boys presented with precocious pseudopuberty, 3 were isosexual with penis enlargement and one was heterosexual with breast development. The 4 patients with precocious pseudopuberty had high level of plasma testosterone before surgery. All of their testosterone level had decreased to normal very quickly and puberty signs disappeared or stopped progressing after surgery. All patients recovered well after surgery, and operated testes developed symmetrically to contralateral ones and with no evidence of recurrence.

**Conclusions**

Testicular Leydig cell tumors are considered benign in children. TSS is suggested to be the first choice of treatment, which can spare the testis and has favourable outcome.
Correction of severe penile curvature using a pedicled tunica vaginalis flap after tunica albuginea incision in hypospadias.

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Background/Purpose
Inadequate correction and post-adequate correction recurrence of severe penile curvature (SPC) in hypospadias is problematic. We evaluated our new technique for SPC correction.

Methods
23 hypospadias patients with SPC treated by a single surgeon from 2005-2015 were reviewed. SPC was corrected by incising the tunica albuginea (TA) at the most curved part of the penis ventrally then patching the TA defect with a “pedicled”, i.e., vascularized tunica vaginalis flap (P-TVF). Correction of SPC was confirmed by artificial erection upon completion of surgery. Urethroplasty was performed 9-12 months later. Parents were asked to rate their satisfaction with SPC correction postoperatively.

Results
Types of hypospadias were distal (n=9), mid-shaft (n=6), penoscrotal (n=6) and scrotal (n=2). Mean age at urethroplasty was 2.5±1.8 years. Two cases (8.7%) required fistula repairs. Three cases (13.0%) had mild urethral stenosis treated by bougienage. At mean follow-up of 6.0±2.8 years, no curvature was present in any case. Parents reported penile cosmesis as good (21/23=91.3%) or acceptable (2/13=8.7%).

Conclusions
Our technique appears to be effective for treating SPC in hypospadias and overcomes the risk for recurrence due to necrosis of the graft when the TA defect is patched with a non-vascularized “free” tunica/dermal graft.
CIC through nephro-fistula: A method of long term decompress renal pelvis without stent

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Background/Purpose
Ureteropelvic junction obstruction (UPJO) is the most common cause of hydronephrosis in neonates. Aggressive observation is more favored for children with unilateral UPJO, but not in patients with single kidney or bilateral huge UPJO. Failed dismembered pyeloplasty could happen due to fine structures and fragile tissue in children. The possibility of infection and stone formation limits long term urine diversion by percutaneous nephrostomy (PCN). A method for long term urine diversion is indicated for children suffered from primary failed dismembered pyeloplasty.

Methods
A PCN tube is inserted by radiologist then changed to CIC tube after one month. The CIC tube has to be left in the muscle layer so the tract will not be closed by the intertwined flank muscles. CIC from the renal pelvis will be done every 1-2 hours during the day. At night, the pelvis is decompressed for 8 hours so the nephro-fistula will not be closed. The fistula tract prevents urine leak at all time.

Results
No infection nor stone formation after CIC from nephro-fistula for 1 year. Renal function was protected by the cyclic urine diversion and successful re-operation was done afterwards.

Conclusions
Long term CIC through nephro-fistula can protect renal function in children after failed dismembered pyeloplasty.
### BASIC SCIENCE

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P1.1.1 ORAL POSTER PRESENTATIONS – SESSION 1 BASIC SCIENCE

The Expressions of Fibrosis Markers in a Rat Model of Biliary Atresia with Kasai Operation

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Background/Purpose
Anti-fibrosis medications are important for biliary atresia (BA) patients. We aimed to examine the expressions of various fibrosis markers to find the biomarkers of fibrosis using our rat model of BA with a successful Kasai operation.

Methods
The liver specimens were retrieved from the rats at post-operative week (POW) 0 (the time to create BA), POW 5 (Kasai operation), POW 9 and POW 18 (at sacrifice). Hematoxylin and eosin stain, Masson stain and immunostains for fibrosis markers were performed. The fibrosis markers included keratinocyte growth factor (KGF), anti-alpha-smooth muscle actin (SMA), anti-glial fibrillary acidic protein (GFAP), vascular endothelial growth factor (VEGF), VEGF receptor 1, tumor growth factor (TGF) beta1, TGF beta1 receptors 1 and 2.

Results
The expressions of VEGF receptor 1, TGF beta1 and KGF were strong at POW5 but disappeared at POW 9 and POW18. Meanwhile, the expressions of TGF beta1 receptors 1 and 2, SMA and GFAP remained strong at POW 9 and 18 in comparison with POW 5.

Conclusions
TGF beta1 receptors 1 and 2, SMA and GFAP may become the fibrosis biomarkers of liver in BA with a successful Kasai operation, which may be used for monitoring the effect of anti-fibrosis medications.

P1.1.2

Jagged1/Notch3 signaling modulates hemangioma-derived pericyte proliferation and maturation

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Background/Purpose
We sought to understand the impact of Notch signaling on hemangioma-derived pericyte fate.

Methods
Hem-pericytes were stimulated by immobilized recombinant Jagged1. Cell proliferation and maturation were measured. The potential mechanisms of Notch-induced Hem-pericytes growth arrest and maturation were analyzed.

Results
We provide direct evidence that Notch3 signaling is activated by Jagged1 in Hem-pericytes. Activation of Notch3 in Hem-pericytes significantly reduced cell proliferation and inhibited cell cycle transition. This event was associated with an increase in the levels of the cyclin-dependent kinase inhibitor p21Cip1. Knockdown of p21Cip1 resulted in a significant rescue of Notch-induced cell growth arrest and an entry into the cell cycle, which was associated with increased cyclin D1, CDK-4 and phospho-Rb expression. Furthermore, we showed that Jagged1 activation of Notch3 signaling upregulated the expression of the pericyte contractile markers smooth muscle myosin heavy chain (smMHC) and smooth muscle actin (SMA), concomitant with an increase in the expression of myocardin in Hem-pericytes. These observations prompted a series of pericyte-endothelial cell coculture experiments that revealed that the endothelial-derived Jagged1 modulated the Hem-pericyte phenotype via a contact-dependent mechanism.

Conclusions
Our results demonstrated that Jagged1 activation of Notch3 signaling resulted in a significant decrease in cell proliferation while concomitantly promoting Hem-pericyte maturation.

P1.1.3
Expression of miRNAs in later stage hindgut development of fetal mice and the regulatory role on the Hoxd-13 gene expression

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Background/Purpose
To study the expression of miRNAs in the later stage hindgut development of fetal mice, and the regulatory role to Hoxd-13 gene, a key anorectal development gene.

Methods
Eighteen pregnant mice were divided into three groups randomly. One centimeter rectum from four similar weight fetal mice were selected for extracting total RNA by Cesarean Section at 16th, 18th, and 20th pregnancy days respectively. miRNAs differential expression profiles of mice hindgut were detected by chip hybridization technique, and the data were analyzed using cluster analysis, target
genes prediction, gene-set enrichment analysis, and Gene Ontology analysis. Then the potential miRNAs of regulating Hoxd-13 gene expression would be acquired, and confirmed by the Dual luciferase assays and gene expression assays in the mice intestinal epithelial cells.

**Results**
The differential expression profiles of miRNAs in mice hindgut were analyzed combined with characteristics of anorectal development in fetal mice and relative literatures. Finally, we discovered miR-193 might be a regulatory factor on the Hoxd-13 gene expression in later stage hindgut development of fetal mice, subsequently, it was confirmed at the gene, mRNA and protein expression levels in mice intestinal epithelial cells.

**Conclusions**
miR-193 played an important role on the Hoxd-13 gene expression in the mice hindgut development.

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**P1.1.4**

*In vivo tissue‐engineered autologous “Biotube” vascular grafts could grow in a beagle model*

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**Background/Purpose**
Size mismatch between implanted artificial vascular grafts and native vessels that is caused by the growth of recipients remains a problem to be solved in pediatric surgery. Because Biotubes, autologous connective tissue tubes, formed by “in body tissue architecture” technology, can be vascular reconstructed within several months of implantation, their the growth potential was highly expected. This study aimed to evaluate the growth potential of Biotubes by examining their caliber adaptation to growing native arteries after transplantation. Allogenic transplantation of pre-prepared Biotubes was performed in adult to juvenile beagles.

**Methods**
Biotubes (diameter: 3 mm) were prepared in adult beagles (ca. 10 kg) by subcutaneous embedding silicone molds for 2 months. Allogenic transplantation of Biotubes (n=4) was performed by end-to-end anastomosis manner to the common carotid arteries (diameter: 2 mm) of the juvenile beagles (ca. 3 kg).

**Results**
After 12-month transplantation Biotubes were patent and vascular reconstruction including endothelialization was achieved. The diameter and length of implanted Biotubes increased ca. 1.3 times and ca. 1.2 times, respectively, in tandem with body growth.

**Conclusions**
This is the first study to confirm the growth potential of Biotubes in an animal model. Biotubes have the potential to be useful in pediatric surgery.
Impact of New Mutation Identification in the RET proto-oncogene in a Family with Hirschsprung’s Disease

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Background/Purpose
Hirschsprung’s disease (HD) is a congenital disorder of the enteric nervous system. Less than 10% of cases are hereditary, however, causal mutations are not detected in most cases. We identified a unique family with inherited HD and investigated their mutations.

Methods
We treated 109 HD patients from 1988 to 2015 and identified 5 familial cases at Kagoshima University. Genomic DNA was extracted from the peripheral blood in the familial cases. The RET gene was examined in all familial cases and complete genome exome sequencing was performed in one family.

Results
Two families exhibited a mutation in the RET gene that resulted in an amino acid change, but only one family had a causal variant. Therefore, we performed genome sequencing in this family(Fig.1). After annotation of variants, we performed sequential filtering steps according to the narrowing protocol(Fig.2). Eight variants were identified; two variants on chromosome 10 and seven variants on chromosome 11(Fig.3). We used pathogenicity prediction tools to predict the impact of variants on the protein activity. Finally, a new mutation in codon 922 in the RET gene was identified as the most causal mutation(Fig.4).

Conclusions
A new mutation in the RET gene is a causal mutation of HD.

Repair and regeneration of diaphragm using biosheets for congenital diaphragmatic hernia in a rabbit model

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**Background/Purpose**
In congenital diaphragmatic hernia with large defects, prosthetic patches are required to achieve tension-free repair. However, prosthetic patches can cause allergic reactions, infection, recurrence and thoracic deformity with growth. Collagenous connective tissue membranes (biosheets) are useful for engineering cardiovascular tissue, cornea and airway. We evaluated the efficacy of biosheets in repair and regeneration of diaphragm using a rabbit model.

**Methods**
Silicone plates were placed in dorsal subcutaneous pouches of 16 rabbits (NZW, age 4 weeks). After 4 weeks, biosheets surrounding the plates were harvested and laparotomy was performed. Defects (1.5 x 1.5 cm) were created in the left diaphragm and biosheets were transplanted autologously. Rabbits were sacrificed and the left diaphragms with incorporated biosheets were retrieved 2 months (group A, n=7), and 3 months (group B, n=9) after transplantation for histological analysis.

**Results**
3 small hernia of liver were observed in group A and 2 in group B. However, in other rabbits biosheets showed no evidence of breakdown and appeared to grow thicker in group B. Histological examination revealed that biosheets generated tissue similar to diaphragmatic tissue.

**Conclusions**
Use of biosheets can be applied to diaphragmatic repair and has the potential to regenerate diaphragm.

**P1.1.7**

Using fecal DNA sequencing to investigate the effect of colostomy surgery on the intestinal microbiota of surgical neonates administered a probiotic preparation

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**Background/Purpose**
Surgical neonates are likely to suffer from disrupted development of intestinal microbiota as a consequence of underlying pathology as well as surgical intervention and irregular feeding. We used fecal DNA sequencing to investigate the effect of colostomy surgery on the intestinal microbiota of surgical neonates administered Bifidobacterium animalis subsp. lactis LKM512 (LKM).

**Methods**
Subjects for this preliminary study were 10 neonates born at our institution requiring surgical intervention within 3 days of birth. Three groups were compared; transverse colostomy with LKM (n=4; stoma+), surgery (not colostomy) with LKM (n=4; stoma-), no surgery, no LKM (n=2; control). Stool specimens (20mg) were collected 5 times (after birth and 3, 7, 10, and 14 days after surgery) for DNA sequencing.

**Results**
Clinical demographics were similar for all groups. There were significantly more Staphylococcaceae and Streptcoccaceae in stoma+ than stoma- (p <0.05). There were significantly more Enterobacteriaceae in stoma- than stoma+ (p <0.05). Unexpectedly, the relative abundance of Bifidobacteriaceae was similar between three groups. (Fig).

**Conclusions**
Surgical stress and intestinal length would appear to alter intestinal microbiota in neonates requiring colostomy surgery more than administration of probiotics.

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**P1.1.8**

**A new experimental invasive model in the treatment of gastroosephageal reflu; Implantation of endoscopic stem cell into the lower esophageal sphincter**

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**Background/Purpose**
In congenital diaphragmatic hernia with large defects, prosthetic patches are required to achieve tension-free repair. However, prosthetic patches can cause allergic reactions, infection, recurrence and thoracic deformity with growth. Collagenous connective tissue membranes (biosheets) are useful for engineering cardiovascular tissue, cornea and airway. We evaluated the efficacy of biosheets in repair and regeneration of diaphragm using a rabbit model.

**Methods**
Silicone plates were placed in dorsal subcutaneous pouches of 16 rabbits (NZW, age 4 weeks). After 4 weeks, biosheets surrounding the plates were harvested and laparotomy was performed. Defects (1.5 x 1.5 cm) were created in the left diaphragm and biosheets were transplanted autologously. Rabbits were sacrificed and the left diaphragms with incorporated biosheets were retrieved 2 months (groupe A, n=7), and 3 months (group B, n=9) after transplantation for histological analysis.
Results
3 small hernia of liver were observed in group A and 2 in group B. However, in other rabbits biosheets showed no evidence of breakdown and appeared to grow thicker in group B. Histological examination revealed that biosheets generated tissue similar to diaphragmatic tissue.

Conclusions
Use of biosheets can be applied to diaphragmatic repair and has the potential to regenerate diaphragm.

Visualization of barrier line in the liquid phase of intestinal lumen

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Background/Purpose
The intestinal mucosa normally functions as a barrier to intraluminal bacteria and noxious macromolecules. Dysfunction of intestinal barrier in the development of systemic infection has been reported in several diseases, such as shock, sepsis, necrotizing enterocolitis. Visualization of barrier line in the liquid phase of intestinal lumen has been difficult. We show the method to observe the distribution of bacteria and macromolecules in the liquid phase of intestinal lumen.

Methods
Segments of rat small intestine including their luminal contents were ligated and excised. Samples were frozen in liquid nitrogen and tissue preparation was performed with the stabilization method of intraluminal contents in cryostat sections with celloidin. Subsequently, slides were stained by periodic acid-Schiff reaction, hematoxylin solution, and Gram’s stain.

Results
Hematoxylin stain showed the barrier line against the intraluminal bacteria and macromolecules. Periodic acid-Schiff reaction showed the luminal mucous gel covering the villi. Gram’s stain showed the barrier line against bacteria formed by mucous gel. This barrier line was maintained in normal condition, but disturbed in several conditions.
**Conclusions**

Stabilization of intraluminal contents in cryostat sections with celloidin enables us to observe the distribution of intraluminal macromolecules, bacteria, and the barrier line in the liquid phase of intestinal lumen.

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**P1.1.10**

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**Gene expression profiling of human necrotizing enterocolitis using next-generation sequencing**

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**Background/Purpose**

Necrotizing enterocolitis (NEC) characterized by intestinal necrosis is one of the most common gastrointestinal emergencies in newborns. RNA sequencing (RNA-seq) has recently emerged as a powerful technology providing a more improved quantification of gene alternative than microarrays with low background signal. To our knowledge, this is the first genome-wide RNA-seq study in human NEC using deep sequencing to evaluate the whole genome expression levels.

**Methods**

A total of 15 transcriptomes from 5 pairs of NEC lesion, transition, and adjacent normal tissues were analyzed. Gene expression values were determined using the Cufflinks 2.2.1 release (http://cole-trapnell-lab.github.io/cufflinks/), and the FPKM (fragments per kilobase of exon per million fragments mapped) values were calculated for each transcript.

**Results**

A total of 65 genes were found to have significantly different expression levels in the NEC lesion compared to adjacent normal tissues. In additional signaling pathway analysis using the Pathway Express (http://vortex.cs.wayne.edu/projects.htm) based on the KEGG database, ESAM involved in the leukocyte transendothelial migration pathway and RET involved in the thyroid cancer pathway were estimated to have roles in the NEC development.

**Conclusions**

Although further replications and functional evaluations are needed, our results suggest that several genes may have different expression profiles in human NEC.
3-Aminobenzamide reduces the severity of necrotizing enterocolitis in a neonatal rat model

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Background/Purpose
Our aim was to evaluate the efficacy of 3-aminobenzamide (3-AB), poly(ADP-ribose) polymerase (PARP) inhibitor, on the oxidative/nitrosative stress and intestinal damage in an experimental model of necrotizing enterocolitis in neonatal rats.

Methods
Immediately after birth, pups were weighed and randomized into three groups; NEC, NEC+3-AB, and control. NEC was induced by enteral formula feeding and exposure to hypoxia following cold stress at 4°C and oxygen. The NEC+3-AB group received 20 mg/kg 3-AB daily for 3-days after the first day of the NEC procedure. The pups were killed on the 4th-day and their intestinal tissues were harvested for analysis.

Results
Tissue malondialdehyde and protein carbonyl content, and nitrate plus nitrite (NOx) levels were significantly decreased in the NEC+3-AB group, suggesting decreased lipid peroxidation, protein oxidation, and nitric oxide and/or peroxinitrite production, when compared to NEC group. Antioxidant enzyme activities (superoxide dismutase and glutathione peroxidase) were significantly increased in the NEC+3-AB group than the NEC group. Serum tumor necrosis factor alpha (TNF-?) and serum interleukin-1? (IL-1?) were decreased and histopathologic injury score were lower in the NEC+3AB group comparing with NEC group.

Conclusions
3-AB has beneficial effects on pups with induced NEC-like injuries by improving antioxidant defense mechanisms and reducing oxidative and nitrosative stress.

Expression and significance of HuD in terminal rectum of anorectal malformation between different gestational age rats

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Background/Purpose
To detect the expression and distribution of HuD in the terminal rectum of fetal rats and explore the possible influence on the development of the enteric nervous system (ENS).

Methods
Pregnant Sprague-Dawley rats were divided into a normal saline control group (15 rats) and an anorectal malformation (ARM) group (30 rats) that were administered ethylene thiourea on gestational day 10 (E10). The fetal rats were collected on E17, E19 and E21. The numbers of terminal rectum nerve plexus were counted. The expression of HuD were detected by immunohistochemistry, qRT-PCR and western bolt.
Results
Each layer of terminal rectum was gradually perfected with the development of the embryo on E17 to E21. However, the nerve plexus were less in ARM rats. Immunohistochemical results showed that the expression of HuD was thimbleful on E17 and increased gradually on E19 to E21. But it was a few expressions in ARM rats. The average integrated optical density value was distinctly lower than the control (p<0.01). The mRNA and protein levels were consistent with the immunohistochemical results.

Conclusions
The expression of HuD had temporal correlation in the different gestational age fetal rats and the abnormal expression of HuD might affect the development of ENS.

P1.1.13 DISPLAY ONLY

Inhibitory effect of sustained perivascular delivery of paclitaxel on neointimal hyperplasia in jugular vein after open cutdown in rats

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Background/Purpose
Inhibitory effect of paclitaxel on neointimal hyperplasia after open cutdown has not been elucidated.

Methods
For the control group (n=16), silicone 2.7 French catheters were placed via the right external jugular vein with the cutdown method. For the treatment group (n=16), a mixture of 0.6 mg of paclitaxel and 1 mL of fibrin glue was infiltrated around the exposed vein after cutdown. After scheduled intervals (1, 2, 4, and 8 weeks; 4 rats in each week), the vein segment was harvested, and morphometric analysis was performed on cross-sections. To detect paclitaxel in systemic circulation, high-performance liquid chromatography was performed on plasma obtained from the left jugular vein.

Results
Proliferation of smooth muscle cells was strongly suppressed in the treatment group, and the ratio of neointima to vein wall was significantly reduced in the treatment group (8 weeks; 0.63 vs. 0.2, p<0.05). Luminal patency was significantly more preserved in the treatment group, and the luminal area was significantly wider in the paclitaxel-treated group compared to the control group (8 weeks; 1.91 mm² vs. 5.1 mm², p<0.05). Paclitaxel was undetectable in systemic circulation (<10 ng/mL). the NEC+3AB group comparing with NEC group.

Conclusions
Sustained perivascular delivery of paclitaxel was effective in inhibiting neointimal hyperplasia in rat jugular vein after open cutdown.
Accuracy of the noninvasive hemoglobin monitoring for preoperative evaluation for pediatric patients

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Background/Purpose
Blood sampling for preoperative evaluation is an invasive procedure. Especially in pediatric patients, it makes fear and leads iatrogenic anemia in small patients. We investigated the accuracy of noninvasive Hb monitoring in pre-anesthetic visit in pediatric patients.

Methods
In pre-anesthetic visiting office, we monitored noninvasive Hb level using Masimo Radical-7 Pulse CO-Oximetry in pediatric patients (body weight <10 kg, age <18y) immediately after venous sampling. We attached R120 or R125 probe on second finger nail according to the body weight. SpHb and perfusion index (PI) was measured. We compared the noninvasive hemoglobin level (SpHb) and the Hb from venous sampling (Hblab).

Results
Seventy-one pairs of SpHb and Hblab were analyzed (Table 1). There was no significant correlation between SpHb and Hblab during pre-anesthetic visit in pediatric patients (r = 0.056) (Figure 1). Mean bias (SpHb - Hblab) was -1.25 ± 1.32 and limits of agreements were -3.89 to 1.39 (Figure 2). The bias showed correlation with Hblab and age (r = -0.648 (P < 0.001) and -0.398 (P = 0.001), respectively) (Figure 3).

Conclusions
The noninvasive Hb monitoring cannot be an alternative method to find out Hb level for preoperative evaluation during pre-anesthetic visiting.

Familial Currarino Syndrome traced through 5 generations

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Background/Purpose
Currarino Syndrome is a rare medical syndrome complex involving anorectal malformation (ARM), sacral malformation, presacral mass, and associated anomalies.
This case report outlines the presentation and management of two siblings - a 3-year-old girl and a 1-year-old boy - with the complete triad; as well as the strong family history tracing back five generations.

**Methods**
Patients V-2 and V-3 (Table1, Figure1) were consulted and examined by paediatric surgeon with consent. Medical notes were reviewed. Patient III-4 and II-2 provided medical notes for the purpose of tracing familial association. The rest of the family history was taken via an interview with VI-3 and his wife.

**Results**
This case report illustrates the familial property of Currrano Syndrome, and its variability in phenotype. Although a complete triad is only reported in V-2 and V-3, it is possible other members have a complete triad that has not been investigated. Management is mainly surgical with adjuvant medical treatment for constipation. ARM is correctable by PSARP and presacral masses often excised.

**Conclusions**
Currrano Syndrome is not life-threatening, but causes severe disturbances to lifestyle. Bringing awareness could make the association more recognizable. Although lessened by the surgical treatment, patients often continue to have problems with bowel function needing further medical treatment.

### P1.2.2

**Outcomes in Children with Hirschsprung Disease and Trisomy 21**

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**Background/Purpose**
We sought to compare enterocolitis rates and bowel function between children with Hirschsprung Disease (HD) alone and those with HD and Trisomy 21 (T21).

**Methods**
A retrospective cohort study of all patients with HD treated at our pediatric colorectal center (2011-2015).

**Results**
11 out of 55 patients (20%) had HD and T21. Median follow up was 57 months. One or more episodes of enterocolitis occurred in 25 (57%) with HD compared to 4 (36%) HD+ T21 (p=0.20). Median time to first episode of enterocolitis (figure), hospitalizations for enterocolitis and total episodes of enterocolitis were similar between the groups. 32 patients were old enough (4 years old) to assess toilet training (25 HD, 7 HD+T21). One child with HD+ T21 was toilet trained by age 4 years compared to 12 with HD (p=0.2). Laxative or enema therapy was required for constipation management in 57% HD compared to 64% HD+ T21.

**Conclusions**
Outcomes in children with Hirschsprung disease and Trisomy 21 are similar to children with Hirschprung’s alone. A significant number of patients in each group had constipation requiring laxative or enema therapy and those with Trisomy 21 tended toward delayed toilet training. The initial enterocolitis episode did not occur after 25 months post operatively.
Acquired Hypoganglionosis in Japan; Based on a Nationwide Survey in 10 Years

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Background/Purpose
Hypoganglionosis (HG) has been proposed to be one of the allied disorders of Hirschsprung’s disease (ADHD). This study aimed to investigate the incidence and treatment of acquired HG in Japan.

Methods
As a nationwide retrospective cohort study, the questionnaires asking the number of each disorder from 2001 to 2010 and the clinical and pathological data, were sent to the major institutes of pediatric surgery or gastroenterology in Japan. Of 355 ADHD cases collected, 5 definitive acquired HG were extracted.

Results
The onset was at 13-17 years of age (n=3), 4 years of age (n=1), and 4 months of age (n=1). The symptoms included abdominal distension/chronic constipation (n=4) and intestinal perforation (n=1). The involved segments showed dilatation and the extents of dilatation varied in each case. All five cases underwent multiple operations (average: 4.6 times), such as enterostomy, resection of dilated intestines, and/or pull-through. All five cases showed the degeneration and decrease of ganglion cells in the resected intestine, whereas the plexus size was normal. Currently, all five cases were alive.

Conclusions
Acquired HG is rare but distinct entity, characterized as the degeneration and decrease of ganglion cells. The outcome is considered to be favorable, whereas requiring multiple operations.

Prevention of Bacterial Dermatitis during Adhesive Strapping of Infantile Umbilical Herni

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**Background/Purpose**
Adhesive strapping for infantile umbilical hernia is effective to complete closure of umbilical ring. Usually, authors’ method continues strapping approximately one week in duration. During this time, bacterial dermatitis occurred in some case. The aim of this study is to search for adequate sterilization materials to prevent this annoying complication.

**Methods**
30 cases of infantile umbilical hernia who undergone Adhesive Strapping were divided into the following three groups: (1) without any skin sterilization (WS), (2) skin sterilization using 0.05% chlorhexidine-gluconate (CHG) and (3) 0.05% chlorhexidine-gluconate ethanol (CHG-E). We evaluated (I) the rate of bacterial dermatitis and (II) the counts of bacterial colonies on the abdominal wall, using “Soybean Casein Digest Agar with Lecithin, Polysorbate 80”.

**Results**
(I) Bacterial dermatitis occurred in 4, 1 and 0 cases of WS, CHG, and CHG-E group, respectively. Each cases of dermatitis were spontaneously cured after cessation of strapping.
(II) Counts of colony of CHG-E group were significantly less than CHG group. Furthermore, in CHG-E group, bacterial colony counts were maintained at the same level until the next change of strapping. All cases of hernia were cured without any other complications.

**Conclusions**
CHG-E sterilization was effective to prevent bacterial dermatitis during adhesive strapping of infantile umbilical hernias.

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**P1.2.5**

**Surgical Masks of Pediatric Malignancies**

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**Background/Purpose**
Malignancies in childhood are very actual problem, increasing from year to year. Abdominal solid malignant tumors have their specific features in the younger age. Our purpose to analyze the ratio of malignancies revealed in children consulted primarily for the acute abdomen.

**Methods**
All patients admitted to the Urgent Surgical Unit #1 of the Regional Children’s Hospital in 2001-2015 with the abdominal pain and/or obstruction, underwent physical examination, standard laboratory and Ultrasound/X-Rays/CT-examination and were operated on with the pre-op Ds: Susp. Abdominal Tumor(?).
Results
During the total period of 15 years 21836 children in the age 1 month- 14 years old were hospitalized to the unit. 13108 had abdominal pain and Susp. Appendicitis (?)(60.02%- 1st group), 8728 had pain and obstruction (39.98%- 2nd group). After the standard examination abdominal tumors were revealed in 11 cases (0.05%): 4 in the 1st group (2004, 2009, 2010, and 2014), 7 in the 2nd (2012, 2013, 2014-3 cases, 2015-2 cases). Four were histologically malignant.

Conclusions
Despite the rarity of malignancies malignancies should be suspected by every pediatrician, surgeon and the fast differential diagnosis is a corner stone of the successful outcome revealing the problem in the early stage. Cooperation with the oncologists and pathologists is essential.

P1.2.6

Characteristics of the contrast enema do not predict an effective bowel management regimen for patients with constipation or fecal incontinence

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Background/Purpose
A bowel management program using large volume enemas may be required for children with anorectal malformations, Hirschsprung’s disease, severe medically refractive idiopathic constipation and other conditions. A pretreatment contrast enema is often obtained. We sought to determine if the contrast enema findings could predict a final enema regimen.

Methods
A retrospective review was performed at a tertiary care children’s hospital from 2011 to 2014 to identify patients treated with enemas in our bowel management program. Patient characteristics, contrast enema findings, and final enema regimen were collected.

Results
83 patients were identified (Table 1). Age ranged from 10 months to 24 years and weight ranged from 6.21 kg to 95.6 kg at time bowel management was initiated. Linear regression showed contrast enema volume was of limited value in predicting effective therapeutic saline enema volume (R2=0.21). Addition of diagnosis, colon dilation and contrast retention on plain x-ray the day after the contrast enema improved the predictive ability of the contrast enema (R2=0.35). Median final effective enema volume was 22 ml/kg (range 5-48 ml/kg).

Conclusions
We were unable to demonstrate a correlation with contrast enema findings and the effective enema volume. However, no patient required daily enema volumes greater than 48 ml/kg to stay clean.
Surgical Techniques and Outcomes in Pediatric Patients with Refractory Constipation Who Fail Antegrade Continence Enemas

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Background/Purpose
Refractory constipation is effectively treated with antegrade continence enemas (ACE) via cecostomy. Those that fail this management are faced with an ostomy as their final therapeutic option. We manage this patient population using fluoroscopic cecostograms to identify areas of obstruction to flow, followed by resection of this dysfunctional area. We report this management technique and outcomes.

Methods
Clinical data from eight patients who failed ACE following cecostomy tube placement for refractory constipation was reviewed. Dynamic cecostogram with fluoroscopic imaging, subsequent surgical management, and postoperative outcomes were evaluated.

Results
The etiology of refractory functional constipation varied (Table-I). All patients required repeat operative disimpactions under fluoroscopic guidance. These procedures identified dysfunctional areas of the colon, which impede flow resulting in proximal dilation and stool impaction. Patients underwent subsequent focused resection of the obstructing colonic segment(s) at varying levels (Table-I). 75% were able to avoid a permanent ostomy. 63% retained their cecostomy for ACE.

Conclusions
Antegrade continence enemas are effective for the majority of patients with refractory constipation. Failure secondary to poor flow through the colon can be identified on fluoroscopic cecostogram, which can help guide surgical resection. This allows for a very focused colon resection, potentially avoiding a permanent ostomy while also improving symptomatic constipation.
Bowel perforation due to Crohn Disease developing during etanercept therapy in a child with juvenile idiopathic arthritis: a case report

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Background/Purpose
Etanercept is a tumour necrosis factor-alpha (TNF-?) inhibitor used in the treatment of juvenile idiopathic arthritis. Other anti-TNF-? drugs are effective in the treatment of Crohn disease, however development of Crohn disease has been rarely reported to occur in patients receiving etanercept. We describe one additional report, and examine the literature related to this association.

Methods

Results
Case Report:
A twelve-year-old male presented with an acute episode of epigastric pain and vomiting. Urgent upper abdominal ultrasound and computed tomography aided the diagnosis of Crohn colitis with transverse colonic perforation. Etanercept therapy was ceased and the child underwent a subtotal colectomy with ileostomy. He recovered well and was suitable for reanastomosis five months later. Prior to this surgery, he was treated with azathioprine and sulfasalazine, on which the patient continued to be in remission of all symptoms.

Conclusions
There is a clinically relevant association between etanercept therapy and the development of Crohn disease, despite the efficacy of other anti-TNF-? agents in the treatment of inflammatory bowel disease. This may be attributable to differences in the structure and effect of these agents on T-lymphocyte function.

Short-term satisfaction of the Kajikawa procedure for umbilical hernias in childhood

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**Background/Purpose**
Data on the satisfaction of patient families regarding the umbilical shape of their children after the Kajikawa procedure is important, yet currently unavailable.

**Methods**
Thirty patients underwent umbilicoplasty using the Kajikawa procedure for umbilical hernias in our department. We evaluated patient conditions and conducted a survey on the satisfaction of patients’ families regarding umbilical shape within 6 months after the surgery, using a 5-point scale (1: worst - 5: excellent).

**Results**
There were 12 male and 18 female patients in our study. Mean age at surgery was 33 months, and mean duration of follow-up was 14 months. The nutritional status of all patients was normal on the Kaup index. Four patients developed postoperative wound infections, which improved immediately after the oral administration of antibiotics. Surgery resulted in a vertically long and deep umbilicus in all patients. Mean satisfaction score was 3.9, demonstrating that families were satisfied with the shape of their children’s umbilicus. Patients with a low score were those who developed deformation of the umbilicus owing to infection.

**Conclusions**
The Kajikawa procedure can create a vertically long and deep umbilicus, with high satisfaction among patients’ families.
Spontaneous fecal fistula complicating strangulated inguinal hernia in a newborn; A case report.

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**Background/Purpose**
Spontaneous fecal fistula secondary to strangulated inguinal hernia in infants is a rare condition. We managed an infant with spontaneous fecal fistula complicating strangulated inguinal hernia.

**Methods**
A 2 months old boy presented with 1-day history of fecal discharge from skin opening below right inguinal crease with severely inflammed and necrotic tissues on inguinal opening edges. Condition started when a reducible inguino-scrotal hernia became irreducible 2 days before fecal discharge. Clinically he suffered dehydration, fever, tachycardia and toxic look. Inguinal region was soiled with greenish fecal matter and showing fistula below inguinal crease with surrounding necrotizing fascitis.

**Results**
Right infraumbilical incision was performed with intestinal loops extraction, revealing ruptured cecum with greenish necrotic edges. Resection of proximal half of ascending colon with ileo-ascending anastomosis was done using 5/0 interrupted vicryl sutures. Herniotomy was performed. Right testis was showing severe congestion & edema. Debridement of inguinal fistula and wound lavage were done. The wound was left open for drainage and repeated dressings. Patient was discharged. Six months follow up showed healed wound & atrophic testis.

**Conclusions**
Delayed diagnosis and management may result in this rare complication which reflects the state of health care in developing countries that needs to be addressed by concerned authorities.

Vacuum-assisted closure device to treat complex wound treatment after Laparotomy in a Child with Entero-Behcet Disease

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Background/Purpose
Behcet’s disease is a multisystemic vasculitic disorder. The gastrointestinal tract is affected in 10%-50% of patients and called Entero-Behcet Disease (EBD). EBD often requires radiological or surgical intervention due to free bowel perforation. Our aim was to evaluate the use of a vacuum-assisted closure (VAC) device in the management of complex wound failures in a boy with EBD after laparotomy.

Methods
A 6 years old boy presented with abdominal tenderness, hyperemia. He has the diagnosis of EBD and been treated for two years. An emergent laparotomy was performed and an enterocutaneous fistula was observed 40 cm distal to treitz ligament. The involved segment was resected and side to side anastomosis was performed.

Results
On postoperative day 8 he had incisional infection which was treated with VAC procedure. VAC was repeated 4 days later. Primer repair was performed 8 days after the VAC procedure. He was discharged uneventfully.

Conclusions
Patients with EBD are prone to problems at the incision site. VAC therapy is a novel treatment using controlled negative pressure to evacuate wound fluid, stimulate granulation tissue, and to decrease bacterial colonization of the wound. Our experience indicates that this is a safe method to treat complex wound failure in pediatric patient with EBD.

P1.2.12 DISPLAY ONLY

Hook, line and sinker - Lead toxicity, an indication for appendicectomy

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Background/Purpose
We present the case of a child who presented with lead toxicity secondary to lead fragments lodged in her appendix after foreign body ingestion.

Methods
A nine year old girl presented to a tertiary paediatric institution with elevated serum lead levels ten days after ingesting lead fragments from a fishing sinker. Her serum lead levels had an increasing trend and were 45 ug/dl (normal <5) at the time of presentation. She was asymptomatic throughout. Plain abdominal x-ray revealed opacities in her right iliac fossa and ultrasound confirmed fragments within the lumen of the appendix. She had an uncomplicated laparoscopic appendicectomy and was given bowel preparation post-operatively.

Results
Subsequent abdominal x-rays confirmed that all lead fragments had been removed. Her serum lead levels continued to decrease after operation but still remain elevated (24ug/dl) at day 85 post-operatively.

Conclusions
Lead toxicity has become uncommon in the paediatric population in the recent years but can potentially lead to encephalopathy if untreated. Clinicians should be aware that foreign bodies lodged in the appendix can lead to ongoing toxicity due to the high absorption rate of lead in the gastrointestinal tract. Plain abdominal x-rays are indicated in children with elevated lead levels that fail to improve.
Treatment strategy and outcome for severe subglottic stenosis in pediatric patients

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Background/Purpose
Subglottic stenosis (SGS) is rare and presents various respiratory distress. Symptomatic SGS may require surgical intervention. Present study aimed to evaluate the validity of treatment strategy for SGS in single institution, which mainly consist of laryngotracheal reconstruction (LTR) via cervical approach with T-tube.

Methods
Medical records of all children with SGS evaluated between 2007 and 2015 were reviewed retrospectively.

Results
27 patients with median age of 7 years, including 4 congenital cases and 23 acquired cases, were analyzed. All cases were diagnosed as Myer-Cotton grade III/IV using rigid bronchoscopy. LTR with an anterior cartilage graft was performed in 15 and without graft in 11. Re-LTR was performed in 4 cases and tracheostomy only was performed in 3. Two patients were reieved balloon laryngotracheoplasty. In all cases after LTR T-tube was inserted to maintain the subglottic lumen and keep the distal airway. Postoperative decannulation rate was 75%(18/24), however 3 cases required re-tracheostomy. Two cases failed to achieve planned decannulation. Other 3 cases are waiting for planned decannulation. The median period of T-tube cannulation was 17.3 months.

Conclusions
Treatment strategy for SGS with combination of precise diagnosis and LTR with T-tube is useful and promising. It is necessary to analyze precisely the cases with failure of decannulation.
Clinical features of Congenital Tracheal Stenosis; The first report of Nation-wide survey in Japan

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Background/Purpose
The current nationwide survey aimed to clear the clinical features of the congenital tracheal stenosis (CTS) and to establish the suitable surgical strategy in consideration with the postoperative problems. We firstly report on the actual condition survey about this disease.

Methods
The surveillance in the whole country about less than 16-year-old patients of CTS who was diagnosed by endoscopy was established between 2009 and 2013. The difficulty of breathing, respiratory support management in more than 1 month, a baseline disease, and treatment method were involved in the more precise retrospective review with statistical analysis under IRB approval of each center.

Results
A questionnaire was distributed to 385 institutes, and there was a 281 answer established (73%). The total number of CTS is 83 cases in this study period. In 63 of 83, associated anomalies were found. (Cardiovascular 55, gastrointestinal, facial anomaly and urogenital). The initial treatments are oxygenation (50), and tracheal intubation (54). Surgical treatments were Tracheoplasty (47), Balloon dilatation (10), Tracheostomy (12). Overall survival is 68 case (82%) and 15 patients died in this series.

Conclusions
The result of the current survey was revealed the nation-wide actual numbers of cases. Standardization of diagnosis and treatment was necessary for improvement of the prognosis.
Two cases of operative management for asymptomatic rib exostosis

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Background/Purpose
Exostosis is the most common benign bone tumor. It could be solitary or present as part of hereditary multiple exostosis (HME), which often involves the metaphyseal region of long bones, including the femur, tibia, humerus and ribs.

Methods
Rib exostosis may cause fatal complications such as pneumothorax, hemothorax, and diaphragmatic injury. We report two cases of rib exostosis which underwent preventive operation.

Results
The first patient was a 13-year-old male with HME. At the eight-year follow-up, exostosis of the ninth left rib was found to have increased to 5 cm in diameter compressed the diaphragm. Preventive operation was performed due to risk of complications. The second patient was a 10-year-old male with HME. At the seven-year follow-up, exostosis of the fourth right rib was found to have developed to 5 cm in diameter and protruded into the thoracic cavity. Because of the risk of complications, preventive operation was performed.

Conclusions
Both patients recovered uneventfully and were discharged on day 6 and 10 post-operation, respectively. Evaluation of rib exostosis and careful follow-up is important in HME patients. In view of the potential fatal complications in patients with exostosis of a certain size, preventive operation may be needed.
Thoracic-Outlet-Plasty using Manubrium-Lifting Procedure: A Novel Alternative Method to prevent Tracheal Obstruction and Tracheo-Brachiocephalic Artery Fistula in Patients with Severe Chest Deformity

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Background/Purpose
Patients with severe chest deformity sometime develop tracheal obstruction and tracheo-brachiocephalic artery fistula. A novel thoracic-outlet-plasty using manubrium-lifting procedure with preserving the brachiocephalic artery is presented.

Methods
Cervical collar and upper thoracic mid-sagittal incisions were made, and a skin flap was created. The sternoclavicular joints were disjointed after detaching the sternothyroid, sternohyoid and sternomastoid muscles from the manubrium. The 1st costal cartilages were divided, and the joint between the manubrium and body of sternum was fractured. The 1st cartilage was overlapped, and the clavicle, sternal manubrium and sternal body were externally fixed with the metallic plates to provide an adequate space of the thoracic outlet.

Results
Two neuromuscular disorder adolescents with airway compression by the brachiocephalic artery underwent the manubrium-lifting procedure. There was no complication except temporary pharyngeal edema in a patient. Postoperative contrast enhanced CT and broncofiberscope revealed a secure airway without tracheal compression by the brachiocephalic artery in both patients.

Conclusions
Division of the brachiocephalic artery has been performed for the patients with tracheal compression by the brachiocephalic artery. This manubrium-lifting procedure can provide a secure airway and prevent a tragic occurrence of tracheo-brachiocephalic artery fistula with preserving the brachiocephalic artery.
Successful Recanalization of a Life-threatening Tracheal Stricture using Modified Balloon Dilatation under the Securing of Respiratory Tract in a Tracheoplasty Child.

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Background/Purpose
Tracheal stricture with life-threatening respiratory insufficiency is one of the major complications of congenital tracheal stenosis. The 15-44% survivors require several endoscopic intervention and/or balloon dilatation (BD). However the biggest severe problem of BD is the hypoxia of the completely obstruction of airway during the treatment. In this article, we present a successful recanalization case after tracheoplasty, using modified BD under the securing of respiratory tract.

Methods
Case: 11-year-old female acquired severe long-segment tracheal stricture in spite of the placement of tracheostomy tube stent and multiple laser scar excisions. She was rescued by the insertion of a smaller tube into the right bronchus via the inside of tracheostomy tube. She did not allow any ventilation-off because of hypoxia and bradycardia.

Results
Under the continuous ventilation using the smaller tube via tracheostomy, the long hard sheath was inserted through the extra endotracheal tube and barely passed through the tracheal stenosis between outside of tracheostomy tube and the granulation. Once an appropriately sized balloon catheter was positioned, the balloon was inflated (200-500 kPa, 60-90 s). The tracheal size was dilated from 5mm to 8mm.

Conclusions
This modified BD can be feasible new method because of the securing of respiratory tract in life-threatening patients.
Infective Endocarditis and Congenital Cardiac Surgery: A Risk Adjusted Analysis of Predictors and Outcomes

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Background/Purpose
The impact of infective-endocarditis (IE) in patients undergoing congenital cardiac surgery (CCS) remains ill-defined. This study aims to determine risk-factors & outcomes associated with IE, a potential quality of care measure, post-operatively after CCS.

Methods
The Kids' Inpatient Database (2004-2009) was queried for patients (≥18y) with ICD-9 procedure-codes consistent with CCS. ICD-9 diagnosis codes were subsequently queried for diagnosis of IE. Propensity-scores were calculated to account for differences in age, gender, race/ethnicity, income, and insurance-status in patients with and without IE. Risk-adjusted models considered differences in mortality (Poisson regression; incident rate ratios [IRR]) and LOS and cost [generalized-linear-models]. Covariates included: propensity-score quintiles; Risk-Adjusted Congenital Heart Surgery (RACHS) Score; and hospital-level factors.

Results
Of 73,217 patients, 630(0.9%) had IE. Average age was 3.3(±5.7)y, with a female preponderance(55.0%). 4.9% of CCS patients died; 7.9% in the IE-group. IE was associated with 69% greater incidence of mortality, longer LOS, higher hospital cost (table). IE was associated with increased age at surgery (IRR [95%CI]: 6.15[5.03-7.51], 0-5y vs. 10-18y) and government insurance (IRR[95%CI]: 1.31[1.10-1.57], reference: private). It is inversely associated with CCS-volume (IRR [95%CI]: 0.45[0.23-0.88], highest vs. lowest quartile).

Conclusions
IE associates poorly across all surgical outcomes in CCS. The results of this study will help to quantify its burden and risk-factors, associated with its occurrence, in the pediatric population.
P1.3.7

Wound management post the Nuss procedure: a case report

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Background/Purpose
To report a case of wound infection post the Nuss procedure.

Methods
A 5-year-old boy underwent the Nuss procedure for surgical correction of pectus excavatum (PE). Since the patient had attention-deficit hyperactivity disorder (ADHD), it was difficult to keep him at rest post surgery.

Results
After the patient was discharged, the wound dissociated and the bar became partially exposed. At the subsequent outpatient follow-up visit, the wound appeared to be slightly infected and remained wet, thus leading to removal of the bar 1.5 years later.

Conclusions
Although the postoperative course was uneventful, the ADHD in this Nuss-procedure case may have led to subsequent wound dissociation, as another 5 patients without ADHD who underwent the procedure experienced no complications during the 5-year postoperative follow-up period. Although postoperative infections post Nuss procedure reportedly occur in only 2% of the patients, continuous tension on the wound can lead to dissociation of the wound followed by bar-related infection. In Nuss-procedure cases, depth of the bar placement and allergy to titanium are factors that always need to be considered, yet our findings indicate that wound management immediately after surgery is the most crucial factor for achieving a good postoperative outcome.

P1.3.8

Mechanics of a Stuck Central Venous Catheter Removal

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Background/Purpose
A surgical removal of tunneled central venous catheter (CVC) can become complicated when the catheter is found to be stuck. We describe the mechanics of central venous catheter breakage and provide a solution that minimizes the possibility of catheter fracture.

Methods
End of a silicone CVC was glued to a wooden board, and the free end was pulled. To show that Young’s modulus (measure of elasticity) of a CVC is increased by
inserting a metal wire within its lumen, an apparatus was set up with a CVC attached to a scale (Fig). To simulate the mechanics of pulling on a stuck CVC with a wire inserted in the lumen, a guidewire was placed through the entire length of the catheter and pulled.

**Results**

When the catheter is pulled, the maximal narrowing occurs on the area adjacent to the fixed part of the catheter. With a guidewire with the lumen, the narrowing of the catheter diameter was most pronounced where the catheter was fixed, not adjacent to the fixed area.

**Conclusions**

We described a technique of placing a guidewire through a lumen of stuck CVC to increase its Young’s modulus, which increases the amount of pull force that a CVC will sustain without fragmentation.

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**P1.3.9 DISPLAY ONLY**

Late presenting Congenital Diaphragmatic Hernia (CDH): Is it a different disease compared to early CDH?

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**Background/Purpose**

Late presenting CDH is considered as a rare subgroup of CDH with few cases reported in literature. This study aims to identify and document late-presenting CDH and compare data to early-presenting CDH.

**Methods**

Late-presenting CDH is defined as CDH diagnosed later than 30 days of age. Patient information from a tertiary institution was reviewed for early-presenting and late-presenting CDH patients diagnosed between 1999-2015. The two groups are compared retrospectively. Exclusion criteria includes Morgagni hernias and in-utero terminations.

**Results**

69 cases were identified with the diagnosis of CDH. 6 cases were excluded due to reasons listed above, and 66 were further analyzed. 9 cases (14%) were identified as late-presenting CDH. Presentations include gastrointestinal and respiratory symptoms, and asymptomatic presentations. All late CDH patients were repaired primarily with overall survival of 100%, whereas 31% of early CDH required patch repair with overall survival of 65%. No recurrence was noted in the late group, and 28% in early CDH.

**Conclusions**

Late-presenting CDH seems to be a subset representing a milder end of the spectrum of CDH. Late CDH in this series occurs in 14%, presenting with mainly gastrointestinal and respiratory complaints. Primary repair is easily possible and recurrence and other complications of early CDH are uncommon.
Optimal timing of surgery for congenital lung malformations comparing those diagnosed prenatally with those presenting after birth

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Background/Purpose
Congenital lung malformation (CLM) is now usually diagnosed prenatally. We compared cases with fetal diagnosis (FD) of CLM to those not diagnosed prenatally (NFD) to determine optimal timing of surgical treatment post-natally.

Methods
Single institution retrospective study of all cases of CLM diagnosed from 2000 to 2015. Cases diagnosed prenatally were identified and all pre-operative infections or symptoms identified on chart review. This group was compared to children who did not receive prenatal diagnosis.

Results
Ten of the 22 cases of CLM were diagnosed between 19 to 25 gestational weeks. Three were complicated by hydrops and 2 were treated with prenatal steroids successfully. Another one resolved spontaneously. All cases in the FD group were operated within 1 year of age without complications. Of the 12 in the NFD group, 5 were diagnosed with pneumonia, 3 of these under 1 year old. The other cases were diagnosed as neonates with symptoms of heart failure or tachypnea. All cases of NFD group were operated when they demonstrated any symptoms but the operations were more difficult because of adhesions.

Conclusions
Patients with fetal diagnosis of CCL should be operated within 1 year of age before they develop complications.
Unusual Pediatric Neck Mass: A Case Report

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Background/Purpose
Neck mass is not rare in children such as brachial remnants or thyroglossal duct cyst. Here we present a case with an unusual neck mass.

Methods
A 5 years old boy without history of trauma was brought to my clinic because of a hung neck mass over left neck, which had been noted since birth, but become much larger recently. The mass appeared only when he was crying or exertion. Venous deformity was suspected. Both sonar and neck showed a segment of internal jugular vein engorgement. Phlebectasia was diagnosed.

Results
We arranged excision for the enlarge segment of internal jugular vein, and end-to-end anastomosed left internal jugular vein. After one year follow up, No recurrence was noted.

Conclusions
Phlebectasia is a kind of aneurysm of vein. Most of cases are secondary to iatrogenic or trauma of internal jugular vein. Sometimes idiopathic phlebectasia happens without specific factor. For prevention of rupture, most treatment is excision of deformity vein with or without anastomosis.
Micro-fragment fat transfer treatment of complex scarring after anoplasty: An initial report

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Background/Purpose
Postoperative scar formation following an anoplasty is routinely treated with a prolonged course of anal dilations. Transferring micro-fragmented fat, a product that contains high amounts of pericyte and mesenchymal stem cells, may help in the treatment of scars in a shorter period of time.

Methods
Two post anoplasty patients were treated using a commercially available kit (LIPOGEMS®). This FDA approved device manually processes the lipoaspirate into the micro-fragmented cell clusters. The processed fat was injected in areas of complex scarring. After the injection of fat cells, dilations were stopped. Patients were followed closely in the clinical setting.

Results
Both patients had significant softening of their anoplasty scars over a 4 week period on follow up digital rectal exam. Repeat micro-fragmented fat transfers were required for one patient.

Conclusions
A known sequela of anoplasty is scarring. These scars traditionally require frequent dilations to improve. Our two case series introduces the use of micro-fragmented fat transfers using the LIPOGEMS® kit to help soften postoperative scarring in an abbreviated time span.
Outcome of Transumbilical Laparoscopic-Assisted Versus Conventional Laparoscopic Appendectomy for all acute appendicitis in Children

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Background/Purpose
Single-incision laparoscopic appendectomy has been associated with improved cosmetic benefits, and decreased postoperative pain. Our aim was to evaluate the outcomes between transumbilical laparoscopic-assisted appendectomy (TULAA) and conventional laparoscopic appendectomy using 3 ports (CLA) for all cases of pediatric acute appendicitis.

Methods
We retrospectively reviewed all appendectomies in children underwent with CLA between January 2007 and October 2011, and TULAA between November 2011 and December 2015. Outcomes analyzed for each group included patient characteristics, mean operative time, length of post-operative hospital stay, and complications.

Results
A total of 237 patients underwent laparoscopic appendectomy, with CLA in 101 patients and TULAA in 136 patients. In CLA, complicated appendicitis was 58/101, and in TULAA was 64/136. TULAA was all successful in uncomplicated appendicitis (72/72), and 67% successful in complicated appendicitis (43/64). There was no significant difference between CLA and TULAA in patient characteristics. TULAA was better than CLA in mean operative time (71341 vs 89339 min, p=0.001), length of post-operative hospital stay (5.133.3 vs 7.334.6 day, p=0.001), and complications (15/136 vs 23/101, p=0.01).

Conclusions
Our data showed that TULAA is a safe and effective procedure for all acute appendicitis in children.
Longitudinal time-course changes of postoperative pain following single-incision laparoscopic appendectomy in children: a prospective case control study

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Background/Purpose
It is uncertain if single-incision laparoscopic surgery (SLA) can effectively reduce postoperative pain. We sought to evaluate time-course changes of pain following SLA compared to conventional laparoscopic appendectomy (CLA).

Methods
Two hundred and seventy children underwent SLA or CLA from 2013/08 to 2015/11. Pain was measured by 10-visual analog scale (VAS) at resting, walking and coughing. Changes of pain were assessed by a series of delta-pain scores (VAS post-op day 1, 2, 3 - preoperative day). Differences of those were compared between two groups by mixed model analysis. Subgroup analyses were also performed in patients with simple or complicated appendicitis separately.

Results
A series of delta-pain scores were significantly higher in SLA at coughing and walking (p=0.01), whereas those were not different at resting. SLA for both simple and complicated appendicitis showed a higher series of delta-pain scores compared to CLA (p=0.01 and 0.03, respectively). The delta-pain score of SLA at coughing increased on post-operative day 1 (0.60Â±32.90, p=0.02). Contrary to CLA, SLA did not significantly reduce delta-pain score at walking on post-operative day 1 (-0.81Â±32.9, p=0.00 and -0.32Â±33.1, p=0.25, respectively).

Conclusions
Recovery from postoperative pain after SLA may be slower than CLA. SLA could temporarily aggravate postoperative pain on activity in children.
Complicated Appendicitis Wrongly Diagnosed As Nonspecific Diarrhea: Ways To Decrease This Continuous Threat

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Background/Purpose
Clinical overlap between acute appendicitis and gastroenteritis can lead to wrong diagnosis, treatment delay and major complications. We analyzed the misdiagnosed cases and suggested guidelines in order to decrease their incidence in the future.

Methods
A total of 348 pediatric patients were divided in 3 groups: 206 underwent appendectomy due to acute appendicitis, 125 were hospitalized due to gastroenteritis, and 17 underwent appendectomy following hospitalization under the wrong diagnosis of gastroenteritis.

Results
By comparing all groups, group 3 presented a more prolonged and complicated clinical course, higher fever, diffuse abdominal pain, repeat vomiting, higher CRP values, longer surgery duration and recovery. Abdominal ultrasound reported a pathologic appendix in all misdiagnosed cases but one, but was performed only when the clinical picture worsened.

Conclusions
When the etiology of right lower quadrant abdominal pain is not immediately evident and associated with atypical diarrhea, high fever, repeat vomiting, and significantly increased CRP values, early surgical consultation is required. If the clinical findings are unclear, an abdominal US should be performed as soon as possible. A limited abdominal CT should follow those cases not resolved by history, physical examination, blood tests, and abdominal US. Using the term “gastroenteritis” to label vague abdominal symptoms should be avoided.
The Outcome of Transumbilical Laparoscopic Assisted Appendectomy in our Institution A comparison with Open Appendectomy

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Background/Purpose
Laparoscopic appendectomy is becoming a common procedure for pediatric appendicitis. We introduced transumbilical laparoscopic assisted appendectomy (TULLA) in 2014. This is a retrospective study to evaluate the outcome of TULLA performed in our institution.

Methods
Patients who were diagnosed acute appendicitis from July 2014 to December 2015 were evaluated. In general, complicated appendicitis underwent interval appendectomy. The selection of procedure, emergency TULLA (eTULLA) or open appendectomy (OA), was depends on operator's choice. The operative time, blood loss, surgical complications and postoperative hospitalization of TULLA and OA were compared.

Results
Thirty-five cases were included in this study. Twenty-one cases underwent TULLA, and 14 cases underwent OA. Fourteen cases of TULLA underwent eTULLA and 7 cases were done electively as interval appendectomy. The operative time of all TULLA cases was 81.9min and blood loss was 2.5ml. The operative time of eTULLA (100.2min) was significant longer than OA (59.9min, p=0.01). The hospitalization of TULLA was significantly shorter than OA (5.0 vs 7.4 days, p=0.02). The hospitalization of eTULLA was shorter than eOA (5.4 vs 7.4 days, p=0.08). Blood loss and postoperative complications did not show any significant difference.

Conclusions
Operative time of TULLA was longer but the hospitalization was shorter than OA. TULLA can be considered as a standard procedure in pediatric appendicitis.
Discharge After Laparoscopic Appendectomy Without an Overnight Stay for Acute Appendicitis

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Background/Purpose
Small series have demonstrated that same day discharge (SDD) following an appendectomy is safe in children with acute appendicitis (AA). In this study we evaluated outcomes following SDD in a large cohort.

Methods
This is a retrospective study of all pediatric patients who underwent an appendectomy from 2010 to 2014 for AA across 14 Southern California Kaiser Permanente Medical Centers. Patients discharged on the day of surgery were compared to those treated with the traditional overnight hospitalization.

Results
There were a total of 2,021 patients in the SDD group and 2,402 patients in the hospitalized group. There was no difference in re-admission between patients in SDD and hospitalized groups (2.5% vs 2.5%, p>0.8). Post-operative wound infection rates (2.0% vs 2.0%, p>0.8), Emergency Room visits (9.0% vs. 10%, p>0.2) and radiology diagnostic/therapeutic imaging (8.0% vs. 8.0%, p>0.7) were not significantly different. There was a higher percentage of post-operative follow-up amongst patients in the hospitalized group (79% vs 83%, p<0.005). The cost per case of appendicitis was lower in the SSD group, $1,988 versus $2,417 (p<0.001).

Conclusions
Selected pediatric patients with AA can be safely discharged on the day of the surgery without higher rates of post-operative complications or re-admissions.
Trans-umbilical assisted appendectomy using a flexible scope and energy device

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Background/Purpose
To reduce the number of incisions and trocars, we have adopted a trans-umbilical laparoscopically assisted single port appendectomy (TULAA) approach since 1988. Additionally, we have been using a flexible scope and energy device in TULAA since 2012. The purpose of this study was to investigate the usefulness of new instruments in TULAA.

Methods
The TULAA procedure was attempted in 597 patients, comprising 500 patients in whom a 0 degree 5mm diameter telescope was used up to 2011 (group A) and 96 patients where a flexible 5mm diameter fiberscope was used from 2012 (group B). We investigated the clinical results for each group.

Results
The mean age of group A was 10.2 years and group B 10.5 years. Successful TULAA procedures required an average time of 44.5min in group A, 71.0min in group B. A total of 416 patients (83.2%) in group A and 90 patients in group B (93.8%) underwent TULAA successfully (p<0.05). Intra-operative complications occurred in 21 patients (5%) in group A, and 2 patients (2%) in group B (p<0.05).

Conclusions
The TULAA procedure is preferable for acute appendicitis. The flexible scope and energy device are useful in performing TULAA.
Clinical Outcomes after Anorectoplasty in 22 Cases of Intermediate/High-type Imperforate Anus treated at Kyushu University Hospital over the Past 10 Years

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Background/Purpose
This study evaluated the clinical outcomes, including the urological and defecation habits after anorectoplasty in intermediate/high-type imperforate anus cases treated at Kyushu University Hospital.

Methods
Of 29 cases (15 intermediate- and 14 high-type) operated on from 2005 to 2014, 22 cases (12 intermediate- and 10 high-type) could be evaluated at 1 year after anorectoplasty regarding bladder dysfunction and defecation according to a postoperative clinical scoring system for anorectal malformations established by the Japanese Study Group of Anorectal Anomalies. All cases were under 2 years old at repair.

Results
In 22 cases (boy: girl=18:4), 3 cases had tethered cord syndrome as an associated anomaly. The operative procedures included anal transposition; 1 intermediate, PSARP; 11 intermediate and 4 high, and laparoscopy-assisted anorectoplasty (LAARP); 6 high cases. Only one PSARP case had postoperative bladder dysfunction. The comparison between PSARP and LAARP according to constipation score was PSARP: LAARP= 4:4 in “4: absent”, 10:2 in “3: others”, 1:0 in “2: daily enema and suppositories required”, and 0:0 in “1: enema washout and stool extraction required”, respectively (p=0.22).

Conclusions
The defecation habit outcome was equally favorable equally in both PSARP and LAARP, whereas the risk of postoperative bladder dysfunction was seen only in PSARP.
Treatment of subcutaneous abscesses in children with incision and loop drainage: A simplified method of care

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Background/Purpose
We hypothesize that loop drainage is the optimal treatment modality for subcutaneous abscesses in children which simplifies the care by obviating the need for debridement and repetitive packing.

Methods
A retrospective study was performed of all children who underwent incision and loop drainage of subcutaneous abscesses at our institution between January 2002 and December 2014. This minimally invasive technique involves two or more very small stab incisions to define the abscess cavity connected by a vessel loop, allowing continued drainage without the need for specific wound care other than bathing.

Results
577 consecutive children underwent loop drainage procedures. Mean values are as follows: age, 3.84 years; length of stay, 0.70 days; drain duration, 8.38 days, and number of postoperative visits, one. Twenty three patients failed loop drainage and required reoperations (4%). Of these, 20 had repeat loop drains, 2 had packing, and 1 had wet-to-dry dressing.

Conclusions
We conclude that incision and loop drainage is a less invasive, safe, and effective treatment modality for subcutaneous abscesses in children. Loop drainage offers low recurrence rates, can be repeated, and there is no need for the pain and trauma of repetitive wound packing which simplifies postoperative care for nurses and families.
Is there such a thing as primary omental infarction?

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Background/Purpose
Omental infarction (OI) is an uncommon cause of abdominal pain in children that can mimic other intra-abdominal pathology. It has been suggested that OI can occur as a primary process. Prompted by several operative cases of OI where we observed the omentum to be clearly twisted and with concurrent intra-abdominal pathology we reviewed our operative experience with this uncommon process.

Methods
We retrospectively reviewed the clinical records of 11 children who underwent operative treatment for OI over a five-year period at our pediatric institution. Attention was given to radiological studies, intra-operative findings, and pathology results.

Results
Indications for operation were failed conservative management (18%), suspected appendicitis (45%), and diagnostic uncertainty (36%). Four patients (36%) had pre-operative imaging suggesting omental infarction. Seven patients (64%) were found to have appendicitis on final pathology; one had a right inguinal hernia. Nine (82%) patients had specific mention of twisting of the omentum in the operative report. The ischemic portion of the omentum was resected in all cases.

Conclusions
In our experience, the majority of children with OI have an intra-abdominal problem that is distinct from the omentum. We hypothesize OI results from torsion while the omentum is responding to another intra-abdominal process.
Treatment of subcutaneous abscesses in children with incision and loop drainage: A simplified method of care

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Background/Purpose
We hypothesize that loop drainage is the optimal treatment modality for subcutaneous abscesses in children which simplifies the care by obviating the need for debridement and repetitive packing.

Methods
A retrospective study was performed of all children who underwent incision and loop drainage of subcutaneous abscesses at our institution between January 2002 and December 2014. This minimally invasive technique involves two or more very small stab incisions to define the abscess cavity connected by a vessel loop, allowing continued drainage without the need for specific wound care other than bathing.

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577 consecutive children underwent loop drainage procedures. Mean values are as follows: age, 3.84 years; length of stay, 0.70 days; drain duration, 8.38 days, and number of postoperative visits, one. Twenty three patients failed loop drainage and required reoperations (4%). Of these, 20 had repeat loop drains, 2 had packing, and 1 had wet-to-dry dressing.

Conclusions
We conclude that incision and loop drainage is a less invasive, safe, and effective treatment modality for subcutaneous abscesses in children. Loop drainage offers low recurrence rates, can be repeated, and there is no need for the pain and trauma of repetitive wound packing which simplifies postoperative care for nurses and families.
Eosinophilic gastroenteritis presenting as a gastric perforation

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Background/Purpose
Eosinophilic gastroenteritis is an uncommon disorder in children. It is characterized by eosinophilic infiltration in the gastrointestinal tract, abnormal gastrointestinal function, and hypereosinophilia in the peripheral blood. Patients with eosinophilic gastroenteritis may present as an intestinal perforation.

Methods
A 15-year-old boy was admitted to the pediatric department complaining of abdominal pain. Physical examination revealed a distended tense abdomen with diffuse tenderness. Initial complete blood count showed leukocytosis without eosinophilia. The computed tomography confirmed a pneumoperitoneum and peritonitis.

Results
The emergency laparoscopic exploration was performed and revealed a gastric perforation. After the surgery, the patient did not recover well despite of the treatment with proton pump inhibitor. One month later, the patient was readmitted with symptoms of dyspnea and general weakness. The evaluation revealed cardiomyopathy with pericardial effusion, diffuse parenchymal disease of the liver, diffuse gastroenteritis, and elevated peripheral eosinophils. The patient was finally diagnosed with hypereosinophilic syndrome and eosinophilic gastroenteritis. After steroid treatment, the patient recovered well, and was free of symptoms at a 10-month follow up.

Conclusions
Eosinophilic gastroenteritis is extremely rare disorder and a complication from gastroenteritis could be an initial presentation of this disease. This is the first report of a gastric perforation caused by eosinophilic gastroenteritis.
Surgical strategies to neonatal duodenal complex anomalies

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Background/Purpose
Neonatal duodenal obstruction may be caused by a number of intrinsic, extrinsic or combined etiologies. Surgery is more effective for unknown reasons of neonatal duodenal obstruction.

Methods
In these 3 cases are female from 3 to 6 days old. Case 1 was proximal jejunal atresia type IV. GI contrast study was done (figure 1). She underwent on resection of jejunal atresia and end-to-end jejunojejunostomy. Tapering duodeno-jejunooplasty was performed due to postoperative duodenojejunal obstruction (figure 2). Case 2 was diagnosed in duodenal obstruction (figure 3). Complete-ASD, PDA and Down’s syndrome were diagnosed. Annular pancreas was found in operation (figure 4). She underwent diamond-shaped-duodenoduodenostomy, resection of jejunum duplication and biopsy of descending to rectal colon. Ectopic pancreas and Hirschsprung’s disease were diagnosed by pathology. (figure 5, 6) Case 3 was diagnosed by radiography with double bubble sign (figure 7). She underwent resection of windsock web and diamond-shaped-duodenoduodenostomy. (figure 8).

Results
Of the 3 cases were discharged on postoperative day 12, 9 and 23. No complication during the follow-up period from 6 months to 2 years.

Conclusions
The cause of neonatal duodenal obstruction may be varied, surgery is effective with identified anomaly and reasonable procedure.

Effects of laparoscopy on intraoperative heat loss in infants

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Background/Purpose
Inadvertent hypothermia during surgery is associated with adverse outcomes. Infants are especially vulnerable to hypothermia due to their high surface area to weight ratio and altered thermoregulation. In adult patients, laparoscopy is associated with increased heat loss. The impact of laparoscopy on body temperature in infants is unknown.

Methods
Infants (<1 year) undergoing laparoscopic or open fundoplication with gastrostomy
tube insertion from 2012-2013 were retrospectively reviewed. Data collected included demographics, anesthesia/procedure time and use of intraoperative warming devices. Core body temperature measurements were obtained from the anesthesia record.

**Results**

Fundoplication with gastrostomy tube was performed in 67 infants. There was no difference in patient age, weight or warming device used between laparoscopic (n=49) and open approaches (n=18). Procedure times were shorter for the laparoscopic group (73 ± 29 versus 116 ± 37 minutes, p=0.0002). Core body temperature was lower at anesthetic induction in the open compared to laparoscopic group (35.5 ± 0.15°C versus 36.5 ± 0.82°C, respectively, p=0.042). Mean temperature was not different between groups at any time during the procedure (Figure 1).

**Conclusions**

Infants undergoing laparoscopic fundoplication with gastrostomy tube do not seem to be at increased risk for hypothermia compared to those undergoing an open procedure.

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**P2.2.2**

**Thoracic and abdominal pediatric trauma and the necessity of operative treatment: A 10-year Experience**

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**Background/Purpose**

While more than 90% of pediatric solid organ abdominal injuries are treated non-operatively, some need operative treatment. The factors dictating this are not clearly defined. The purpose was to analyze the pediatric thoracic and abdominal trauma cases, focusing on survival versus death, and whether or not operative treatment was performed.

**Methods**

A retrospective review was carried out to identify all thoracic and abdominal trauma admission between 2006 and 2016. Trauma scoring systems were: Injury Severity Score (ISS), Revised Trauma Score (RTS), and the Probability of Survival (Ps).

**Results**

67 patients (90.5%) survived and 7 patients (9.5%) expired. Comparative trauma scores in the survival and death groups were: ISS 12.2/38.6, RTS 5.09/1.75, and Ps 60.7%/14.6%, respectively. In the 15 operative treatment cases, 9 patients (60%) survived and 6 (40%) expired. The comparative trauma scores in the operative and non-operative groups were: ISS 25/121, RTS 7.55/7.51, and Ps 97%/99.5%, respectively.

**Conclusions**

The Ps was less than 25% in all of our cases that expired except one. Although higher ISS cases required more operative treatments, these treatments did not always improve the survival rate. Further investigation is needed to look at which factors should be focused on to determine whether or not operative treatments are indicated.
P2.2.3
Single- and multisite laparoscopic Nissen fundoplication for hiatal hernia in children

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Background/Purpose
To review the experience of single- and multisite laparoscopic Nissen fundoplication (LNF) for hiatal hernia in children.

Methods
From January 2010 to May 2015, 39 cases of hiatal hernia were performed by LNF in Shanghai Children’s Hospital and Children’s Hospital of Fudan University. All the patients were divided into 3 groups chronologically. Group A, 9 cases with 5-port procedure; group B, 14 cases with 3-port method; group C, 16 cases with 3-port method(9 cases) or single-site technique(7 cases). The following factors such as average operative time, conversion rate, volume of bleeding, hospital stay, and postoperative complications were analyzed.

Results
The average operative time in group A (4.7±1.2 hours) was longer than those of group B (2.8±0.7 hours) and C (3.1±0.5 hours) respectively. And conversion rate of group A (33.3%) was higher than those of group B (7.1%) and group C (0%). The other factors were nearly same. 31 patients followed up 2.4±31.5years (rang 0.3-4.5years). One patient underwent an opening redo-Nissen fundouplication for recurrence and 2 children performed post-operative esophageal balloon dilatation for dysphagia.

Conclusions
The results of single- and multisite LNF are nearly same for hiatal hernia in children for experienced surgeon.

P2.2.4
Intra-operative splenic artery clamping with splenic ultrasound may determine the possibility of the splenic infarction after laparoscopic distal pancreatectomy with preservation of the spleen utilizing Warshaw’s technique

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Background/Purpose
Laparoscopic distal pancreatectomy with preservation of the spleen (LDPPS) is minimally invasive, but it is technically difficult. LDPPS with preserving splenic vessels usually takes a longer operating time and bleeding risks. On the other hand, LDPPS utilizing Walshaw technique with which splenic vessels can be resected is a simple and relatively easy procedure. However, it has some incidence of splenic infarction postoperatively. We performed an intra-operative splenic artery clamping with splenic ultrasound examination (ISAC-US) during LDPPS in order to determine the splenic blood flow after resection of the splenic artery.

Methods
13-year-old girl with a large tumor on the distal pancreas underwent LDPPS utilizing Warshaw technique. During dissection of the pancreas, ISAC-US was examined. Even though the artery was clamped, enough blood flow was seen in the ultrasound. Then LDPPS was performed safely with using Endo-GIA.

Results
Post-operative course was uneventful, and CT scan showed no hypo-perfusion in the spleen. Patient has not had any signs and symptoms of splenic infarction for the past 5 years.

Conclusions
Thus, ISAC-US may determine the possibility of infarction after LDPPS utilizing Warshaw technique, and may help to decide the type of procedures for the distal pancreatectomy.

P2.2.5
Minimally Invasive Repair of Pediatric Morgagni Hernias using Transfascial Sutures with Extracorporeal Knot Tying

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Background/Purpose
Morgagni hernias are rare, reportedly with an incidence of 2% of Congenital Diaphragmatic Hernias (CDH). The purpose of this study is to review techniques to repair pediatric Morgagni hernias.

Methods
Retrospective chart review of pediatric patients who underwent a repair of a Morgagni Hernia from November 2009 to August 2015 within a defined population.

Results
Over a 6 year period, 15 out of 60 patients with CDH had Morgagni hernias (incidence: 25%). Twelve were repaired through a minimally invasive approach. Three large hernias were repaired with an open approach. Six repairs were completed utilizing a GORE-TEX® patch. All minimally invasive repairs were completed with transfascial sutures utilizing a Covidien Endo Close™ and 2-0 non-absorbable synthetic sutures with extracorporeal knot tying. Median follow up was 671 days (range: 79 days - 3.3 years). No patients had post-operative pectus excavatum defects. One hernia recurred (7% recurrence rate) that was initially repaired laparoscopically without mesh.
Conclusions
Morgagni hernias are more common than previously believed when data is collected within a defined population. Most are amenable to minimally invasive repair with this simple technique. Synthetic patches should be used with large defects. Recurrences are rare and morbidity is low.

P2.2.6

Thoracoscopic Assessment and Repair of Bochdalek Congenital Diaphragmatic Hernia at a Non-ECMO Center

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Background/Purpose
To review the results of a thoracoscopic approach to repair CDH in the absence of ECMO therapy.

Methods
Retrospective review over 8 years at 4 neonatal surgical institutions. Patients were managed with the goal of safely completing a thoracoscopic repair of Bochdalek hernias avoiding the division of the latissimus muscle.

Results
45 patients presented with a posterolateral CDH; 5 were unstable and referred to an external ECMO center thus excluded from analysis. Of the remaining 40 patients, 29 underwent attempted thoracoscopic repair (73 %), of which 6 were converted to open. One patient was repaired laparoscopically. There were 21 primary and 19 patch repairs. Open repairs (10 patients, 25%) were required for instability, large defects and/or ischemic bowel. Median age at repair was 9 days (range: 2 days to 7 years). Patients requiring patch repairs had longer operative times than primary repairs (159 vs 140 minutes respectively, p<0.05) and had a higher recurrence rate (36.8% vs 4.8% respectively, p <0.05). Length of stay was 11.5±34.06 days (median ± SEM). No mortalities.

Conclusions
Thoracoscopic approach to CDH allows for minimally invasive repair in most cases, reserving laparotomy for large defects while preserving the latissimus muscle in case future diaphragm replacement is needed.

P2.2.7 DISPLAY ONLY

Foreign body ingestion in children

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Background/Purpose
The aim of this study is to examine foreign body ingestion for children.

Methods
We conducted a retrospective chart review of all children aged ≤15 years between 1 January 2011 and 31 December 2015 with foreign body ingestion. Data were collected on age, sex, type of foreign body, location of foreign body, time to arrive at the hospital after ingestion, the treatment, and complications.

Results
109 patients had a foreign body in esophagus, stomach, and intestines in 270 patients. The foreign bodies were successfully removed in all cases. 10 patients (9.2%) were removed by endoscopic retrieval under general anesthesia and 20 patients (18.3%) by use of a magnet catheter or a Foley catheter under fluoroscopic control. The mean age of the patients was 2.9 years (median, 1 year) and there was a male preponderance. The vast majority of foreign bodies were batteries. The mean time to arrive at the clinic was 152 minutes (median, 152 minutes). Tracheoesophageal fistula developed in 1 patient with lithium battery ingestion.

Conclusions
Foreign body ingestions may cause serious harm to children. Endoscopy is very useful for removing them. There is an urgent need to educate parents about the potential harm to children that can result from foreign body ingestion.

Balanced Transfusion in Pediatric Trauma Patients

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Background/Purpose
To examine outcomes of red blood cell (PRBC) transfusion and balanced blood transfusion (1:1-2:1 ratio of PRBC to plasma) at a pediatric level one trauma center.

Methods
Among 1,582 trauma patients ≤14 years in a prospective institutional database, patients were divided into transfused (n=44) and non-transfused groups (n=1538), then balanced transfusion (n=15) and non-balanced transfusion (n=29). Patient characteristics were compared using summary statistics and logistic regression was used to control for confounders.
Results
Among transfused patients compared to non-transfused, significant differences were found in higher injury severity scores (ISS), lower GCS, lower initial hematocrit, longer length of stay, and higher rate of death, than non-transfused (all p<0.0001). Transfused were not significantly younger than non-transfused (median 4 vs 6, p=0.1827). Controlling for GCS and ISS, the mortality rate was not significantly different between transfused versus non-transfused (p=0.901), or between balanced versus non-balanced transfusion (p=0.877). Balanced transfusion patients were not significantly older (p=0.0803) and had higher weights than non-balanced transfusion patients (p=0.0496), otherwise the two groups were not significantly different.

Conclusions
Balanced blood product transfusion did not affect mortality in this study, but transfusion was rare. Further studies are needed to determine if balanced transfusion improves pediatric trauma survival and outcomes, particularly in younger patients.

Single Port Laparoscopic Appendectomy For Children by Surgical Trainees

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Background/Purpose
Single port laparoscopic appendectomy (SPLA) is one of most commonly performed single port surgery. However, there is few data of young residents’ experience. The purpose of this study was to investigate clinical outcomes of SPLA by surgical trainee and to evaluate its feasibility and safety compared to conventional three port laparoscopic appendectomy (CLA) by surgical trainee and SPLA by surgical staffs.

Methods
Between September 2014 and August 2015, clinical data was retrospectively collected for SPLA and CLA. Surgery was performed by 3 surgical trainees who have experience of more than 50 cases of CLA, and of more than 30 cases of SPLA by gastrointestinal surgery specialist. The indication of SPLA by surgical trainee was non-complicated appendicitis.

Results
Thirty-five patients underwent SPLA, 98 patients underwent CLA by surgical trainees and 31 patients underwent SPLA by surgical staffs. In comparison of SPLA and CLA by surgical trainees, mean age was younger and operative time was shorter in SPLA group. There was no significant difference in mean hospital stay and postoperative complication.

In comparison of SPLA by surgical trainees and surgical staffs, there were no significant differences in operative time, hospital stay, and postoperative complications.

Conclusions
SPLA for non-complicated appendicitis could be performed by surgical trainees safely with good postoperative results.
Laparoscopic appendectomy in children with complicated appendicitis

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Background/Purpose
Surgical resection of the appendix in children with complicated appendicitis will always be a challenge due to distortion of the anatomy by severe inflammation. We present our case series of laparoscopic appendectomy in children with complicated appendicitis that had the appendix dissected in a retrograde manner.

Methods
Twelve cases of complicated appendicitis were considered for this case series. All patients were treated laparoscopically with a retrograde dissection. A clip was used at the base to perform the appendectomy and a drainage was left in place. Intravenous antibiotics were given during hospital stay.

Results
Of the 12 cases, 8 are boys and 4 girls. There were no conversions to an open approach. In all of the cases we found that the base of the appendix was the least affected by the inflammatory process making it a good starting point for dissection. The average intrahospital stay was 4 days. We did not experience cases of post-operative abscess formation.

Conclusions
Retrograde dissection of the appendix is a good technique that should be used in every patient with perforated appendicitis with distortion of the anatomy. With this approach we can avoid damage to the cecum, or produce a iatrogenic perforation of the appendix.

A Minimally Invasive Combined Therapy with Laparoscopy and Endoscopy for Intestinal Obstruction due to Trichobezoar: A Case Report

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Background/Purpose
We herein report a case of intestinal obstruction due to trichobezoar in which the patient was treated by a minimally invasive combined therapy with laparoscopy and endoscopy.
Methods
A 6-year-old girl was admitted to our institute complaining of abdominal pain and vomiting. An abdominal computed tomography scan suggested the presence of trichobezoar in the stomach and small intestine. Emergency single-incision laparoscopy was performed. A trichobezoar was identified in the small intestine and could be removed manually and reached at the end of duodenum over the ligament of Treitz. Intraoperative upper gastrointestinal endoscopy was then performed. We found the trichobezoar in the stomach and another trichobezoar that we moved retrogradely to the duodenum could be removed by an endoscopic procedure. But, we were unable to remove the trichobezoar in the stomach completely.

Results
On the sixth post-operative day, the patient underwent endoscopy for the second time, but the trichobezoar in the stomach could not be detected. Enzymes and sodium bicarbonate were administered to soften the trichobezoar in order to avoid causing intestinal obstruction.

Conclusions
The method that was applied in the present case has an advantage in that it is less invasive as it requires no incision on the wall of the gastrointestinal tract.

Laparoscopic assisted transumbilical excision of giant cystic ovarian tumor in a child: a case report

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Background/Purpose
Cystic ovarian tumors are not uncommon in children. This tumor may be cystic or complex. The majority of cystic ovarian tumors in children are benign, the most common being simple cysts, serous cystadenomas, mucinous cystadenomas and mature teratomas. The surgical treatment has become more conservative and less invasive; hence, a laparoscopic approach in the presence of a benign tumor has become a standard strategy. However, large cystic ovarian tumors in the pediatric population require a thoughtful consideration to the preservation of the ovary when possible and the risk of malignancy.

Methods
We herein report a case of a 12-year-old girl referred to our department for an abdominal mass. An abdominal computed tomography scan showed a complex cyst measuring approximately 31 cm x 22 cm x 15 cm arising from the right ovary. She was treated with the laparoscopic assisted surgery.

Results
The tumor was removed en bloc through the umbilicus. We used an umbilical zigzag skin incision technique reported in adult laparoscopic surgery. The wound of the umbilical region was nearly scarless in this case.
Conclusions
This method has advantages of lower invasiveness and better cosmetic appearance, may be able to accomplish radical excision of ovarian tumors and preservation.

**P2.3.1 ORAL POSTER PRESENTATIONS – SESSION 2 GI-3**

**Atypical Bowel Ischemia in Petersen Hernia after Living Donor Liver transplantation (LDLT): A Case report**

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**Background/Purpose**
To present the clinical course of a pediatric case suffering from internal hernia 2 years after LDLT for biliary atresia.

**Methods**
This 2y11m/o male patient received LDLT at the age of 9 months. He suffered from abdominal pain 3 months before this attack. Chronic abdominal pain continued and an attack with dehydration occurred in June, 2015. Computed tomography on Pediatric ICU revealed poor perfusion of bowel segment near the liver graft.

**Results**
Laparotomy was performed with the impression of bowel strangulation. The hepatic limb of retrocolic Roux-en-Y became blackish with internal herniation of the ascending colon and ileum via the Petersen’s foramen. After reducing the hernia, segmental bowel resection and reanastomosis, the patient recovered smoothly.

**Conclusions**
This atypical ischemia of hepatic limb rather than herniated bowel may be due to intensive adhesion resulting in poor hepatic limb mobility and rigid vascular supply compromised by the progressive hernia of bowel with better flexible vascular supply.

**P2.3.2**

**Discordant meconium related ileus in monozygotic twins: - pathological findings of maturating ganglion cells in the intestine**

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Background/Purpose
Meconium related ileus is one cause of lethal neonatal intestinal obstruction. We encountered a case absent cystic fibrosis in a preterm infant.

Methods
Thirty-week-monozygotic male twins were referred to us for intestinal dilatation seen in one fetus by ultrasonography. Just after delivery at 31 weeks by C-section, one boy showed abdominal distention. Gastrointestinal series showed distended small intestine and micro colon with normal rotation. Laparotomy for suspected intestinal atresia or aganglionosis revealed caliber change in necrotic ileum without mechanical obstruction or atresia. He underwent 5 laparotomies. Progressively bowel function obtained normal movement. Four months later, ileostomy was closed, and gastrointestinal tract continuity was recovered. He is doing well at 5 months old with normal oral feeding. The other twin needed no surgical intervention despite having relative abdominal distention initially.

Results
Through 5 laparotomies, specimens were taken from small intestine, appendix, colon, and rectum for evaluation of ganglion cells. Cell density was normal in every specimen. Obvious cell size increases and nuclear/cell ratio decreases were seen in small intestinal specimens, taken from almost the same region (fig.1-3).

Conclusions
This case visually shows how ganglion cells mature with time. Their maturation speed might differ individually since discordance in clinical symptoms was seen in monozygotic twins.

Phytobezoar with Meckel's Diverticulum Causing Pediatric Small Bowel Obstruction

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Background/Purpose
A phytobezoar is a mass of poorly digested food fibers caught in the intestinal tract. The most common presentation of phytobezoar is small bowel obstruction. While Meckel’s diverticulum (MD) is a common anomaly, finding a phytobezoar within MD is rare.

Methods
A retrospective chart review was performed.

Results
An otherwise healthy 13 year old boy presented with abdominal pain and emesis for 2 days. His white blood cell count was normal with an elevated C-reactive protein. Imaging revealed a bowel obstruction with transition in the distal small bowel. He underwent laparotomy and was found to have MD in addition to a bezoar of sunflower seed shells. The bezoar was evacuated and diverticulum resected. Pathology showed MD with chronic inflammation and foreign body. Post-operative discussion with the family revealed that the patient frequently ate unshelled sunflower seeds at his baseball games.

Conclusions
Bowel obstruction due to a phytobezoar in MD is rare with only few cases reported. As opposed to bezoars with a suggestive history (i.e pica, trichotillomania), there may be fewer clues in the clinical presentation of a phytobezoar. An MD may predispose to formation of a phytobezoar and should be included in the differential diagnosis in children with small bowel obstruction.

P2.3.4
A Rare Case of Multiple Small Bowel Intussusceptions and Bowel Obstruction Caused by Rapunzel Syndrome

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Background/Purpose
Rapunzel syndrome is a rare condition that is characterized by a gastric trichobezoar with a long tail extending from the stomach to the small bowel. Patients can be asymptomatic for a long period, and symptoms develop later when the bezoar enlarges in size. The most common presentations include chronic abdominal pain, malabsorption, gastrointestinal tract obstruction, gastrointestinal bleeding, and intussusceptions.

Methods
We report a case of a 5-year-old girl with Rapunzel syndrome causing multiple small bowel intussusceptions. Abdominal computerized tomography revealed multiple target signs (Fig. 1) over the jejunum.

Results
We were unable to identify the main cause of this condition during laparoscopic reduction. Definite diagnosis was made after the development of gastrointestinal tract obstruction (Fig2).

Conclusions
We report a case of a 5-year-old girl with Rapunzel syndrome who had multiple intussusceptions and bowel obstruction caused by a trichobezoar with a long tail. Multiple intussusceptions at unusual locations are extremely rare. Surgeons should consider the possibility of Rapunzel syndrome when diagnosing the cause of intussusceptions.
Intussusception encephalopathy: An unusual case in a 9yo boy

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Background/Purpose
Encephalopathy is a rare and poorly described presentation of intussusception which has previously only been reported in toddlers less than 3 years of age. Theories have been postulated however the cause is largely unknown.

Methods
We present a case report of a patient presenting with intussusception encephalopathy and undertake a comparison with the theories regarding this puzzling clinical phenomenon.

Results
A 9 year old boy, previously healthy, presented as an emergency with sudden onset seizure-like activity in the absence of typical symptoms for intussusception. A Meckel’s diverticulum was identified as the lead point containing gastric mucosa, although there was no gangrenous bowel.

Within the literature, several theories for altered consciousness are postulated including:- electrolyte imbalance, hypovolaemia, septicaemia, toxic metabolite release from ischaemic bowel, massive endorphin release and neuro-active gut hormones release.

All previous case reports have involved children less than 3 years old. Our case was exceptional as the child was past the toddler age group, and the encephalopathy could not be explained by any postulated hypotheses.

Conclusions
Intussusception is an unusual but important differential diagnosis in children who present with altered consciousness. The patho-physiology of encephalopathy associated with intussusception is not adequately explained by the theories currently postulated in the literature.

Gastrojejunostomy feeding dependence following pediatric fundoplication

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Background/Purpose
Management for complicated reflux in infants and children is controversial. One strategy is to use jejunal feeding, which requires continuous feeds and is fraught with tube malfunction. In children unable to tolerate bolus gastric feeds and thus require jejunal feeds, we sought to determine how successful fundoplication was to allow for physiologic gastric feeds post-operatively.
Methods
A retrospective review of patients requiring jejunal feeds prior to fundoplication between 2010 and 2015 was conducted.

Results
114 children were identified. Mean duration of nasojejunal feeds prior to fundoplication was 1.3 months. After fundoplication, gastric feeds were attempted in all, but 18% subsequently developed gastric feeding intolerance and were treated with gastrojejunal tube (GJT) placement at a mean of 12 months post-op. There were no differences in gestational age, age at fundoplication and presence of neurologic impairment between those who went on to GJT placement and those who did not.

Conclusions
In the majority of patients requiring continuous jejunal feeds to manage complications of reflux, fundoplication allow for transition to gastric bolus feeding.

P2.3.7
Gastro-jejunostomy Tube Feeding, Is It a Durable Definitive Option?

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Background/Purpose
Gastric feeding may not be tolerated in patients with severe gastro-oesophageal reflux (GOR) or gastric emptying pathologies. Some are not candidates for fundoplication because of their high anesthetic risk. The less invasive option of gastro-jejunostomy tube (GJT) feeding may seem more appealing in selected groups. The purpose of this study is to examine the impact of GJT feeding on symptom control and quality of life.

Methods
The medical records, interventional radiology records, admission logs and radiation exposure of patients who underwent radiologically placed GJTs were reviewed. This was conducted in two pediatric surgical tertiary centers over a fifteen year period.
Results
Fifty four patients underwent GJT placement. Vomiting was controlled after initiation of GJT feeding in 81% of the patients. Symptoms of aspiration were controlled in 73%. Three bowel perforations occurred post GJT insertion and there were two mortalities as a result of aspiration pneumonia. No patients required fundoplication for uncontrolled symptoms post GJT placement.

Conclusions
In patients with high anesthetic risk, failed antireflux surgery, or severe gastric dysmotility, GJT feeding is effective in controlling emesis and aspiration in the majority of cases. We suggest that it should be considered as an alternative to fundoplication in selected patients.

The morphological type of internal inguinal ring analysis of contralateral patent processus vaginalis by laparoscopic findings in children

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Background/Purpose
The incidence of metachronous contralateral inguinal hernia (MCIH) is about 6% (male 4.1%, female 8.2%) by a meta-analysis of prospective studies. We investigated the relationship between the gender difference of the incidence of MCIH and morphological type of contralateral internal inguinal ring (MT-CIIR) during single incision laparoscopic percutaneous extraperitoneal closure (SILPEC).

Methods
354 patients (199 males and 155 females) diagnosed with unilateral inguinal hernia (mean: 3.8 years old) underwent SILPEC at our hospital between July 2012 and December 2015. Patients with CPPV were divided into two groups based on MT-CIIR observed. Gender differences were analyzed. Statistical analyses were performed using the Chi-square test.

Results
Using SILPEC, 354 patients, 109 patients (54 males, 27% of their total, 65 females, 42% of their total) were diagnosed with CPPV. The numbers of the patients with MT-CIIR type were as follows:
- male; wide open 23, narrow open 31
- female; wide open 41, narrow open 24
The incidence of narrow open is significantly higher in males, while the incidence of wide open is significantly higher in females (p=0.0257)
Conclusions
The difference of MT-CIIR may come from the variant pathogenesis of PPV in male and females. Our data shows that MT-CIIR may have some relation to the incidence of MCIH.

The impact of histopathological hepatitis-like findings on response to postoperative steroids in biliary atresia

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Background/Purpose
The efficacy of steroids following Kasai procedure for biliary atresia (BA) is controversial. The aim of this study is to determine if histopathological hepatitis-like findings (HLF) may affect outcome of postoperative steroids.

Methods
We reviewed 30 patients with BA treated between 1986 and 2015. The patients were divided into two groups according to clearance of jaundice at the time of discharge (total bilirubin $\leq$ 1.2mg/dL). Prednisone (4mg/kg/day) was started on postoperative day 7 and tapered during the first few weeks. Liver biopsies taken at Kasai procedure were evaluated for HLF including hepatocyte multinuclear change, ballooning and apoptosis. The severity of each finding was graded on a scale of 0 to 2 and was compared between the two groups.

Results
Twenty-five patients who received steroids therapy comprise Group A (n=15) with clearance of jaundice and Group B (n=10) without clearance. There were no demographic differences between the two groups. HLF grade showed a positive correlation with bilirubin level (p=0.037). The grade was significantly lower in Group A than that in Group B (2.2±3.3 vs. 3.6±3.4; p=0.047).

Conclusions
Steroids may not be indicated for the patients with severe HL.
Laparoscopic percutaneous extraperitoneal closure (LPEC) for inguinal hernia repair in premature infants weighing 3kg or less: is it safe?

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Background/Purpose
LPEC is a simple technique and the most popular laparoscopic procedure for pediatric inguinal hernia in JAPAN. Previously, 764 consecutive patients (479 boys, 285 girls) had undergone LPEC for standard inguinal hernia repair from 2006 to 2015 at Tokushima University Hospital. This study aims to evaluate the feasibility, safety and complication rate of LPEC for premature infants weighing 3kg or less.

Methods
A retrospective review was carried out for 23 infants (13 boys and 9 girls) weighing 3kg or less who underwent LPEC during same period. In two cases of huge hernias, we performed Advanced LPEC (LPEC + laparoscopic ilio-pubic tract repair).

Results
The mean weight at surgery was 2,575g (range 2,206-2,916g) and the mean gestational age at surgery was 42.7 weeks (37.0-50.0 weeks). The intraoperative complications were nothing. A postoperative apnea was noted in one case (2.8%). In 5 boys (21.7%), persistent scrotal hydroceles were noted. One patient (2.8%) had recurrence, requiring subsequent Advanced LPEC.

Conclusions
LPEC for inguinal hernia repair in premature infants weighing 3kg or less is feasible and safe and even less technically demanding than open inguinal herniotomy. However, it is necessary to be careful about the occurrence of the postoperative scrotal hydrocele.

Therapeutic strategies of Ileostomy closure in Extremely Low Birth Weight Infants (ELBWIs)

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Background/Purpose
To establish the early oral nutrition for ELBWIs with ileostomy, we injected elemental diet (ED) and Probiotics into the distal stoma prior the stoma closure. We investigated the utility of this treatment.

Methods
We reviewed 7 cases of ELBWIs who underwent ileostomy and closed ileostomy at our institution from 2008 to 2013. In order to prevent disuse mucosal atrophy and keep the absorption ability, we injected ED and Probiotics into the distal stoma for a month. In those cases, the medical charts were retrospectively reviewed.

Results
Injection of ED was started on from 14th to 65th postoperative day (median 25). Ileostomy was closed on from 31th to 75th day (median 34 days) after starting of injection into the distal stoma. The average body weight at the time of ileostomy closure was 1621g (median 1400g). The oral feeding was started at 4-6 days after closure of ileostomy. Injection of ED and probiotics improved postoperative weight gain in cases with poor weight gain preoperatively. All cases were restored to normal intestinal function in early period of postoperative days, and discharged the hospital with survival.

Conclusions
Doing the injection of ED and probiotics into the distal stoma is likely to improve the poor weight gain for ELBWIs.
Results
Emergent diagnostic laparotomy confirmed splenic torsion surrended with omentum and intestinal malrotation. The vascular pedicle was twisted 1080Â°. Thrombosis of the hilar vessels was noted. Splenectomy was performed for splenic infarction. Post-operative course was uneventful and the patient was discharged home on postoperative day five.

Conclusions
Torsion of a wandering spleen should be considered among the differential diagnoses in patients presenting to the emergency department with acute abdomen. Ultrasound is a highly efficient method for definite diagnosis. Association with malrotation is only seen in prune belly syndrome. When children with malrotation presented with acute abdomen, splenic torsion must be kept in mind for early intervention.
Malpractice in Pediatric Appendectomy: Who is Charged and Why?

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Background/Purpose
Little is known about malpractice litigation for common pediatric general surgery procedures such as appendectomy.

Methods
A retrospective review of United States federal and state malpractice court records in the WestLaw legal database from 1985-2015 involving children (age <=18 years) with appendicitis.

Results
Fifty-three cases were identified. Mean patient age was 11.3 years (+/-4.3) and 58% were male. In 87% of cases (n=46), the reason for litigation was delayed diagnosis of appendicitis resulting in rupture and/or morbidity. Four (7.5%) malpractice cases were related to intraoperative technical errors, 2 (3.8%) were based on misdiagnosis, and 1 was due to patient positioning and resultant neck subluxation. General Surgeons, Emergency Medicine physicians, or Pediatricians were one of the defendants in 36.5%, 32.7%, and 17.3% of cases, respectively (Figure). A single specialist was the only defendant in 85% of litigations. Most (62%) verdicts were in favor of the defendant(s), 17% in favor of the plaintiff, and 21% reached settlement. The mean settlement was US$280,500 (range: US$40,000-US$800,000) and the mean plaintiff award was US$1,696,557 (range: US$16,400-US$5,700,000).

Conclusions
Malpractice litigation for appendectomy in children is primarily pursued when diagnosis is delayed and subsequently results in morbidity. General Surgeons and Emergency Medicine physicians are the most frequent defendants.
Surgical Techniques and Outcomes in Pediatric Patients with Refractory Constipation Who Fail Antegrade Continence Enemas

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Background/Purpose
Refractory constipation is effectively treated with antegrade continence enemas (ACE) via cecostomy. Those that fail this management are faced with an ostomy as their final therapeutic option. We manage this patient population using fluoroscopic cecostograms to identify areas of obstruction to flow, followed by resection of this dysfunctional area. We report this management technique and outcomes.

Methods
Clinical data from eight patients who failed ACE following cecostomy tube placement for refractory constipation was reviewed. Dynamic cecostogram with fluoroscopic imaging, subsequent surgical management, and postoperative outcomes were evaluated.

Results
The etiology of refractory functional constipation varied (Table-I). All patients required repeat operative disimpactions under fluoroscopic guidance. These procedures identified dysfunctional areas of the colon, which impede flow resulting in proximal dilation and stool impaction. Patients underwent subsequent focused resection of the obstructing colonic segment(s) at varying levels (Table-I). 75% were able to avoid a permanent ostomy. 63% retained their cecostomy for ACE.

Conclusions
Antegrade continence enemas are effective for the majority of patients with refractory constipation. Failure secondary to poor flow through the colon can be identified on fluoroscopic cecostogram, which can help guide surgical resection. This allows for a very focused colon resection, potentially avoiding a permanent ostomy while also improving symptomatic constipation.

Achieving a Primary Skin-Level Cecostomy for Antegrade Colonic Enema Using a Modification of the Laparoscopic-Assisted Percutaneous Endoscopic Cecostomy (LAPEC)

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**Background/Purpose**
Children failing medical management for severe constipation and/or fecal incontinence may require surgical intervention for antegrade enema administration. We present a modification of the laparoscopic-assisted percutaneous endoscopic cecostomy (LAPEC) that allows primary placement of a skin-level device (MIC-Key).

**Methods**
A single-institution retrospective review was performed from 2009-2015. In the modified technique the colonoscope is advanced to the cecum, cecal suspension sutures are placed under laparoscopic visualization, and percutaneous needle puncture of the cecum is performed under direct visualization. A skin-level cecostomy tube is then placed over a guide wire. Patient characteristics and 30-day results were analyzed by Fisher’s exact test.

**Results**
52 patients underwent attempted LAPEC. Successful LAPEC using both laparoscopic and endoscopic guidance was achieved in 46 (88.5%). A MIC-Key device was placed in 38. Corpak tube placement was necessary in 14 due to high BMI (mean 28.4). Colonoscopy failed to reach the cecum in 6. Cecostomy site infections occurred in 3 (5.8%), only in those undergoing Corpak placement (p < 0.05).

**Conclusions**
Primary placement of a skin-level device was successful in the majority. Visualization via colonoscopy with the use of cecal suspension sutures is recommended. High BMI necessitates initial placement of a Corpak tube and complications exclusively occurred in this group.

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**P3.1.4**

**Current characteristics and management of congenital esophageal stenosis? 37 consecutive cases from a multicenter study in Kyushu Area of Japan?**

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Background/Purpose
Congenital esophageal stenosis (CES) is rare with limited clinical data. The aim of this study was to clarify the diagnosis, treatment and outcome of CES.

Methods
A questionnaire survey was performed using medical records at pediatric surgical centers in Kyushu area.

Results
In a 10-year period, 37 patients (22 boys) had CES. The incidence of associated anomalies was 54.1% (20/37), and with esophageal atresia was 21.6% (8/37). Mean diagnosis was 17.5 months (1 day-8 years). Seven (18.9%) patients were diagnosed in the neonatal period. Symptoms included vomiting (83.8%), respiratory symptoms (29.7%), dysphagia (21.6%) and food impaction (18.9%). The diagnosis was confirmed by contrast enema (100%) and/or endoscopy (88.2%). Ten cases (27.0%) were caused by tracheobronchial remnants, 14 (37.8%) by fibromuscular stenosis, and 1 (2.7%) by membranous stenosis. Involved regions was upper (2.7%), middle (8.1%), lower (59.5%) and abdominal (32.4%). Two patients had 2 stenotic sites. Thirty-three (89.2%) patients were treated by dilatation (mean 4.3 times, 1 to 20). Perforation at dilatation was recognized in 5 (13.5%) patients: 3 were treated conservatively and 2 required intervention. Finally, 17 (45.9%) patients underwent surgery (3 primary, 14 secondary to dilatation). All patients survived, but 7 (18.9%) patients exhibited growth retardation.

Conclusions
Our study clarifies characteristics and outcomes of CES, including neonatal-onset cases. CES requires a long-term follow-up and further study for therapeutic improvement.

P3.1.5

Surgical indications for Peroral Endoscopic Myotomy (POEM) for the treatment of esophageal achalasia in children

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Background/Purpose
Peroral endoscopic myotomy (POEM) is a novel treatment for esophageal achalasia. We previously reported the efficacy of POEM for esophageal achalasia in children at the 47th annual meeting of PAPS. However, the diagnosis of esophageal achalasia is difficult to make in young children, particularly when trying to differentiate it from congenital esophageal stenosis (fibromuscular stenosis). We herein investigated patients with congenital esophageal stenosis in this retrospective study.
Methods
Between February 2011 and December 2015, we reviewed three patients (one child and two adults) for which POEM was ineffective, and two patients that were identified not to have a diagnosis of esophageal achalasia according to a preoperative study. We compared these 5 patients with POEM-effective patients.

Results
According to a barium swallow esophagram and endoscopic study, several different findings were noted between the 5 POEM-ineffective patients and POEM-effective patients. The operation was difficult in POEM-ineffective patients, and subsequent balloon dilatation was necessary after surgery.

Conclusions
We suspect that the 5 patients for which POEM was ineffective had congenital esophageal stenosis, rather than esophageal achalasia. For patients with suspected congenital esophageal stenosis, the preoperative diagnosis is critical.

P3.1.6

Characteristics of the contrast enema do not predict an effective bowel management regimen for patients with constipation or fecal incontinence

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Background/Purpose
A bowel management program using large volume enemas may be required for children with anorectal malformations, Hirschsprung’s disease, severe medically refractive idiopathic constipation and other conditions. A pretreatment contrast enema is often obtained. We sought to determine if the contrast enema findings could predict a final enema regimen.

Methods
A retrospective review was performed at a tertiary care children’s hospital from 2011 to 2014 to identify patients treated with enemas in our bowel management program. Patient characteristics, contrast enema findings, and final enema regimen were collected.

Results
83 patients were identified (Table 1). Age ranged from 10 months to 24 years and weight ranged from 6.21 kg to 95.6 kg at time bowel management was initiated. Linear regression showed contrast enema volume was of limited value in predicting effective therapeutic saline enema volume (R2=0.21). Addition of diagnosis, colon dilation and contrast retention on plain x-ray the day after the contrast enema improved the predictive ability of the contrast enema (R2=0.35). Median final effective enema volume was 22 ml/kg (range 5-48 ml/kg).

Conclusions
We were unable to demonstrate a correlation with contrast enema findings and the effective enema volume. However, no patient required daily enema volumes greater than 48 ml/kg to stay clean.
A modified shish kebab technique for repair of familial multiple jejunoileal atresia

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Background/Purpose
Familial multiple jejunoileal atresia is a surgical challenging condition. The author presents a rare case of familial multiple jejunoileal atresia with 16 interruptions of bowel continuity (type I, II and IIIa atresia) managed by seven end-to-end anastomoses over a transanastomotic tube (TAT) extending from proximal jejunum till the cecum. The TAT entry site was the jejunum proximal to the first anastomosis and the distal end was in the cecum without externalization, thus, avoiding the stomas and exit site for the stent. TAT was used for postoperative enteral feeding and contrast study prior to removal. The removal of TAT was made safer by using a small size (6F) soft silastic tube with multiple side holes despite the convoluted course of the small bowel. Spatulation of both bowel segments ends prior to anastomoses over a stent using interrupted 6/0 PDS sutures could have played a role in minimizing stricture rate. Thus maximizes the preserved bowel length and prevent the complications of short bowel syndrome (SBS) and stomas.

Keywords: Multiple intestinal atresia; Hereditary; Familial; Transanastomotic tube.

Methods

Results

Conclusions

A transverse infra-umbilical incision for premature infant with intestinal perforation

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Background/Purpose
Laparotomy for a premature infant with intestinal perforation is generally carried out through a transverse supra-umbilical incision, and it is crucial to take special care to the liver not to injure during laparotomy. We thought laparotomy without seeing
the liver is much safer and a transverse infra-umbilical incision would be better way to achieve it. We report our experience of a transverse infra-umbilical incision for premature infant with intestinal perforation.

Methods
A retrospective review of premature infants underwent laparotomy with our incision for existing or impending perforation of intestine between 2009 and 2015 was performed.

Results
Twelve patients were identified with the median gestational age of 25.4 weeks and the median birth weight of 728g. Four had necrotizing enterocolitis (NEC), six had focal intestinal perforation (FIP), and two had meconium related ileus (MRI). All patients received intestinal resection and enterostomy. During laparotomy, only 2 required direct liver retraction. No liver hemorrhage during laparotomy occurred. One required additional mid-line incision because of an inadequate visualization. Postoperative wound related complications were seen in three. Wound infection occurred in 3, one of them developed dehiscence, and another developed incisional hernia.

Conclusions
A transverse infra-umbilical incision seems to be safely performed, and it might reduce chance to injure liver during laparotomy.

Kawasaki Disease presenting as acute abdomen

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Background/Purpose
Kawasaki Disease (KD) is an acute vasculitis that affects small and medium sized arteries. Gastrointestinal tract manifestations occur but rarely present as an acute abdomen. The aim of this study was to ascertain the proportion of KD patients who present with abdominal pathology.

Methods
A retrospective review of all patients admitted to a tertiary paediatric referral hospital between January 2002 and July 2015 was undertaken.

Results
119 patients were diagnosed with KD during this period. Two patients had an acute abdomen. Patient One was a 23-month-old boy who presented with fevers, vomiting and diarrhoea. He developed right iliac fossa pain and underwent a laparoscopic appendicectomy. Histology demonstrated serositis. He subsequently developed a rash and an echocardiogram on day 20 suggested KD. Patient Two was a four-year-old female who presented with abdominal pain, vomiting and fevers. On day three, she developed a rash. Day 7 diagnostic laparoscopy was normal. She subsequently developed a pericardial effusion and had an echocardiogram on day 13 consistent with KD.

Conclusions
Gastrointestinal manifestations of KD, though rare, may mimic other pathologies such as acute appendicitis or bowel obstruction. Clinicians must have a high index of suspicion of KD when assessing children with acute abdominal pain, high fevers and rash...
Magnetic compression anastomosis technique for congenital esophageal atresia postoperative anastomotic stenosis

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Background/Purpose
Following surgery for congenital esophageal atresia, repeated balloon dilatation may be required due to anastomotic stenosis caused by gastroesophageal reflux disease.

Methods
We report on two cases of infant patients, in which relief from pressure and stenosis with a magnetic compression was carried out five times in total using a 3200 G of magnetic power, following surgery for Type C congenital esophageal atresia.

Results
Both cases suffered from Type C congenital esophageal atresia and underwent tracheoesophageal fistula resection and esophagoesphagostomy at birth. Severe anastomotic stenosis was complicated by severe gastroesophageal reflux. In the present cases, pressure from a magnetic material resulted in re-stenosis in both cases, eventually leading to improvement by relieving stenosis with a balloon dilatation.

Conclusions
Regarding pressure from magnetic materials, while it is believed that the risk of rupture or perforation of the stenosis is low compared to balloon dilatation, it is disadvantageous in that insertion becomes difficult when the tissues and guide wire cannot be inserted. As of the present moment, it has been suggested that this procedure may be an option as a first step in relieving stenosis for long gap cases in which the use of a balloon is difficult or cases with fragile tissues.
Persistent gastrostomy site infection in patients with laparoscopic and open Nissen fundoplication

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Background/Purpose
Gastrostomy for feeding disorders or swallowing dysfunctions can be complicated by persistent gastrostomy site infection (PGSI). PGSI causes nutrient leakage, and finally requires gastrostomy reconstruction due to its dilation.

Methods
To evaluate the causes of PGSI after Nissen fundoplication and gastrostomy for patients with gastroesophageal reflux. We evaluated the patient characteristics and perioperative management of PGSI in 40 patients treated with Nissen fundoplication and gastrostomy over the past 12 years.

Results
The age at surgery was 1 - 49 (median: 11). Twenty cases were laparoscopically treated, and the other 20 cases underwent open surgery. Gastrostomy was performed with the Stamm technique in all patients. Four cases showed PGSI. The gastrostomy tubes had migrated to the pyloric side in 3 of 4 cases of PGSI in the perioperative period (p<0.001), leading to an increase in the intragastric pressure. All of the four cases also required positive pressure ventilation in the perioperative period (p<0.001).

Conclusions
The results suggest that the occurrence of PGSI is correlated with the management of positive pressure in the perioperative period and an increase in intragastric pressure by pyloric obstruction, which is caused by aberrant distribution of gastrostomy tube to the pyloric side.
Dextrogastria, duodenal web, preduodenal portal vein and intestinal malrotation; a very rare association in newborns

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Background/Purpose
Association of duodenal atresia with situs inversus is rarely reported with about 25 patients in literature.

Methods
A 45 days old female (3 Kg weight) complaining of intermittent bilious vomiting & feeding intolerance since birth. X-ray with contrast showed dextrogastria, dilated duodenum and opacification of intestine distally. Echocardiography showed levocardia and patent foramen ovale.

Results
Laparotomy through right supra-umbilical transverse incision showed dextrogastria & dilated duodenum. Intestinal loops were in middle & left side of abdomen. Caecum & right colon were on right side. Liberation of adhesions at pyloroduodenal junction revealed preduodenal portal vein. Injection of saline through nasogastric tube has failed to evacuate completely through duodenum indicating intraluminal obstruction. Anterior wall of duodenum was opened longitudinally (junction of dilated & collapsed parts) revealing circular mucosal web with central canalization. Web was excised & incision was closed transversely by interrupted 5/0 vicryl sutures. Liver, spleen and kidneys were in normal position. Widening of mysentry, appendectomy & repositioning of small bowel were performed. Abdominal closure was done leaving a drain in left hepatorenal space.

Conclusions
There is no basic difference in treatment of congenital duodenal obstruction with or without associated situs inversus however, preoperative assessment of different organs position will help in surgical scope.

Hypertrophic pyloric stenosis in a 15 year-old male

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**Background/Purpose**
We present the case of a 15 year-old male with hypertrophic pyloric stenosis.

**Methods**
In the early weeks of infancy, projectile non-bilious emesis was treated with feedings using an eyedropper. Feedings improved, but emesis, abdominal pain, early satiety, and failure to thrive persisted throughout childhood.
He presented to our institution at 12 years old with a perforated pre-pyloric gastric ulcer and received a Graham patch. Intestinal symptoms improved modestly after treatment for Helicobacter pylori gastritis.
At 14 years old, he returned with a contained perforated new pre-pyloric ulcer that was treated non-operatively. Helicobacter pylori serology was negative. Serum gastrin, chromogranin A, calcium, and parathyroid hormone levels were normal. Upper gastrointestinal contrast and nuclear gastric emptying studies showed delayed gastric emptying.
Endoscopy revealed a narrow pyloric channel and a thick pylorus on ultrasound. Gastric biopsies were non-diagnostic. Injection of pylorus with botox produced transient relief of symptoms. Electrogastrogram and antroduodenal motility studies supported a mechanical gastric outlet obstruction.
A distal gastrectomy with Billroth I reconstruction was performed.

**Results**
Pathology revealed hypertrophic pyloric muscle. Ten months after surgery he is asymptomatic and gained 26 kg.

**Conclusions**
A gastric outlet obstruction due to presumed untreated congenital hypertrophic pyloric stenosis was successfully treated with a distal gastrectomy.

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**P3.2.1 ORAL POSTER PRESENTATIONS - SESSION 3 NEONATOLOGY**

**Association between congenital heart defects and isolated gastrointestinal malformations in Chinese neonates**

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**Background/Purpose**
We aimed to investigate the incidence of congenital heart defects (CHDs) in Chinese neonates undergoing surgery for isolated gastrointestinal malformations (GISM) and determine appropriate preoperative evaluations of cardiac risk in GISM patients.

**Methods**
We retrospectively reviewed all neonates with isolated gastrointestinal malformations undergoing operative repair in our hospital between 2010 and 2015. Demographics, approaches to cardiac risk assessments, CHD and GISM types, post-operative complications were recorded.
Results
A total of 444 neonates with GISM were identified. The most frequent GISM were anorectal malformations (41.4%), esophageal atresia (28.2%), intestinal atresia (10.4%), Hirschsprung disease (9.9%), and congenital diaphragmatic hernia (6.5%). All the patients underwent chest X-ray, electrocardiography and echocardiogram for cardiac risk assessments. CHDs were observed in 34% of the GISM patients. 90.4% of those were structural malformations. The most frequent defects were atrial septal defect (46.4%), ventricular septal defect (35.8%) and patent ductus arteriosus (7.3%). Incidence of CHDs in preterm neonates (49.7%) was higher than that in full-term neonates (18.3%). Furthermore, there was significant difference (P<0.05) in post-operative complication rate in patients with CHDs (21.6%) and without CHDs (8.5%).

Conclusions
There is high incidence of CHDs among GISM patients. It is necessary to evaluate cardiac risks in all GISM patients with echocardiogram before operation.

P3.2.2

Congenital Short Bowel Syndrome: A Rare Condition With a Common Presentation!

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Background/Purpose
Congenital Short bowel syndrome (CSBS) is a rare condition resulting from failure of bowel elongation during embryonic life. About 36 cases reported worldwide. If not diagnosed early those newborn may suffer severe dehydration, organ dysfunction and death.

Methods
6weeks old girl born at term with birth weight of 2500 grams. During the first few weeks of life she suffered refractory non-bloody diarrhea and frequent admissions. At age of 6 weeks patient was admitted due renal failure and severe dehydration. Radiological test showed dilated bowel and abnormal bowel rotation. Patient explored and found to have only 35 cm of dilated small bowel (SB) in non-rotation position. Ladd’s procedure performed plus primary serial transverse enteroplasty (STEP) for the proximal 15 cm of the SB and feeding gastrostomy. At age of 7 month second STEP performed and SB reached 85-cm. At age of 8 months pt. weaned off TPN and discharged home.

Results
Follow up at age 18 months pt. is doing well gaining wt. and normal mile stones.

Conclusions
CSBS diagnoses can be challenging. Primary STEP is a feasible treatment option and may accelerate TPN weaning process. Up to our knowledge this is the first case reported in the Saudi Arabia and the Arab countries.
Outcomes of surgery interference for necrotizing enterocolitis in a single institution

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Background/Purpose
To analyze the outcomes of operation for necrotizing enterocolitis in Shanghai children’s hospital.

Methods
The data of 25 pediatric patients with necrotizing enterocolitis whom were performed operation between December 2011 and December 2015 were retrospectively analyzed. The information included patients’ birth weight, accompanied by gastrointestinal perforation or not before operation, extent of NEC (Focal Disease, F, Multisegmental Disease, M Pan-involvement, P), the time and math for ostomy-closing.

Results
12 (48%) patients were with very low birth weight, 7 (28%) patients were with low birth weight. Of the extent of NEC, 11 patients were classified as F, 8 patients were M and 6 patients were P, 9 patients had pneumoperitoneum before operation, 8 patients were found intestinal perforation at laparotomy. The survival rate in this study was 68% (17/25), 8 patients died (3 patients were M, 5 patients were Pt). Ostomy-closing should be considered 3-6 months later after the operation.

Conclusions
The extent of NEC correlated to the outcomes of surgical intervention. Low birth weight is a risk factor for NEC. Protecting the edge of the bowel is a key factor to ensure the survival and improve the quality of life of NEC patients. The time and the math of ostomy-closing should be considered depending on patients’ condition.
Background/Purpose
The optimal timing of surgical closure of Exomphalos Major (EM) remains controversial. At our institutions, conservative management with delayed closure is favoured. A leaking EM sac is a rare but serious problem with only anecdotal information available regarding management options.

Methods
The clinical presentation is described of two neonates born with EM who subsequently developed a leaking sac. The management of the membranous tears and the patients’ clinical courses are discussed.

Results
Two neonates undergoing conservative management of EM with silver dressings in tertiary pediatric surgery centres developed a leaking sac. The defects were repaired with porcine biological patches, Permacol®, Surgisis®, and sealed over with Dermabond®, tissue adhesive. Further layers of adhesive or mesh were applied as required to ensure a complete seal and routine conservative management of the EM sac continued.

Conclusions
We report the novel use of a biological patch and tissue glue as a straightforward and successful method of repairing tears in an EM sac during conservative management. This technique avoids the need for difficult primary repair of the sac or abandonment of conservative management in favour of surgical closure. If necessary, the mesh can be removed at the time of delayed repair of the ventral hernia.

P3.2.5

Antenatal Magnesium Sulfate Exposure and Neonatal Bowel Obstruction

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Background/Purpose
Magnesium sulfate is first line therapy for eclampsia prophylaxis and tocolysis for preterm labor. Studies have shown an association between magnesium sulfate and NICU admissions, nutritional support, and perinatal mortality in neonates weighing 770-1249g. In addition, prenatal magnesium sulfate is correlated with a significant delay in the passage of first stool and meconium plug syndrome/meconium ileus. Despite safety concerns and the lack of evidence for tocolytic effectiveness, its use is widespread.

Methods
This is a retrospective review of 3 infants from 24 to 29 weeks estimated gestational age with antenatal magnesium sulfate exposure who required urgent neonatal surgical intervention for meconium plug-like obstruction without cystic fibrosis or anatomic/functional abnormality.

Results
All 3 patients were exposed to magnesium sulfate antenatally and their obstructive symptoms resolved postoperatively after mechanical irrigation and clearance of luminal contents.
Conclusions
We identified 3 cases of neonatal bowel obstruction in premature newborns exposed to antenatal magnesium sulfate. The obstructive symptoms resolved after surgical irrigation without recurrence. We propose that antenatal exposure to magnesium sulfate be considered in the differential diagnosis of neonatal bowel obstruction. Further research in this area is warranted to elucidate the incidence of this potential life-threatening problem and to determine optimal diagnostic and treatment strategies.

P3.2.6

Pneumoperitoneum in preterm infants: Not always a surgical emergency

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Background/Purpose
Pneumoperitoneum most often results from a perforated abdominal viscus, requiring emergent surgical exploration. However, in preterm infants, pneumoperitoneum is occasionally caused by nonsurgical etiologies such as mechanical ventilation or cardiopulmonary resuscitation, or it may be idiopathic. This study reviewed the etiologies and clinical results of pneumoperitoneum in preterm infants.

Methods
The medical records of preterm neonates with pneumoperitoneum, admitted to the neonatal intensive care unit between January 2007 and February 2015, were reviewed retrospectively. A total of 27 preterm infants were analyzed based on the cause of pneumoperitoneum, clinical characteristics, and outcomes.

Results
Twenty three cases (85.1%) were caused by intestinal perforation, while 4 patients (14.8%) had pneumoperitoneum without intestinal perforation. In 3 of the latter cases, the etiology was related to pulmonary air leaks due to resuscitation, and one case was idiopathic. The causes of the intestinal perforations were necrotizing enterocolitis (NEC) (n=8), focal intestinal perforation (FIP) (n=7), and perforation due to distal obstruction (n=8). Mortality was higher in the NEC group (P= 0.0022).

Conclusions
Pneumoperitoneum in the preterm infant is not always a surgical emergency. NEC, FIP, distal obstruction, and pulmonary air leaks should be differentiated before deciding on exploration, based on the perinatal and clinical characteristics.
Predicting the Risk of Umbilical Cord Bleeding in Congenital Intestinal Atresia Using Trypsin Level in Amniotic fluid

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Background/Purpose
Umbilical cord bleeding is a severe prenatal complication of upper intestinal atresia, in which loss of Wharton’s jelly results in the rupture of umbilical cord vessels and massive hemorrhage. We will report the trial of predicting the risk of bleeding.

Methods
Between 2009 and 2014, 13 patients were referred. We divided 13 cases into two groups depending on the concentration of trypsin in amniotic fluid. Group A (trypsin <25,000ng/ml) contains 6 cases, and Group B (trypsin>25,000ng/ml) contains 7 cases. Umbilical cords were examined microscopically and graded according to Ichinose’s grade after birth. The risk of bleeding of 2 patients in 2015 was evaluated.

Results
In Group A, the grade of ulceration was 1 or 2. In Group B, one was graded as 2, five cases were graded as 3, and one was graded as 4 which umbilical cord vessels were ruptured and the baby died intrauterine. The trypsin level in 2 cases in 2015 was 7,680 ng/ml and 4,980ng/ml respectively. The risk of bleeding in this two patients was predicted as low. The grade of ulceration was determined as 1 and 2.

Conclusions
The level of trypsin in amniotic fluid might be a useful factor predicting the risk of umbilical cord bleeding.

Usefulness of peritoneal drainage in extremely low birth weight infants with intestinal perforation: single center experience

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Background/Purpose
The purpose of this study is to evaluate if peritoneal drainage is beneficial in extremely low birth weight infants with intestinal perforation.
Methods
Retrospective cohort study of extremely low birth weight infants with a diagnosis of intestinal perforation. They were received primary peritoneal drainage (n=23, PD group) or laparotomy (n=13, LAP group). Laboratory and physiologic data were collected and organ failure scores calculated and compared between pre-procedure and post-procedures.

Results
Between January 2005 and December 2015, 13 infants (M:F=9:4) received laparotomy. Of 23 infants (M:F=16:7) received peritoneal drainage, 20 infants received subsequent laparotomy. There were no demographic differences between PD group and LAP group. There were no differences in total failure organ score in either group (PD, p=0.486; LAP, p=0.115). However, in LAP group, respiratory score was statistically improved between pre- and post-procedure organ failure score (p=0.02). In physiologic parameter, PD group had a statistically worsening inotropics requirement (p=0.025). On the other hand, LAP group had a improvement of PaO2/FiO2 ratio (p=0.01).

Conclusions
Peritoneal drainage cannot improve clinical status in extremely low birth weight infants with intestinal perforation.

P3.2.9
Short-term surgical outcomes of preterm infants with necrotizing enterocolitis (NEC): a single-center experience

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Background/Purpose
We studied the extent of disease, surgical approach, complications and survival in infants with NEC at our institution.

Methods
24 preterm infants (GA<37 weeks) with surgical NEC were retrospectively analyzed from January 2012 to December 2014. Patients were divided into two groups: low birth weight (LBW, <2500g, n=19) and normal birth weight (NBW, ≥2500g, n=5).

Results
The LBW and NBW groups differed dramatically in RDS incidence (52.6% vs. 0%, respectively) and onset of NEC (20d vs. 10d). Pneumoperitoneum was the most common surgical indication across both groups. No differences in the extent of disease (7 isolated, 8 multifocal and 4 pan-intestinal in LBW; 2 isolated, 3 multifocal in NBW, P=0.814), surgical procedure (14enterostomy, 2 primary anastomosis, 3 peritoneal drainage in LBW; 5enterostomy in NBW, P=0.590), or complications (LBW 73.7%, NBW 40%, P=0.289). The most common post-operative complications were sepsis, intestinal stricture, and short bowel syndrome. Median hospital stay was longer in the LBW group (73d vs. 19d, P=0.015). Overall one-year survival was 66.6% (63.2% vs. 80%, P=0.584). Extent of disease correlated with mortality (11.1% in focal, 27.3% in multifocal, 100% in pan-intestinal, P=0.005).

Conclusions
The short-term outcomes for surgical NEC can be grave, and are strongly correlated with extent of disease.
Possible Etiologies of Increased Incidence of Gastroschisis

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Background/Purpose
The incidence of gastroschisis has increased over the past decade both nationally and in Hawaii. Pesticides have been implicated as potential causative factors for gastroschisis, and use of Restricted Use Pesticides (RUPs) is widespread in Hawaii as well. This study was conducted to characterize gastroschisis cases and determine whether RUP application correlates with gastroschisis incidence.

Methods
Patients with gastroschisis treated at Kapiolani Medical Center between September, 2008 and August, 2015 were identified and their homes were mapped by zip code along with RUP use. Spatial analysis software was used to identify patient homes located within the pesticide application zone.

Results
57 gastroschisis cases were identified with 2 excluded due to out-of-state residence. Two (3.6%) patients were from Kauai, 38 (69.1%) from Oahu, 10 (18.2%) from Hawaii, 4 (7.3%) from Maui, and 1 (1.8%) from Molokai. RUPs have been used on all of these islands. 82% of patients’ homes shared zip codes with areas of restricted use pesticide application.

Conclusions
The majority of patients with gastroschisis were from RUP-use areas, supporting the idea that pesticides may contribute to development of gastroschisis. Additional work identifying specific pesticides and using more granular location data is underway and will be helpful to elucidate this possible connection.

A case of staged abdominal closure with intramuscular tissue expanders and modified components separation technique in a giant incisional hernia after repair of a ruptured omphalocele

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Background/Purpose
After repair of large or ruptured omphaloceles, incisional hernias could remain. The use of intraabdominal tissue expanders and the components separataion technique are useful for the repair of large abdominal wall defects.
Methods
We present a one-year-old boy with a giant incisional hernia after repair of a ruptured omphalocele. A boy was born at 35 weeks of gestation, weighing 2014 g with a ruptured omphalocele. At birth, skin flap coverage associated with silo formation occurred, but a giant abdominal hernia remained. To expand the layers of the abdominal wall, tissue expanders were placed between the bilateral internal oblique and transverses abdominis muscles. Postoperatively, a modified components separation technique using abdominis muscle advancement flap with separation of the posterior rectal sheath from the rectus abdominal muscle was performed after removing the bilateral tissue expanders.

Results
He was discharged 15th days postoperatively, though a wound infection and wound dehiscence developed. At the age of one year and 5 months, the patient had no recurrent incisional hernia nor any wound complications.

Conclusions
In a giant abdominal hernia, the placement of tissue expanders within the abdominal wall stretches the abdominal wall muscles. Afterwards, the fascia could be successfully closed by a modified components separation technique.

P3.2.12 DISPLAY ONLY

Successfully management of a large lingual foregut duplication cyst with an ex utero intrapartum procedure

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Background/Purpose
Foregut duplication cysts are rare congenital choristoma and sometimes cause feeding and respiratory problems depending on their size and location. We present a case of prenatally identified large oral cystic mass that caused respiratory difficulties at birth. This mass was successfully managed by an ex utero intrapartum (EXIT) procedure.
Methods
CASE REPORT: Prenatal screening sonography showed a fetus with a large oral cystic mass and with polyhydramnios. Differential diagnosis included ranula, lymphangioma, and thyroglossal duct cyst. A multidisciplinary fetal care team devised an airway management plan. We performed an EXIT procedure, because the origin and patency of the fetal airway could not be confirmed by fetal magnetic resonance imaging.

Results
At delivery, a lingual cyst was found to occupy the oral cavity and protrude out of the mouth. Oral intubation was performed after aspiration of the cyst during EXIT. On day 16 of life, the cyst was completely excised. A histological examination showed a foregut duplication cyst lined by respiratory and gastric epithelium.

Conclusions
Lingual foregut duplication cysts pose a risk of airway obstruction. For cases diagnosed prenatally, coordination of a multidisciplinary fetal care team and early discussions can optimize the plan for prenatal management, including the EXIT procedure.

Staged closure of a giant omphalocele with amnion preservation modified technique

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Background/Purpose
Closure of a giant omphalocele can be challenging. Preservation of the amnion in staged closure is not commonly practiced. Here we describe 2 cases of giant omphalocele treated with a modified amnion preservation, staged closure technique.

Methods
The amnion and adjacent skin were prepped, and a circumferential skin incision was made a few millimeters on the skin side of the amnio-cutaneous junction. Skin flaps were raised over a distance of 2 cm to expose the underlying fascia, and a mesh reinforced Silasticâ"¢ (Dow Corning, Midland, MI) sheet was sewn carefully to the exposed fascia, directly below its junction with the amnion and subsequent daily tension on the mesh facilitated primary closure within 1 week.

Results
One patient achieved delayed primary closure and the other suffered severe pulmonary hypertension requiring removal of the mesh and keeping preserved amnion to form an eschar.

Conclusions
This paper demonstrates the feasibility and safety of this technique, and the versatility of amnion to adapt to an escharization strategy if closure is not achievable.
Midgut volvulus in a neonate after thoracosopic repair of congenital diaphragmatic hernia

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Background/Purpose
Thoracoscopic repair of congenital diaphragmatic hernia (CDH) has a difficulty in detection of intra-abdominal disorders. We report a case of midgut volvulus in the early postoperative period of thoracoscopic CDH repair.

Methods
A 2.4kg male baby was born at 33 weeks of gestation by cesarean section, and prenatal ultrasonography showed left diaphragmatic hernia. He was intubated after birth promptly, and ventilation was initiated using high-frequency oscillation without nitric oxide. After stabilizing, thoracoscopic repair of CDH was performed under positive pressure by CO2 insufflation (4-6mmHg) on 4 days after birth. After reducing the herniated organs into the abdominal cavity, the diaphragmatic defect was closed using 3x4cm Gortex patch thoracoscopically. The postoperative course was uneventful. Abdominal distension and hematochezia suddenly developed on 18 days after birth. He was given a diagnosis of midgut volvulus by the ultrasonography. An emergent Ladd procedure was performed transumbilically. The patient recovered from the second operation uneventfully.

Conclusions
As malrotation of the intestine is often associated with CDH, early detection and operation of midgut volvulus is required in patients who undergo thoracoscopic repair of CDH.
Jejuno-ileo-colic atresia in neonates: A case report

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Background/Purpose
Jejuno-ileo-colic atresia associated with colonic atresia is extremely rare in literature. Authors report a case of neonatal intestinal obstruction with jejuno-ileo atresia and transverse colon atresia just proximal to splenic flexure.

Methods
A full term 6 days old female presenting with bilious vomiting since birth. Routine preoperative laboratory screening was done. Echocardiography revealed no major cardiac anomalies and plain X-ray revealed dilated intestinal loops. IV fluids and antibiotics were commenced.

Results
Right supra-umbilical incision revealed jejunal atresia type IV with presence of ileal atresia distally. jejunal atresia was located at 15 cm from duodeno-jejunal junction with ectatic pouch increasing in size towards distal end. There were two sites of ileal atresia at 15 & 20 cm from ileocecal valve. Tapering extramucosal jejunoplasty was done after resection of 5 cm of ectatic loop with end to oblique anastomosis. Two ileal atresias were managed by simple end to end anastomosis after resection of atretic segment (1cm each). Injection of normal saline distally revealed colonic atresia at end of transverse colon. Resection of atretic segment (2cm) and defunctioning colostomy were done. Closure of colostomy was done 2 months after.

Conclusions
Jejuno-ileo-colic atresia is seldom mentioned in literature with no more than 10 cases.

Evaluation of treatment for Meconium-related ileus

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Background/Purpose
Meconium-related ileus (MRI) is one of the major causes of bowel obstruction in infants. Cases with MRI were recovered by conservative treatment (ex. contrast enemas) and surgical treatment. The aim of this study is found clinical outcomes of MRI.

Methods
76 infants with MRI were encountered between 2003 and 2015. We reviewed retrospectively the data of infants included: average of gestational age, birth weight, very low birth weight infants (VLBW), intrauterine growth restriction (IUGR), pH, lactate at birth, treatment (contrast enemas, operation).

Results
This study had 62 VLBW and 36 infants with IUGR. The average of gestational age and birth weight, pH, lactate was 29.6 weeks and 1210g, 7.39, 4.1mmol/L, respectively. There were 69 infants who received contrast enemas, 30 more than twice. 16 received operation (9 after enemas, 7 without enemas). In univariate analysis, we found that multiple enemas were more likely with VLBW infants (p=0.03). Receiver Operating Characteristic analysis was identified that lactate > 4.0 had greater odds of operation (AUC = 0.68).

Conclusions
Infants with MRI who had higher lactate and lower weight in birth status were intractable.

Histological prognostic findings in biliary atresia: a systematic review and meta-analysis

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Background/Purpose
Some underpowered studies have reported a relationship between histological findings and prognosis in biliary atresia (BA). We conducted a systematic review and meta-analysis.

Methods
Relevant articles were identified via PubMed until June 2014. Histological findings of the ductular structure in the porta hepatis remnant (DS), hepatic fibrosis (HF), and ductal plate malformation (DPM) of BA were evaluated. The odds ratio (OR) of death or liver transplantation in the mid-term with 95% confidence intervals (CI) was used to estimate the effects.

Results
Two hundred fifty articles were evaluated. Regarding DS, 4 articles had enough information to perform meta-analyses. Large ductules were associated with a better prognosis than small ductules (OR = 0.32, 95% CI = 0.18–0.59, p = 0.0003) (Figure 1). Regarding HF, 4 articles had enough data to perform meta-analyses. Mild HF was associated with a good prognosis compared to progressive HF (OR = 0.23, 95% CI = 0.06–0.91, p = 0.04) (Figure 2). Regarding DPM, 3 articles had enough information to perform meta-analyses. DPM may be associated with a worse prognosis (OR = 4.36, 95% CI = 0.20–97.33, p = 0.35).

Conclusions
The ductular size in the fibrous remnant of porta hepatis and severity of HF were significant prognostic factors of BA.

P3.3.2

The current situation and problems of new nationwide stool color card screening for early diagnosis of biliary atresia in Japan

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Background/Purpose
A new nationwide stool color card screening (defined as No.1-3, abnormal, No.4-7, normal) for biliary atresia (BA) was launched in 2012 in Japan. However, according to the national BA registry, 9 out of 25 patients reported their stool colors as No.4. Our aim is to investigate the necessity of detailed examination for infants with stool color of No.4.

Methods
Caretakers whose infants were aged 2 weeks (Group A, 10-18 days) and 1 month (Group B, 27-35 days) were asked about their infants’ stool colors that were compared to urinary sulfated bile acid (USBA). The correlation coefficient was calculated and multiple linear regression was used to control for age at examination.

Results
Among a total of 1,817 infants (A, 1,115 infants, B, 702 infants), 707 (63.4%) in Group A and 376 (53.6%) in Group B had a stool color of No.4. The association between stool color and USBA adjusted for age at examination was statistically significant (p<0.05).
Conclusions
Given the same stool color, older infants may have bile congestion. Since a fairly large proportion of infants showed their stool color as No.4, further evaluation for validity of stool color card No.4 is needed.

P3.3.3

Reoperation after choledochal cyst excision with hepaticojejunostomy: an institutional experience with 18 cases

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Background/Purpose
Choledochal cyst (CC) typically entails cyst excision with Roux-en-Y hepaticojejunostomy reconstruction. Indications and approach to re-operation have not been well-described.

Methods
275 children with CC underwent cyst excision with hepaticojejunostomy between January 1995 and December 2014. 18 patients (female/male, 15/3) were identified that required reoperation.

Results
With a median follow-up of 6 years, all 18 reoperative patients had developed severe postoperative complications (7 type ?a cysts, 2 ?c, 9 ?a). Two reoperative cases were due to early complications, an anastomotic bile leak and an intussusception. The late complications included 5 anastomotic strictures with/without stones, 4 retained intrapancréatic cyst remnants, 3 adhesive bowel obstructions, 3 with intrahepatic calculi, and 1 internal hernia. For the patients with ductal or anastomotic stricture, removal of stones (if present) and revision of the hepaticojejunostomy were performed, +/- hepatic ductoplasty. Pancreatic pseudocyst was identified 4 months after the primary procedure in one child, managed by external drainage. Radical excision of a dilated cystic remnant was performed in 3 patients. Sixteen patients recovered uneventfully. Two had wound infections.

Conclusions
A widely patent hepatico-jejunostomy, with/without ductoplasty is essential to prevent cholangitis, anastomotic stricture and calculi formation. Complete cyst excision, including the intrapancreatic portion, should be meticulously pursued.
**P3.3.4**

**Comparison of clinical presentation and results of laparoscopic treatment between choledochal cysts type I and type IVa in children**

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**Background/Purpose**
To compare clinical presentations and results of laparoscopic treatment between choledochal cyst type I and type IVa in children.

**Methods**
Retrospective study of all patients undergoing elective laparoscopic surgery for ChC at our center from 2007 to 2012.

**Results**
517 patients were identified: 303 patients with type I and 214 patients type IVa. There were no significant differences between the 2 groups regarding age, gender, time from onset of symptoms, rate of abdominal pain, vomiting, palpable mass. Preoperatively, patients with ChC type IVa suffered from jaundice and cholangitis more frequently and had larger ChC than patients with type I. After the surgery, a median follow up of 24 months (range: 1 month to 90 months) was available in 82% of the patients. Intrahepatic biliary dilatation (IHBD) resolved in 99% of the patients with ChC type IVa. There were no significant differences between the 2 group regarding peri- and post-operative outcome.

**Conclusions**
Preoperatively, patients with ChC type IVa have higher incidence of jaundice and cholangitis and have larger ChC than patients with ChC type I. Intrahepatic biliary dilatation resolves in almost all patients with ChC type IVa after the surgery. There were no significant differences regarding results of laparoscopic treatment between the 2 groups.

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**P3.3.5**

**Management of choledochal cysts with complete cyst excision and hepaticoduodenostomy- a 15 year experience**

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Background/Purpose
Recent publications question the superiority of hepaticojejunostomy over hepaticoduodenostomy after choledochal cyst excision. Hepaticoduodenostomy provides more physiological biliary drainage, less risk from intra-abdominal adhesions and easier endoscopic access for biliary intervention or surveillance.

Methods
Children operated on and followed up locally, from November 2000 to April 2015, were included. There were 60 patients (40 females). Mean age 4.8 years (range 0.1-14.1). Mean weight 21.2kg (range 2.6-86.8). All patients had one or more: MRCP (32), percutaneous cholangiogram (14) or intraoperative cholangiogram (54). The choledochal cysts were types 1c (23), 1f (30), 2 (2) and 4 (5). The following biliary-enteric reconstructions were performed: open hepaticoduodenostomy (49), laparoscopic hepaticoduodenostomy (6), open hepaticojejunostomy (4) and laparoscopic hepaticojejunostomy (1). Mean follow up is 2.7 years (range 0.1-10.1).

Results
Patients made a quick post-operative recovery (Table 1). Two patients required re-operation for a bile leak following laparoscopic hepaticojejunostomy and hepaticoduodenostomy. No patients had adhesive bowel obstruction. Of the patients treated with hepaticoduodenostomy three were treated for possible cholangitis.

Conclusions
Patients undergoing choledochal cystectomy with hepaticoduodenostomy make a quick recovery with a low rate of peri-operative complications. They are not prone to adhesive bowel obstruction and have a low rate of cholangitis.

P3.3.6

Clinical characteristics and risk factors for symptomatic pediatric gall bladder disease in a Central America country

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Background/Purpose
To determine the clinical characteristics and risk factors for symptomatic pediatric gallbladder disease and cholecystectomies in a Central America country.

Methods
This was a retrospective cohort study of children, 0 to 18 years of age, who underwent a cholecystectomy from January, 2010 to December, 2014. BMI percentile 95 or more were considered obesity.

Results
Seventy-six patients were enrolled in the study. The median age was 9.5 years (0.3-18) and 71% were female. Comorbidities were identified in 42 patients (55.3%), including hemolytic disease (n=14; 18.4%); obesity (n=13; 17.1%); chemotherapy (n=4; 5.2%); parenteral nutrition (n=3; 3.9%); biliary malformation (n=2; 2.6%); pancreatitis (n=2; 2.6%); and bowel resection (n=1; 1.3%). However, thirty-four patients (44.7%) had no identifiable comorbidity.

Conclusions
Females were prone to have symptomatic pediatric gallbladder disease. Obesity and hemolytic disease are two major risk factors, accounting 18 and 17% of the patients. However, more than 40% of the patients in this series showed no specific risk factors.
Intra-graft FOXP3+ T lymphocyte repopulation in pediatric liver transplant recipients undergoing prospective calcineurin inhibitor minimization

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Background/Purpose
POXP3+ T lymphocyte had been reported to be tolerangenic with an increasing number in the allografts achieving clinical operational tolerance (COT) in a cross-section of liver transplant patients. This study is to investigate its dynamic change in pediatric liver transplant recipients undergoing prospective calcineurin inhibitor (CNI) minimization.

Methods
Immunohistochemistry stain for POXP3+ T lymphocytes was undertaken on liver biopsies at baseline, during CNI minimization, and after complete withdrawal per protocol.

Results
Total 15 patients with more than 50 biopsy slides were reviewed. In contrary to be hardly detected at baseline, intra-graft FOXP3+ T lymphocytes were detectable in 11 of the 15 patients (73.33%) after CNI minimization, including 4 (out of 5) patients achieving COT and 7 (out of 10) patients did not (non-COT group). In the COT group, its presence was sustainable for 3-5 years after CNI withdrawal. Nonetheless, 4 patients in the non-COT group with detectable FOXP3+ T lymphocytes also had suspicious rejections on the concurrent biopsy slides.

Conclusions
This is the first longitudinal study to demonstrate a steady increase of intra-graft FOXP3+ lymphocytes after CNI minimization in pediatric liver transplant recipients, but the effect of its repopulation on the immune repertoire needs to be further elucidated.

Biliary atresia associated with situs Inversus abdominus and rotation of Intestine: a case report and literature review

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Background/Purpose
Report one case of biliary atresia associated with situs Inversus abdominus and rotation of intestine.

Methods
A 2-month-old male presented with jaundice, clay colored stools, and abdominal distension since the first week of life. General physical examination revealed a infant with obvious jaundice, abdominal distension and hepatomegaly. His laboratory investigations showed conjugated hyperbilirubinemia (total bilirubin 17 mg/dl, and direct bilirubin 12 mg/dl). Gallbladder was not visualized on ultrasound of the abdomen. On HIDA scan no excretion of the radiopharmaceutical tracer was noted.

Results
At operation the cholangiogram confirmed extrahepatic biliary atresia. The liver was enlarged and central in position. Stomach and spleen were present on the right side of the abdominal cavity with gut malrotation. The atretic gallbladder and portal plate were dissected meticulously. Reverse rotation was corrected and Roux-en Y hepatico-jejunostomy was performed without going through the transverse colon window. He was followed up and his bilirubin declined to normal after 2 months postoperatively.

Conclusions
Biliary atresia associated with situs Inversus abdominus and rotation of Intestine is a rare occurrence, and only 7 such patients were reported in English language literature. The operating surgeon must be aware of the surgical implications.

Experience of pediatric laparoscopic cholecystectomy in a local district general medical center

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Background/Purpose
Cholelithiasis is a rare finding in children, even though recent series show increased detection of this disease. On the other hand, the laparoscopic cholecystectomy is considered as the golden standard method for the treatment of symptomatic cholelithiasis. We present our experience of the treatment for this disease at a local district general medical center.

Methods
A total of 2 children of cholelithiasis have been treated in our institution since 2014. We performed single-port laparoscopic cholecystectomy by the same surgical members.

Results
Both of them were boys aged 10 years and 11 years. All children had no past medical history of factors potentially predisposing to stones. A clinical presentation with vomiting (50%), abdominal pain (100%) were observed. The diagnosis was based on abdominal ultrasound and MRI. Both had pigmented stones. No major morbidity was observed as well as no mortality. All patients were asymptomatic postoperatively with a minimum follow-up time of 5 months.

Conclusions
Cholelithiasis in children is an unusual finding, but is not exceptional and is associated with nonspecific symptoms. Laparoscopic cholecystectomy is also highly effective in cases of symptomatic cholelithiasis in children. Pediatric surgeons even in a local district general medical center should be familiarized with the minimal invasive technique to treat this disease.
Trend of pediatric Cholecystectomy: Clinical characteristics and indications for cholecystectomy

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Background/Purpose
Frequency of pediatric cholecystectomy has been recently showing a gradually increasing trend. The purpose of this study was to investigate the clinical features of patients who underwent cholecystectomy, and the latest trend in cholecystectomy.

Methods
In the present study, we conducted a retrospective chart review on 47 patients who had undergone cholecystectomy at a single center. The entire patient population was divided into two groups, according to the time of cholecystectomy (January 1999–January 2006, January 2006–August 2014).

Results
The comparison between the early and late groups showed that the frequency of cholecystectomy increased from 13 to 24 cases representing a 2.6-fold increase. The mean patient age also increased from 5.94 ± 4.08 to 10.51 ± 5.57 years (p = 0.01). Laparoscopic surgery also increased from 15.4 % to 79.4%, respectively (p < 0.001). However, Sex, mean BMI, comorbidities, indications of cholecystectomy, long-term use of total parenteral nutrition were not statistically significant.

Conclusions
The results of this study showed that pediatric cholecystectomy cases are increasing, particularly in the 10–19 year age group and laparoscopic cholecystectomies are being performed at an increasing rate. When the patients were compared according to the time of cholecystectomy, there were no differences in other risk factors or indications for cholecystectomy.
**P4.1.1 ORAL POSTER PRESENTATIONS – SESSION 4 HEPATOBILIARY-2**

**Fn14 Hepatic Progenitor Cells are Associated with Liver Fibrosis in Biliary Atresia**

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**Background/Purpose**
The liver in biliary atresia (BA) is characterized by progressing liver fibrosis. So this study elevated the hypothesis that hepatic progenitor cells (HPCs) are associated with liver fibrosis in biliary atresia.

**Methods**
6 BA and 3 hepatoblastoma infants who donated the liver were enrolled in this study to clarify the biomarkers of HPCs and the liver fibrosis by RT-PCR, WESTERN BLOT, and immunofluorescence methods in biliary atresia.

**Results**
Fn14(+) cells that were HPCs co-expressed CD133 in liver in biliary atresia. Fn14 and ?-SMA increased in biliary atresia, in contrary those hardly expressed in control. And the myofibroblast cells which produce collagen and laminin were surrounded by Fn14(+) cells in portal area.

**Conclusions**
Fn14(+) HPCs is reactived and associated with liver fibrosis in biliary atresia.

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**P4.1.2**

**Is laparoscopic Kasai portoenterostomy for biliary atresia minimally invasive? An evaluation of the associated perioperative alterations in inflammatory mediator, creatine kinase, and liver enzyme levels**

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**Background/Purpose**
The purpose of this study is to determine the invasiveness of laparoscopic Kasai portoenterostomy (Lap-Kasai) based on the perioperative alterations in inflammatory mediator, and liver enzyme levels.

**Methods**
We reviewed the patients who underwent Kasai portoenterostomy (laparotomy, n=61; laparoscopy, n=12) between 2002 and 2015. We also reviewed the patients with choledochal cysts that were treated between 2007 and 2015 (laparotomy, n=58; laparoscopy, n=12) because such patients undergo a similar surgery to Kasai portoenterostomy. The patients’ clinical data and the perioperative alterations in their neutrophil counts and C-reactive protein, creatine kinase, and liver enzyme levels were analyzed.

**Results**
In both disease disease groups, the outcomes of laparoscopic and open surgery were almost the same, but laparoscopic surgery took significantly longer than open surgery. In the patients with biliary atresia significantly less blood loss occurred during the laparoscopic procedure than during the open procedure. Significantly smaller increases in the levels of C-reactive protein and creatine kinase were seen after laparoscopic surgery than after open surgery in both disease groups. However, a significantly greater increase in liver enzyme levels was seen after laparoscopic surgery than after open surgery in the patients with choledochal cysts.

**Conclusions**
Lap-Kasai for biliary atresia is minimally invasive.

**P4.1.3**
Percutaneous suture-assisted three-port laparoscopic resection for choledochal cyst: initial experience

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**Background/Purpose**
Laparoscopic resection of choledochal cyst typically requires four or more ports. However, surgical techniques with fewer ports have been reported. Here we describe our initial experience with percutaneous traction sutures and three laparoscopic ports for choledochal cyst resection.

**Methods**
52 patients underwent laparoscopic resection of choledochal cyst between March 2010 and December 2014. 14 resection used 4 trocars, without traction sutures, by three different surgeons. 38 cases used percutaneous traction sutures and 3 trocars, by two different surgeons. Three traction sutures were placed. One around the round ligament, a second through the gallbladder bed, and the third in the anterior wall of the cyst. Procedure time, blood loss, postoperative hospital stay, complications, cosmetic outcome were noted.
Results
The operative time with traction sutures was shorter (P<0.01), but no significant differences in blood loss or hospital stay were seen (P>0.05). There were 2 cases of intraoperative damage to the duodenal wall in the no traction suture group, 1 case of biliary leakage in each group.

Conclusions
In our initial experience, this technique shortened the operation time and reduce the use of trocars for laparoscopic resection of choledochal cyst. There was improved cosmetic outcome and better exposure in the operative field.

Noninvasive acoustic radiation force impulse (ARFI) elastography for evaluating the liver fibrosis staging in biliary atresia

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Background/Purpose
Acoustic radiation force impulse (ARFI) elastography has the capacity of noninvasive assessment for tissue elasticity and stiffness. The aim of this study was to determine the feasibility of ARFI elastography for the noninvasive evaluation of liver fibrosis in biliary atresia.

Methods
32 children with biliary atresia accepted the ARFI elastography and Histopathologic examination. Results of these two methods were compared and statistical analyzed.

Results
Histopathologic liver fibrosis was evaluated by Metavir scoring; F0: 0 cases, F1:7 cases, F2:8 cases, F3:8 cases and F4:9 cases. Liver stiffness determined by ARFI elastography was correlated with Histopathologic liver fibrosis. The children were divided into the non-cirrhosis group (F0-F3, n=23) and cirrhosis group (F4, n=9), The area under the ROC curves was 0.976 (95%CI: 0.930 to 1.021), the SWV value 2.035m/s was determined as the optimal cut off value of diagnosis, and the sensitivity, specificity, positive predictive value, negative predictive value and accuracy for biliary atresia diagnosis were 100%, 91.30%, 81.82%, 100 %, 93.75%, respectively.

Conclusions
Ultrasonic AFRI elastography is a reliable method for noninvasive evaluation of liver fibrosis. It can make a contribution to judging the clinical outcome in children with biliary atresia.
Changes in plasma ghrelin levels in children after the Kasai procedure or living donor liver transplantation for post-Kasai biliary atresia

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Background/Purpose
Ghrelin, a stomach-derived hormone, suppresses inflammation and stimulates appetite and gastrointestinal activity. Plasma ghrelin levels were recently reported to be reduced after upper gastrointestinal surgery in adult patients. The aim of this study was to investigate perioperative ghrelin levels in pediatric patients who underwent the Kasai procedure or living donor liver transplantation (LDLT) for post-Kasai biliary atresia.

Methods
We measured plasma ghrelin in 4 patients who underwent Kasai procedures and 6 who underwent LDLTs before surgery, at the end of surgery, and postoperative days (POD) 1, 3 and 7.

Results
The plasma ghrelin levels greatly declined after LDLT to 12.4% of the preoperative level, whereas the decline was less significant after the Kasai procedure (44.5% at the end of surgery). On POD1, plasma ghrelin levels in the Kasai procedure recovered to the preoperative level, whereas those in LDLT slightly recovered upto 51.9%.

Conclusions
Plasma ghrelin levels of these pediatric surgeries were postoperatively reduced, similar to adults undergoing upper gastrointestinal surgery. Additionally, the ghrelin levels were significantly reduced under more stressful surgery, indicating that the levels might reflect the severity of surgical stress. Therefore, postoperative recovery in these pediatric patients might be enhanced by the administration of ghrelin.
Surgical management and perioperative risk factors of retroperitoneal teratomas in children: A single institution experience

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Background/Purpose
Retroperitoneal teratomas (RTs) are rare among germ cell tumors (GCTs) and predominantly occur in infants. RTs are often difficult to manage by perioperative management. In this study, we retrospectively reviewed our series of RTs.

Methods
Seventy patients with GCTs were treated from 1989 to 2015 in our institution. Fourteen patients had RTs (3 boys and 11 girls). The median age at diagnosis was 5.5 months (range, 0 - 64), and 3 were antenatally diagnosed.

Results
All except one underwent total tumor excision. They exhibited dense adhesions with major vessels, and ligation of the splenic and gastroduodenal arteries was required in 2. Injuries of PV and renal artery occurred in 2. IVC injury in a neonate with a giant mass caused circulatory failure and brain death occurred postoperatively. Other major complications included injury of the diaphragm and bile duct. An infant whose tumor compressed the superior mesenteric artery developed enteritis while waiting for surgery and subsequent non-occlusive mesenteric ischemia, resulting in massive intestinal necrosis. The perioperative complication rate was 50%.

Conclusions
Surgery for RTs remains challenging, and preoperative evaluation of the vascular anatomy is crucial due to the high complication rate. Moreover, pre- and intraoperative fluid management is important to avoid any unexpected fatalities.
Laparoscopic resection of extra-adrenal tumor in children

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Background/Purpose
Laparoscopic adrenalectomy has progressively gained popularity in children, but the minimally invasive approach for extra-adrenal tumor poorly defined in pediatric age. The aim of our study was to describe the safety and feasibility of laparoscopic removal of extra-adrenal tumors in children.

Methods
From March 2013 to October 2015, 4 cases of extra-adrenal tumors were resected laparoscopically. Three boys and one girl with the mean age of 3.75 years (rang, 1.7 to 5.5 years old) underwent laparoscopic resection. The mean size of lesions in greatest diameter was 5.9 Å3 2.4 cm (3.5 to 7.5) in CT scanning with no signs of lymph node or distant metastases. And one patient had hypertension as 150/110 mmHg.

Results
All the cases were completely performed by laparoscopic excision. The mean operative time was 75 ± 47 (55-145) minutes and the average intra-operative blood loss was 15-35ml. The mean hospital stay was 5.7 days (4-8) and average follow-up time was 27 months (2-27) without recurrence. Histopathology revealed pheochromocytomas(1), and neuroblastoma (2) and ganglioneuroma (1). And one patient followed chemotherapy according to COG protocol.

Conclusions
With our initial experience, laparoscopic procedure is safe and feasible in the treatment of children with extra-adrenal tumors in early stage by experienced surgeon.

Cost efficiency of lobectomy versus fine needle aspiration for diagnostic work up of thyroid nodules in children

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Background/Purpose
Contemporary pediatric guidelines recommend that suspicious thyroid nodules undergo ultrasound guided fine needle aspiration (FNA) as the initial diagnostic study. However, this practice has not been widely adopted and may not be available in all hospitals. This study examines the cost efficiency of FNA versus initial diagnostic lobectomy (DL) in children with an ultrasound-confirmed thyroid nodule.

Methods
Decision analysis was conducted using costs and probabilities identified through literature searches. A tornado diagram identified the most influential variables in the model. A Monte Carlo probability simulation and sensitivity analyses were performed.

Results
Costs for FNA were estimated at $2577 versus DL at $5680. The probability of an indeterminate result of the initial FNA contributed the most to variance in cost outcomes. Sensitivity analysis did not produce a threshold value, indicating that although cost increased as the probability of an indeterminate initial FNA increased, FNA remained cost efficient. Monte Carlo simulation supported the cost efficiency of FNA in 74% of 10,000 simulations.

Conclusions
FNA evaluation of ultrasound-confirmed thyroid nodules was more cost efficient than proceeding directly to lobectomy. Mobilizing resources to perform FNA may therefore be financially beneficial to hospitals aiming to provide high quality, guideline compliant care.

Open Tunneled Central Line Insertion In Children - External Or Internal Jugular Vein?

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Background/Purpose
To compare the feasibility and outcome of the external jugular vein (EJV) as the first choice for open insertion of tunneled central lines.

Methods
A retrospective analysis of patients requiring tunneled central access between 2009 and 2014 in a single institution, where the open approach is preferred. Data records included: Insertion site, operative time, duration of access, and complications. EJV access was the first preference for one consultant, and outcomes were compared to IJV insertions by five other consultants.
**Results**

1,009 Broviac catheters were inserted in 805 patients over a 5-year period. The commonest indication was chemotherapy for oncological pathology. 757 (75%) IJV and 252 (25%) EJV catheters were inserted. 24 (8.7%) patients had a failed EJV attempt with successful ipsilateral IJV insertion during the same operation. EJV access was achieved in 3 patients with bilateral IJV blockage and 16 children under 3 months of age. Duration of use was similar in both groups. The EJV group had a lower infection rate and operative time.

**Conclusions**

The EJV provides easier and faster access for open insertion of tunneled central lines in over 91% of children. Procedure time is shorter with the additional advantage of hemostasis in children with coagulopathy and/or reduced platelet counts.

**Tumors arising from Maldescended Testes**

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**Background/Purpose**

Tumors from Maldescended Testes are rare. 4 cases were encountered over a period of 30 years at two Institutions.

**Methods**

Their age ranged from 2 to 16 years. Sites where tumor occurred are retroperitoneum, intraabdominal, canalicular & right femoral region. The age at presentation was 2 years, 6 years, 3-years & 16 years. The retroperitoneal tumor was a Yolk sac carcinoma, intrabdominal mobile mass was a fetus-in-fetu. The canalicular testis was a Yol-sac tumor, & the femoral ectopic testis was a seminoma. The retroperitoneal mass was treated with Chemotherapy. The intra-abdominal Fetus-in-Fetu was excised & contained a 6-week old fetus. Was excised. The canalicular Yolk-sac Tumor was excised by high Orchidectomy. The femoral testis was excised completely.

**Results**

The child with retroperitoneall tumor died of sepsis after chemotherapy at home. The femoral tumor child was lost to follow up after 3-years. The other two children are alive & well.
Conclusions
Tumors from MDT are rare. Delay in diagnosis in retroperitoneal Germ Cell Tumors leads to late presentation. Benign lesions are curable. Proper physical examination & a high index of suspicion is essential, for early diagnosis & therapy. Review of the incidence varies from seven times higher to three times higher.

P4.2.6
Multimodality Treatment of a Massive Cervicothoracic Venolymphatic Malformation in a 13 year-old Boy

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Background/Purpose
We present multi-modality treatment of a massive congenital cervicothoracic venolymphatic malformation in a 13-year-old boy.

Methods
This boy was born with a small cervical lymphangioma. Sclerotherapy performed at 4 years of age provided temporary resolution. He came to our institution at 9 years old with a massive cervicothoracic venolymphatic malformation. He was an active boy whose only symptom was bleeding from the surface of the mass due to a chronic consumptive coagulopathy. Radiologic imaging revealed a massive venolymphatic malformation involving the neck, chest wall, axilla and mediastinum. Treatment with sildenafil produced no change. Coagulopathy improved with subcutaneous enoxaparin. A multi-disciplinary team performed partial excision of the mass when he was 11 years old. Coagulation studies normalized and enoxaparin was stopped. Slow enlargement of the mass and a rise in d-dimer level prompted treatment with rapamune. Two sessions of sclerotherapy using a mixture of sodium tetradecyl sulfate, lipiodol, air and Gel foam arrested enlargement of the mass.

Results
The mass is significantly smaller after multi-modality treatment. (Figs. 2-4).

Conclusions
Multi-modality treatment resulted in a marked reduction of a venolymphatic malformation in a child. However, enlargement of the mass and further treatment is anticipated as a cure has not yet been found.
Two cases of Unusual Neck Tumours

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Background/Purpose
Malignant rhabdoid tumours and benign myofibroblastic tumours are uncommon tumours of the neck, with few cases reported in the literature. Two cases are presented with a literature review.

Methods

Results
Case 1: A two-year-old female presented with an eight-week history of a right-sided neck mass. Biopsies and chest CTs revealed a malignant rhabdoid tumour with local lymphatic invasion and metastatic disease in the lower lobe of the left lung. The child underwent a thorascopic stapled resection of the lung lesions, and was initiated on a soft tissue chemotherapy protocol. After a good response following two months of treatment, the neck lesion was resected. Her chemotherapy regime continued for a further four months until the tumour was discovered to be rapidly progressive. At this stage, palliative care was commenced.
Case 2: A fourteen-year-old male presented with an eight-week history of an unusual neck lump. Situated in the suprasternal fossa on the left anterior aspect of his neck, the lump was solid, non-mobile, and non-tender, with a firm consistency. It measured 21x19x17mm. Biopsy revealed a benign myofibroblastic tumour. He is currently on surveillance.

Conclusions
These cases show rare neck tumours in children, which should be kept in the differential diagnosis of neck lumps.

Experiences of surgical resection of pulmonary metastasis in children with advanced hepatoblastoma

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**Background/Purpose**
The most common site of metastasis in advanced hepatoblastoma is the lung but the role of pulmonary metastasectomy remains unclear. In this study, we examined the long-term outcome of patients with hepatoblastoma who have a surgical resection of pulmonary metastatic lesions.

**Methods**
Patients with hepatoblastoma who were treated in our institution between 2001 and 2014 were reviewed. Among them, 10 cases had pulmonary metastasis at diagnosis. Prognostic factors (histology, tumor margin, surgical complications, and alpha-fetoprotein) were also reviewed.

**Results**
In these 10 metastatic hepatoblastoma cases, the ages at diagnosis ranged between 15 and 129 months old and the serum alpha-fetoprotein levels ranged between 153,428 and 1,223,990. All cases underwent resection of primary tumors after preoperative chemotherapy. Pulmonary metastasis diminished in four cases. In the remaining 6 cases, two cases simultaneously underwent resection of pulmonary metastasis and 4 cases received pulmonary metastasectomy later. Four of these 6 cases were survivors with tumor free. In the recent case, we tried the Indocyanine green (ICG) fluorescent imaging for detecting micrometastases in surgery.

**Conclusions**
In some metastatic hepatoblastoma cases, metastasectomy is effective. In the management of pulmonary metastasis, more aggressive management of metastases using ICG imaging system might improve the cure rates of hepatoblastoma.

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**P4.2.9 DISPLAY ONLY**

### Surgically Treated Gastrointestinal Complications of Graft versus Host Disease in the Pediatric Population

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**Background/Purpose**
To characterize surgical treatments of gastrointestinal complications of graft versus host disease (GVHD) in the pediatric population.
Methods
Five individuals requiring surgical intervention for complications of acute GVHD following bone marrow or hematopoietic stem cell transplantation between 2004 and 2014 were identified, and their medical records examined.

Results
All five of the patients were diagnosed with gastrointestinal GVHD within 100 days of transplantation. The indications for transplantation were myriad. Three were male. The average age was 6.8 years (range, 4-12). Three had associated skin GVHD at the time of presentation. Three of the patients underwent small bowel resections for stricture, while a fourth underwent a right hemicolectomy for extensive pneumatosis and a colonic microperforation. The other patient developed esophageal strictures nearly ten years after transplantation and underwent multiple esophageal dilation procedures. All of the patients are alive today.

Conclusions
Although GVHD management is almost exclusively medical, a small subset of patients develops complications of gastrointestinal GVHD that require surgical intervention. With an ever-increasing variety of indications for stem cell transplantation, and critical care support rendering previously fatal bouts of gastrointestinal GVHD survivable, it is likely that surgical intervention will become more common in these complicated patients.

Risk Factors Affecting the Longevity of Totally Implantable Access Ports in Pediatric Cancer Patients

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Background/Purpose
Totally implantable venous access port system (Port-A-cath) are safe and widely used in pediatric cancer patients, however, port-A-cath are not free of complications.

Our objective in this study are to investigate the reasons for Port-A-cath removal. And the underline risk factors that may predispose to premature removal (i.e. removed before completion of therapy).

Methods
This retrospective review of port-A-cath removed in pediatric hem-oncology patients during the period from 2010 to 2013. Data were extracted by review patient’s files, electronic patient’s records and medical notes.

Results
Over two years period 106 port-A-cath were removed. the common cause of removal was completion of therapy 74 (69.8%) followed by infection 20 (18.9%). the rest of complication that lead to removal are 5 (4.7%) malfunction, 1 (0.9%) displacement and 6 (5.7) due to other reasons (catheter rupture or flipping). Cross table analysis of data showed that type of cancer is the only significant risk factor SD (0.019), with no other significant risk factor that independently contribute to the premature removal of portacath.
Conclusions
We recommend that Port-A-cath should be well looked after especially in acute lymphocytic leukemia patients. With especial consideration to the other risk factors especially ANC (absolute neutrophil count) at the time of catheter insertion.

P4.3.1 UROLOGY DISPLAY ONLY

Case report: Laparoscopic correction of the transverse testicular ectopia with persistent Mullerian duct syndrome

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Background/Purpose
Transverse testicular ectopia (TTE) with persistent Mullerian duct syndrome (PMDS) is a rare genitourinary anomaly with uncertain embryologic etiology.

Methods
We want to introduce a case of incidentally found TTE with PMDS in an 11 month-old boy, corrected by laparoscopy.

Results
The patient visited our hospital due to right inguinal hernia. Testis was palpable in the right scrotum while left scrotum was nonpalpable. During laparoscopic exploration Mullerian duct was visible in the right pelvic cavity as a tubular structure, and spermatic cords were present bilaterally. While right testis was placed inside the scrotum, left testis was found on the left side of the Mullerian duct. After identifying the vas deferens, it was dissected to make the left testis redundant. Due to the short length of spermatic cord, descending the left scrotum through the left internal inguinal ring was impossible. Therefore, we incised the left scrotum and made another internal inguinal ring and placed the scrotum inside the scrotum. Orchiopexy of both testes was performed, and both sides of processus vaginalis was closed laparoscopically.

Conclusions
Laparoscopic correction of the transverse testicular ectopia with persistent Mullerian duct syndrome was successfully performed. The patient was discharged 6 hours after the operation.

P4.3.2 DISPLAY ONLY

Successful management of posterior urethral hemangioma by steroid injection-
A case report

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Background/Purpose
Posterior urethral hemangioma is an uncommon disorder in children and adults. Patients may have hematuria, hematospermia and/or post-ejaculation or posterection hematuria. The diagnosis was usually confirmed by cystoscopy. Treatment depends on the size and involvement of the lesions. We report a case of posterior urethral hemangioma in a 5 year old boy.

Methods
The boy had a few episodes of gross hematuria for about one year. The symptom usually happened after physical exercise. There was no pain and no fever during the episodes. Cystoscope showed a reddish polypoid lesion near the prostate urethra. With the impression of hemangioma, oral inderal was tried but stopped soon after an asthma attack. Intralesional injection under cystoscope using 1:1 dexamethasone and triamcinalone was then performed because of persisted hematuria.

Results
Hematuria disappeared after the injection. Hemangioma was not found in the follow-up cystoscopic examination.

Conclusions
Urethral hemangiomas are rare benign vascular tumors and usually present as urethral bleeding and/or hematuria. Open or endoscopic resection, elecrofulguration, laser, selective arterial embolisation had been reported in the literature with various success rates and morbidities. Cystoscopic steroid injection, not reported previously, may provide a safe and effective option to manage the problem.

P4.3.3 DISPLAY ONLY
Surgical Approach for Impalpable Testis: Open or Laparoscopic Exploration

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Background/Purpose
There is controversy over whether the surgical approach for impalpable (non-palpable) testis (IPT) should be open or laparoscopic. This study investigated the appropriate surgical approach for IPT.

Methods
Between June 2000 and December 2013, 58 IPTs (also non-detectable with ultrasonography) in 54 patients, 50 unilateral and 4 bilateral, were treated. The median age of the patients was 17.5 months (range, 6-135 months). At surgery, the inguinal canal was initially explored and laparoscopy, usually through the internal inguinal ring, was used when the testis was not detected in the inguinal region.

Results
Twenty-four testes (41.4%) were detected in the inguinal canal or at the internal inguinal ring (peeping testis). Open orchidopexy was performed and re-orchidopexy was necessary for only one testis. Laparoscopic exploration was performed for the remaining 34 testes. The diagnosis was a vanishing testis in 30 (51.7%) and an intra-abdominal testis in 4 (6.9%). The two-stage Fowler-Stephens method was applied for the latter, but testicular atrophy and testicular maldevelopment occurred in one patient each.
Conclusions
Since the incidence of a high abdominal testis requiring laparoscopic orchidopexy is low, inguinal exploration and open orchidopexy when required are recommended in the surgical approach for IPT.

P4.3.4 DISPLAY ONLY

Diagnostic performance of diffused-weighted imaging (DWI) in the detection of impalpable testis: Comparison with surgical and pathological findings

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Background/Purpose
Conventional MRI with diffused-weighted imaging (DWI) for impalpable testis is a very useful evaluation tool for detecting testicular location. The aim for this study was to reassess optimal management for impalpable testis.

Methods
Between 2010 and 2015, 10 boys with impalpable unilateral testes who had preoperative abdominal and pelvic MRI (DWI) were evaluated. MRI findings of 4 removed testes were compared with, operative, and histological findings. In pathological examination, MTD (Mean Tubular Diameter) decreasing rate and TFI (Tubular Fertility Index) were used for evaluation of atrophic testis.

Results
Histological findings showed mild atrophy (MTD decreasing rate<10%, TFI>50%) with viable cells. Three out of 10 testes were not detected by DWI. During exploration, 3 DWI negative testes were nubbin and orchiectomy was performed. Viable testicular tissues were not found, histologically.

Conclusions
Seven out of 10 testes were positive for MRI with DWI. Orchidopexy was successfully performed for 6 patients. One small testis required orchiectomy. Its DWI negative testes were nubbin and no viable tissue. One DWI positive testis had viable tissue. As DWI was strongly relating with histological findings, it should be one the useful tools for managing impalpable testis.
SS1.1 Expression of Prx1 and Tcf4 is decreased in diaphragmatic muscle connective tissue of nitrofen-induced congenital diaphragmatic hernia

Figure 1

SS1.6 Pattern of YAP-CCNE2-TJP2 as a unique signature in pediatric hepatocellular carcinoma

Figure 1. Heatmap demonstrating gene expression levels for 84 Hippo-related genes, including components of the core kinase cascade, upstream regulators, downstream effectors, and YAP target genes, organized by hierarchical clustering.
Table 1. YAP nuclear localization, and expression of Hippo pathway-related genes. YAP nuclear localization is expressed as percentage of total nuclei that are YAP-positive in tumor sections, normalized to matched non-neoplastic sections. Gene expression is presented as fold change between non-neoplastic liver and tumor. The mean of all 6 patients is given for each category ± the standard error of the mean. * p-value ≤ 0.05.

<table>
<thead>
<tr>
<th></th>
<th>Patient 1</th>
<th>Patient 2</th>
<th>Patient 3</th>
<th>Patient 4</th>
<th>Patient 5</th>
<th>Patient 6</th>
<th>Mean ± SEM</th>
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<td>3.64</td>
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<td>CCNE2</td>
<td>1.52</td>
<td>1.20</td>
<td>4.87</td>
<td>1.11</td>
<td>8.28</td>
<td>2.60</td>
<td>3.27 ± 1.15 *</td>
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<tr>
<td>MPP5</td>
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<td>1.09</td>
<td>4.93</td>
<td>1.97</td>
<td>5.37</td>
<td>1.39</td>
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SS1.7 A potent chemotherapeutic strategy in Neuroblastoma (S-trityl-L-cysteine) a novel Eg5 inhibitor

Figure 1
SS1.12 Ghrelin Improves Intestinal Mucosal Atrophy during Parenteral Nutrition: An Experimental Study

Figure 1

**Figure 2**

**Figure 3**
SS1.13 Kampo medicine: Daikenchuto (TU-100) prevents bacterial translocation and hepatic fibrosis in biliary atresia rat model.

Figure 1

AZAN staining of the liver

TU-100 reduced hepatic fibrosis on POD14.

Figure 2

Effect of TU-100 on hepatic fibrosis

TU-100 reduced hepatic fibrosis by suppressing BT and HSC activation.
SS2.6 AORN Wound Classification May Not Apply to Contemporary Operations in Children

Figure 1

Table Actual and Expected Infection Rates per Wound Classification

<table>
<thead>
<tr>
<th>Wound Classification</th>
<th>Procedure</th>
<th>Superficial Surgical Site Infection (%)</th>
<th>Organ Space Infection (%)</th>
<th>Total Expected Infection (%)</th>
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<td>0</td>
<td>0</td>
<td>1.5</td>
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<td></td>
<td>Umbilical hernia</td>
<td>1</td>
<td>0</td>
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<td>Pyloromyotomy</td>
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<td>0</td>
<td>1.11</td>
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<tr>
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<td>Ostomy reversal</td>
<td>17</td>
<td>0</td>
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<td></td>
<td>Cholecystectomy</td>
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<td>8</td>
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<td>Nonperforated appendectomy</td>
<td>2</td>
<td>2</td>
<td>10-17</td>
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<td></td>
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<td>0</td>
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<td>Dirty</td>
<td>Perforated appendectomy</td>
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<td>15</td>
<td>&gt;27</td>
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SS2.9 Don’t forget the dose: improving computed tomography dosing for pediatric appendicitis

Figure 1
SS2.10  
**Increased Morbidity and Mortality in Cardiac Patients Undergoing Nissen Fundoplication: Evidence from NSQIP-P**

Figure 1

SS2.11  
**The Impact of Cardiac Risk Factors on Outcomes for Children Undergoing a Ladd Procedure**

Figure 1

![Graph showing event rate for different cardiac risk categories](image)
The Impact of Cardiac Risk Factors on Outcomes for Children Undergoing a Ladd Procedure

**Figure 1**

![Mortality and Adverse Events]

- **Event Rate**
  - 0% - 50%
  - 0.6% - 18%
  - 2.4% - 31%
  - 2.8% - 29%
  - 3.9% - 37%

- **Cardiac Risk Category**
  - None (n=633)
  - Minor (n=84)
  - Major (n=109)
  - Severe (n=52)

**Figure 2**

![Adverse Events by Age and Cardiac Risk Category]

- **Adverse Events**
  - 0% - 60%
  - Age < 60 days
  - Age 60-120 days
  - Age > 120 days

- **Cardiac Risk Category**
  - None
  - Minor
  - Major
  - Severe
**SS2.13**  
Time-Driven Activity-Based Costing to Identify Opportunities for Cost Reduction in Pediatric Appendectomy

Figure 1

**SS2.15**  
Long-term outcome of bowel function for 109 consecutive cases of Hirschsprung's disease: Comparison of the abdominal approach and transanal approach over 30 years of experience at a single institution

Figure 1
SS3.3 The clinical and epidemiological characteristics of simply traumatic spleen injury in children in China-- Single institute analysis

Table 1 Conservative of traumatic spleen injury in children in China

<table>
<thead>
<tr>
<th>Imaging classification</th>
<th>Grade I</th>
<th>Grade II</th>
<th>Grade III</th>
<th>Grade IV or above</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>5</td>
<td>26</td>
<td>21</td>
<td>5</td>
</tr>
<tr>
<td>Fasting (day)</td>
<td>2.2 (1–5)</td>
<td>2.65 (0–15)</td>
<td>3.09 (0–6)</td>
<td>3.6 (0–8)</td>
</tr>
<tr>
<td>Bed rest (week)</td>
<td>3.25 (2–6)</td>
<td>3.2 (0.5–6)</td>
<td>3.4 (1–6)</td>
<td>6.08 (0.5–14)</td>
</tr>
<tr>
<td>Antibiotics (day)</td>
<td>2.2 (0–5)</td>
<td>5.4 (0–16)</td>
<td>6.7 (0–17)</td>
<td>8 (5–12)</td>
</tr>
<tr>
<td>Hospitalization days(day)</td>
<td>4.8 (3–7)</td>
<td>8.5 (3–18)</td>
<td>9.4 (3–17)</td>
<td>11 (6–14)</td>
</tr>
<tr>
<td>Abdominal pain(day)</td>
<td>2.4 (0–5)</td>
<td>3.03 (0–12)</td>
<td>3.7 (1–15)</td>
<td>2.6 (0–5)</td>
</tr>
<tr>
<td>CT scan (time)</td>
<td>1.4 (1–2)</td>
<td>2.13 (1–4)</td>
<td>2.47 (1–5)</td>
<td>2.6 (2–4)</td>
</tr>
</tbody>
</table>

SS3.4 Is football dangerous for children? A retrospective national database analysis of Emergency Department presentations

Figure 1
**Is football dangerous for children? A retrospective national database analysis of Emergency Department presentations**

**Figure 2**

- **a)**
  - Tennis
  - Swimming
  - Snow tubing
  - Running
  - Park play
  - Horse riding
  - Football
  - Biking
  - Basketball
  - ATV

- **b)**
  - Sports deaths

- **c)**
  - Spinal injury
  - Seizure
  - Internal/organ injury
  - Head injury
  - Drowning
  - Cardiac trauma
  - Cardiac arrest

**Table 1**

<table>
<thead>
<tr>
<th>Sports</th>
<th>Football (n=10041)</th>
<th>Basketball (n=9843)</th>
<th>Hockey (n=399)</th>
<th>Wrestling (n=968)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age (mean +/- SD)</strong></td>
<td>12.9 +/- 0.06</td>
<td>13.6 +/- 0.06</td>
<td>13.1 +/- 2.9</td>
<td>14.1 +/- 2.4</td>
</tr>
<tr>
<td><strong>Gender (%M)</strong></td>
<td>95.7%</td>
<td>76.6%</td>
<td>92.7%</td>
<td>95.8%</td>
</tr>
<tr>
<td><strong>Race</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>4216 (42%)</td>
<td>3201 (32%)</td>
<td>205 (51%)</td>
<td>521 (51%)</td>
</tr>
<tr>
<td>Black/African</td>
<td>2715 (27%)</td>
<td>3167 (32%)</td>
<td>4 (1%)</td>
<td>72 (7%)</td>
</tr>
<tr>
<td>American</td>
<td>25 (0.2%)</td>
<td>112 (1%)</td>
<td>6 (1.5%)</td>
<td>78 (8%)</td>
</tr>
<tr>
<td>Asian</td>
<td>17 (0.1%)</td>
<td>26 (0.2%)</td>
<td>2 (0.5%)</td>
<td>12 (1%)</td>
</tr>
<tr>
<td>American Indian</td>
<td>14 (0.1%)</td>
<td>12 (0.1%)</td>
<td>1 (0.25%)</td>
<td>7 (1%)</td>
</tr>
<tr>
<td>Native Hawaiian</td>
<td>3032 (30%)</td>
<td>3325 (34%)</td>
<td>0 (0%)</td>
<td>0</td>
</tr>
<tr>
<td>Other/Unclear</td>
<td>2297 (23%)</td>
<td>2518 (26%)</td>
<td>181 (45%)</td>
<td>278 (29%)</td>
</tr>
<tr>
<td><strong>Body Part Injured</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Head/Neck</td>
<td>2712 (27%)</td>
<td>2229 (22%)</td>
<td>193 (48%)</td>
<td>295 (31%)</td>
</tr>
<tr>
<td>Upper Extremity</td>
<td>3911 (39%)</td>
<td>3323 (33%)</td>
<td>108 (27%)</td>
<td>376 (39%)</td>
</tr>
<tr>
<td>Trunk</td>
<td>706 (7%)</td>
<td>565 (6%)</td>
<td>34 (9%)</td>
<td>87 (9%)</td>
</tr>
<tr>
<td>Lower Extremity</td>
<td>2624 (26%)</td>
<td>3660 (37%)</td>
<td>65 (16%)</td>
<td>200 (20%)</td>
</tr>
<tr>
<td>Systemic (heat stroke/hypothermia etc.)</td>
<td>86 (0.8%)</td>
<td>63 (0.55%)</td>
<td>0 (0%)</td>
<td>10 (1%)</td>
</tr>
<tr>
<td><strong>Injury Type</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Musculoskeletal</td>
<td>2536 (26%)</td>
<td>2086 (22%)</td>
<td>64 (16%)</td>
<td>237 (25%)</td>
</tr>
<tr>
<td>Concussion</td>
<td>1995 (20%)</td>
<td>1189 (12%)</td>
<td>145 (36%)</td>
<td>151 (16%)</td>
</tr>
<tr>
<td>Cardio/Respiratory</td>
<td>943 (9.4%)</td>
<td>1091 (11%)</td>
<td>24 (6%)</td>
<td>129 (13%)</td>
</tr>
<tr>
<td>Internal Organ Injury</td>
<td>28 (0.3%)</td>
<td>6 (0.06%)</td>
<td>4 (1%)</td>
<td>2 (0.2%)</td>
</tr>
<tr>
<td><strong>Disposition</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Discharged from ED</td>
<td>9641 (96%)</td>
<td>9609 (98%)</td>
<td>387 (97%)</td>
<td>934 (96%)</td>
</tr>
<tr>
<td>Admitted</td>
<td>332 (3%)</td>
<td>167 (1.7%)</td>
<td>11 (2%)</td>
<td>28 (2%)</td>
</tr>
<tr>
<td>Left AMA</td>
<td>67 (0.6%)</td>
<td>67 (0.6%)</td>
<td>1 (0.7%)</td>
<td>6 (0.6%)</td>
</tr>
<tr>
<td>Dead</td>
<td>1 (0.001%)</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td><strong>Type of sports</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Casual</td>
<td>521 (5%)</td>
<td>665 (7%)</td>
<td>6 (1.5%)</td>
<td>3 (0.3%)</td>
</tr>
<tr>
<td>Formal</td>
<td>7461 (74%)</td>
<td>6499 (66%)</td>
<td>374 (94%)</td>
<td>884 (91%)</td>
</tr>
<tr>
<td>Not clear</td>
<td>2059 (21%)</td>
<td>2679 (27%)</td>
<td>19 (4.5%)</td>
<td>81 (8%)</td>
</tr>
</tbody>
</table>
### SS3.5 The Burden of Pediatric Emergency Surgery: Delineating National Estimates & Predictors of Surgical Outcomes

**Table:** Patient demographic and hospital-level characteristics influencing outcomes in pediatric acute care surgery

<table>
<thead>
<tr>
<th></th>
<th>Mortality</th>
<th>Complications</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Odds Ratios [95% Confidence Interval]</td>
<td></td>
</tr>
<tr>
<td><strong>Age Categories</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Reference: 0-1 years)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13-18 years</td>
<td>0.58 [0.53-0.65]*</td>
<td>0.78 [0.74-0.83]*</td>
</tr>
<tr>
<td><strong>Race</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Reference: Non-Hispanic White)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-Hispanic Black</td>
<td>1.37 [1.20-1.56]*</td>
<td>1.23 [1.15-1.32]*</td>
</tr>
<tr>
<td><strong>Insurance Status</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Reference: Private)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Government (Medicaid)</td>
<td>1.01 [0.91-1.11]</td>
<td>1.10 [1.05-1.15]*</td>
</tr>
<tr>
<td>Uninsured</td>
<td>1.82 [1.54-2.16]*</td>
<td>0.81 [0.97-1.29]</td>
</tr>
<tr>
<td><strong>Income</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Reference: Lowest Quartile)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Highest Quartile</td>
<td>0.77 [0.67-0.89]*</td>
<td>0.84 [0.78-0.90]*</td>
</tr>
<tr>
<td>Teaching Hospital</td>
<td>2.56 [2.19-2.99]*</td>
<td>1.60 [1.50-1.71]*</td>
</tr>
<tr>
<td>Urban Location</td>
<td>1.87 [1.25-2.81]*</td>
<td>1.13 [0.99-1.28]</td>
</tr>
<tr>
<td><strong>Hospital Volume</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Reference: Lowest Quartile)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Highest Quartile</td>
<td>1.45 [0.58-3.5]</td>
<td>0.87 [0.65-1.15]</td>
</tr>
</tbody>
</table>

*Two-sided p-value<0.05; Models were risk-adjusted for variations in categorical age (0-1, 2-5, 6-10, 11-12 and 13-18), sex, race/ethnicity (non-Hispanic White, non-Hispanic Black, Hispanic, other, Not reported), insurance (private, government, uninsured), familial income quartile, pediatric surgical risk score, rurality, geographic region (Northeast, Midwest, South and West), teaching status, bed size (small, medium and large), and quartile of emergency procedure volume.

### SS3.6 A closer look at non-accidental trauma: caregiver assault compared to non-caregiver assault

**Table 1.** Characteristics and outcomes of NAT and AT patients

<table>
<thead>
<tr>
<th>NAT ACH (n=171)</th>
<th>AT ACH (n=3586)</th>
<th>P</th>
<th>NAT FL (n=535)</th>
<th>AT FL (n=46022)</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, yr</td>
<td>0.69 ± 1.09</td>
<td>8.05 ± 3.26</td>
<td>&lt;0.05</td>
<td>1.63 ± 3.38</td>
<td>8.76 ± 3.87</td>
</tr>
<tr>
<td>ISS</td>
<td>15.4 ± 10.7</td>
<td>8.06 ± 6.24</td>
<td>&lt;0.05</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>ISSS &lt;0.85, n (%)</td>
<td>74 (43.3)</td>
<td>425 (81)</td>
<td>&lt;0.05</td>
<td>208 (39.0)</td>
<td>1362 (23.0)</td>
</tr>
<tr>
<td>ICU admit, n (%)</td>
<td>3.32 ± 25.16</td>
<td>3.76 ± 6.94</td>
<td>&lt;0.05</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>ICU LOS, d</td>
<td>9.28 ± 2.71</td>
<td>4296.5 ± 2714</td>
<td>&lt;0.05</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>ICU charges</td>
<td>NA</td>
<td>NA</td>
<td></td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Hospital LOS, d</td>
<td>7.74 ± 9.82</td>
<td>2.19 ± 4.36</td>
<td>&lt;0.05</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Operative intervention within 24 hrs, n (%)</td>
<td>48 (25.7)</td>
<td>2019 (51.7)</td>
<td>&lt;0.05</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Operative intervention, n (%)</td>
<td>13 (3.84)</td>
<td>142 (26.5)</td>
<td>&lt;0.05</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Mortality, n (%)</td>
<td>14 (8.2)</td>
<td>130 (3.43)</td>
<td>&lt;0.05</td>
<td>36 (6.73)</td>
<td>546 (11.9)</td>
</tr>
</tbody>
</table>
SS3.6  A closer look at non-accidental trauma: caregiver assault compared to non-caregiver assault

Table 1. Characteristics and outcomes of NAT and AT patients

SS3.7  The Influence of Insurance Status on the Probability of Transfer for Pediatric Trauma Patients

Table 1. Adjusted Odds Ratio for Transfer to Level I/II Trauma Center

SS3.9  Application of a Low Risk Decision Rule for Blunt Abdominal Injuries in Children with Moderate to Severe Head Injuries

Figure 1
SS4.1 A Pain in the Butt: ND:YAG Laser Therapy for Rectal and Vaginal Venous Malformations

Figure 1
Rectal venous malformation before (A) and after (B) laser treatment with ND:YAG laser

SS4.6 Recto-bulbar fistula is better outcome than recto-prostatic fistula in male with imperforate anus, irrespective of surgical procedures: First report

Figure 1

<table>
<thead>
<tr>
<th></th>
<th>RBF (n=26)</th>
<th>RPF (n=19)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>MRI Score</td>
<td>0.8 ± 0.6</td>
<td>1.0 ± 0.8</td>
</tr>
<tr>
<td>Wound infection%</td>
<td>1.2% (3/26)</td>
<td>0% (0/19)</td>
</tr>
<tr>
<td>Rectal mucosal prolapse%</td>
<td>26.9% (7/26)</td>
<td>21.0% (4/19)</td>
</tr>
<tr>
<td>Peak C-reactive protein (mg/dL)</td>
<td>6.0 ± 2.1</td>
<td>7.6 ± 3.4</td>
</tr>
<tr>
<td>Duration of raised C-reactive protein (days)</td>
<td>4.3 ± 2.1</td>
<td>5.0 ± 1.1</td>
</tr>
<tr>
<td>Peak WBC (/µL)</td>
<td>13,100 ± 3,100</td>
<td>14,000 ± 3,600</td>
</tr>
<tr>
<td>Duration of raised WBC (days)</td>
<td>3.2 ± 1.4</td>
<td>3.3 ± 0.7</td>
</tr>
<tr>
<td>Duration of requirement for postoperative analgesia (days)</td>
<td>2.6 ± 1.4</td>
<td>2.6 ± 1.4</td>
</tr>
</tbody>
</table>

*p = NS
**SS4.6** Recto-bulbar fistula is better outcome than recto-prostatic fistula in male with imperforate anus, irrespective of surgical procedures: First report

<table>
<thead>
<tr>
<th>Factors of evaluating postoperative outcome: RBF versus RPF</th>
<th>RBF (n=26)</th>
<th>RPF (n=19)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>MRI Score</td>
<td>0.8 ± 0.6</td>
<td>1.0 ± 0.8</td>
</tr>
<tr>
<td>Wound infection (%)</td>
<td>1.2 % (3/26)</td>
<td>0 % (0/19)</td>
</tr>
<tr>
<td>Rectal mucosal prolapse (%)</td>
<td>26.9 % (7/26)</td>
<td>21.0 % (4/19)</td>
</tr>
<tr>
<td>Peak C-reactive protein (mg/dL)</td>
<td>6.0 ± 2.1</td>
<td>7.6 ± 3.4</td>
</tr>
<tr>
<td>Duration of raised C-reactive protein (days)</td>
<td>4.3 ± 2.1</td>
<td>5.0 ± 1.1</td>
</tr>
<tr>
<td>Peak WBC (/µL)</td>
<td>13,100 ± 3,100</td>
<td>14,000 ± 3,600</td>
</tr>
<tr>
<td>Duration of raised WBC (days)</td>
<td>3.2 ± 1.4</td>
<td>3.3 ± 0.7</td>
</tr>
<tr>
<td>Duration of requirement for postoperative analgesia (days)</td>
<td>2.6 ± 1.4</td>
<td>2.6 ± 1.4</td>
</tr>
</tbody>
</table>

*p =NS

**SS4.7** A 40-year Nationwide Survey of 4939 patients of Hirschsprung’s disease in Japan

Figure 1

![Figure 1](image1)

Figure 2

![Figure 2](image2)
SS4.11  Diagnostic Value of Rectal Suction Biopsies Using Calretinin Immunochemical Staining in Hirschsprung's Disease

Table 1: diagnostic test with calretinin immunochemical staining (table 2x2), n=86

<table>
<thead>
<tr>
<th>Calretinin Accessory</th>
<th>Diagnostics</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hirschsprung</td>
<td>Non Hirschsprung</td>
</tr>
<tr>
<td>Absence of reactivity of CIS</td>
<td>31</td>
<td>1</td>
</tr>
<tr>
<td>Presence of reactivity of CIS</td>
<td>0</td>
<td>54</td>
</tr>
<tr>
<td>Total</td>
<td>31</td>
<td>55</td>
</tr>
</tbody>
</table>

Specificity, 54/55 (98.2%); sensitivity, 100% (31/31); positive predictive value, 31/32 (96.9%); negative predictive value, 54/54 (100%), accuracy, 85/86 (98.8%); Cohen’s kappa concordance coefficient, 0.9754

Table 2: diagnostic test with conventional H&E staining (table 2x2), n=86

<table>
<thead>
<tr>
<th>H&amp;E Accessory</th>
<th>Diagnostics</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hirschsprung</td>
<td>Non Hirschsprung</td>
</tr>
<tr>
<td>Absence ganglion cells</td>
<td>31</td>
<td>6</td>
</tr>
<tr>
<td>Presence ganglion cells</td>
<td>0</td>
<td>49</td>
</tr>
<tr>
<td>Total</td>
<td>31</td>
<td>55</td>
</tr>
</tbody>
</table>

Specificity, 49/55 (89.1%); sensitivity, 100% (31/31); positive predictive value, 31/37 (83.8%); negative predictive value, 49/49 (100%), accuracy, 80/86 (93%), Cohen’s kappa concordance coefficient, 0.8720.
SS4.12  Outcomes in Children with Hirschsprung Disease and Trisomy 21

Figure 1
SS5.5  Validated Quality of Life Scores and Maternal, Fetal and Neonatal Characteristics in Pediatric Patients with Simple versus Complex Gastroshisis

Table 1

<table>
<thead>
<tr>
<th></th>
<th>All Patients (n=34) Mean ± SD</th>
<th>Simple Gastroshisis (n=24) Mean ± SD</th>
<th>Complex Gastroshisis (n=10) Mean ± SD</th>
<th>P-value (Simple vs Complex)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Score</td>
<td>78.36 ± 18.81</td>
<td>86.13 ± 14.92</td>
<td>70.08 ± 23.41</td>
<td>0.0607</td>
</tr>
<tr>
<td>Physical Health</td>
<td>81.40 ± 22.13</td>
<td>86.59 ± 16.74</td>
<td>73.45 ± 29.49</td>
<td>0.1296</td>
</tr>
<tr>
<td>Psychosocial Health</td>
<td>76.98 ± 18.09</td>
<td>86.42 ± 14.92</td>
<td>68.63 ± 21.49</td>
<td>0.0488</td>
</tr>
<tr>
<td>Emotional Functioning</td>
<td>73.84 ± 17.44</td>
<td>80.07 ± 15.28</td>
<td>69.65 ± 21.08</td>
<td>0.3121</td>
</tr>
<tr>
<td>Social Functioning</td>
<td>80.44 ± 22.62</td>
<td>94.14 ± 19.55</td>
<td>69.17 ± 24.92</td>
<td>0.0323</td>
</tr>
<tr>
<td>Cognitive/School Functioning</td>
<td>75.72 ± 23.03</td>
<td>89.72 ± 18.10</td>
<td>63.67 ± 27.39</td>
<td>0.0385</td>
</tr>
</tbody>
</table>

Published scores for healthy children, children with type diabetes and ECMO survivors are Total = 87.61, 76.56, 73.9; Physical Health = 85.32, 81.99, 79.7; Psychosocial Health = 86.56, 73.61, 70.7; Emotional Functioning = 82.64, 69.08, 69.7; Social Functioning = 91.56, 81.03, 79.5; Cognitive/School Functioning = 85.47, 70.80, 68.2 respectively.

SS5.8  Benchmarking the value of ultrasound for acute appendicitis in children

Figure 1
**SS5.10**  Effect of hospital type on the treatment of acute appendicitis in adolescents

Table 1 Appendicitis outcomes by hospital type

<table>
<thead>
<tr>
<th></th>
<th>Adult</th>
<th>Mixed</th>
<th>Pediatric</th>
<th>*p &lt; 0.05</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients, n (%)</td>
<td>5,585 (59)</td>
<td>2,287 (24)</td>
<td>1,625 (17)</td>
<td>*</td>
</tr>
<tr>
<td>Complicated appendicitis, n (%)</td>
<td>1,138 (20.4)</td>
<td>508 (22.2)</td>
<td>536 (33.0)</td>
<td>*</td>
</tr>
<tr>
<td>Laparoscopic appendectomy, n (%)</td>
<td>4,670 (83.6)</td>
<td>1,870 (81.8)</td>
<td>1,346 (83.0)</td>
<td>0.135</td>
</tr>
<tr>
<td>Open appendectomy, n (%)</td>
<td>704 (12.6)</td>
<td>268 (11.7)</td>
<td>97 (6.0)</td>
<td>*</td>
</tr>
<tr>
<td>Length of stay (days)</td>
<td>2.26 ± 2.06</td>
<td>2.69 ± 2.35</td>
<td>2.67 ± 2.68</td>
<td>*</td>
</tr>
<tr>
<td>Postoperative complications, n (%)</td>
<td>75 (1.3)</td>
<td>36 (1.6)</td>
<td>13 (0.8)</td>
<td>0.102</td>
</tr>
<tr>
<td>Total hospital charges ($)</td>
<td>36,617.1± 19,413.9</td>
<td>35,068 ± 18,671.9</td>
<td>18,571.9 ± 21,749.6</td>
<td>*</td>
</tr>
</tbody>
</table>

**SS5.11**  More than one-third of successfully nonoperatively treated patients with complicated appendicitis experienced recurrent appendicitis

Table 1 Patient characteristics

<table>
<thead>
<tr>
<th></th>
<th>Operative treatment (n = 33)</th>
<th>Nonoperative treatment (n = 55)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>9.1 ± 3.3 (range, 4–14.6)</td>
<td>9.3 ± 3.0 (range, 4.1–15.8)</td>
<td>0.74</td>
</tr>
<tr>
<td>Male/female</td>
<td>19/14</td>
<td>33/22</td>
<td>0.82</td>
</tr>
<tr>
<td>Height (cm)</td>
<td>131 ± 21</td>
<td>133 ± 18</td>
<td>0.79</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>29.6 ± 12.6</td>
<td>29.6 ± 12.5</td>
<td>1.0</td>
</tr>
<tr>
<td>Duration of symptoms (h)</td>
<td>64.7 ± 42.1</td>
<td>88.4 ± 65.8</td>
<td>0.045</td>
</tr>
<tr>
<td>WBC (×10⁹/L)</td>
<td>15.9 ± 4.4</td>
<td>17.2 ± 5.1</td>
<td>0.22</td>
</tr>
<tr>
<td>Maximum CRP (mg/dL)</td>
<td>16.6 ± 5.3</td>
<td>13.4 ± 5.8</td>
<td>0.012</td>
</tr>
<tr>
<td>Maximum diameter of appendix (mm)</td>
<td>10.8 ± 2.7</td>
<td>10.3 ± 3.4</td>
<td>0.42</td>
</tr>
<tr>
<td>Length of initial stay (days)</td>
<td>12.9 ± 5.2</td>
<td>13.0 ± 3.9</td>
<td>0.91</td>
</tr>
<tr>
<td>Recurrence of appendicitis</td>
<td>0/33 (0%)</td>
<td>14/39 (35.9%)</td>
<td></td>
</tr>
<tr>
<td>Readmission</td>
<td>3/33 (ileus or rest abscess)</td>
<td>29/55 (recurrence or IA)</td>
<td></td>
</tr>
<tr>
<td>Complications</td>
<td>7/33 (ileus or rest abscess)</td>
<td>1/55 (conversion to surgery)</td>
<td></td>
</tr>
</tbody>
</table>

WBC, white blood cells; CRP, C-reactive protein; IA, interval appendectomy.
More than one-third of successfully nonoperatively treated patients with complicated appendicitis experienced recurrent appendicitis.

Table 1: Patient characteristics

<table>
<thead>
<tr>
<th></th>
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<tr>
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<td>33/22</td>
<td>0.82</td>
</tr>
<tr>
<td>Height (cm)</td>
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<td>133 ± 18</td>
<td>0.79</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>29.6 ± 12.6</td>
<td>29.6 ± 12.5</td>
<td>1.00</td>
</tr>
<tr>
<td>Duration of symptoms (h)</td>
<td>64.7 ± 42.1</td>
<td>88.4 ± 65.8</td>
<td>0.045</td>
</tr>
<tr>
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<td>0.22</td>
</tr>
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<td>16.6 ± 5.3</td>
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<td>0.012</td>
</tr>
<tr>
<td>Maximum diameter of appendix (mm)</td>
<td>10.8 ± 2.7</td>
<td>10.3 ± 3.4</td>
<td>0.42</td>
</tr>
<tr>
<td>Length of stay for surgery (days)</td>
<td>12.9 ± 5.2</td>
<td>13.0 ± 3.9</td>
<td>0.91</td>
</tr>
<tr>
<td>Recurrence of appendicitis</td>
<td>0/33 (0%)</td>
<td>14/55 (35.9%)</td>
<td></td>
</tr>
<tr>
<td>Readmission</td>
<td>3/33 (ileus or rest abscess)</td>
<td>29/55 (recurrence or IA)</td>
<td></td>
</tr>
<tr>
<td>Complications</td>
<td>7/33 (ileus or rest abscess)</td>
<td>1/55 (conversion to surgery)</td>
<td></td>
</tr>
</tbody>
</table>

WBC, white blood cells; CRP, C-reactive protein; IA, interval appendectomy.

Table 2: Surgery at the time of recurrence versus interval appendectomy

<table>
<thead>
<tr>
<th>Operative treatment at the time of recurrence after a successful nonoperative treatment (n = 12)</th>
<th>Interval appendectomy (n = 16)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>9.7 ± 2.6 (range, 5.9–13.9)</td>
<td>8.8± 3.0 (range, 4.1–15.5)</td>
</tr>
<tr>
<td>Male/female</td>
<td>10/2</td>
<td>10/6</td>
</tr>
<tr>
<td>Height (cm)</td>
<td>136 ± 14</td>
<td>128 ± 17</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>33.2 ± 10.1</td>
<td>27.5 ± 12.9</td>
</tr>
<tr>
<td>Operative time (min)</td>
<td>83.7 ± 20.7</td>
<td>72.4 ± 30.6</td>
</tr>
<tr>
<td>Length of stay for appendectomy (days)</td>
<td>9 ± 3.4</td>
<td>5.5 ± 1.2</td>
</tr>
<tr>
<td>Readmission after surgery</td>
<td>0/12 (0%)</td>
<td>0/16 (0%)</td>
</tr>
<tr>
<td>Complications</td>
<td>1/12 (rest abscess)</td>
<td>2/16 (wound infection, rest abscess)</td>
</tr>
</tbody>
</table>

SS5.13 The experience of Malone's continent appendicostomy

Figure 1
SS6.1 MEK inhibitors as a novel therapy for neuroblastoma: Their in vitro effects and predicting their efficacy

Figure 1

<table>
<thead>
<tr>
<th>Cell lines</th>
<th>CHP134</th>
<th>IMRK</th>
<th>NB69</th>
<th>NLF</th>
<th>SK-N-AS</th>
</tr>
</thead>
<tbody>
<tr>
<td>p-ERK</td>
<td>E2F</td>
<td>E2F</td>
<td>E2F</td>
<td>E2F</td>
<td>E2F</td>
</tr>
<tr>
<td>ERK</td>
<td>E2F</td>
<td>E2F</td>
<td>E2F</td>
<td>E2F</td>
<td>E2F</td>
</tr>
<tr>
<td>MYCN</td>
<td>E2F</td>
<td>E2F</td>
<td>E2F</td>
<td>E2F</td>
<td>E2F</td>
</tr>
</tbody>
</table>

Western blotting analyses

<table>
<thead>
<tr>
<th>Effects of MEK inhibitors</th>
<th>Transretinib</th>
<th>CHS126766</th>
</tr>
</thead>
<tbody>
<tr>
<td>not effective</td>
<td>not effective</td>
<td></td>
</tr>
</tbody>
</table>

| Immunohistochemical staining for p-ERK before treatment | negative | negative | negative | positive | positive |

Figure 2

A: Tissue sample
B: Measuring scale
C: Tissue sample
D: Skin incision

Figure 3

Table showing ERK pathway with activation of RAS/RAF/MEK/ERK.
SS6.2  Telomere biology including TERT rearrangement in neuroblastoma: a useful indicator for surgical treatments

Figure 1

SS6.3  Usefulness of autologous tubular collagenous tissue, BIOTUBE, as a novel tracheal scaffold: a pilot study in a rat orthotopic tracheal transplantation model

Figure 1
Usefulness of autologous tubular collagenous tissue, BIOTUBE, as a novel tracheal scaffold: a pilot study in a rat orthotopic tracheal transplantation model
SS6.4 Improved Survival in a Murine Orthotopic Sarcoma Model by Delivering Vincristine through a Controlled Release Silk Platform

Figure 1

SS6.5 Intestinal Barrier Dysfunction in Human Necrotizing Enterocolitis

Figure 1

* Fig.1  Transepithelial Resistance

*, #, p<0.02 vs. all other groups
SS6.5  Intestinal Barrier Dysfunction in Human Necrotizing Enterocolitis

Figure 1

Fig. 1  Transepithelial Resistance
*, #, p<0.02 vs. all other groups

Fig. 2  Mannitol Flux
*, #, p<0.02 vs. all other groups

SS6.8  Spring Mediated Distraction Enterogenesis In-continuity

Figure 1

SS6.9  Does a large abdominal wall defect affect lung growth?

Table 1

<table>
<thead>
<tr>
<th></th>
<th>Group A (11)</th>
<th>Group B (14)</th>
<th>Group C (3)</th>
<th>Group D (8)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lung volume (ml)</td>
<td>264.5</td>
<td>259.4</td>
<td>158.0</td>
<td>304.4**</td>
</tr>
<tr>
<td>AT1/AT2 ratio</td>
<td>0.53</td>
<td>0.58</td>
<td>0.55</td>
<td>0.54</td>
</tr>
</tbody>
</table>

*p<0.01 vs Group A, **p<0.05 vs Group C
**Table 1** Patient demographics

<table>
<thead>
<tr>
<th></th>
<th>Group I, N=20 (%)</th>
<th>Group II, N=14 (%)</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>18 (90%)</td>
<td>9 (64%)</td>
<td>0.071</td>
</tr>
<tr>
<td>Female</td>
<td>2 (10%)</td>
<td>5 (36%)</td>
<td>0.071</td>
</tr>
<tr>
<td>Type of anorectal</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>malformation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intermediate</td>
<td>14 (70%)</td>
<td>6 (43%)</td>
<td>0.12</td>
</tr>
<tr>
<td>High</td>
<td>6 (30%)</td>
<td>8 (57%)</td>
<td>0.12</td>
</tr>
<tr>
<td>VACTERAL</td>
<td>7 (35%)</td>
<td>5 (36%)</td>
<td>0.967</td>
</tr>
<tr>
<td>Vertebral-spinal</td>
<td>7 (35%)</td>
<td>3 (21%)</td>
<td>0.408</td>
</tr>
<tr>
<td>deformity</td>
<td>2 (10%)</td>
<td>3 (21%)</td>
<td>0.370</td>
</tr>
<tr>
<td>Chromosomal disorder</td>
<td>7 (35%)</td>
<td>4 (29%)</td>
<td>0.704</td>
</tr>
<tr>
<td>Cardiovascular comorbidities</td>
<td>0 ( )</td>
<td>3 (21%)</td>
<td>0.03</td>
</tr>
<tr>
<td>Gastrointestinal</td>
<td>5 (25%)</td>
<td>3 (21%)</td>
<td>0.816</td>
</tr>
<tr>
<td>comorbidities</td>
<td>193 ± 63</td>
<td>242 ± 49</td>
<td>0.048</td>
</tr>
<tr>
<td>Mean follow up duration</td>
<td>60</td>
<td>168</td>
<td>&lt;0.01</td>
</tr>
</tbody>
</table>

Table 2. Post-operative complications

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Group I, N=20 (%)</th>
<th>Group II, N=14 (%)</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rectal prolapse</td>
<td>4 (20%)</td>
<td>9 (64%)</td>
<td>0.008</td>
</tr>
<tr>
<td>Symptoms</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bleeding</td>
<td>0</td>
<td>1 (7%)</td>
<td>0.411</td>
</tr>
<tr>
<td>Protrusion</td>
<td>0</td>
<td>2 (14%)</td>
<td>0.235</td>
</tr>
<tr>
<td>Median time to develop</td>
<td>7</td>
<td>5</td>
<td>0.767</td>
</tr>
<tr>
<td>prolapse (months)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mucosectomy</td>
<td>3 (15%)</td>
<td>5 (36%)</td>
<td>0.171</td>
</tr>
<tr>
<td>Anal stricture</td>
<td>1 (5%)</td>
<td>1 (7%)</td>
<td>0.801</td>
</tr>
<tr>
<td>Intestinal obstruction</td>
<td>0</td>
<td>2 (14%)</td>
<td>0.086</td>
</tr>
</tbody>
</table>

Table 3. Functional outcomes

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Group I, N=20 (%)</th>
<th>Group II, N=14 (%)</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voluntary bowel movements</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Soiling</td>
<td>8 (40%)</td>
<td>4 (29%)</td>
<td>0.507</td>
</tr>
<tr>
<td>Grade 1</td>
<td>0</td>
<td>5 (36%)</td>
<td>0.003</td>
</tr>
<tr>
<td>Grade 2</td>
<td>3 (15%)</td>
<td>2 (14%)</td>
<td>0.956</td>
</tr>
<tr>
<td>Grade 3</td>
<td>11 (55%)</td>
<td>11 (79%)</td>
<td>0.167</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constipation</td>
<td>3 (15%)</td>
<td>2 (14%)</td>
<td>0.956</td>
</tr>
<tr>
<td>Grade 1</td>
<td>8 (40%)</td>
<td>7 (50%)</td>
<td>0.577</td>
</tr>
<tr>
<td>Grade 2</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Grade 3</td>
<td>11 (55%)</td>
<td>9 (64%)</td>
<td>0.601</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Malone antegrade</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>continence enema (MACE)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Voluntary bowel movements</td>
<td>15 (75%)</td>
<td>20 (71%)</td>
<td>0.823</td>
</tr>
</tbody>
</table>

**Application of anchoring stitch prevents rectal prolapse in laparoscopic assisted anorectal pullthrough**
SS7.6  Quality of life after esophagoesophagostomy for tracheoesophageal fistula. Open versus thoracoscopic repair.

Table 1

<table>
<thead>
<tr>
<th>(score)</th>
<th>Food type</th>
<th>Vomiting</th>
<th>Bougienage</th>
<th>Coughing</th>
<th>Growth delay</th>
<th>Schooling*</th>
<th>Thoracic deformity*</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>milk/liquids only</td>
<td>daily</td>
<td>&gt;2</td>
<td>frequent</td>
<td>&gt;-2</td>
<td>special support class</td>
<td>scoliosis</td>
</tr>
<tr>
<td>1</td>
<td>minced/mashed</td>
<td>weekly</td>
<td>1</td>
<td>often</td>
<td>&lt;-2, &gt;-1</td>
<td>mixed ability class</td>
<td>scaring</td>
</tr>
<tr>
<td>2</td>
<td>normal for age</td>
<td>never</td>
<td>0</td>
<td>rarely</td>
<td>&lt;-1</td>
<td>regular class</td>
<td>nil</td>
</tr>
</tbody>
</table>

(per year) standard deviations

*: assessed at the time of starting elementary school
Maximum scores:
10 for QOL one year postoperative=POQ
14 for QOL when starting elementary school=ScQ

SS7.8  Single Incision Laparoscopic Splenectomy in Children: Improved Pain Control with Rectus Sheath Block

Table 1

![Table 1](image)

SS7.9  Operative technique in total proctocolectomy: a comparison among open, multiport laparoscopic, and single-incision laparoscopic techniques

Table 1  Patient demographics and outcomes by operative technique

<table>
<thead>
<tr>
<th></th>
<th>Open</th>
<th>ML-TPC</th>
<th>SIL-TPC</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age (yr)</strong></td>
<td>11.81 ± 6</td>
<td>12.93 ± 2.9</td>
<td>14.94 ± 4.05</td>
<td>0.65</td>
</tr>
<tr>
<td><strong>BMI percentile</strong></td>
<td>40.1 ± 36.63</td>
<td>68.8 ± 34.56</td>
<td>45.43 ± 40.35</td>
<td>0.57</td>
</tr>
<tr>
<td><strong>Operative time (min)</strong></td>
<td>125 ± 14.1</td>
<td>287.2 ± 81.6</td>
<td>182.7 ± 25.1</td>
<td>&lt; 0.05</td>
</tr>
<tr>
<td><strong>Postoperative pain score</strong></td>
<td>1.1 ± 0.14</td>
<td>2.52 ± 1.52</td>
<td>3.4 ± 1.21</td>
<td>0.23</td>
</tr>
<tr>
<td><strong>Doses of pain medication</strong></td>
<td>31 ± 12.73</td>
<td>46.2 ± 34.94</td>
<td>33.33 ± 3.51</td>
<td>0.73</td>
</tr>
<tr>
<td><strong>Length of stay (day)</strong></td>
<td>7.5 ± 3.53</td>
<td>9.6 ± 5.37</td>
<td>6 ± 4.36</td>
<td>0.61</td>
</tr>
<tr>
<td><strong>30 day complications</strong></td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>NA</td>
</tr>
</tbody>
</table>
Table 1 Cobb angles and space available for lung (SAL) of 23 CDH patients with scoliosis.

<table>
<thead>
<tr>
<th></th>
<th>Pre-surgical</th>
<th>Post-surgical</th>
<th>Most Recent</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cobb angle mean (range)</td>
<td>SAL mean (range)</td>
<td>Cobb angle mean (range)</td>
</tr>
<tr>
<td>Surgical treatment</td>
<td>50° (21-69)</td>
<td>90% (81-96)</td>
<td>31° (11-47)</td>
</tr>
<tr>
<td>Bracing</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Observation alone</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**SS8.8** Magnetic Mini-Mover Procedure (3MP) for Pectus Excavatum: Update on Phase II Clinical Trial

![Figure 1](image1)

![Figure 2](image2)
SS8.11 Use of Transthoracic Cryoanalgesia during a Nuss Procedure

Figure 1
SS9.2 Failing to Rescue? Pre-operative Characteristics Contribute More to Mortality in Pediatric Surgical Patients

Table 1

Table 2

<table>
<thead>
<tr>
<th>Pre-operative Characteristics</th>
<th>OR</th>
<th>95% Confidence Interval</th>
<th>Adverse Events (Post-operative)</th>
<th>OR</th>
<th>95% Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-op CPR</td>
<td>121.4</td>
<td>91.3-161.3</td>
<td>CPR</td>
<td>292.5</td>
<td>200.4-443.5</td>
</tr>
<tr>
<td>Coma</td>
<td>108.3</td>
<td>48.0-244.2</td>
<td>Septic Shock</td>
<td>104</td>
<td>70.6-153.3</td>
</tr>
<tr>
<td>Inotropic Support</td>
<td>84.7</td>
<td>71.1-100.8</td>
<td>Renal Failure</td>
<td>72.3</td>
<td>58.2-94.1</td>
</tr>
<tr>
<td>Mechanical Ventilation</td>
<td>83.6</td>
<td>70.4-99.6</td>
<td>Stroke</td>
<td>42.9</td>
<td>26.8-77.3</td>
</tr>
<tr>
<td>Supplemental Oxygen</td>
<td>48.3</td>
<td>40.9-56.7</td>
<td>Intracranial Hemorrhage</td>
<td>38</td>
<td>14.9-98.7</td>
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<tr>
<td>Pre-operative Transfusion</td>
<td>43.7</td>
<td>36.6-52.2</td>
<td>Transfusion</td>
<td>17</td>
<td>14.5-20.9</td>
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<tr>
<td>Low Birth Weight</td>
<td>34.6</td>
<td>28.0-42.7</td>
<td>Reintubation</td>
<td>16.9</td>
<td>12.9-22.2</td>
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<tr>
<td>Premature Neonate</td>
<td>94.6</td>
<td>28.9-345.5</td>
<td>Severe</td>
<td>34.8</td>
<td>18.8-70.4</td>
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<tr>
<td>Renal Failure</td>
<td>27</td>
<td>18.2-40.1</td>
<td>Central Line Associated</td>
<td>11.1</td>
<td>4.9-25.1</td>
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<tr>
<td>Bleeding Disorder</td>
<td>23.3</td>
<td>18.3-29.6</td>
<td>Blood Stream Infection</td>
<td>34.2</td>
<td>20.5-56.3</td>
</tr>
<tr>
<td>Nutritional Support</td>
<td>75.1</td>
<td>17.9-345.5</td>
<td>All Significant Pre-operative</td>
<td>75.2</td>
<td>56.7-98.8</td>
</tr>
<tr>
<td>All Significant Pre-operative Characteristics</td>
<td>75.2</td>
<td>56.7-98.8</td>
<td>All Significant Adverse Events</td>
<td>24.2</td>
<td>20.5-28.3</td>
</tr>
</tbody>
</table>
SS9.5  Infant Gastrostomy Outcomes: The “Cost” of Complications

Table 1

SS9.7  Clinical features of congenital cystic lung disease with a focus on the definitive diagnosis

Table 1
SS9.12  Acceptability of in utero hematopoietic cell transplantation (IUHCT) for sickle cell disease (SCD)

Table 1

SS10.2  Anicteric survival with the native liver after redo Kasai. Long-term follow-up. A first report.

Figure 1

---

**Note:** The diagrams and tables are not transcribed due to their visual nature and the limitations of text-based representation.
SS10.3  Classification of biliary atresia in the laparoscopic era. Suggested modifications for type III.

Figure 1

SS10.4  Current status of primary liver transplantation for biliary atresia in Japan

Figure 1
SS10.12  Hepatic volume changes after Kasai operation

Table 1 Clinical characteristics

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Case</td>
<td>167</td>
</tr>
<tr>
<td>Duration</td>
<td>05.03-15.12</td>
</tr>
<tr>
<td>Sex(M:F)</td>
<td>0.14:1</td>
</tr>
<tr>
<td>Age at operation(m)</td>
<td>3.44±15.0</td>
</tr>
<tr>
<td>Weight at operation</td>
<td>5.9±2.89</td>
</tr>
<tr>
<td>Follow-up period(ys)</td>
<td>3.34±2.76</td>
</tr>
<tr>
<td>Transplantation</td>
<td>48</td>
</tr>
<tr>
<td>Death</td>
<td>11(6.5%)</td>
</tr>
</tbody>
</table>

Table 2 Result

<table>
<thead>
<tr>
<th>Group</th>
<th>A (66cases)</th>
<th>B (53cases)</th>
<th>C (48cases)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hepatic volume change (Atrophic change)</td>
<td>9(13.6%)</td>
<td>25(47.2%)</td>
<td>9(18.8%)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Intrahepatic cyst</td>
<td>10(15.5%)</td>
<td>25(47.2%)</td>
<td>17(35.4%)</td>
<td>0.003</td>
</tr>
<tr>
<td>Recurrent cholangitis</td>
<td>25(37.8%)</td>
<td>38(71.7%)</td>
<td>34(70.8%)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Esophageal varices bleeding</td>
<td>0</td>
<td>15(28.3%)</td>
<td>16(33.3%)</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

SS10.13  Resection of hepatic tumors with central venous and right atrial extension using cardiopulmonary bypass
SS11.2 Surgical Feeding Tubes in Pediatric and Adolescent Cancer Patients - A Necessary Evil?

Figure 1

Table 1

<table>
<thead>
<tr>
<th></th>
<th>Any Complication</th>
<th>Major Complication</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>OR (95% CI)</td>
<td>p-value</td>
</tr>
<tr>
<td>Age (&gt;10 years)</td>
<td>0.77 (0.34, 1.76)</td>
<td>0.54</td>
</tr>
<tr>
<td>Diagnosis (non-CNS tumor)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leukemia</td>
<td>0.75 (0.11, 4.40)</td>
<td>0.90</td>
</tr>
<tr>
<td>CNS solid tumor</td>
<td>0.71 (0.20, 2.50)</td>
<td>0.78</td>
</tr>
<tr>
<td>BMI &gt; 25 kg/m²</td>
<td>1.46 (0.40, 5.36)</td>
<td>0.57</td>
</tr>
<tr>
<td>Absolute neutrophil count</td>
<td>0.35 (0.04, 2.83)</td>
<td>0.32</td>
</tr>
<tr>
<td>Platelet count &lt; 50,000</td>
<td>1.79 (0.26, 12.3)</td>
<td>0.55</td>
</tr>
<tr>
<td>Steroids</td>
<td>2.82 [0.89, 8.90]</td>
<td>0.08</td>
</tr>
<tr>
<td>Abdominal radiation</td>
<td>2.61 [0.86, 7.91]</td>
<td>0.09</td>
</tr>
<tr>
<td>Procedure (PEG)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Laparoscopic</td>
<td>1.24 (0.23, 6.54)</td>
<td>0.66</td>
</tr>
</tbody>
</table>
SS11.5 Tumor-homing effect of human mesenchymal stem cells in a TH-MYCN mouse model of neuroblastoma

Figure 1

Figure 2
SS11.6 Reduction of miR-21 induces SK-N-SH cell apoptosis and inhibits proliferation via PTEN/PDCD4

Figure 1

Figure 2
Table 1 Sequences of miR-21 inhibitor and control oligonucleotides and primers used in their construction.

<table>
<thead>
<tr>
<th>Oligonucleotide</th>
<th>Sequence</th>
</tr>
</thead>
<tbody>
<tr>
<td>miR-21 inhibitor</td>
<td>5'-TCAACATCAGTCTGATAAGCTA-3'</td>
</tr>
<tr>
<td>(Forward)miR-21-</td>
<td>5'-GATCCCTCAACATCGTCTGATAAGCTACGATTCAACA</td>
</tr>
<tr>
<td>inhibitor-BamHI</td>
<td>TAAGCTATCACTCAACATCGTCTGATAAGCTATATTGT-3'</td>
</tr>
<tr>
<td>(Reverse)miR-21-</td>
<td>5'-ACCAGGGTTAGCTTATCAGACTGATGTTGAATCGTAGCTTATCAGACTGATGTTGAATT-3'</td>
</tr>
<tr>
<td>inhibitor-EcoRI</td>
<td>miRNA NC</td>
</tr>
<tr>
<td>(Forward)NC-BamHI,</td>
<td>5'-GATCCGTTCTCCGAACGTGTCAGTTCTCAGAAGAGACGAGACTGATGTTGAATT-3'</td>
</tr>
<tr>
<td>(Reverse)NC-EcoRI</td>
<td>5'-AATTCAAAAAAGTCTCCGAACGTGTCACGTCTCTTCTGAAACGAGACGAGACTGATGTTGAATT-3'</td>
</tr>
</tbody>
</table>

Table 2 Primer sequences used in qRT-PCR amplifications.

<table>
<thead>
<tr>
<th>Primer</th>
<th>Sequence</th>
</tr>
</thead>
<tbody>
<tr>
<td>U6 forward primer</td>
<td>5'-ATTGGAACGATACAGA GAAGATT-3'</td>
</tr>
<tr>
<td>U6 reverse primer</td>
<td>5'-GGAACGCTTCACGAATTTG-3'</td>
</tr>
<tr>
<td>miR-21 forward primer</td>
<td>5'-ACGTTGTGTAGCTTATCAGACTG-3'</td>
</tr>
<tr>
<td>miR-21 reverse primer</td>
<td>5'-AATGGTTGTGTTCCACACTCTC-3</td>
</tr>
<tr>
<td>GAPDH forward primer</td>
<td>5'-GAGTCACCGATTTGTCGTTCTC-3</td>
</tr>
<tr>
<td>GAPDH reverse primer</td>
<td>5'-TTGATTGAGGGATCAGCTC-3</td>
</tr>
<tr>
<td>PTEN forward primer</td>
<td>5'-GCACGTGTGTTCCACAGATAGTGG-3</td>
</tr>
<tr>
<td>PTEN reverse primer</td>
<td>5'-GCAGACACACAACTGAGGATTTG-3</td>
</tr>
<tr>
<td>PDCD4 forward primer</td>
<td>5'-CGACAGTGTTGGAGACGGCCTTATA-3</td>
</tr>
<tr>
<td>PDCD4 reverse primer</td>
<td>5'-CAGACACCTTTGCCCTCTGACC-3</td>
</tr>
</tbody>
</table>
SS11.7  Identification of hsa-miR-21 as a target gene of tumorigenesis in neuroblastoma

Figure 1
Figure 1. GO enrichment analysis of miRNA-targets. GO analysis of miRNA target genes according to (A) biological process, (B) cell component and (C) molecular function.

Figure 2

Figure 3
Table 1: Expression of 30 miRNAs upregulated by > 2-fold in NB tissues compared to fetal adrenal tissues, in fetal adrenal tissues compared to normal adrenal tissues, and in NB tissues compared to normal adrenal tissues.

<table>
<thead>
<tr>
<th>Systematic name</th>
<th>NB tissues/fetal adrenal tissues</th>
<th>Fetal adrenal tissues/normal adrenal tissues</th>
<th>NB tissues/normal adrenal tissues</th>
</tr>
</thead>
<tbody>
<tr>
<td>hsa-miR-100</td>
<td>2.84979168</td>
<td>2.394143859</td>
<td>6.822811251</td>
</tr>
<tr>
<td>hsa-miR-106a</td>
<td>2.07176792</td>
<td>3.40813232</td>
<td>7.06085921</td>
</tr>
<tr>
<td>hsa-miR-135b</td>
<td>2.376697816</td>
<td>7.443996508</td>
<td>17.69213024</td>
</tr>
<tr>
<td>hsa-miR-140-5p</td>
<td>2.354743573</td>
<td>2.142091969</td>
<td>5.044077296</td>
</tr>
<tr>
<td>hsa-miR-142-3p</td>
<td>4.668981881</td>
<td>5.330269104</td>
<td>24.88692987</td>
</tr>
<tr>
<td>hsa-miR-146a</td>
<td>2.59616883</td>
<td>14.29574089</td>
<td>37.11415766</td>
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<tr>
<td>hsa-miR-146b-5p</td>
<td>2.528712349</td>
<td>7.42561627</td>
<td>18.77724756</td>
</tr>
<tr>
<td>hsa-miR-153</td>
<td>2.901638029</td>
<td>11.27321282</td>
<td>32.71078302</td>
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<tr>
<td>hsa-miR-17*</td>
<td>2.329895151</td>
<td>2.522529255</td>
<td>5.759322163</td>
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<tr>
<td>hsa-miR-181d</td>
<td>2.070417701</td>
<td>11.13317291</td>
<td>23.05031826</td>
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<tr>
<td>hsa-miR-199a-5p</td>
<td>2.600231105</td>
<td>2.222150157</td>
<td>5.778103959</td>
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<tr>
<td>hsa-miR-21</td>
<td>7.867051197</td>
<td>2.140276637</td>
<td>16.83766588</td>
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<tr>
<td>hsa-miR-221</td>
<td>2.764282383</td>
<td>2.389430978</td>
<td>6.605061956</td>
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<tr>
<td>hsa-miR-24-1*/24-2*</td>
<td>2.693764975</td>
<td>2.230135579</td>
<td>6.007461113</td>
</tr>
<tr>
<td>hsa-miR-302c*</td>
<td>2.183283787</td>
<td>3.997701828</td>
<td>8.728117585</td>
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<tr>
<td>hsa-miR-30e</td>
<td>2.187156165</td>
<td>2.940838127</td>
<td>6.432072238</td>
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<tr>
<td>hsa-miR-331-5p</td>
<td>2.256557047</td>
<td>3.521266704</td>
<td>7.945939195</td>
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<tr>
<td>hsa-miR-338-5p</td>
<td>2.073467136</td>
<td>2.033992023</td>
<td>4.217415614</td>
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<tr>
<td>hsa-miR-373*</td>
<td>2.073211787</td>
<td>7.646179129</td>
<td>15.85214869</td>
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<tr>
<td>hsa-miR-504</td>
<td>2.276215468</td>
<td>2.073765208</td>
<td>4.720336443</td>
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<tr>
<td>hsa-miR-587</td>
<td>2.566833641</td>
<td>3.18590797</td>
<td>8.177695755</td>
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<tr>
<td>hsa-miR-604</td>
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<td>3.250400035</td>
<td>7.846614956</td>
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<td>hsa-miR-652</td>
<td>2.28448194</td>
<td>7.352095316</td>
<td>16.79572897</td>
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<td>hsa-miR-876-3p</td>
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<td>3.963738344</td>
<td>8.697348663</td>
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<td>hsa-miR-93</td>
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<td>8.17380087</td>
<td>30.30557839</td>
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<td>miRPlus_17821</td>
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<td>2.328163517</td>
<td>5.504218297</td>
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<tr>
<td>miRPlus_17828</td>
<td>2.048633962</td>
<td>2.210252554</td>
<td>4.527998448</td>
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<td>miRPlus_17897</td>
<td>2.488712617</td>
<td>5.636606409</td>
<td>14.02789349</td>
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<tr>
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<td>2.042248699</td>
<td>4.482006327</td>
</tr>
<tr>
<td>miRPlus_28534</td>
<td>3.208542051</td>
<td>2.107600657</td>
<td>6.762325336</td>
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</table>
Table 2: The predicted target of has-miR-21 with KEGG pathways analysis

<table>
<thead>
<tr>
<th>Category</th>
<th>Term</th>
<th>RT</th>
<th>Genes</th>
<th>Count</th>
<th>%</th>
<th>P-Value</th>
<th>Benjamini</th>
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<tr>
<td>KEGG_PATHWAY</td>
<td>JAK-STAT SIGNALING</td>
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<td></td>
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</tr>
<tr>
<td>KEGG_PATHWAY</td>
<td>CYTOKINE-CYTOKINE RECEPTOR</td>
<td>RT</td>
<td>6</td>
<td>0.5</td>
<td>1.20E-02</td>
<td>9.10E-01</td>
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<td>KEGG_PATHWAY</td>
<td>INTERACTION</td>
<td>RT</td>
<td>7</td>
<td>0.6</td>
<td>2.80E-02</td>
<td>9.30E-01</td>
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<tr>
<td>KEGG_PATHWAY</td>
<td>MAPK SIGNALING</td>
<td>RT</td>
<td>7</td>
<td>0.6</td>
<td>3.90E-02</td>
<td>9.20E-01</td>
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<tr>
<td>KEGG_PATHWAY</td>
<td>PATHWAY</td>
<td>RT</td>
<td>4</td>
<td>0.3</td>
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<td>8.80E-01</td>
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<tr>
<td>KEGG_PATHWAY</td>
<td>APOPTOSIS</td>
<td>RT</td>
<td>4</td>
<td>0.3</td>
<td>5.30E-02</td>
<td>8.30E-01</td>
<td></td>
</tr>
</tbody>
</table>

**SS11.8** A preliminary study of the TGF-beta1-induced epithelial-mesenchymal transition in neuroblastoma cells

Figure 1. Immunofluorescence staining showed that SK-N-SH cells expressed the TGF-β receptor I and receptor II (A: TGF-β receptor I 1:200; B: TGF-β receptor II 1:50; C: DAPI 1:5000; D: Merge. Scale bar, 20µm)

Figure 2. Cultured SK-N-SH cells were treated with TGF-β1(10ng/mL) for 14 days. Phase contrast microscopic images of SK-N-SH cells switch to a mesenchymal phenotype exhibited by a spindle-shape change (A: control group; B: TGF-β1 group. Scale bar, 50µm).
Figure 3. Detection of E-cad and α-SMA expression after SK-N-SH cells treatment with TGF-β1.
(C) RT-qPCR analysis showed the downregulation of E-cad and upregulation of α-SMA in SK-N-SH cells after three days of treatment with TGF-β1 compared to parental SK-N-SH cells (F=8.144, P=0.0353 and F=547.3, P<0.0001). (D) Western blot analysis confirmed the downregulation of E-cad and upregulation of α-SMA in SK-N-SH cells after three days of treatment with TGF-β1 compared to parental SK-N-SH cells (F=74.81, P=0.0006 and F=68.81, P=0.0007) (*means compare with control group P<0.05).

Figure 4. TGF-β1 promotes migration in SK-N-SH cells after treatment with TGF-β1.
(A)(B)(C)(D) Scratch test showed higher concentrations of TGF-β1 led to significantly increased SK-N-SH cells migration (A: TGF-β1 0ng/mL, B: TGF-β1 1ng/mL, C: TGF-β1 5ng/mL, D: TGF-β1 10ng/mL). The arrow represents the migration cells (Scale bar, 100µm).
Figure 4. TGF-β1 promotes migration in SK-N-SH cells after treatment with TGF-β1. (A)(B)(C)(D) Scratch test showed higher concentrations of TGF-β1 led to significantly increased SK-N-SH cells migration (A: TGF-β1 0ng/mL, B: TGF-β1 1ng/mL, C: TGF-β1 5ng/mL, D: TGF-β1 10ng/mL). The arrow represents the migration cells (Scale bar, 100 µm).

Figure 5. Detection of Gli1, Gli2 and Gli3 protein expression. (A)(B)(C) Western blot confirmed that the expression level of the Gli1, Gli2 and Gli3 protein were significantly increased after SK-N-SH cells were treated with TGF-β1 for three days (A: Gli1 protein, F = 268.3, P < 0.0001; B: Gli2 protein, F=36.06, P=0.0024; C: Gli3 protein, F=17.17, P=0.0095).

Table 1 Event-free survival cases according to chemo responsiveness and resectability after neoadjuvant chemotherapy in JPLT-2 study

<table>
<thead>
<tr>
<th>CHIC risk stratificationa</th>
<th>After neoadjuvant chemotherapy</th>
<th>Responder (CR or PR)</th>
<th>Unresponer (SD or PD)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Resectable</td>
<td>Unresectable</td>
</tr>
<tr>
<td>Standard (n = 198)</td>
<td>154/160 **</td>
<td>24/38</td>
<td></td>
</tr>
<tr>
<td></td>
<td>149/155**</td>
<td>5/5 (OLT: 3)</td>
<td>2133</td>
</tr>
<tr>
<td>Intermediate (n = 73)</td>
<td>39/51</td>
<td>12/22</td>
<td></td>
</tr>
<tr>
<td></td>
<td>33/42</td>
<td>6/9 (OLT: 7)</td>
<td>6/7</td>
</tr>
<tr>
<td>High (n = 71)</td>
<td>29/53</td>
<td>6/18</td>
<td></td>
</tr>
<tr>
<td></td>
<td>28/47 *</td>
<td>1/6 (OLT: 2)</td>
<td>3/8</td>
</tr>
</tbody>
</table>

*cCHIC (The Children's Hepatic tumors International Collaboration) risk stratification are as follows: standard risk: tumors involving three or fewer sectors of the liver), intermediate risk: tumors involving all sectors of the liver or invasion into main portal or hepatic vein and high risk: tumors with distant metastasis, *tumor response was classified according to RECIST criteria. OLT: Liver transplantation, **P < 0.01, *P <0.05
SS11.12  Liver Transplantation for Hepatoblastoma: Single-Center Long-Term Outcomes

Figure 1. Kaplan-Meier survival curves showing overall survival post-transplant for 1) All patients, 2) Primary liver transplant patients who did not have pulmonary metastases at diagnosis, and 3) Primary liver transplant patients who did have pulmonary metastases at diagnosis.

<table>
<thead>
<tr>
<th>Analysis</th>
<th>N</th>
<th>Mean Age (mo)</th>
<th>1-year OS</th>
<th>5-year OS</th>
<th>Recurrence</th>
</tr>
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<tbody>
<tr>
<td>A</td>
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<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>pLT</td>
<td>18</td>
<td>31</td>
<td>100%</td>
<td>84.61%</td>
<td>5.55%</td>
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<td>pLTm</td>
<td>4</td>
<td>38</td>
<td>100%</td>
<td>50%</td>
<td>25%</td>
</tr>
<tr>
<td>sLT</td>
<td>3</td>
<td>67</td>
<td>100%</td>
<td>n/a</td>
<td>33.33%</td>
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<tr>
<td>B</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mixed fetal/embryonal histology</td>
<td>12</td>
<td>25</td>
<td>90.91%</td>
<td>60%</td>
<td>16.66%</td>
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<td>Mixed epithelial/mesenchymal histology</td>
<td>6</td>
<td>23</td>
<td>100%</td>
<td>100%</td>
<td>0%</td>
</tr>
<tr>
<td>Pure embryonal histology</td>
<td>4</td>
<td>40</td>
<td>100%</td>
<td>100%</td>
<td>0%</td>
</tr>
<tr>
<td>Transitional cell histology</td>
<td>3</td>
<td>107</td>
<td>100%</td>
<td>50%</td>
<td>33.33%</td>
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<tr>
<td>Overall cohort</td>
<td>25</td>
<td>37</td>
<td>95.65%</td>
<td>80%</td>
<td>12%</td>
</tr>
</tbody>
</table>
SS11.14  A clinical trial of low-dose mTOR inhibitor therapy for the treatment of children with refractory lymphatic anomaly

Case 1  Photograph appearance

Prior to everolimus  On everolimus for 9 months

Case 2  Colonoscopy

Prior to everolimus  On everolimus for 6 months

Case 3  photograph of glossal lesion

Prior to everolimus  On everolimus for 4 months

Table 1

Outcome of everolimus therapy for refractory lymphatic anomaly

<table>
<thead>
<tr>
<th>Case</th>
<th>gender</th>
<th>age at initiation of therapy</th>
<th>duration of therapy</th>
<th>trough level (ng/ml)</th>
<th>lesion size</th>
<th>clinical symptom</th>
<th>side effect</th>
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<tbody>
<tr>
<td>1</td>
<td>male</td>
<td>1y9m</td>
<td>10m</td>
<td>1.5-6.5ng/ml</td>
<td>decreased</td>
<td>improvement of pigmentation</td>
<td>hyperlipidemia, diarrhea</td>
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<tr>
<td>2</td>
<td>male</td>
<td>11y</td>
<td>7m</td>
<td>1.5-6.2ng/ml</td>
<td>mildly decreased</td>
<td>no bloody stool</td>
<td>none</td>
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<tr>
<td>3</td>
<td>female</td>
<td>13y</td>
<td>4m</td>
<td>1.6-4.6ng/ml</td>
<td>no change</td>
<td>no glossal bleeding</td>
<td>hyperlipidemia</td>
</tr>
</tbody>
</table>
SS11.16  Treatment Outcomes in Pediatric Melanoma - Are There Benefits to Specialized Care?

Figure 1

Kaplan-Meier Survival Curves for Stage III and IV Patients
Robotic assisted Heller Myotomy for Esophageal Achalasia in Children

Figure 1 Pre-Op

Figure 2 Post-Op
SS12.2 Correction of severe penile curvature using a pedicled tunica vaginalis flap after tunica albuginea incision in hypospadias.

Figure 1

SS12.3 Reinforcing the ventral penile shaft with pedicled fat/connective tissues before urethroplasty lowers the risk for post-urethroplasty complications in hypospadias

Figure 1
SS12.7  eGFR in long-term survivors who underwent unilateral nephrectomy for malignancy during childhood

Figure 1

SS12.9  STING versus HIT techniques in the Endoscopic Treatment of Vesico-ureteral Reflux: A systematic review and Meta-analysis

Table 1

SS12.10 Polyorchidism: Three case reports and review of the literature

Table 1
SS12.12  Diagnosis and treatment of congenital prepubic sinus in female infants: Experience with 3 cases

Figure 1

Figure 2

Figure 3

Figure 4
SS12.15  Correction of severe penile curvature using a pedicled tunica vaginalis flap after tunica albuginea incision in hypospadias.

Figure 1

P1.1.3  Expression of miRNAs in later stage hindgut development of fetal mice and the regulatory role on the Hoxd-13 gene expression

Figure 1

Chip hybridization cluster analysis

Figure 2

gene-set enrichment analysis
P1.1.3 Expression of miRNAs in later stage hindgut development of fetal mice and the regulatory role on the Hoxd-13 gene expression

Figure 1

Chip hybridization cluster analysis

gene-set enrichment analysis

Figure 2

dual luciferase assays of miR-193 regulate 3’ UTR of Hoxd-13

P1.1.4 In vivo tissue-engineered autologous “Biotube” vascular grafts could grow in a beagle model

Figure 1

Immediately after implantation

12-month after implantation

angiography

Biotube

Biotube
P1.1.5  Impact of New Mutation Identification in the RET proto-oncogene in a Family with Hirschsprung's Disease

Figure 1

![Family Tree](image1)

Figure 2

```
Methodology for narrowing down the candidate variants

Exonic or splicing variants
  Remove synonymous variant

Non-synonymous or splicing site variants
  Remove variants recorded in the dbSNP135
  Remove variants with MAF>1% in 1000 Genomes Project

Novel or rare variant
  Remove variants with over 0.7 and under 0.3 allele frequency

Heterozygous variant
  Common among patients and genetic carriers
  Remove variants observed in unaffected

Candidate Variants List
```
Filtering and screening candidate SNVs

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<tr>
<th>Status</th>
<th>F1-1</th>
<th>F1-2</th>
<th>F1-3</th>
<th>F1-4</th>
<th>F1-5</th>
<th>F1-6</th>
<th>F1-7</th>
<th>F1-8</th>
<th>F1-9</th>
<th>F1-10</th>
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<td>Unaffected detected</td>
<td>456</td>
<td>420</td>
<td>430</td>
<td>479</td>
<td>509</td>
<td>444</td>
<td>455</td>
<td>456</td>
<td>468</td>
<td>457</td>
<td>483</td>
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<tr>
<td>1000 genomes &lt;= 1%</td>
<td>450</td>
<td>413</td>
<td>425</td>
<td>470</td>
<td>505</td>
<td>437</td>
<td>466</td>
<td>450</td>
<td>461</td>
<td>450</td>
<td>475</td>
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<td>RefSeq</td>
<td>283</td>
<td>272</td>
<td>258</td>
<td>303</td>
<td>312</td>
<td>277</td>
<td>277</td>
<td>283</td>
<td>315</td>
<td>295</td>
<td>326</td>
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</tbody>
</table>

F1-10 was excluded for filtering to narrow down the candidate variants. The variants located in segmental duplicate region were removed.

Common among affected and genetic carriers

Candidate variants and predicting the effects of amino acid substitutions

<table>
<thead>
<tr>
<th>Gene</th>
<th>AAChange</th>
<th>1000G</th>
<th>SIFT</th>
<th>PolyPhen2</th>
<th>PhyloP</th>
<th>GERP</th>
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<tr>
<td>RET</td>
<td>p.S922Y</td>
<td>0.0005</td>
<td>0</td>
<td>1</td>
<td>0.999</td>
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<tr>
<td>A1CF</td>
<td>p.G398D</td>
<td>0</td>
<td>0.656</td>
<td>0.999</td>
<td>5.41</td>
<td></td>
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<tr>
<td>PRDM11</td>
<td>p.V22A</td>
<td>0</td>
<td>0.548</td>
<td>0.958</td>
<td>2.81</td>
<td></td>
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<tr>
<td>F2</td>
<td>p.S203N</td>
<td>0.32</td>
<td>0</td>
<td>0.869</td>
<td>0.11</td>
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<tr>
<td>OR5AR1</td>
<td>p.Y60H</td>
<td>0.93</td>
<td>0.998</td>
<td>4.74</td>
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<td>SLC22A12</td>
<td>p.R342C</td>
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<td>0.008</td>
<td>0.117</td>
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<td>0.996</td>
<td>4.56</td>
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<td>XRRA1</td>
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<td>0.03</td>
<td>0.998</td>
<td>4.74</td>
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<td>MYEOV</td>
<td>p.L269fs</td>
<td></td>
<td></td>
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<td></td>
<td></td>
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</table>
P1.1.7 Using fecal DNA sequencing to investigate the effect of colostomy surgery on the intestinal microbiota of surgical neonates administered a probiotic preparation

Figure 1
<table>
<thead>
<tr>
<th>No</th>
<th>Down-/Up-regulation</th>
<th>Gene</th>
<th>Locus</th>
<th>Expression level (average)</th>
<th>Fold change (NEC lesion vs. Adjacent normal)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>NEC lesion (n = 5)</td>
<td>Adjacent normal tissue (n = 5)</td>
<td>NEC lesion (average)</td>
<td>Adjacent normal tissue (average)</td>
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<tr>
<td>1</td>
<td>Down</td>
<td>HTR3A</td>
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<td>0.71</td>
<td>2.43</td>
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<tr>
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<td>Chr5:175223609-175311023</td>
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<td>1.09</td>
<td>-2.90</td>
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<td>PCP4</td>
<td>Chr21:41229346-41301322</td>
<td>12.98</td>
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<td>0.39</td>
<td>1.08</td>
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<td>ST8SIA6</td>
<td>Chr10:17362675-17496254</td>
<td>0.53</td>
<td>1.39</td>
<td>-2.64</td>
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<td>SLC5A7</td>
<td>Chr2:108602994-108630443</td>
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<td>3.98</td>
<td>-2.62</td>
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<td>7</td>
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<td>PCDHG5A6</td>
<td>Chr5:140753650-140892546</td>
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<td>1.11</td>
<td>-2.55</td>
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<td>8</td>
<td>Down</td>
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<td>0.45</td>
<td>1.13</td>
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<td>9</td>
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<td>Chr1:65730376-65881552</td>
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<td>0.59</td>
<td>1.38</td>
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<td>13</td>
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<td>Chr14:78636715-80334633</td>
<td>2.96</td>
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<td>-2.19</td>
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<td>-1.77</td>
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<td>-1.75</td>
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<td>Chr20:13976145-16033841</td>
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<td>0.82</td>
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<td>43</td>
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<td>VAMP1</td>
<td>Chr12:8571403-6579843</td>
<td>3.88</td>
<td>6.76</td>
<td>-1.74</td>
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### Table 2

Potential pathways in comparison of NEC lesion, transition, and adjacent normal tissues

<table>
<thead>
<tr>
<th>Comparison tissues</th>
<th>Pathway Name</th>
<th>Differentially regulated genes</th>
<th>Input genes in pathway (%)</th>
<th>Impact Factor</th>
<th>Corrected P-value</th>
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<tbody>
<tr>
<td>NEC lesion vs. Adjacent normal</td>
<td>Thyroid cancer</td>
<td>RET</td>
<td>1.59</td>
<td>6.91</td>
<td>0.008</td>
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<td>Axon guidance</td>
<td>LRRC4C, SEMA4F CAMK4</td>
<td>3.18</td>
<td>5.74</td>
<td>0.02</td>
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<tr>
<td>Calcium signaling pathway</td>
<td></td>
<td>1.59</td>
<td>4.64</td>
<td>0.05</td>
<td></td>
</tr>
<tr>
<td>NEC lesion vs. Transition</td>
<td>Leukocyte transendothelial migration</td>
<td>ESAM</td>
<td>1.67</td>
<td>975.3</td>
<td>&lt; 0.0001</td>
</tr>
<tr>
<td>Tight junction</td>
<td>PRKCE</td>
<td>1.67</td>
<td>5.71</td>
<td>0.02</td>
<td></td>
</tr>
<tr>
<td>Axon guidance</td>
<td>EFNB1, SEMA3F JAG1</td>
<td>3.33</td>
<td>5.53</td>
<td>0.03</td>
<td></td>
</tr>
<tr>
<td>Notch signaling pathway</td>
<td></td>
<td>1.67</td>
<td>4.81</td>
<td>0.05</td>
<td></td>
</tr>
<tr>
<td>Transition vs. Adjacent normal</td>
<td>Pathways in cancer</td>
<td>FGF5, ZBTB16</td>
<td>10.53</td>
<td>5.09</td>
<td>0.04</td>
</tr>
<tr>
<td>Melanoma</td>
<td>FGF5</td>
<td>5.26</td>
<td>4.91</td>
<td>0.04</td>
<td></td>
</tr>
</tbody>
</table>
P1.1.14  Accuracy of the noninvasive hemoglobin monitoring for preoperative evaluation for pediatric patients

Figure 1

Figure 2
Table 1
Demographic and experimental data

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value (mean ± SD or median [range])</th>
</tr>
</thead>
<tbody>
<tr>
<td>N = 71</td>
<td></td>
</tr>
<tr>
<td>age (year)</td>
<td>4.7 ± 2.3 [0.5, 12]</td>
</tr>
<tr>
<td>sex (F/M)</td>
<td>30/41</td>
</tr>
<tr>
<td>height cm</td>
<td>106.7 ± 16.1 [70, 150]</td>
</tr>
<tr>
<td>weight (kg)</td>
<td>18.5 ± 6.4 [9.0, 45.0]</td>
</tr>
<tr>
<td>SpHb (mg/dL)</td>
<td>11.4 ± 1.0 [9.3, 14.1]</td>
</tr>
<tr>
<td>Hb_{lab} (mg/dL)</td>
<td>12.7 ± 0.9 [9.8, 14.7]</td>
</tr>
<tr>
<td>Perfusion index</td>
<td>5.9 ± 2.3 [1.9, 15.0]</td>
</tr>
</tbody>
</table>

**P1.2.10** Familial Currarino Syndrome traced through 5 generations

Figure 1
<table>
<thead>
<tr>
<th></th>
<th>I-1</th>
<th>II-2</th>
<th>II-4</th>
<th>II-5</th>
<th>III-1</th>
<th>III-2</th>
<th>III-3</th>
<th>III-4</th>
<th>IV-3</th>
<th>IV-4</th>
<th>V-2</th>
<th>V-3</th>
<th>V-4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sacral malformation</td>
<td></td>
<td>*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>ARM</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prenatal mass</td>
<td>Osteoma</td>
<td>Meningocele</td>
<td>? Dermoid cyst</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age of identifying symptoms</td>
<td>Autopsy</td>
<td>Adulthood</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**P1.2.10**

Spontaneous fecal fistula complicating strangulated inguinal hernia in a newborn; A case report.

**Figure 1**
Table 1 Infective Endocarditis and Congenital Cardiac Surgery: A Risk Adjusted Analysis of Predictors and Outcomes

Table: Comparison of outcomes between CCS patients with and without infective endocarditis.

<table>
<thead>
<tr>
<th></th>
<th>Patients with Infective Endocarditis (n=630)</th>
<th>Patients without Infective Endocarditis (n=72,587)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incidence Rate Ratios [95% Confidence Interval]</td>
<td>1.69 [1.28-2.24]</td>
<td>Reference</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Mortality</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Days [95% Confidence Interval]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Length of Stay</td>
<td>41.78 [38.58-44.96]</td>
<td>23.67 [23.42-23.92]</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Cost of Index Hospital Stay</td>
<td>135,154 [124,884-145,424]</td>
<td>86,753 [85,998-87,508]</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

P1.3.8 Mechanics of a Stuck Central Venous Catheter Removal

Figure 1
**P2.1.4** Complicated Appendicitis Wrongly Diagnosed As Nonspecific Diarrhea: Ways To Decrease This Continuous Threat

**Table 1**

<table>
<thead>
<tr>
<th></th>
<th>Group 1</th>
<th>Group 2</th>
<th>Group 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender (F/M)-%</strong></td>
<td>63.6/36.4</td>
<td>64.8/35.2</td>
<td>70.6/29.4</td>
</tr>
<tr>
<td><strong>Age (years)</strong></td>
<td>3-17</td>
<td>1-18</td>
<td>2.5-15</td>
</tr>
<tr>
<td><strong>Mean ± SE</strong></td>
<td>11.6±0.22</td>
<td>5.05±0.41</td>
<td>8.7±0.96</td>
</tr>
<tr>
<td><strong>Sick days before</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Hospitalization (Number)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Range</strong></td>
<td>1-14</td>
<td>1-30</td>
<td>1-6</td>
</tr>
<tr>
<td><strong>Mean ± SE</strong></td>
<td>1.1 ±0.1</td>
<td>3.3±0.4</td>
<td>3.1±0.2</td>
</tr>
<tr>
<td><strong>Abdominal pain (%)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Central</td>
<td>10.67</td>
<td>33.6</td>
<td>29.4</td>
</tr>
<tr>
<td>Diffuse</td>
<td>7.8</td>
<td>0</td>
<td>29.4</td>
</tr>
<tr>
<td>Right lower quadrant</td>
<td>95.71</td>
<td>0</td>
<td>23</td>
</tr>
<tr>
<td><strong>Loss of appetite (%)</strong></td>
<td>2.9</td>
<td>11.2</td>
<td>11.76</td>
</tr>
<tr>
<td><strong>Nausea (%)</strong></td>
<td>0</td>
<td>10.19</td>
<td>9.42</td>
</tr>
<tr>
<td><strong>Vomiting (%)</strong></td>
<td>51.46</td>
<td>78.4</td>
<td>70.59</td>
</tr>
<tr>
<td><strong>Fever (%)</strong></td>
<td>14.6</td>
<td>65.6</td>
<td>47</td>
</tr>
<tr>
<td><strong>Diarrhea (%)</strong></td>
<td>2.42</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td><strong>Duration of surgery (minutes)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Range</strong></td>
<td>12-81</td>
<td></td>
<td>21-86</td>
</tr>
<tr>
<td><strong>Mean±SE</strong></td>
<td>36.13±1.06</td>
<td>54.5±4.9</td>
<td></td>
</tr>
<tr>
<td><strong>Appendix status (%)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>7</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Acute</td>
<td>48</td>
<td>6.25</td>
<td></td>
</tr>
<tr>
<td>Phlegmonous</td>
<td>36</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Gangrenous</td>
<td>4</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>Perforated</td>
<td>2</td>
<td>18.75</td>
<td></td>
</tr>
<tr>
<td>Gangrenous perforated</td>
<td>3</td>
<td>50</td>
<td></td>
</tr>
</tbody>
</table>
Table 2

Table 2 – Ancillary examinations (348 patients)

<table>
<thead>
<tr>
<th></th>
<th>Group 1</th>
<th>Group 2</th>
<th>Group 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>WBC</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Range</td>
<td>5,300-30,000</td>
<td>4,300-30,900</td>
<td>4,200-21,800</td>
</tr>
<tr>
<td>Mean + SE</td>
<td>13,614+319</td>
<td>12,942+601</td>
<td>15,035+1,249</td>
</tr>
<tr>
<td><strong>CRP</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Range</td>
<td>0.6-291.59</td>
<td>0.6-300.23</td>
<td>6.35-338</td>
</tr>
<tr>
<td>Mean+SE</td>
<td>31.47+3.92</td>
<td>34.7+4.1</td>
<td>169.64+27.29</td>
</tr>
<tr>
<td><strong>US (number)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Performed</td>
<td>167</td>
<td>1</td>
<td>17</td>
</tr>
<tr>
<td>Pathologic</td>
<td>116</td>
<td>0</td>
<td>16</td>
</tr>
<tr>
<td>Not recognized</td>
<td>49</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Normal appendix</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

AA – Acute appendicitis ; GE – Gastroenteritis
GE+AA – Gastroenteritis + Acute appendicitis

**P2.1.13** Surgical strategies to neonatal duodenal complex anomalies

Figure 1

![Figure 1](image1)

Figure 2

![Figure 2](image2)
Surgical strategies to neonatal duodenal complex anomalies

Figure 3

Figure 4

Figure 5

Figure 6

Figure 7

Figure 8
P2.2.1 Effects of laparoscopy on intraoperative heat loss in infants

Figure 1

![Core Body Temperature in Infants Undergoing Laparoscopic versus Open Fundoplication + G-tube](image1)

- Anesthesia Start
- Procedure Start

Figure 2

Intra-operative splenic artery clamping with splenic ultrasound may determine the possibility of the splenic infarction after laparoscopic distal pancreatectomy with preservation of the spleen utilizing Warshaw's technique.

Figure 1

![Image 1](image1)

Figure 2

![Image 2](image2)

P2.2.4
P2.2.4 Intra-operative splenic artery clamping with splenic ultrasound may determine the possibility of the splenic infarction after laparoscopic distal pancreatectomy with preservation of the spleen utilizing Warshaw’s technique.

P2.2.5 Minimally Invasive Repair of Pediatric Morgagni Hernias using Transfascial Sutures with Extracorporeal Knot Tying

Figure 1: Sutures placed in anterior diaphragm rim. Diaphragm re-approximated to anterior abdominal wall one sutures tied.
### Table 1: Patient Characteristics by Transfused vs Not Transfused

<table>
<thead>
<tr>
<th>Variable</th>
<th>Not Transfused (n=1538)</th>
<th>All Transfused (n=44)</th>
<th>P-value*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years, n=1521)</td>
<td>6 [2-10]</td>
<td>4 [1.58-10]</td>
<td>0.1827</td>
</tr>
<tr>
<td>Male (n=1536)</td>
<td>954 (60)</td>
<td>29 (66)</td>
<td>0.6400</td>
</tr>
<tr>
<td>Initial Heart Rate (n=1522)</td>
<td>111 [92-133]</td>
<td>120.5 [109-157.5]</td>
<td>0.1176</td>
</tr>
<tr>
<td>Injury Severity Score</td>
<td>5 [2-9]</td>
<td>10.5 [14-26]</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Glasgow Coma Score (n=1522)</td>
<td>15 [15-15]</td>
<td>7 [3-14]</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>First Hematocrit in ER (n=1472)</td>
<td>36 [33.9-38.2]</td>
<td>28.9 [25.9-34.9]</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Length of Stay (days)</td>
<td>1 [1-3]</td>
<td>10.5 [3-17]</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Died (n)</td>
<td>18 (11)</td>
<td>10 (24)</td>
<td>&lt;0.0001</td>
</tr>
</tbody>
</table>

*Values expressed as a (percent) or median [IQR]
Not transfused = 15/10 unless otherwise specified
*P-values derived from Fisher’s Exact Test or Mann-Whitney Test

### Table 2: Patient Characteristics by Transfusion Category, Balanced (PRBC:FFP 1:1-2:1) versus Not Balanced (PRBC:FFP>2:1 or no FFP given)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Balanced Transfusion + (n=11)</th>
<th>Not Balanced Transfusion (n=35)</th>
<th>P-value*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>7.5 [3-12]</td>
<td>3 [1.42-9]</td>
<td>0.0474</td>
</tr>
<tr>
<td>Male</td>
<td>9 (82)</td>
<td>20 (63)</td>
<td>0.2820</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>21.17 [16.78-49.90]</td>
<td>14.53 [10.89-29.97]</td>
<td>0.0193</td>
</tr>
<tr>
<td>Initial Heart Rate</td>
<td>131.45 [96-173]</td>
<td>118 [88-148]</td>
<td>0.3931</td>
</tr>
<tr>
<td>Injury Severity Score</td>
<td>26 [18-30]</td>
<td>17 [13-25]</td>
<td>0.1033</td>
</tr>
<tr>
<td>Glasgow Coma Score</td>
<td>5 [3-15]</td>
<td>8 [3-14]</td>
<td>0.9220</td>
</tr>
<tr>
<td>First Hematocrit in ER (n=41)</td>
<td>28.1 [24.7-34.6]</td>
<td>29.1 [26.6-35.1]</td>
<td>0.6377</td>
</tr>
<tr>
<td>Transfused Packed Red Cells</td>
<td>2 [1-3]</td>
<td>2 [1-3]</td>
<td>0.8769</td>
</tr>
<tr>
<td>Transfused Platelets (units, n=42)</td>
<td>0.600 ± 0.906</td>
<td>0.31 ± 0.644</td>
<td>0.4510</td>
</tr>
<tr>
<td>Transfused Cryoprecipitate (units, n=42)</td>
<td>0.100 ± 0.316</td>
<td>9 ± 0</td>
<td>0.0736</td>
</tr>
<tr>
<td>Length of Stay (days)</td>
<td>17 [2-29]</td>
<td>9 [7-15]</td>
<td>0.4512</td>
</tr>
<tr>
<td>Died (n)</td>
<td>2 (18)</td>
<td>8 (23)</td>
<td>0.9999</td>
</tr>
</tbody>
</table>

*Values expressed as a (percent) or median [IQR] or mean ± SD
**P-values derived from Fisher’s Exact Test or Mann-Whitney Test
***All transfusion values within 1st-4 hours
P2.3.1 Atypical Bowel Ischemia in Petersen Hernia after Living Donor Liver transplantation (LDLT) : A Case report

Figure 1

Poor bowel wall enhancement

Figure 2

Roux-en-Y hepatic limb segmental necrosis due to internal herniation
Discordant meconium related ileus in monozygotic twins: pathological findings of maturating ganglion cells in the intestine

Figure 1

Figure 2
**P2.3.4**  
A Rare Case of Multiple Small Bowel Intussusceptions and Bowel Obstruction Caused by Rapunzel Syndrome

Figure 1

Figure 3
P3.1.1  Malpractice in Pediatric Appendectomy: Who is Charged and Why?

Figure 1
P3.1.1 Malpractice in Pediatric Appendectomy: Who is Charged and Why?

Figure 1

P3.1.6 Characteristics of the contrast enema do not predict an effective bowel management regimen for patients with constipation or fecal incontinence

Table 1
Character of the colon on contrast enemas.

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>Non-Dilated</th>
<th>Rectosigmoid dilation</th>
<th>Global Dilation</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARM</td>
<td>23</td>
<td>14</td>
<td>0</td>
<td>37</td>
</tr>
<tr>
<td>HD</td>
<td>5</td>
<td>1</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>IC</td>
<td>22</td>
<td>11</td>
<td>1</td>
<td>34</td>
</tr>
<tr>
<td>Spina bifida</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>SCT</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>53</td>
<td>28</td>
<td>2</td>
<td>83</td>
</tr>
</tbody>
</table>

ARM-Anorectal Malformation. HD-Hirschsprung’s Disease. IC-Idiopathic Constipation. SCT-Sacralcoccygeal Teratoma. Rectosigmoid dilation includes patients with rectal dilation and megarectum.
A modified shish kebab technique for repair of familial multiple jejunouileal atresia

Figure 1
Fig. (a) Illustration of small bowel atresia morphology

Figure 2
Fig. (b) Illustration of the reconstructed seven end to end anastomoses. TJ= tapering jejunoplasty, RS= resected segment, W= web. 16 bowel interruptions, 6 isolated segments, 3 webs (enterotomies for excision), seven primary end-to-end anastomoses. Length of residual small bowel= 60 cm, transanastomtic tube (TAT) extending from duodenojejunal flexure (DJ) to cecum with only abdominal entry site and no exit. Insets show spatulation of both bowel ends and placement of 8 interrupted 6/0 PDS sutures.
P3.1.12  Dextrogastria, duodenal web, preduodenal portal vein and intestinal malrotation; a very rare association in newborns

Figure 1
P3.2.2  Congenital Short Bowel Syndrome. A Rare Condition With a Common Presentation!

Figure 1

P3.2.7  Predicting the Risk of Umbilical Cord Bleeding in Congenital Intestinal Atresia Using Trypsin Level in Amniotic fluid

Figure 1
P3.2.10  Possible Etiologies of Increased Incidence of Gastrochisis

Figure 1

P3.2.13  Staged closure of a giant omphalocele with amnion preservation modified technique

Figure 1
P3.2.15  Jejuno-ileo-colic atresia in neonates: A case report

Figure 1
P3.3.1 Histological prognostic findings in biliary atresia: a systematic review and meta-analysis

Figure 1

![Figure 1](image1.png)

Figure 2

![Figure 2](image2.png)

P3.3.5 Management of choledochal cysts with complete cyst excision and hepaticoduodenostomy- a 15 year experience

Table 1

<table>
<thead>
<tr>
<th>Biliary Reconstruction</th>
<th>Time to start fluids: Median (min - max) days</th>
<th>Time to full feeds: Median (min - max) days</th>
<th>Length of stay: Median (min - max) days</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hepaticoduodenostomy (n=49)</td>
<td>2 (1-5)</td>
<td>4 (2-34)</td>
<td>5 (3-45)</td>
</tr>
<tr>
<td>Laparoscopic hepaticoduodenostomy (n=6)</td>
<td>2 (1-4)</td>
<td>3.5 (3-5)</td>
<td>4.5 (4-7)</td>
</tr>
<tr>
<td>Hepaticojejunostomy (n=4)</td>
<td>2.5 (2-4)</td>
<td>4 (3-6)</td>
<td>5 (5-8)</td>
</tr>
<tr>
<td>Laparoscopic hepaticojejunostomy (n=1)</td>
<td>6</td>
<td>8</td>
<td>9</td>
</tr>
</tbody>
</table>

Table 1- Time taken to start oral fluids, establish full feeds and length of stay with the different types of biliary reconstruction following choledochal cyst excision
Table 1 Demographics

<table>
<thead>
<tr>
<th>Age categories</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>13–18 y</td>
<td>24 (31.5)</td>
</tr>
<tr>
<td>8–12 y</td>
<td>25 (32.89)</td>
</tr>
<tr>
<td>2–7 y</td>
<td>23 (30.26)</td>
</tr>
<tr>
<td>&lt;3 y</td>
<td>4 (5.2)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Gender</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>22 (29)</td>
</tr>
<tr>
<td>Female</td>
<td>54 (71)</td>
</tr>
</tbody>
</table>

Table 2 Comorbidities

<table>
<thead>
<tr>
<th>Comorbidities</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>34 (44.7%)</td>
</tr>
<tr>
<td>Hemolytic Pathology</td>
<td>14 (18.4%)</td>
</tr>
<tr>
<td>Obesity</td>
<td>13 (17.1%)</td>
</tr>
<tr>
<td>Chemotherapy</td>
<td>4 (5.2%)</td>
</tr>
<tr>
<td>Parenteral nutrition</td>
<td>3 (3.9%)</td>
</tr>
<tr>
<td>Diuretic use</td>
<td>3 (3.9%)</td>
</tr>
<tr>
<td>Biliary malformations</td>
<td>2 (2.6%)</td>
</tr>
<tr>
<td>Pancreatitis</td>
<td>2 (2.6%)</td>
</tr>
<tr>
<td>Intestinal resection</td>
<td>1 (1.3%)</td>
</tr>
</tbody>
</table>

TOTAL 76

Trend of pediatric Cholecystectomy: Clinical characteristics and indications for cholecystectomy

Figure 1
P4.1.1 Fn14 Hepatic Progenitor Cells are Associated with Liver Fibrosis in Biliary Atresia

Figure 1

Figure 2

Fn14 p=0.007; Cd133 p=0.002; Epcam p=0.042; Cd24 p=0.001
Biliary atresia: Red: FN14; Green: CD133; Blue: nucleus; arrow: FN14 and CD133 co-expression (20")

Biliary atresia: Red: FN14; Green: α-SMA; Blue: nucleus
P4.1.3 Percutaneous suture-assisted three-port laparoscopic resection for choledochal cyst: initial experience

Figure 1

Figure 2

Figure 3

Figure 4

Figure 5
P4.1.5 Changes in plasma ghrelin levels in children after the Kasai procedure or living donor liver transplantation for post-Kasai biliary atresia

Figure 1

Data are expressed as the means ± standard error
*, P < 0.05; Wilcoxon matched-pairs signed rank test
P4.2.3 Cost efficiency of lobectomy versus fine needle aspiration for diagnostic work up of thyroid nodules in children

Figure 1

P4.2.6 Multimodality Treatment of a Massive Cervicothoracic Venolymphatic Malformation in a 13 year-old Boy

Figure 1
Multimodality Treatment of a Massive Cervicothoracic Venolymphatic Malformation in a 13-year-old Boy

Figure 2

Figure 3
Case report: Laparoscopic correction of the transverse testicular ectopia with persistent Mullerian duct syndrome

Figure 1