CANADIAN ASSOCIATION of
PAEDIATRIC SURGEONS
ASSOCIATION CANADIENNE de
CHIRURGIE PÉDIATRIQUE

39th - 39ième

Annual Meeting - Réunion Annuelle
40th Anniversary - 40 ième Anniversaire
August 23 - August 26, 2007
Août 23 - Août 26, 2007
St. John’s
Newfoundland & Labrador
Terre-Neuve & Labrador
CANADA
“Then and Now”
“Jadis et Maintenant”
Thirty-ninth Annual Meeting
Trente-neuvième Réunion Annuelle
August 23rd – August 26th, 2007
Août 23 - Août 26, 2007

Hôtel Fairmont Newfoundland Hotel
St. John’s
Newfoundland & Labrador
Terre-Neuve & Labrador
CANADA
In keeping with CMA Guidelines, program content and selection of speakers are the responsibility of the planning committee. Support is directed toward the costs of the course and not to individual speakers. All speakers must disclose any involvement with industry that may be perceived as potentially influencing the presentation of the educational material. Disclosure may be done verbally or using a slide at the beginning of the presentation.

Examples of relationships that should be disclosed include, but are not limited to:

- any direct financial interest in a company whose interests are in the area(s) covered by the educational material ("the Company")
- investments held by the speaker in the Company
- membership on the Company's Advisory Board or similar committee
- current or recent participation in a clinical trial sponsored by the Company
- research by the speaker sponsored by the Company
- the speaker is a paid consultant for the Company

The Royal College of Physicians and Surgeons of Canada
Le Collège royal des médecins et chirurgiens du Canada
774 promenade Echo Drive, Ottawa, Canada K1S 5N8

This event is an Accredited Group Learning Activity (Section 1) as defined by the Maintenance of Certification program of The Royal College of Physicians and Surgeons of Canada approved by Dalhousie Continuing Medical Education

This program has been approved for up to 13.0 credit hours.
If the speaker has no involvement with industry he/she should inform the audience that they have nothing to disclose, i.e., cannot identify any potential conflict of interest. It is the sole responsibility of the individual speaker to make such disclosure to the audience at the time of the presentation.

Educational Objectives

The Annual meeting of the Canadian Association of Paediatric Surgeons is intended to provide 3 days of comprehensive continuing education in the field of pediatric general and thoracic surgery. Specifically, the objectives are to:

- Present current updates on advances in clinical pediatric surgery
- Present current updates on advances in the pathophysiology of pediatric surgical disorders
- Provide for group discussion on controversial issues in pediatric general and thoracic surgery through:
  - Discussion of presented scientific papers
  - Interactive panel discussion on the management of clinical pediatric problems

Over the 2 and a half days of the meeting, the breadth of pediatric general and thoracic surgery topics will be covered through presentation of original works by trainees, professional colleagues and allied health care workers involved in the field. The works will acquaint participants with the latest clinical and basic science research findings and trends influencing the clinical practice of pediatric surgery, as well as reacquaint participants with interesting pediatric surgical entities. Controversial topics will invite participatory discussion by the delegates.

A panel of 6 members of the CAPS Program Committee has chosen the abstracts presented, based on quality of abstracts submitted and reflecting what is commonly relevant to the practice of pediatric surgery. Input for subsequent meetings and how to improve this one will be solicited from the delegates at the conclusion of the meeting.
## SCIENTIFIC AND SOCIAL PROGRAM

**PROGRAMME SCIENTIFIQUE ET SOCIAL**

**Thursday, August 23, 2007**
**Jeudi, Août 23, 2007**

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**Friday, August 24, 2007**
**Vendredi, Août 24, 2007**

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IN MEMORIAM

DR. HARVEY BEARDMORE
February 4th, 1921 - February 10th, 2007

FIRST CAPS PRESIDENT 1967-1973
Welcome one and all to CAPS 2007 Meeting in St. John’s Newfoundland.

This year, paediatric surgeons from Canada and abroad will meet in Newfoundland on the shores of the Atlantic Ocean.

This year marks our 40th anniversary and a very special meeting will be held to honor the founding members of CAPS. Thank you to Dr. David Price for the local arrangements, which are sure to make CAPS 40th birthday memorable.

Our Canadian Association is once again grateful to Dr. Natalie Yanchar and the Program Committee for their efforts in compiling what is sure to be an outstanding and stimulating scientific program. To those who attend, we welcome your participation through the medium of commentary, questions and criticisms.

Thank you to Dr. Charles Stolar for becoming our JPS-McLeod Lecturer. We look forward to your pediatric surgical insights and to your lecture (congenital diaphragmatic hernia). CAPS will strive to be your worthy host.

Dr. Harvey Beardmore, our first president and founding member, passed away this year. CAPS fondly remembers Dr. Beardmore, and this as well as every future meeting will be a proud reflection of Dr. Beardmore’s vision of Canadian paediatric surgery.

This year marks the year of secretary transition. Our able, immediate past secretary; Dr. Peter Fitzgerald is to be thanked for his excellent service to our Association as well as the recipient of the secretary’s portfolio, who too is to be thanked for a remarkable year of hard work; Dr. Juan Bass.

Thanks as well to all of our Committee Chairs and members for making CAPS a vibrant and successful Association.

Please come and enjoy our 40th Anniversary Meeting-CAPS 2007.

N. Wiseman, MD, FRCSC, FACS
President, Canadian Association of Paediatric Surgeons
Bienvenue à tous et chacun pour le congrès de CAPS 2007 à St John’s, Terre-Neuve.

Cette année, les chirurgiens pédiatriques du Canada et d’ailleurs, se rencontrent à Terre-Neuve sur les bords de l’Atlantique.

Ce congrès marque le 40e anniversaire de CAPS et nous en profitons pour rendre hommage aux membres-fondateurs. Nos remerciements au Dr David Price qui assume l’organisation locale pour garder un souvenir impérissable de ce quarantième anniversaire de CAPS.

L’Association remercie le Dr Nathalie Yanchar et le comité du programme pour leurs efforts soutenus pour mettre en place un programme scientifique enrichissant. Nous vous invitons tous à participer en donnant vos commentaires, en posant des questions et en formulant des critiques constructives.

Nos remerciements au Dr Charles Stolar qui a accepté d’être notre conférencier JPS-McLeod. Nous attendons avec intérêt votre conférence sur la hernie diaphragmatique congénitale et vos commentaires perspicaces sur la chirurgie pédiatrique. CAPS s’efforcera d’être un hôte digne de votre valeur.

Le Dr Harvey Beardmore, membre-fondateur et notre premier président, est décédé cette année. CAPS garde un souvenir affectueux du Dr. Beardmore et le congrès, de cette année et des années futures, se veut une représentation fidèle de la vision éclairée de la chirurgie pédiatrique canadienne que nous a laissée le Dr. Beardmore.

C’est une année de transition au poste de secrétaire de l’Association. Nous remercions le Dr Peter Fitzgerald, qui a quitté ce poste, pour son travail inlassable et sa compétence; et nous remercions aussi le nouveau titulaire du poste, le Dr Juan Bass, pour une année de travail soutenu.

Nos remerciements à tous les présidents et membres de comités qui travaillent à faire de CAPS une association prospère et pleine de vie.

Que ce quarantième congrès-anniversaire de CAPS soit pour vous enrichissant et agréable.

N. Wiseman, MD, FRCSC, FACS.
Président de l’Association Canadienne de Chirurgie Pédiatrique
The Canadian Association of Paediatric Surgeons was granted its charter in 1967. Its goal is to improve the surgical care of infants and children in Canada. Its areas of interest include all aspects of general and thoracic paediatric surgery with recognition of its unique responsibility to infants born with congenital anomalies and children with malignancies. While its responsibility to paediatric trauma is not unique, it assumes a pivotal role in issues related to paediatric trauma.

The Canadian Association of Paediatric Surgeons presents an opportunity, particularly through its annual meetings, to share information concerning diagnosis, treatment, and research with regards to its areas of interest. In addition, it assumes responsibility to participate in the education of not only its members, but other members of the community interested in and involved in related aspects of paediatric care.

EDUCATION FUND: To help achieve its responsibility to education for issues related to paediatric surgery, the Association has an education fund. This fund was established and continues to exist through the generosity of donations from individuals and groups, both medical and non-medical, interested in the surgical care of children. The Association solicits annual donations to the fund to maintain an adequate working capital to support the annual education programming endorsed by the CAPS membership. This fund is registered with the federal government and all contributions are fully tax-deductible. It is audited annually.

Contributions to educational fund can be made online at www.caps.ca or send cheque to:

Juan Bass
CAPS Secretary-Treasurer
Children's Hospital of Eastern Ontario
401 Smyth Rd
Ottawa, Ontario. K1H 8L1
Email: bass.caps@gmail.com
Telephone: (613) 737-7600 ext 2799
Fax: (613) 738-4849
L’Association canadienne de chirurgie pédiatrique a reçu sa charte en 1967. Son objectif est d’améliorer les soins chirurgicaux aux nouveau-nés et aux enfants du Canada. Elle s’intéresse à tous les aspects de la chirurgie pédiatrique générale et thoracique tout en reconnaissant sa responsabilité unique à l’égard des bébés nés avec des anomalies congénitales et des enfants atteints de tumeurs malignes. Bien que sa responsabilité en matière de traumatismes pédiatriques ne soit pas unique, elle exerce un rôle crucial dans les questions relatives à ces traumatismes.

L’Association canadienne de chirurgie pédiatrique offre la possibilité, particulièrement dans le cadre de son assemblée générale annuelle, d’échanger des informations concernant le diagnostic, le traitement et la recherche liés à ses domaines de travail. De plus, elle assume la responsabilité de participer à l’éducation non seulement de ses propres membres, mais aussi des autres membres de la communauté qui s’intéressent à des aspects apparentés des soins pédiatriques et qui travaillent dans ces domaines.

**LE FONDS D’ÉDUCATION :** Pour l’aider à remplir ses engagements en matière d’éducation sur les sujets relatifs à la chirurgie pédiatrique, l’association a créé un fonds pour l’éducation. Ce fonds a été établi et continue d’exister grâce à la générosité des individus et des associations, de nature médicale ou autre, intéressées par les soins chirurgicaux aux enfants. L’association sollicite annuellement des dons en faveur de son fonds afin de maintenir un fonds de roulement suffisant pour soutenir les programmes d’éducation approuvés par les membres de l’ACCP. Ce fonds est enregistré auprès du gouvernement fédéral et toutes les contributions sont pleinement déductibles d’impôts. Le fonds fait l’objet d’une vérification comptable annuelle.

Les dons pour le fonds d’éducation peuvent être envoyé par courriel à [www.caps.ca](http://www.caps.ca) ou adressé par chèque à :

Juan Bass  
Secrétaire-trésorier de l’ACCP  
Children’s Hospital of Eastern Ontario  
401 Smyth Rd  
Ottawa, Ontario. K1H 8L1  
Email: bass.caps@gmail.com  
Telephone: (613) 737-7600 ext 2799  
Fax: (613) 738-4849
### PRESIDENTS - PRÉSIDENTS

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<tr>
<th>Years</th>
<th>Name</th>
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<td>Harvey Beardmore*</td>
<td>Montreal</td>
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<td>1973-1975</td>
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<td>Vancouver</td>
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* deceased/ décédé

### SECRETARY-TREASURERS

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### PRESIDENTS - PRÉSIDENTS

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# Founding Members

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<td>ASHMORE</td>
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<tr>
<td>BEARDMORE*</td>
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<tr>
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<td>DESJARDINS</td>
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<td>DUCHARME</td>
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<td>DUVAL*</td>
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<tr>
<td>SHRAGOVITCH*</td>
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<td>SIMPSON*</td>
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<tr>
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<tr>
<td>TURCOT*</td>
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* deceased / décédé

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* deceased / décédé

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Le premier CONGRÈS ANNUEL eut lieu le 22 janvier, 1969 à VANCOUVER

1st ANNUAL MEETING was held January 22, 1969 in VANCOUVER
THE COAT OF ARMS OF THE CANADIAN ASSOCIATION OF PAEDIATRIC SURGEONS

LES ARMOIRIES DE L'ASSOCIATION CANADIENNE DE CHIRURGIE PÉDIATRIQUE
Per pale gules and purpure, dexter a scalpel erect entwined by a serpent, sinster a child standing, all argent.
Crest: On the three maple leaves slipped gules and blacked purpure, the date 1967.
Motto: "Je le pensay, Dieu le guérit".

Description
The red and purple of the arms are also the colours of the Royal College of Physicians and Surgeons of Canada and represent the blood met in surgery - arterial and venous. The scalpel with the healing serpent of Aesculapius, and the figure of a well child combine to symbolize the practice of Paediatric Surgery. The crest is the Canadian maple leaf and the founding date of the Association (1967).
The Motto is a quotation from Ambroise Pare, a father of modern surgery. The sixteenth-century French translates, "I treated him, God cured him".

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Au gauche, un bistouri droit entouré d'un serpent alors qu'à droite se tient un enfant, tout argent.
Au sommet se trouvent trois feuilles d'érable ainsi que la date 1967.
Devise: "Je le pensay, Dieu le guérit".

Description
Le rouge et le violet des armoiries sont les couleurs du Collège Royal des Médecins et Chirurgiens du Canada et représentent le sang artériel et veineux vu au cours de la chirurgie. L'association du bistouri avec le serpent guérisseur d'Esculape ainsi qu'avec l'image d'un enfant en bonne santé symbolise la pratique de la chirurgie pédiatrique.

La couronne du blason est la feuille d'érable du Canada et la date de fondation de notre association (1967).
La devise est une citation d'Ambroise Paré, père de la chirurgie moderne.

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Professor of Surgery and Pediatrics
Columbia University, Department of Surgery
New York, New York

Director, Division of Pediatric Surgery
Morgan Stanley Children's Hospital of New York-Presbyterian
(Columbia Campus)
Kaminsky Children's Health Center (Cornell Campus)
New York Presbyterian Hospital

Director
Center for Extracorporeal Membrane Oxygenation
Morgan Stanley Children's Hospital of New York-Presbyterian

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Morgan Stanley Children's Hospital of New York-Presbyterian
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Columbia University Medical Center
The Canadian Association of Paediatric Surgeons is pleased to invite

DR. CHARLES J. H. STOLAR

to give the JPS / Fred MacLeod Annual Lecture.

The visit by Dr. Stolar is made possible with the financial support of Elsevier.

L’Association Canadienne de Chirurgie Pédiatrique est fière d’inviter

DR. CHARLES J. H. STOLAR

À donner la conférence annuelle JPS/ Fred MacLeod.

La visite du Dr Stolar est rendue possible grâce à la générosité de Elsevier.
RESIDENT’S PAPERS

A panel of members from the Publication Committee adjudicates the papers presented by Surgical Residents. There are two award categories: the best Clinical paper and the best Experimental paper. Selection will be made only from the Original Papers Category.

PRÉSENTATIONS DES RÉSIDENTS

Les présentations faites par les résidents en chirurgie sont jugées par un jury constitué des membres du Comité de Publication. Il y a deux catégories: celui du meilleur travail clinique et celui du meilleur travail expérimental (Prix Maria DiLorenzo).

WINNERS OF THE 2006 RESIDENT BEST PAPER AND POSTER AWARDS
PRIX POUR LES MEILLEURES COMMUNICATIONS DES RÉSIDENTS 2006

BEST CLINICAL RESEARCH PAPER
MEILLEUR TRAVAIL CLINIQUE

• 1st prize - Biren Modi - "Ileal Exclusion for Refractory Symptomatic Cholestasis in Alagille Syndrome" – one year Journal of Pediatric Surgery subscription

• 2nd prize - Marianne Beaudin - "Clinical Pathways and Resource Utilization in the Management of Minor Head Trauma in Children" - one year Seminars in Pediatric Surgery subscription

BEST CLINICAL RESEARCH PAPER
MEILLEUR TRAVAIL CLINIQUE

• 1st prize - Biren Modi - "Ileal Exclusion for Refractory Symptomatic Cholestasis in Alagille Syndrome" – one year Journal of Pediatric Surgery subscription

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Dr. MARIA DI LORENZO
BEST BASIC SCIENCE RESEARCH PAPER
MEILLEUR TRAVAIL EXPÉRIMENTAL, PRIX MARIA DI LORENZO

• 1st prize - Robert Baird - "Tracheal Occlusion Upregulates Late Gestation Lung-1 (LGL1), but not Hedgehog (SHH) Expression in the Fetal Rat" - one year Journal of Pediatric Surgery subscription
• 2nd prize - Tatsura Kaji - "Timing of Glucagon-like Peptide-2 Stimulation and Intestinal Adaptation" - one year Seminars in Pediatric Surgery subscription

BEST POSTER- MEILLEURE AFFICHE

• Jackie Allotey - "Physiological Benefits of Performed Silos in the Management of Gastroschisis" - Grosfeld's Pediatric Surgery Textbook

Dr. MARIA DI LORENZO
BEST BASIC SCIENCE RESEARCH PAPER
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L'ASSOCIATION CANADIENNE DE CHIRURGIE PÉDIATRIQUE REMERCIE LES COMMANDITAIRES POUR LEUR CONTRIBUTION

Baxter Corporation
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Olympus Canada Inc
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Thieme Publishers

1. Sponsor of the JPS/Fred MacLeod Lecture and Resident prizes

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O 7 minutes: original paper- présentation originale
R resident’s paper- présentation par résident
C/T 4 minutes case /technique report- présentation de cas ou de technique
P poster presentation- présentation d’affiche

O,R, P Adjudicated-permis
C/T Not adjudicated- non permis
### THURSDAY, AUGUST 23RD, 2007

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<th>End Time</th>
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<td>17:00</td>
<td>Speaker Ready Room</td>
<td>Signal Room - Main Level</td>
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<tr>
<td>10:00</td>
<td>17:00</td>
<td>Executive Board Meeting</td>
<td>Confederation Boardroom 7th floor</td>
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<tr>
<td>14:30</td>
<td>18:00</td>
<td>Registration</td>
<td>Foyer - between Salon A &amp; B</td>
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<tr>
<td>18:00</td>
<td>18:45</td>
<td>CAPSNET steering meeting</td>
<td>Hibernia Boardroom 3rd floor</td>
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<tr>
<td>19:00</td>
<td>22:00</td>
<td>Welcoming Reception</td>
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### FRIDAY, AUGUST 24TH, 2007

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<td>07:00</td>
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<td>Speaker Ready Room</td>
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<tr>
<td>07:00</td>
<td>08:00</td>
<td>Continental Breakfast</td>
<td>Salon A</td>
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<td>08:00</td>
<td>17:00</td>
<td>Office or Storage Room</td>
<td>Garrison Room - Main Level</td>
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<td>07:00</td>
<td>16:00</td>
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<td>15:30</td>
<td>Scientific meeting</td>
<td>Salon B</td>
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<td>08:00</td>
<td>Welcome and Opening Ceremony</td>
<td>Dr. Nathan Wiseman</td>
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<td>08:00</td>
<td>09:31</td>
<td>Scientific session I</td>
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<td>09:55</td>
<td>Coffee Break</td>
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<td>13:10</td>
<td>2 mins slides</td>
<td>Salon B</td>
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<tr>
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<td>13:30</td>
<td>CAPSNET Update &amp; meeting</td>
<td>Salon B</td>
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<td>14:00</td>
<td>Coffee Break</td>
<td>Salon A</td>
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<td>15:30</td>
<td>Scientific Session III Poster session</td>
<td>Salon A</td>
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<td>18:45</td>
<td>CAPSNET steering meeting</td>
<td>Hibernia Boardroom 3rd floor</td>
</tr>
<tr>
<td>19:00</td>
<td>22:00</td>
<td>Welcoming Reception</td>
<td>Court Garden – Lower level</td>
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</tbody>
</table>

### FRIDAY, AUGUST 24TH, 2007

<table>
<thead>
<tr>
<th>Start Time</th>
<th>End Time</th>
<th>Function</th>
<th>Room</th>
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<tbody>
<tr>
<td>06:30</td>
<td>08:00</td>
<td>Meeting: Publication</td>
<td>Hibernia Boardroom</td>
</tr>
<tr>
<td>07:00</td>
<td>17:00</td>
<td>Speaker Ready Room</td>
<td>Signal Room - Main Level</td>
</tr>
<tr>
<td>07:00</td>
<td>08:00</td>
<td>Continental Breakfast</td>
<td>Salon A</td>
</tr>
<tr>
<td>08:00</td>
<td>17:00</td>
<td>Office or Storage Room</td>
<td>Garrison Room - Main Level</td>
</tr>
<tr>
<td>07:00</td>
<td>16:00</td>
<td>Registration</td>
<td>Foyer – between Salon A &amp; B</td>
</tr>
<tr>
<td>08:00</td>
<td>16:00</td>
<td>Exhibits</td>
<td>Salon A</td>
</tr>
<tr>
<td>07:45</td>
<td>15:30</td>
<td>Scientific meeting</td>
<td>Salon B</td>
</tr>
<tr>
<td>07:45</td>
<td>08:00</td>
<td>Welcome and Opening Ceremony</td>
<td>Dr. Nathan Wiseman</td>
</tr>
<tr>
<td>08:00</td>
<td>09:31</td>
<td>Scientific session I</td>
<td></td>
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<tr>
<td>09:31</td>
<td>09:55</td>
<td>Coffee Break</td>
<td>Salon A</td>
</tr>
<tr>
<td>09:55</td>
<td>11:02</td>
<td>Scientific session II</td>
<td></td>
</tr>
<tr>
<td>11:05</td>
<td>12:00</td>
<td>JPS / Fred MacLeod Lecture</td>
<td>Dr. Charles Stolar</td>
</tr>
<tr>
<td>12:00</td>
<td>12:15</td>
<td>Box Lunch</td>
<td>Salon A</td>
</tr>
<tr>
<td>12:15</td>
<td>13:10</td>
<td>2 mins slides</td>
<td>Salon B</td>
</tr>
<tr>
<td>13:10</td>
<td>13:30</td>
<td>CAPSNET Update &amp; meeting</td>
<td>Salon B</td>
</tr>
<tr>
<td>13:30</td>
<td>14:00</td>
<td>Coffee Break</td>
<td>Salon A</td>
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<tr>
<td>14:00</td>
<td>15:30</td>
<td>Scientific Session III Poster session</td>
<td>Salon A</td>
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Dr. Charles Stolar  
**JPS Lecture / Fred MacLeod**  
“Congenital Diaphragmatic Hernia – Infants Becoming Adolescents and Adults”
<table>
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<th>Start Time</th>
<th>End Time</th>
<th>Function</th>
<th>Room</th>
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</thead>
<tbody>
<tr>
<td>06:00</td>
<td>08:00</td>
<td>Meeting: RCPSC</td>
<td>Viking Suite – 1st floor</td>
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<tr>
<td>06:30</td>
<td>08:00</td>
<td>Meeting: Ethics Committee</td>
<td>Hibernia Boardroom</td>
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<tr>
<td>07:00</td>
<td>17:00</td>
<td>Speaker Ready Room</td>
<td>Signal Room</td>
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<td>08:00</td>
<td>Continental Breakfast</td>
<td>Salon A</td>
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<tr>
<td>07:00</td>
<td>12:00</td>
<td>Registration</td>
<td>Foyer – between Salon A &amp; B</td>
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<td>07:00</td>
<td>13:00</td>
<td>Exhibits</td>
<td>Salon A</td>
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<td>08:00</td>
<td>15:00</td>
<td>Office – Storage room</td>
<td>Garrison Room</td>
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<tr>
<td>08:00</td>
<td>12:20</td>
<td>Scientific Meeting</td>
<td>Salon B</td>
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<tr>
<td>08:00</td>
<td>09:38</td>
<td>Scientific Session IV</td>
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<td>Refreshment Break</td>
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<tr>
<td>10:00</td>
<td>11:14</td>
<td>Scientific Session V</td>
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<td>11:20</td>
<td>12:20</td>
<td>Panel Discussion: 40 years of CAPS- From Then to Now</td>
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<tr>
<td>12:30</td>
<td>15:00</td>
<td>Lunch Buffet</td>
<td>Salon C&amp;D</td>
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<tr>
<td>18:00</td>
<td>23:00</td>
<td>Presidential Dinner</td>
<td>GEO Center</td>
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SATURDAY, August 25th, 2007

SATURDAY, August 25th, 2007

Transportation to GEO center at 17:45
<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Title</th>
<th>Authors</th>
<th>Institution</th>
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<tr>
<td>7:45-8:00</td>
<td></td>
<td>President's Welcome: Dr. Nathan Wiseman</td>
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<tr>
<td>8:00-8:07</td>
<td>1 OR</td>
<td>The Current Association Between Meconium Plug Syndrome and Hirschsprung's Disease</td>
<td>S.J. Keckler, S.D. St. Peter, G.W. Holcomb III, D.J. Ostlie, C.L. Snyder</td>
<td>Children's Mercy Hospital, Kansas, MO, USA</td>
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<tr>
<td></td>
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<td></td>
<td>5 minute discussion</td>
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<tr>
<td>8:12-8:19</td>
<td>2 OR</td>
<td>The Quality of Life in Children Following Surgical Repair for Hirschsprung's Disease: From Toddlerdom to Young-Adulthood</td>
<td>J.L.A. Mills, D.E. Konkin, J.G. Penner, M. Langer, E.M. Webber</td>
<td>British Columbia Children's Hospital and the University of British Columbia</td>
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<td>Vancouver, B.C., CANADA</td>
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<td>5 minute discussion</td>
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<tr>
<td>8:36-8:43</td>
<td>4 OR</td>
<td>High Diagnostic Yield of Gastrointestinal Endoscopy in Children with Short Bowel Syndrome</td>
<td>Y.A. Ching, B.P. Modi, T. Jaksic, C. Duggan</td>
<td>Children's Hospital Boston and Harvard Medical School, Boston, MA, USA</td>
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<td>5 minute discussion</td>
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<tr>
<td>9:00-9:04</td>
<td>6 CR</td>
<td>Infantile Hypertrophic Pyloric Stenosis: An Association Between Twins?</td>
<td>G. Yang, G. Brisseau, N. Yanchar</td>
<td>IWK Health Centre, Dalhousie University, Halifax, CANADA</td>
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<td>3 minute discussion</td>
</tr>
<tr>
<td>9:07-9:14</td>
<td>7 OR</td>
<td>Appendiceal Fecalith is Associated with Early Perforation in Pediatric Patients</td>
<td>D.I. Alaedeen, M. Cook, W.J. Chwals</td>
<td>Rainbow Babies and Children’s Hospital, Case Western Medical Center,</td>
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<td>Cleveland, Ohio, USA</td>
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<td>9:31-9:55</td>
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<td>BREAK</td>
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<tr>
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<td>Presenters</td>
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<tr>
<td>10:07-10:11</td>
<td>CR</td>
<td>Intestinal Venous Congestion as a Complication of Elective Silo Placement for Gastroschisis</td>
<td>J. Ryckman, A. Aspirot, J-M. Laberge, K. Shaw</td>
<td>The Montreal Children’s Hospital, Montréal, Québec, CANADA</td>
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<tr>
<td>10:26-10:33</td>
<td>OR</td>
<td>Lack of Consensus Among Canadian Pediatric Surgeons Regarding Management of Congenital Cystic Adenomatoid Malformation (CCAM)</td>
<td>A.Y.S. Lo, S.A. Jones</td>
<td>Kingston General Hospital, Queen’s University, Kingston, CANADA</td>
</tr>
<tr>
<td>10:38-10:45</td>
<td>OR</td>
<td>Extracorporeal Membrane Oxygenation as a Bridge to Definitive Tracheal Reconstruction in Neonates</td>
<td>S.M. Kunisaki, D.O. Fauza, N. Craig, R.W. Jennings</td>
<td>Children’s Hospital, Boston, Massachusetts, USA</td>
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<tr>
<td>10:50-10:57</td>
<td>OR</td>
<td>Outcome Predictors in Congenital Diaphragmatic Hernia (CDH)</td>
<td>R. Baird, Y.C. MacNab, E.D. Skarsgard and the Canadian Pediatric Surgery Network</td>
<td>Children and Women’s Hospital of British Columbia, University of British Columbia, Vancouver, B.C., CANADA</td>
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<tr>
<td>11:05-12:00</td>
<td>OR</td>
<td>JPS/ FRED MACLEOD LECTURE: Congenital Diaphragmatic Hernia – Infants Becoming Adolescents and Adults</td>
<td>Dr. Charles J. Stolar</td>
<td>Morgan Stanley Children’s Hospital of New York-Presbyterian, Columbia University, New York City, N.Y., USA</td>
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<tr>
<td>12:00-12:15</td>
<td>OR</td>
<td>BOX LUNCH BREAK (All)</td>
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<tr>
<td>12:15-13:10</td>
<td>OR</td>
<td>TWO MINUTES TWO SLIDES &amp; VIDEOS</td>
<td>Moderator: Natalie Yanchar</td>
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<tr>
<td>13:10-13:30</td>
<td>OR</td>
<td>CAPSNET UPDATE &amp; MEETING</td>
<td>Moderators: Erik Skarsgard, Jennifer Claydon</td>
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<tr>
<td>13:30 –14:00</td>
<td>OR</td>
<td>BREAK</td>
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</table>
Scientific Session III – POSTER SESSION
Moderator: Peter Ehrlich

14:00 – 15:30

15 PR Diaphragmatic pacing for the treatment of congenital central alveolar hypoventilation syndrome (CCAHS)
A. Ali, H. Flageole
The Montreal Children’s Hospital, Montreal, Quebec, CANADA

16 PR Salvaging the Most Severe Congenital Diaphragmatic Hernias: Is a Silo the Solution?
C.S. Motts Children’s Hospital, University of Michigan, Ann Arbor, Michigan, USA

17 PR Eosinophilic Esophagitis After Tracheosophageal Fistula (TEF) Repair: A Case Series
C. Olivera, M. Zamakhshary, P. Marcon, P. Kim
The Hospital for Sick Children, Toronto, Ontario, CANADA

18 PR A novel technique for safe delivery and application of Mitomycin-C to pediatric esophageal strictures
R. Baird, R. Heran, A. Robinson, G.K. Blair, E.D. Skangard
Children and Women’s Hospital of British Columbia, University of British Columbia, Vancouver, B.C., CANADA

19 PR Versatility of the Circum-Umbilical incision: in Neonatal Surgery
M. Singh, A. Lall, A. Mohee, A. Bianchi, A. Morabito
St Mary’s Hospital, Manchester, ENGLAND

20 PR Chest Radiographs Following Central Line Placement Using Fluoroscopy: Utility or Futility?
B. Ho, S.J. Kercher, T.L. Spilde, K. Tsao, D.J. Ostlie, G.W. Holcomb III, S.D. St. Peter
Children’s Mercy Hospital, Kansas City, Missouri, USA

21 PR Utilization of Simulator Baby for Training in Pediatric Trauma Resuscitation
B. Byrnneski, D. Hochstuhl, E. Deutsch, S. Jones, S.G. Murphy
DuPont Hospital for Children, Thomas Jefferson University, Wilmington, Delaware, USA

22 PR Surgical Correction of Pectus Excavatum (PE): A Descriptive Comparison of Outcomes including Postoperative Quality of Life (QoL), between the Nuss and Ravitch procedures
M.C.W. Lam, A.F. Klassen, J.G. LeBlanc, E.D. Skangard
Children and Women’s Hospital of British Columbia, University of British Columbia, Vancouver, B.C., CANADA

23 PR Novel use of Vacuum Assisted Closure (VAC) Therapy in Complex Cystic Hygroma
C.M. Finck, M. Moront, M.C. Crisanti, C. Newton, R. Supernia
St Christopher’s Hospital for Children, Philadelphia, PA, USA

24 PR Intussusception: Eight Year Review of the Imaging and Management.
A. Aziz, S. Parann, R.J. Fitzgerald
Our Lady’s Hospital for Sick Children, Crumlin, Dublin, IRELAND

25 PR Advantages of the Distal Sigmoid Colostomy in the Management of Infants with Short Bowel Syndrome
I.R. Diamond, P.W. Wales
The Hospital for Sick Children, Toronto, Ontario, CANADA

26 PR CCK Receptor Positivity in Children with Chronic Acalculus Gallbladder Dysfunction (CAGD). A Pilot Study to Investigate the Aetiology of CAGD
G. Karplus, P.R. Ruiz, D.G. Thomas, P.F. Ehrlich
C.S. Motts Children’s Hospital, University of Michigan, Ann Arbor, Michigan, USA

27 P Membranous Stenosis of the Hepatic Duct at the Porta Hepatis in Children with Choledochal Cyst
H. Kimmoto, T. MourI
Ibaraki Children’s Hospital, Mito, JAPAN
<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Title</th>
<th>Presenters</th>
<th>Institution</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:00-8:07</td>
<td>28 OR</td>
<td>Blunt Intra-abdominal Arterial Injury in Pediatric Trauma Patients: injury distribution and markers of outcome</td>
<td>C.E. Hamner, J.I. Groner, D.A. Caniano, J.R. Hayes, B.D. Kenney</td>
<td>Columbus Children’s Hospital, Ohio State University, Columbus, OH, USA</td>
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<tr>
<td>8:12-8:19</td>
<td>29 OR</td>
<td>Traumatic Pseudo-Aneurysms of the Liver and Spleen: Should We Worry?</td>
<td>P. Beaudry, A. Abdalwahab, J.J. Murphy</td>
<td>Children and Women’s Hospital of British Columbia, University of British Columbia, Vancouver, B.C., CANADA</td>
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<tr>
<td>8:24-8:31</td>
<td>30 OR</td>
<td>Are Children Protected from Post-Traumatic Multiple Organ Failure (MOF)? Inflammatory Mediators (IL-6, IL-8, sICAM) are Reduced in Children Relative to Adults Following Injury</td>
<td>J.P. Roach, D.A. Partrick, E.E. Moore, J.L. Johnson, D.D. Bensard, R.C. McIntyre Jr.</td>
<td>The Children’s Hospital Denver, The University of Colorado Health Sciences Center, Denver Colorado, USA</td>
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<tr>
<td>8:36-8:43</td>
<td>31 OR</td>
<td>Acute Chest Syndrome After Splenectomy in Children with Sickle Cell Disease</td>
<td>S. Ghantous, S. Al Mulhim, F. Shalak, S. Yazbeck</td>
<td>Dhahran Health Center, Dhahran, SAUDI ARABIA</td>
<td></td>
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<tr>
<td>8:48-8:52</td>
<td>32 CR</td>
<td>Obstructive Neonatal Respiratory Distress: Infected Pyriform Sinus Cyst</td>
<td>A.S. de Buys Roessingh, M-C. Quintal, J. Dubois, A.L. Bensoussan</td>
<td>CHU Sainte-Justine, Montreal, Quebec, CANADA</td>
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<tr>
<td>8:55-9:02</td>
<td>33 OR</td>
<td>Granulocyte Colony Stimulating Factor (GCSF) Alters Phenotype of SK-N-SH Neuroblastoma cells</td>
<td>A.N. Gay, L. Rutland, B. Naik-Mathuria, L. Yu, O.O. Olutoye</td>
<td>Baylor College of Medicine, Houston, TX, USA</td>
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<tr>
<td>Time</td>
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<tr>
<td>9:19-9:23</td>
<td>TR</td>
<td>35</td>
<td>Intraoperative Radioactive Iodine Localization of Residual Metastatic Thyroid Carcinoma in Children: A Case Report</td>
<td>CHU Sainte-Justine &amp; CHUM-Notre-Dame, Montreal, Quebec, CANADA</td>
<td>3 minute</td>
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<tr>
<td>9:38-10:00</td>
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<td>BREAK</td>
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<tr>
<td>10:00-10:07</td>
<td>OR</td>
<td>37</td>
<td>Treatment of Ingrown Toenails in the Pediatric Population</td>
<td>IWK Health Centre, Dalhousie University, Halifax, Kingston General Hospital, Queen’s University, Kingston, CANADA</td>
<td>5 minute</td>
</tr>
<tr>
<td>10:12-10:19</td>
<td>OR</td>
<td>38</td>
<td>The Frequency of Apneas in Premature Infants After Inguinal Hernia Repair: Do They Need Overnight Monitoring in the ICU?</td>
<td>J.J. Murphy, T. Swanson, M. Ansermino, R. Milner, B.C. Children’s Hospital, University of British Columbia, Vancouver, British Columbia, CANADA</td>
<td>5 minute</td>
</tr>
<tr>
<td>10:36-10:40</td>
<td>TR</td>
<td>40</td>
<td>Thoracoscopic-Assisted Central Line Placement for a Thrombosed SVC</td>
<td>A. Moustafa, A. Talukder, A. Al Qahtani, King Khalid University Hospital and College of Medicine, Riyadh, SAUDI ARABIA</td>
<td>3 minute</td>
</tr>
<tr>
<td>10:43-10:47</td>
<td>TR</td>
<td>41</td>
<td>Combined Endovascular and Surgical Recanalization After Central Venous Catheter-Related Obstructions</td>
<td>A.S. de Buys Roessingh, A. M. Joseph, University Hospital Center of the Canton of Vaud (CHUV), Lausanne, SWITZERLAND</td>
<td>3 minute</td>
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<td>10:50-10:57</td>
<td>O</td>
<td>42</td>
<td>Laparoscopic Placement of Peritoneal Dialysis Catheters</td>
<td>G. Stringel, W.J. McBride, R. Weiss, Maria Fareri Children’s Hospital, New York Medical College, Valhalla, NY, USA</td>
<td>5 minute</td>
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<tr>
<td>11:02-11:09</td>
<td>OR</td>
<td>43</td>
<td>Utilization of Internet-Based Animations to Understand Procedures</td>
<td>S. Ramesh, G. Jones, P.J. Wolfson, S.G. Murphy, DuPont Hospital for Children, Thomas Jefferson University, Wilmington, Delaware, USA</td>
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<td>11:20-12:20</td>
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<td>BREAK</td>
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<td>12:30-15:00</td>
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<td>CAPS BUSINESS MEETING</td>
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<td>07:00</td>
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<td>Continental Breakfast</td>
<td>Salon A</td>
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<td>08:00</td>
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<td>Registration</td>
<td>Foyer – between Salon A &amp; B</td>
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<td>08:00</td>
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<td>Exhibits</td>
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<td>08:00</td>
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<td>Scientific Session</td>
<td>Salon B</td>
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<td>08:00</td>
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<td>Scientific Session VI</td>
<td>Salon A</td>
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<td>09:20</td>
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<td>Refreshment Break</td>
<td>Salon A</td>
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<td>09:45</td>
<td>10:32</td>
<td>Scientific Session VII</td>
<td>Salon A</td>
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<td>10:32</td>
<td>10:50</td>
<td>CAPS</td>
<td>Traveling Resident's Report</td>
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<td>10:50</td>
<td>11:00</td>
<td>President's Closing Remarks</td>
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**ADJOURNEMENT**
# Scientific Session VI
**Moderators:** Mary Santos, Robin Eccles

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Type</th>
<th>Title</th>
<th>Authors</th>
<th>Location</th>
<th>Discussion</th>
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<tr>
<td>08:00-08:07</td>
<td>44 O</td>
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<td>The Increasing Incidence of Snowboard-Related Trauma</td>
<td>J.R. Hayes, J.I. Groner</td>
<td>Columbus Children’s Hospital, Ohio State University College of Medicine</td>
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<td>08:24-08:31</td>
<td>46 O</td>
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<td>Using multiple imputation and propensity scores to test the effect of car seats and seat belt usage on injury severity from trauma registry data.</td>
<td>J.R. Hayes, J.I. Groner</td>
<td>Columbus Children’s Hospital, Ohio State University College of Medicine</td>
<td>5 minute</td>
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<td>08:36-08:43</td>
<td>47 O</td>
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<td>Gastro-esophageal reflux in caustic stenosis of the esophagus in children</td>
<td>O. Reinberg, M-C. Osterheld, S. Tercier, K. Meagher-Villemure, F. Gudinchet, L. Alamo-Maestre</td>
<td>University Hospital Center and University of Lausanne, Lausanne, SWITZERLAND</td>
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<td>08:48-08:55</td>
<td>48 O</td>
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<td>Primary Anterior Cricoid Split, the Better Alternative to Tracehostomy, Can Also be Performed by Paediatric Surgeons</td>
<td>H. Lindahl</td>
<td>Children’s Hospital, University of Helsinki, Helsinki, FINLAND</td>
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<td>09:00-09:07</td>
<td>49 O</td>
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<td>Non-interventional treatment of selected head and neck lymphatic malformations</td>
<td>R. Dasgupta, D. Adams, R. Elluru, M.S. Wentzel, R. Azizkhan</td>
<td>Cincinnati, OH, USA</td>
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<td>09:12-09:16</td>
<td>50 T</td>
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<td>Extensive Small Bowel Tapering in Chronic Intestinal Pseudo-Obstruction</td>
<td>P. Fitzgerald, W. Alfadhili, R. Issenman</td>
<td>McMaster Children’s Hospital, Hamilton, Ontario, CANADA</td>
<td>3 minute</td>
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9:19-9:45 | BREAK |
Scientific Session VII
Moderators: BJ Hancock, Javed Akhtar

09:45-09:52 51 O  Experience with a Non-Laparoscopic, Transumbilical, Intra-Cavitary Pyloromyotomy
M.W.L. Gauderer
Children's Hospital, Greenville Hospital System University Medical Center
Greenville, South Carolina, USA
5 minute discussion

9:57-10:04 52 O  Is intraabdominal abscess commoner after laparoscopic appendicectomy in children?
F. Chindewere, U. Samarakkody
Waikato Hospital, Hamilton, NEW ZEALAND
5 minute discussion

10:09-10:16 53 O  Thoracoscopic Sympathectomy in Youngsters with Palmar Hyperhidrosis
- Eleven Years of Experience -
D. Kravarusic, E. Freud
Schneider Children's Medical Center, Sackler Medical School, University of Tel Aviv, Israel
5 minute discussion

10:21-10:28 54 O  Ten Things We Knew "For Sure" 50 Years Ago
G.S. Cameron, B.H. Cameron
McMaster Children's Hospital, Hamilton, Ontario, CANADA
5 minute discussion

10:32:10:50  CAPS Traveling Resident's Report
G. Aspelund, T. Gerstle
The Hospital for Sick Children, Toronto, Ontario, CANADA

10:50-11:00  President's Closing Remarks
Dr. Geoffrey Blair

Meeting Adjourned
Have a Safe Trip Home!
See you in Toronto in 2008!
ABSTRACTS

O 7 minutes : original paper- présentation originale
R resident's paper- présentation par résident
C/T 4 minutes case /technique report- présentation de cas ou de technique
P poster presentation- présentation d'affiche

O,R, P Adjudicated-permis
C/T Not adjudicated- non permis
The Current Association Between Meconium Plug Syndrome and Hirschsprung's Disease

Scott J. Keckler, Shawn D. St. Peter, George W. Holcomb III, Daniel J. Ostlie, Charles L. Snyder

BACKGROUND:
The significance of meconium plug syndrome is dependent on the underlying diagnosis. The incidence of pathology, particularly Hirschsprung's disease, contributing to the presence of these plugs, has been debated. However, there are little recent data in the literature. Therefore, we reviewed our experience with meconium plugs as a cause of abdominal distension to evaluate the associated conditions and incidence of Hirschsprung's disease.

METHODS:
We reviewed the records of newborns with meconium plugs found in the distal colon on contrast enema from 1994-2007. Demographics, radiologic findings, histologic findings, operative findings, and clinical courses were reviewed.

RESULTS:
77 patients were identified. Mean gestational age was 37.4 weeks and birth weight 2977gm. Hirschsprung's disease was found in 10 patients (13%). One had ultra-short segment disease and another had total colonic aganglomania. Maternal diabetes was identified in six patients. No patients were diagnosed with cystic fibrosis, meconium ileus, malrotation or intestinal atresia.

CONCLUSION:
Meconium plugs found on contrast enema are associated with a 13% incidence of Hirschsprung's disease in our experience. While all patients with plugs and persistent abnormal stooling patterns should prompt a rectal biopsy and genetic probe, the incidence of Hirschsprung's and cystic fibrosis may not be as high as previously reported.

Sponsoring CAPS member: Jean-Martin Laberge

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THE QUALITY OF LIFE IN CHILDREN FOLLOWING SURGICAL REPAIR FOR HIRSCHSPRUNG’S DISEASE: FROM TODDLERDOM TO YOUNG-ADULTHOOD

Jessica L.A. Mills, David E. Konkin, Janice G. Penner, Monica Langer, Eric M. Webber
Division of Pediatric General Surgery, British Columbia Children’s Hospital and the University of British Columbia, Vancouver, B.C.

Background/Purpose: Little is known about the quality of life of children with Hirschsprung’s disease as they grow older. The purpose of this study was to measure the quality of life (QOL) and bowel function of these children as they mature.

Methods: All children who were surgically treated for Hirschsprung’s disease at BC Children’s Hospital between 1986 and 2003 were invited to participate. Each family was sent three previously validated questionnaires exploring current QOL and bowel function.

Results: Fifty one families participated (63%). Both constipation and fecal continence were significant predictors of overall QOL in the univariate analysis. In the multivariate analysis only fecal continence and gender were significantly associated with overall QOL scores but subscale analysis showed a significant relationship between increasing age and improved psychosocial QOL. Age was not predictive of QOL in either univariate or multivariate analysis.

Conclusions: Fecal continence and not age is the most important predictor of overall QOL of children surgically treated for Hirschsprung’s disease. Although the physical impact of incontinence affects all age groups, older children appear to compensate for their physical limitations and achieve a relatively higher psychosocial QOL. Our study indicates that interventions for children with incontinence may offer gains in QOL as well as bowel function.

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CHANGING THE PARADIGM: OMEGAVEN FOR THE TREATMENT OF LIVER FAILURE IN PEDIATRIC SHORT BOWEL SYNDROME

Paul W Wales, Ivan R Diamond, Anca Sterescu, Paul P Pencharz, Jae H Kim

Group for Improvement of Intestinal Function and Treatment (GIFT)

The Hospital for Sick Children, Toronto, Canada

Background: Substitution of parenteral nutrition (PN) Omega-6 fatty acids for Omega-3 fatty acids, such as Omegaven®, may benefit the 25% of patients with pediatric short bowel syndrome (SBS) who develop liver failure.

Methods: Retrospective review of 9 infants with SBS and advanced liver disease started on Omegaven® (target n6:n3 ratio = 1-2) during 2006. Liver function along with enteral tolerance and septic episodes will be presented graphically over the treatment course.

Results: Median age 7.7 (range: 3.5 – 45.8) months [5 males]. Mean PN duration prior to Omegaven was 218 days, and mean initial conjugated bilirubin was 180 mmol/L. Of the 9 patients, 6 had complete and sustained resolution of hyperbilirubinemia within a median of 118 days, and all were de-listed for transplantation. Two had a mean bilirubin reduction of 30% with a mean of 76 days of therapy, with ongoing improvement. One patient was transplanted while on Omegaven®. Enteral tolerance didn't change meaningfully. There were no complications, and no deaths.

Conclusion: Omegaven® has the ability to restore liver function in SBS patients with advanced liver disease. This provides time for ongoing gut adaptation, or in patients with no adaptive potential it permits survival until an intestinal transplant is possible.

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High Diagnostic Yield of Gastrointestinal Endoscopy in Children with Short Bowel Syndrome

Y. Avery Ching1,2, Biren P. Modi1,2, Tom Jaksic1,2, Christopher Duggan1,2
From the 1Center for Advanced Intestinal Rehabilitation (CAIR), 2Department of Surgery and 2Division of Gastroenterology and Nutrition, Children’s Hospital Boston and Harvard Medical School, Boston, MA, USA

**Background:** Children with short bowel syndrome (SBS) often have gastrointestinal (GI) symptoms, including bleeding, increased stool output, and feeding intolerance. The utility of endoscopic assessment of these symptoms has not been widely reported. This report evaluates the diagnostic yield of GI endoscopy in the setting of SBS.

**Methods:** After IRB approval, we reviewed the medical records (including endoscopy, pathology and microbiology data) of SBS patients who underwent endoscopy between September 1999 and March 2007.

**Results:** 27 patients underwent 61 GI endoscopies: 34 esophagogastroduodenoscopies, 17 colonoscopies, 7 flexible sigmoidoscopies, and 3 ileoscopies. Indications for endoscopy, which were not mutually exclusive, included chronic diarrhea (39%, n=24), GI bleeding (36%, n=22), suspected bacterial overgrowth (36%, n=22), and suspected peptic ulcer disease (15%, n=9). Based on gross endoscopic appearance, histopathology, or microbiology, 43 (70%) procedures yielded abnormalities. These included infectious (20%, n=12), anatomic (18%, n=11), peptic (15%, n=9), allergic (15%, n=9), and other (3%, n=2) etiologies. 13 of 15 (87%) duodenal cultures grew a spectrum of 17 bacterial species. Overall, 24 of 27 patients (89%) had gross endoscopic, histopathologic or microbiologic abnormalities.

**Conclusions:** In pediatric SBS patients, diagnostic upper and lower GI endoscopies yield high rates of abnormalities and can help guide clinical management.

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High Diagnostic Yield of Gastrointestinal Endoscopy in Children with Short Bowel Syndrome

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Endoscopic Injuries in Children: Incidence, Management, and Outcomes

Iqbal CW, Askegard-Giesmann JR, Pham TH, Ishitani MB, Moir CR
Department of General Pediatric Surgery, Mayo Clinic Rochester, Rochester, MN

Background: Endoscopy has assumed a significant role in managing gastrointestinal disorders. However, endoscopic-related injuries are poorly reported.

Methods: Review of surgical database (1980-2006) identified all patients age <18yrs with an endoscopic-related injury at our institution. Data was obtained via chart review.

Results: 3,269 colonoscopies were performed; there were 3 iatrogenic perforations (incidence 0.09%). All were managed operatively: 2 required fecal diversion, and one was repaired primarily. There was 1 post-operative complication (internal hernia), and no deaths related to colonoscopic perforation. 9,308 esophagastroduodenoscopies (EGD) were performed resulting in 6 iatrogenic injuries: bleeding (2), perforation (2), and mucosal tears (2) (incidence 0.02% each). All EGD-related injuries occurred in the esophagus except for 1 duodenal perforation with diffuse peritonitis managed operatively by primary repair. Both patients with bleeding complications underwent repeat endoscopy and cautery with satisfactory results. The other 3 patients were managed conservatively without complication. 389 endoscopic retrograde cholangiopancreatograms (ERCP) were performed with 2 iatrogenic injuries: 1 bleed and 1 perforation (incidence 0.25% each). Both were managed conservatively without complication.

Conclusion: Endoscopic injuries are uncommon. Colonoscopic perforations require prompt surgical intervention. EGD and ERCP-related injuries are amenable to conservative therapy in clinically stable patients devoid of peritonitis.

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INFANTILE HYPERTROPHIC PYLORIC STENOSIS: AN ASSOCIATION BETWEEN TWINS?

Gaby Yang, Guy Brisseau, Natalie L. Yanchar
Division of Pediatric General Surgery, IWK Health Centre, Dalhousie University, Halifax, Canada

**Background:** The etiology of IHPS still remains a mystery. Some suspected risk factors include: birth rank, maternal age, sex, family history, and monozygosity in twins. Various theories attempt to explain the etiology of IHPS. Scientific research suggests that enteric neuronal damage and nitric oxide synthase dysfunction may be implicated, but the consensus is that environmental modification must exist to account for the variability in its occurrence.

**Cases:** Four cases of concordant occurrences of IHPS in twins were examined to determine history and outcome of IHPS development in twins. Three sets were dizygotic and one monozygotic. Of the 8 infants, 3 were female, including the one monozygotic pair. In all four cases a time lag existed between the development of symptomatic onset of IHPS in twin A and twin B. In one set, sonographic confirmation, performed because of IHPS diagnosis in the twin sibling, occurred concurrently with onset of vomiting, leading to early surgery before fluid and electrolyte imbalances developed.

**Conclusions:** Despite the lack of agreement as to whether the cause of IHPS is genetic, environmental, or both, the high concordance rate seen in twins is indisputable. Empirical evidence thus provides credence to examine the asymptomatic co-twin when one of twins presents with IHPS.

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APPENDICEAL FECALITH IS ASSOCIATED WITH EARLY PERFORATION IN PEDIATRIC PATIENTS

Diya I. Alaedeen, MD, Marc Cook, MS, and Walter J. Chwals, MD
Rainbow Babies and Children's Hospital
Case Western Medical Center
Cleveland, Ohio, USA

Background/Purpose:
A fecalith is a fecal concretion that can obstruct the appendix leading to acute appendicitis. We hypothesized that the presence of a fecalith would lead to an earlier appendiceal perforation.

METHODS:
Between January 2001 and December 2005 the charts of all patients younger than 18 years old who underwent appendectomy at our institution were reviewed. Duration of symptoms, and timing between presentation and operation were noted along with radiological, operative and pathological findings.

RESULTS:
There were 418 patients who met the study criteria. A fecalith was present in 28.7% of patients (N=120). The appendix was perforated in 57.5% of patients who had a fecalith versus 31.8% in patients without a fecalith (p<0.001). The overall rate of interval appendectomies was 11%. A fecalith was present on the initial radiological studies of 35% of the patients who had interval appendectomies, and the appendix was perforated significantly sooner in these patients when compared to those without a fecalith (91 vs. 150 hours, P= 0.036).

CONCLUSION:
The presence of fecalith is associated with earlier and higher rates of appendiceal perforation in pediatric patients with acute appendicitis. An expedient appendectomy should therefore be performed in the pediatric patient with a radiological evidence of fecalith.

Sponsoring CAPS member: Dr. Jean-Martin Laberge

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Outcome of laparoscopic appendectomy for perforated appendicitis in children- A single center experience

Esmaeel Taqi, M.D., Wendy Su, M.D., Ann Aspirot, M.D.; Jon Ryckman, M.D.; Pramod Puligandla, M.D.,

Hélène Flageole, M.D.

and Jean-Martin Laberge, M.D.

Division of Pediatric General Surgery, Montreal Children's Hospital, McGill University Health Centre, Montreal, Canada

Background: To evaluate the outcome of Laparoscopic (LA) versus Open appendectomy (OA) in patients with perforated appendicitis in our center.

Method: Retrospective review from June 2002-January 2007 (IRB approved), evaluating 269 patients with perforated appendicitis based on approach. We compared demographics, mean operative time (MOT), length of stay (LOS), infectious complications and follow-up in patients with OA (n=210) and LA (n=59).

Results: LA patients were significantly older (12 versus 9.5 years), heavier (50 kg versus 37 kg) and more frequently female (47% versus 34%). MOT was longer in LA (74 versus 50 minutes). Median LOS was 5 days in LA and 6 in OA. Post-operative intra-peritoneal collections were not increased in LA patients (13.5%LA versus 16.6%OA; P = 0.689). Few patients in each group required a drainage procedure for a persistent abscess (LA 3.5%, OA 4.7%; P=1.0). LA patients had less wound infections (1.7% versus 9.5%; P = 0.054) and less follow-up needed (more than two clinic visits 5.3% versus 16.1%; P=0.031).

Conclusion: LA has a shorter median LOS, a trend towards less post-operative infectious complications and fewer clinic visits than OA, which makes it a safe and effective procedure for patients with perforated appendicitis.

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IMPACT OF MATERNAL SUBSTANCE ABUSE ON CHILDREN WITH GASTROSCHISIS

Robert L. Weinsheimer, Natalie L. Yanchar Canadian Pediatric Surgery Network
Division of Pediatric General Surgery, IWK Health Centre, Dalhousie University, Halifax, Nova Scotia

Background: Conflicting information exists regarding the effects of maternal substance abuse on gastroschisis. The objectives of this study are to determine if maternal smoking leads to an increased incidence of gastroschisis, and whether substance abuse is associated with the severity of gastroschisis.

Methods: The Canadian Pediatric Surgery Network (CAPSNET) database was evaluated for associations between maternal substance abuse and the severity of the gastroschisis. We also compared smoking rates from this group to overall Canadian maternal smoking rates.

Results: 114 cases of gastroschisis acquired over 18 months were evaluated. After adjusting for covariates, illicit drug use was associated with bowel necrosis (OR=9.4, 95%CI:1.1-77) and marijuana use with severe matting of the intestines (OR=4.2, 95%CI:1.1-17). Functional outcomes assessment revealed that slower initiation of enteral feeds was associated with maternal smoking (OR=3.8, 95%CI:1.3-12). The overall maternal smoking rate in this cohort (30.7%) was higher than the known Canadian rate (19.4%). This may be accounted for by the considerably higher smoking rate of mothers age 20-24 in our cohort (49%).

Conclusions: Substance abuse is associated with a greater severity of gastroschisis in terms of both the degree of intestinal injury and functional outcomes. High smoking rates among young mothers may be putting children with gastroschisis at risk for poor outcomes.

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Intestinal venous congestion as a complication of elective silo placement for gastroschisis

Jon Ryckman, Ann Aspirot, Jean-Martin Laberge, Kenneth Shaw
Division of Pediatric Surgery, The Montreal Children's Hospital, Montréal, Québec, Canada, H3H 1P3

Purpose: Use of a spring-loaded silastic silo has been advocated as a means of gentle reduction of the herniated bowel while avoiding the possible complications of primary closure of gastroschisis. We recently treated two babies who suffered intestinal venous congestion during elective silo reduction of gastroschisis.

Methods: Case report

Results: Two babies with gastroschisis were treated post-delivery with a spring-loaded silo placed under the fascial defect and the eviscerated bowel suspended within the silo. Patient #1 had no bowel matting. On day of life two, the bowel within the silo was noted to be dusky. The silo was removed, the bowel was indeed congested, but viable. Complete reduction with a Bianchi closure was performed at the bedside. Patient #2 had severe matting of the bowel and did not require intubation for silo placement. As daily reductions progressed, the bowel was noted to be congested on day two. On day three, removal of the silo revealed frank bowel necrosis with impending perforation. Two-thirds of the small bowel required resection, leaving the child with short bowel.

Conclusion: Venous congestion within a silo should be given prompt attention, including removal of the silo, as bowel infarction may result.

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GASTROSCHISIS CLOSURE - DOES METHOD REALLY MATTER?

Robert L. Weinsheimer, Natalie L. Yanchar and The Canadian Pediatric Surgery Network

Division of Pediatric General Surgery, IWK Health Centre, Dalhousie University, Halifax, Nova Scotia

Background: Management of gastroschisis varies. This study aims to determine which aspects of practice influence outcomes.

Methods: All cases of uncomplicated gastroschisis in the CAPSNET database were analyzed, looking at methods of preoperative bowel protection, timing and success of primary of closure, closure techniques, and intraperitoneal pressure (IPP) monitoring. Outcomes assessed included time to onset of enteral feeds, duration on TPN, and length of stay (LOS).

Results: 99 cases were assessed. After adjusting for covariates, preoperative silo use was associated with a 37-fold increased risk of closure being delayed beyond 24 hours (OR=40.95%CI:10-158) and longer duration on TPN (OR=6.4.95%CI:1.1-34) but not longer LOS. Cases with successful primary closure had a reduced risk of prolonged time on TPN (OR=0.1.95%CI:0.01-0.9) while high post-closure peak inspiratory pressures (>20 mm H2O) increased it significantly. IPP monitoring and closure technique had no effect on outcomes. Prolonged LOS (>37d) was associated only with closure established beyond the first day of life (OR=3.1.95%CI:1.1-8.9), likely reflecting cases that failed primary closure, which independently predicted prolonged LOS (OR=10.95%CI:1.1-100).

Conclusions: Methods of preoperative bowel protection and closure techniques have no effect on ultimate outcome of cases of uncomplicated gastroschisis. Closure established beyond the first day of life, however, may predict longer LOS, especially if associated with a failure of primary closure.

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GASTROSCHISIS CLOSURE - DOES METHOD REALLY MATTER?

Robert L. Weinsheimer, Natalie L. Yanchar and The Canadian Pediatric Surgery Network

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Background: Management of gastroschisis varies. This study aims to determine which aspects of practice influence outcomes.

Methods: All cases of uncomplicated gastroschisis in the CAPSNET database were analyzed, looking at methods of preoperative bowel protection, timing and success of primary of closure, closure techniques, and intraperitoneal pressure (IPP) monitoring. Outcomes assessed included time to onset of enteral feeds, duration on TPN, and length of stay (LOS).

Results: 99 cases were assessed. After adjusting for covariates, preoperative silo use was associated with a 37-fold increased risk of closure being delayed beyond 24 hours (OR=40.95%CI:10-158) and longer duration on TPN (OR=6.4.95%CI:1.1-34) but not longer LOS. Cases with successful primary closure had a reduced risk of prolonged time on TPN (OR=0.1.95%CI:0.01-0.9) while high post-closure peak inspiratory pressures (>20 mm H2O) increased it significantly. IPP monitoring and closure technique had no effect on outcomes. Prolonged LOS (>37d) was associated only with closure established beyond the first day of life (OR=3.1.95%CI:1.1-8.9), likely reflecting cases that failed primary closure, which independently predicted prolonged LOS (OR=10.95%CI:1.1-100).

Conclusions: Methods of preoperative bowel protection and closure techniques have no effect on ultimate outcome of cases of uncomplicated gastroschisis. Closure established beyond the first day of life, however, may predict longer LOS, especially if associated with a failure of primary closure.

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LACK OF CONSENSUS AMONG CANADIAN PEDIATRIC SURGEONS REGARDING MANAGEMENT OF CONGENITAL CYSTIC ADENOMATOID MALFORMATION (CCAM)

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Background: Review of the literature suggests there is lack of consensus regarding the management of antenatally diagnosed CCAM which is asymptomatic at birth. This study aims to describe the variability among Canadian pediatric surgeons in how this pathology is managed.

Methods: Surveys were sent to all practicing Canadian CAPS members. Responders were asked to state whether they recommend resection or non-operative management, and to describe the follow-up imaging type and frequency employed.

Results: A 69% response rate was obtained. There was no consistency regarding the imaging modality used to detect asymptomatic CCAM. 70% of responders recommend resection of persistent but asymptomatic CCAM: there was no consensus with regard to age at which resection is performed (2 to 18 months), nor technical considerations at resection (61% open, 83% lobectomy). Among those responders who do not recommend resection, the frequency of follow-up was variable (every 3 months to every year), as were the imaging modality employed, and the length of follow-up (3 years to indefinitely); 80% of neonates in whom non-operative management was recommended initially, ultimately underwent resection.

Conclusion: Lack of consensus among Canadian pediatric surgeons, and even within institutions, regarding the management of antenatally diagnosed CCAM in the asymptomatic neonate, is demonstrated. This clearly highlights the need for prospective studies.

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EXTRACORPOREAL MEMBRANE OXYGENATION AS A BRIDGE TO DEFINITIVE TRACHEAL RECONSTRUCTION IN NEONATES

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Background: Neonates born with severe tracheal anomalies may not survive beyond the first few hours of life without aggressive cardiopulmonary support and/or emergent airway surgery. The purpose of this study was to review our experience with neonates born with tracheal anomalies who were emergently supported on extracorporeal membrane oxygenation (ECMO) prior to tracheal reconstruction.

Methods: An 8-year retrospective review of neonates with tracheal anomalies requiring preoperative ECMO was conducted.

Results: Three children with tracheal anomalies (complete tracheal rings, n=2; bronchogenic cyst, n=1) were identified in our series. All were placed on ECMO (venovenous, n=2; venoarterial, n=1) within 24 hours after birth. Definitive tracheal reconstruction (resection with end-to-end anastomosis, n=2; slide tracheoplasty and free graft, n=1) was performed at mean of 3.7 days of life. There were no hemorrhagic complications over a mean ECMO time of 117.3 hours. The mean postoperative times until extubation and hospital discharge were 12 days and 34 days, respectively. All children remain alive and well without cardiopulmonary sequelae at a mean follow up of 4.5 years.

Conclusion: To our knowledge, this is the first series describing excellent, long-term outcomes in children born with severe tracheal anomalies who were managed by extracorporeal membrane oxygenation as a bridge to definitive tracheal reconstruction.

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**Background:** A validated risk stratification tool for CDH is required for accurate outcomes analyses. Mortality-predictive models have been derived from the CDH Study Group using birth weight and 5 minute Apgar score, and the Canadian Neonatal Network using gestational age (GA) and admission SNAP-II (Score Neonatal Acute Physiology version II). The purpose of this study was to evaluate the calibration and discrimination of these predictive models using the Canadian Pediatric Surgical Network (CAPSNET) dataset.

**Methods:** Neonatal risk variables and birth hospital survivorship were collected prospectively in a 14 centre CDH cohort over 18 months. Logistic regression was performed to test the calibration (goodness of fit between predicted and actual outcomes) and discrimination of both predictive models.

**Results:** 13 of 70 (19%) infants with CDH died during their birth hospitalization. Calibration (AUC) and discrimination of both models is shown below:

<table>
<thead>
<tr>
<th>Variable</th>
<th>CDHSG model (birth weight + 5 min Apgar)</th>
<th>CNN model (GA + SNAP-II)</th>
<th>SNAP-II only</th>
</tr>
</thead>
<tbody>
<tr>
<td>AUC</td>
<td>0.85</td>
<td>0.787</td>
<td>0.784</td>
</tr>
<tr>
<td>$X^2$</td>
<td>6.543</td>
<td>12.267</td>
<td></td>
</tr>
</tbody>
</table>

AUC: Area Under Curve

**Conclusion:** Using the CAPSNET dataset, the CNN model had comparable calibration but poorer discrimination than the CDHSG model (due to the poor predictive performance of GA). SNAP-II remains a robust predictor of survival in the CAPSNET dataset and could be used to risk adjust cases in future analyses of treatment and outcome.

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Diaphragmatic pacing for the treatment of congenital central alveolar hypoventilation syndrome (CCAHS)

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Purpose:
Congenital central alveolar hypoventilation syndrome (CCAHS), known as Ondine's curse, is characterized by absence of autonomic control of respiration. The purpose of our study is to review our 20-year experience with diaphragmatic pacing to treat CCAHS.

Methods:
After obtaining IRB approval, the medical records of all patients in the diaphragmatic pacing program at the Montreal Children's Hospital were reviewed. In addition to demographic details, associated anomalies were noted. Data regarding age at surgery, technical approach, complications, particularly equipment replacement were noted. We were interested in the long-term outcome, notably their quality of life.

Results:
Patients are comprised of 4 females and 2 males. Their age ranges between 4 to 23 years. They were operated at an average age of 47.8 months. Surgical approach utilized was mainly bilateral axillary thoracotomy. Internal component failure is the most common complication. All patients are ventilator-free during daytime. They all are active, productive, either attending school or working full-time.

Conclusion:
Diaphragmatic pacing is an effective treatment for Ondine's disease. As equipment improved, there is much less need for replacement of components. Patients can lead a more normal existence by being ventilator-free at least during the day, enabling them to participate in normal daily activities.

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Salvaging the Most Severe Congenital Diaphragmatic Hernias: Is a Silo the Solution?

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Background
Babies with severe congenital diaphragmatic hernia (CDH) requiring extracorporeal membrane oxygenation (ECMO) have a high morbidity and mortality. We hypothesized that placement of an abdominal silo and staged abdominal wall closure may reduce problems associated with decreased abdominal domain in CDH.

Methods
We performed a retrospective review and identified 7 CDH patients requiring ECMO whom had a silastic abdominal wall silo from 2003-2006. Patient characteristics analyzed included survival, ECMO duration, duration of silo, time to discharge, and long term outcome.

Results:
Predicted mean survival for the entire cohort using the published CDH Study Group equation was 47% (range 9-86%). All patients (100%) survived. ECMO duration averaged 15 days (range 5-19 days). Four of the patients (58%) were repaired with a silo on ECMO, and three (42%) had their repair after ECMO. Abdominal wall was closed at a mean of 21 days (range 4 to 41 days). Hospital stay after silo placement averaged 54 days (range 20-170 days) with no infections or wound complications.

Conclusions:
Abdominal silo placement in infants with CDH requiring ECMO appears to be an effective strategy for decreased abdominal domain. Further studies are warranted to determine the efficacy of such a strategy for these high risk CDH patients.

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EOSINOPHILIC ESOPHAGITIS AFTER TRACHEOSOPHAGEAL FISTULA (TEF) REPAIR:
A CASE SERIES

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Background: Eosinophilic esophagitis (EE) is often missed or underdiagnosed in children, particularly in the setting of reflux disease associated with TEF. Here we present a case series of EE associated with long term follow up of TEF and their clinical characteristics.

Methods: A retrospective analysis of four patients between 2003 and 2007 and their clinical presentation, endoscopic findings and treatment was performed.

Results: Interestingly, all patients were male and had history of atopia. The time to diagnosis was 11 years. The most frequent symptoms were: dysphagia (50%), vomiting (50%) and failure to thrive (50%). On endoscopy, 75% had white plaques, 50% had furrows and 50% had non-specific reflux like findings. Peripheral serum eosinophilia and degranulated eosinophils on endoscopic biopsy was seen in 100% of patients. All patients required steroids and montelukast (leukotriene antagonist). However, only patients treated with oral steroids had complete resolution of their symptoms.

Conclusions: The diagnosis of EE is frequently missed or delayed. EE should be suspected in reflux disease refractory to conventional treatment. Endoscopic biopsies are diagnostic and allow institution of specific medical treatment. Long term follow up is needed for patients with TEF.

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A novel technique for safe delivery and application of Mitomycin-C to pediatric esophageal strictures

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Background: Non-surgical treatment of recalcitrant pediatric esophageal strictures is challenging. The chemotherapy drug Mitomycin-C, which reduces collagen synthesis and scar formation, shows anecdotal promise in the topical treatment of these strictures. Mitomycin-C is cytotoxic, and a safe endoluminal delivery system that avoids inadvertent application to adjacent mucosa has not yet been described.

Discussion: We have treated 3 patients with a combined endoscopic/fluoroscopic technique that ensures protected delivery of a Mitomycin-C soaked pad directly to the targeted site. Following pneumatic balloon dilation of the stricture under fluoroscopy, flexible esophagoscopy is performed to the disrupted stricture. Through the gastrostomy tract, a 12-16Fr semi-rigid sheath is introduced over a guidewire and passed retrograde up the esophagus to the stricture. A grasping forcep introduced through the instrument channel of the esophoscope is advanced through the sheath and grasps a Mitomycin-C soaked pad. The pad is drawn back through the sheath up to the stricture where timed, serial radial applications to the stricture are performed without contamination of the rest of the esophagus or stomach.

Conclusion: We describe a novel technique of endoluminal delivery and focused application of Mitomycin C to an esophageal stricture that avoids inadvertent exposure to adjacent mucosa.

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Background:
Minimally invasive techniques are becoming increasingly popular in neonatal surgery. We present the outcomes of Circum-Umbilical (CU) incisions for neonatal laparotomy.

Methods:
55 neonates undergoing CU laparotomy at a single centre were reviewed retrospectively. Laparotomy was performed via a CU skin and transverse or circumferential muscle cutting incision. The viscera are operated on either intra or extracorporeally. Further assess was gained from lateral extension of the incision into an Ω shape. Primary outcome measure was need for conversion to standard transverse incision. Secondary outcome measures were: indications for surgery and complications.

Results:
Indications for surgery were: malrotation (18), intestinal atresia (18), NEC/isolated perforation (10), meconium ileus (5), intestinal duplication (2), vitello intestinal duct (2). There were no conversions to standard incision. 4 patients need Ω extension of the incision for access. Postoperative complications included: wound infection (1), Caecal perforation (1), incisional hernia (2). Both patients with incisional hernia underwent successful delayed repair. All patients had an aesthetic scar on long term follow up.

Conclusions:
The CU incision offers an aesthetic, adequate and safe access for neonatal laparotomy with a low complication rate.

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CHEST RADIOGRAPHS FOLLOWING CENTRAL LINE PLACEMENT USING FLUOROSCOPY: UTILITY OR FUTILITY?

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Background: Post-operative chest radiographs are considered the standard of care following fluoroscopic placement of central venous catheters (CVC) to evaluate line position and to evaluate for significant complications (e.g. pneumothorax). Recent studies in the adult literature have called this practice into question. Therefore, we reviewed our routine post-operative chest films to see if they have altered management.

Methods: After obtaining IRB approval, all charts of patients undergoing CVC placement from January, 2004 to December, 2005 were reviewed. Outcome measures included whether or not there was a complication, and whether or not that complication required an intervention.

Results: 237 CVCs were placed. There were two complications; both pneumothoraces (0.085%). One patient was symptomatic and was treated with tube thoracostomy. The other was asymptomatic and the pneumothorax resolved spontaneously. Twelve CVCs were placed without fluoroscopy (bedside lines or following ECMO decannulation). Fourteen patients did not have a postoperative chest film and no adverse consequences developed. Total charges for these portable chest films was $56,196.

Conclusions: For CVCs placed using fluoroscopy, postoperative chest films in asymptomatic patients add unnecessary cost. Thus, we feel discontinuing the routine practice of postoperative chest films in asymptomatic patients undergoing CVC placement with fluoroscopy is justifiable.

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UTILIZATION OF SIMULATOR BABY FOR TRAINING IN PEDIATRIC TRAUMA RESUSCITATION

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Background: In Pediatric Trauma Centers without high patient volume, there is a particularly pressing need for an alternate path to training personnel in the resuscitation and care of the trauma victim. Whether trauma volume is high or low, timely clinical expertise is critical.

Methods: The Simulator baby has been incorporated into the pediatric residency training curriculum for the past 2 years. Advantages include: predictability of timing of acute event, availability of real-time feedback, physiologic changes with various interventions, opportunity to repeat same clinical scenario. We have now instituted Mock Pediatric Trauma Resuscitations with the Simulator baby. The model can be programmed for a number of common pediatric trauma scenarios.

Results: Mock Trauma Simulator Resuscitations with Simulator baby were initiated in 2007. Clinical scenario occurs in real time with physiologic feedback. Failure to treat appropriately may result in death. After the resuscitation, a debriefing occurs. The clinical scenario is then repeated.

Conclusion: Any center receiving pediatric trauma victims requires clinical expertise in resuscitation and treatment. For low volume trauma centers, the Simulator baby provides an opportunity for repetitions with real-time physiologic feedback.

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Surgical Correction of Pectus Excavatum (PE): A Descriptive Comparison of Outcomes including Postoperative Quality of Life (QoL), between the Nuss and Ravitch procedures

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Purpose:
The purpose of this study was to compare clinical and QoL outcomes between patients treated for PE by the Nuss or Ravitch procedure.

Methods:
A retrospective review of patients undergoing surgery (either Nuss or Ravitch) for PE between 2003 and 2006 was conducted. Patient characteristics and outcomes (complications, pain management and LOS) were recorded. QoL assessment was performed post-operatively using a mailed questionnaire consisting of the generic 10 domain CHQ-CF87 and the 12-item condition-specific Pectus Excavatum Evaluation Questionnaire (PEEQ). Statistical analysis was performed using SPSS for Windows®; p-values <0.05 were considered significant.

Results:
43 patients (39 M; 91%) underwent surgery; 19 (37%) by Nuss procedure. Duration of epidural analgesia and LOS were significantly longer in Nuss patients. Eleven/nineteen (58%) Nuss and 12/24 (50%) Ravitch patients returned questionnaires. In the CHQ-CF87 Nuss patients reported significant improvements in the family activities domain, and in overall health, compared to Ravitch patients. On the PEEQ, Nuss patients reported being less bothered by the appearance of their chest.

Conclusions:
Patients undergoing for PE by either technique have similar outcomes, although Nuss patients may have more pain and longer hospital stays. QoL analysis demonstrated only subtle differences between groups, suggesting comparable outcome.

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Novel use of Vacuum Assisted Closure (VAC) Therapy in Complex Cystic Hygroma

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Background: Cystic hygromas (CH) are multiloculated structures resulting from abnormal lymphatics. Complete surgical resection (CR) remains the choice therapy however; this may not be possible in multicystic CH with neurovascular invasion. In these instances, several treatment options are available with limited efficacy.
VAC therapy promotes wound healing by controlled negative pressure. Herein we describe the first reported use of subtotal surgical excision with VAC therapy (SE+VAC) in the management of complex CH.

Methods: The records of patients with complex CH treated by SE+VAC were reviewed. Age, CH site, number of previous excisions, recurrence rate, hospital stay, follow up and complication rates were reviewed.

Results: 4 patients (newborn-20 years) were identified with 5 CH. Sites included neck, back, perianal, and an extensive arm/thorax/abdomen. There was an average of 1.2 previous excisions. The average hospital stay after SE+VAC was 11 days and average number of VAC dressing changes was 4.4. The average length of follow up is 7 months. There has been one recurrence at a remote site in the extensive CH. This recurrence has been treated with SE+VAC and is included in this analysis.

Conclusions: SE+VAC therapy is a novel approach with promising results in complicated CH. A prospective randomized trial is warranted.

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Intussusception: Eight year review of the imaging and management.

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BACKGROUND/PURPOSE:
Our experience in treating childhood intussusception by attempted air enema reduction over an eight year period is reviewed and compared with previously published experience from the same institution, when Barium enema was the method of choice.

METHODS:
Pneumatic reduction was attempted in 237 of 253 patients. Age ranged from 2 months to 7 years. 90% were between 2 months and 2 years. Reduction by air enema was achieved in 192 children (81%). Plain AXR were helpful in confirming the diagnosis in 86%, negative in 14% and not performed in 34 of the 253. There were 7 cases where perforation occurred during the procedure (3%). 16 patients went straight to the operation theatre without attempted reduction by air enema. There were no deaths.

We have reviewed our experience in a single institution and compared the results of pneumatic reduction in the period 1995 – 2003 with those obtained by barium enema in the 7 years period 1976 – 82. We review the changes in Diagnostic approaches to the Diagnosis and comment on the techniques applied.

RESULTS:
The results were as follows, 90% of the patients were between the ages of 2 months to 2 years. Plain films were positive in 86%, negative in 14% and not carried out in 34 of the 253. Ultrasound was positive in 99.4% and not performed in 56 of the 253. Air enema was successful in 81% and was not attempted in 16 of the 253. 59%, 8%, 33% were successfully reduced in one, two and more than two attempts respectively. Complication rate of 3% in the form of perforation and was detected at the time or post procedure radiograph. 6 patients showed spontaneous reduction and 10 were taken directly to the theatre as there were clinical signs of perforation. Seven patients were found to have a lead point at operation.

CONCLUSION:
The success rate with air enema was significantly higher 81% (barium enema 55%). There were no perforations with barium enema (air enema was 3%).
The main advantages of the air enema is that it is easy, quick and clean technique, has less radiations and more successful.

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ADVANTAGES OF THE DISTAL SIGMOID COLOSTOMY IN THE MANAGEMENT OF INFANTS WITH SHORT BOWEL SYNDROME

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Background: Infants with short bowel syndrome (SBS) frequently have proximal enterostomies with the colon excluded from intestinal continuity. Restoring intestinal continuity may create difficulty with perineal soiling. We propose creation of a distal sigmoid colostomy as an option for these infants.

Methods: Descriptive case-series of all children with SBS who received a distal sigmoid colostomy.

Results: Ten infants (mean age = 70 days) received creation of a distal colostomy. In 1, placement of the colostomy was done at the initial surgery for SBS, 2 at the time of intestinal lengthening, and 7 during another procedure. Median length of small bowel was 57cm. At 60 days post procedure, median gain in enteral tolerance was 21% (p=0.09), with median stoma output of 125% enteral intake. There were no complications directly attributable to the distal colostomy.

Conclusion: Establishment of a distal sigmoid colostomy is an excellent management strategy for children with SBS. It provides the benefits of restoring bowel continuity such as increased fluid and electrolyte absorption, improved energy absorption from fermentation of carbohydrate to short chain fatty acids, the theoretical enhancement of GLP-2 secretion that may optimize intestinal adaptation – all this while protecting the perineal skin and simplifying quantification and collection of stool.

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In this pilot study expression of CCK receptors in the epithelial cells is noted in children with CAGD compared to controls. The significance of this finding requires further investigation.

**Conclusions**

In this pilot study expression of CCK receptors in the epithelial cells is noted in children with CAGD compared to controls. The significance of this finding requires further investigation.

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MEMBRANOUS STENOSIS OF THE HEPATIC DUCT AT THE PORTA HEPATIS IN CHILDREN WITH CHOLEDOCHAL CYST

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Background: The intrahepatic gallstone can develop as a postoperative complication of choledochal cyst. Since the stenosis of the hepatic duct is seen just distal to the gallstone at reoperation, the stenosis is thought to be contributory to the stone formation. This report describes membranous stenosis of the hepatic duct found during the initial operation of choledochal cyst.

Methods: From 1996 to 2003, fourteen children were operated on for choledochal cyst. In order to identify the presence of the membranous stenosis, intraoperative cholangiography was performed, and the lumen of the hepatic duct was observed carefully. In those patients with membranous stenosis, the membrane was resected.

Results: Eight sites of hepatic duct stenosis by membranous structure were identified in six children. They were classified into three types; a small opening around center of the membranous structure in five instances, an opening at marginal area of the membranous structure in two instances, and bridge-like structure in one instance. In all cases whose membranous structures were resected the formation of the gallstone has not been observed until now.

Conclusions: It is advisable that membranous stenosis of the hepatic duct should be examined at the initial operation and surgical intervention should be done when membranous stenosis is identified.

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Background: The epidemiology of pediatric blunt intra-abdominal arterial injury is ill-defined. We analyzed a multi-institution trauma database to better define injury patterns and predictors of outcome.

Methods: The ACS National Trauma Database was evaluated for all patients age<17 years with blunt intra-abdominal arterial injury from 2000 to 2004. Injury distribution, operative treatment, and variables associated with mortality were considered.

Results: 113 intra-abdominal arterial injuries were identified in 104 pediatric blunt trauma patients. Single arterial injury (92.3%) occurred most frequently: renal (34.5%), mesenteric (22.1%), and iliac (20.4%). All patients had associated injuries (abdominal visceral 79.8%; major extra-abdominal skeletal/visceral 76%). Arterial control was obtained operatively (n=39, 37.5%) or by embolization (n=5, 4.8%) in 44 patients. Overall mortality was 16.3%. Increased mortality was associated with multiple arterial injuries (p=0.047), intra-abdominal venous injury (p=0.007), head injury (p=0.04), GCS < 8 (p<0.0001), severe colon injury (p=0.031), cardiac arrest (p<0.0001), profound base deficit (p=0.007), and poor performance on multiply injured outcomes scoring systems [RTS (p<0.0001), ISS (p=0.001), and TRISS (p=0.002)].

Conclusion: Blunt intra-abdominal arterial injury in children usually affects a single vessel. Associated injuries appear to be universal. The high mortality rate is influenced by serious associated injuries and is reflected by overall injury severity scores.

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Traumatic Pseudo-aneurysms of the Liver and Spleen: Should We Worry?

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BACKGROUND
Blunt spleen or liver injury can lead to pseudo-aneurysm formation. The natural history of these lesions in pediatric trauma patients is poorly understood. Delayed splenic and hepatic hemorrhage has been reported. Current guidelines for non-operative management of these injuries do not stipulate follow-up imaging of injured organs.

METHODS
Retrospective review of patients with post-traumatic splanchnic pseudo-aneurysms. Demographics, grade of injury, duration of hospitalization, and activity restriction were obtained. Outcomes including hemorrhage, spontaneous thrombosis, and angiographic embolization were determined.

RESULTS
Hepatic artery pseudo-aneurysms were associated with high grade (III or IV) injury and spontaneous hemorrhage occurred if they were not embolized. Splenic artery pseudo-aneurysms thrombosed spontaneously in six of eight patients, and underwent angiographic embolization in one. Delayed life-threatening hemorrhage occurred in one boy due to presumed pseudo-aneurysm rupture.

CONCLUSIONS
Splanchnic post traumatic pseudo-aneurysms may rupture and precipitate life-threatening bleeding. While hepatic artery pseudo-aneurysms appear to be more likely to rupture, splenic artery pseudo-aneurysms may also lead to delayed hemorrhage. Early recognition is essential to facilitate angiographic embolization. Routine follow up ultrasonography for higher grade injuries may help prevent delayed hemorrhage. A duplex ultrasound may be warranted in children with high grade splanchnic injuries prior to discharge from hospital.

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Background: The degree of inflammatory response correlates with the incidence of post-injury MOF. Children have a decreased incidence of MOF than adults. We hypothesized injured children have decreased systemic expression of IL-6, IL-8, and sICAM-1 when compared to adults.

Methods: Children <18 years old with ISS >15 were eligible for this study. Serum levels of IL-6, IL-8, and sICAM-1 were measured at 8-12, 24-36 and 48-60 hours after admission. Five patients completed the blood draw protocol. Comparisons were made to published adult data in a similar population (mean age 34.0 ± 2.1, mean ISS 30.6 ± 1.6).

Results: The mean age was 7.5 (± 4.3) years. The mean ISS was 20 (± 3.1). The levels of IL-6 were attenuated in children at 8-12, and 24-36 hours. Similarly, IL-8 levels were decreased at all time points. sICAM-1 levels were also decreased in children (not shown).

Conclusions: We found that children have an attenuated inflammatory response following injury. IL-6, IL-8 and sICAM levels are lower in children at all measured time points relative to adults. Post-traumatic MOF is in part mediated by inflammatory products our data suggests that children may be protected in part due to this attenuated inflammatory response.

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Acute chest syndrome after splenectomy in children with Sickle Cell disease

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Background/purpose: The possibility of acute chest syndrome (ACS) is the reason for ICU admission in children with Sickle Cell disease undergoing splenectomy.

Methods: A retrospective review of all Sickle Cell patients undergoing splenectomy between 1999 and 2007 in our institution. Charts were screened for demographics, perioperative clinical status (vasoocclusive crises vs. sequestration crises), preoperative hemoglobin electrophoresis and preoperative transfusion, post operative development of ACS and need for an ICU admission.

Results: 43 children, 17 Females and 16 Males, (mean age 9 years) with sickle cell disease underwent splenectomy (19 laparoscopy and 24 open). ACS occurred in 9 patients (20%), 1 of the 19 (5.2%) in the laparoscopy group and 8 of the 24 (33.3%) in the open group. All ACS patients were admitted to ICU. ACS developed in the first 24 hours in 5 of the 9 patients, on the 2nd postop day in one patient while three patients developed ACS more than one month postop. 6/9 ACS patients had been transfused preoperatively. All ACS patients had had vasoocclusive crises before surgery. There was no death in our series.

Conclusion: The incidence of ACS is in accordance with the literature. Preop transfusions did not prevent ACS. There is a clear tendency for laparoscopically operated patients to present less ACS post operatively. There are no clear benefits for preventive admission to ICU in all patients operated on for splenectomy in sickle cell disease.

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Infected lateral cervical cysts in newborn are rare. We present the case of a baby born at 41 weeks of gestation. At day three, persistent cyanosis was noted and a mass appeared in the left cervical region next to the sterno-cleido-mastoid sternocleidomastoid muscle. No cutaneous sinus was visible. Ultrasound imaging showed no sign of blood flow within the mass and no septa. On the mass extended to the aortic arch which provoked aand compressed compression of the trachea extending. Lymphangioma was suspected but a partition of the mass evacuated 80 ml of pus. A few days later, injection of a contrast through the drain showed a tract originating from the left pyriform fossa. Preoperative laryngoscopy and catheterization of the fistula tract confirmed the diagnosis. The cyst was excised totally up to the sinus with the assistance of a guide wire inserted orally through a rigid laryngoscope. This is a rare case of an infected pyriform sinus cyst in a neonate.
Granulocyte Colony Stimulating Factor (GCSF) Alters Phenotype of SK-N-SH Neuroblastoma cells

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**Background**
GCSF is commonly employed for treating chemotherapy-induced neutropenia. Despite high dose intensive chemotherapy for advanced stage neuroblastoma, survival remains poor. GCSF therapy is quite common in these children, thus we questioned its effect on neuroblastoma cells. We hypothesized that exogenous GCSF stimulates the proliferation and invasive character of neuroblastoma cells.

**Methods**
Expression of GCSF receptor in 5 different neuroblastoma cell lines was determined by PCR. Using the SK-N-SH cell line, we determined the effect of increasing doses of GCSF (0, 10 ng/ml, 100 ng/ml, 1 μg/ml, 10 μg/ml) on cell proliferation (BrdU incorporation) and invasiveness (Matrigel invasion chambers).

**Results**
All five neuroblastoma cell lines tested expressed the G-CSF receptor. GCSF treatment resulted in increased proliferation of SK-N-SH cells at physiologic doses. Likewise, increased invasiveness was observed at all doses of GCSF except maximum dose.

**Conclusions**
These results indicate that neuroblastoma cell lines express the G-CSF receptor and respond to exogenous GCSF by increased proliferation and invasiveness. These findings suggest that G-CSF may stimulate the growth of neuroblastoma cells in patients undergoing high dose chemotherapy with G-CSF rescue and could have significant impact on the ability to eradicate these tumors.

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Outcome of Adrenocortical Tumors in Children.

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Purpose. This study reviews adrenocortical tumors in children to determine factors that significantly affect outcome.

Methods. An IRB-approved retrospective review from 1976-2005 identified 23 patients less than 19 years old with histologic confirmation of adrenocortical carcinoma (ACC) and adenomas.

Results. The mean age of the 23 children was 8.6 ± 1.5 years; girls predominated (F:M = 2.3:1) as did cancers (ACC 15, adenoma 8); tumor hormone production (78%); and advanced stage for disease (66%). All malignancies were >2.5 cm. Adrenalectomy, including en bloc resection of adjacent structures (35%) achieved grossly-negative margins in 65% of patients. Three patients received chemotherapy or chemoradiation as primary treatment without surgery. There was no perioperative mortality; morbidity was 10% (pneumothorax, acute renal failure, chylous ascites and thrombocytosis). Surgical cure without adjuvant therapy was achieved for all adenomas and ACC stages I and II. For ACC stage III and IV, median survival was 25 months, 5-year survival was 8%. All advanced-staged ACC received adjuvant therapy. Surgically-negative margins conferred a survival advantage.

Conclusions. Children, especially females with ACC present with large advanced-staged tumors. Surgically-negative margins with or without en bloc resection improves survival. The high percentage of children with functioning tumors suggests earlier detection is possible.

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INTRAOPERATIVE RADIOACTIVE IODINE LOCALIZATION OF RESIDUAL METASTATIC THYROID CARCINOMA IN CHILDREN: A CASE REPORT

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A 13 year-old-female with history of papillary thyroid cancer presented with new area of uptake on scintigraphy after total thyroidectomy and local lymph node excision performed in 2004. The patient was treated with three cycles of radioactive iodine with persistence of the lesion on nuclear imaging. Since the mass was located retrosternally and was thus not palpable on physical exam, radioactive iodine was injected preoperatively and a gamma probe was used to identify the lesion intraoperatively. During the surgery, the lesion was easily localized when the probe registered an uptake of 520 units at the retrosternal site compared to 100 units at background. The mass was excised and found to contain four lymph nodes, one of which was malignant. We describe a novel and effective technique for the localization of residual malignant thyroid tissue in a pediatric patient.

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The Canadian Pediatric Thyroid NODULE (CAPTN) Study: An Evaluation of Current Management Practices

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Background: Thyroid nodules in children often require surgical treatment. We evaluated management practices for these across Canada.

Methods: Patient records from 9 Canadian pediatric centers of children undergoing surgery for thyroid nodules over a 6-year period were reviewed. Demographics, presenting features, investigations, surgical treatment, pathology and complications were assessed.

Results: 141 patients were reviewed (75% female), of which 105 presented with a palpable mass. Ultrasound and/or thyroid scintigraphy were the most common pre-operative imaging studies. Fine needle aspiration cytology (FNAC) correlated with final pathology in 49% (39/81) of cases. Overall, the rate of carcinoma was 43%, with half being papillary. Only 35 of 57 patients (61%) undergoing primary total thyroidectomy had a malignancy, of which 14 had positive pre-operative FNAC's. Twenty-seven percent (19/70) of patients undergoing initial hemithyroidectomy +/- isthmusectomy had a malignancy, of which 89% (17/19) subsequently underwent completion thyroidectomy; 17% (3/17) of these had malignancy in the second specimen. Hypocalcemia and hoarseness occurred in 14 and 4 patients, respectively, mostly after primary total thyroidectomy. No complications occurred for patients undergoing completion thyroidectomy.

Conclusions: The incidence of malignancy in pediatric thyroid nodules is high, and the risk of surgical complications significant. With variable management practices across Canada, evidence-based guidelines for diagnosis and surgical treatment may be valuable.

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Treatment of ingrown toenails in the pediatric population

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Background: Chemical matrixectomy (CM) using NaOH as an alternative to surgical matrixectomy (SM) has recently been used in the treatment of ingrown toenails (IGTNs) in adults. No studies dictate the most effective and safe treatment method in the pediatric population.

Methods: A retrospective review of pediatric IGTNs treated at 2 institutions over 6 years was performed, assessing presentation, treatment modality, SM versus CM and outcomes.

Results: 466 IGTNs (331 patients) were reviewed with an average age of 12.2+/-3.7 years. 70% appeared simply inflamed at the time of presentation; 30% were deemed infected. 55% of patients had been taking antibiotics within the preceding week. The most common procedure was avulsion+SM (60%), followed by avulsion+CM (26%), avulsion alone (12%), and avulsion+ curettage (2%). The overall recurrence rate after initial surgery was 15%, with a mean time to recurrence of 13+/10 weeks, 31% of recurrences occurring in those undergoing avulsion only. 14% recurred in the SM group versus 6% undergoing CM (p=0.1). The overall post-operative infection rate was 1%.

Conclusion: IGTNs present a significant problem to youth, with a recurrence rate in this population higher than that reported in the adult literature. CM using NaOH appears to be a safe and effective alternative to SM, and maybe associated with a lower rate of recurrence

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The Frequency of Apneas in Premature Infants After Inguinal Hernia Repair: Do They Need Overnight Monitoring in the ICU?

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Background: Post-operative apneas have been reported in up to 31% of premature infants undergoing anesthesia for inguinal hernia repair. Current practice is to monitor these patients overnight in the intensive care unit following surgery.

Method: A retrospective chart review of all premature infants undergoing elective inguinal hernia repair between 2001 and 2006 was performed. All post-operative apneas were noted. Patient charts were reviewed to identify potential risk factors.

Results: Five of 126 (4.8%) premature infants had apneic spells following hernia repair. All of these infants had prior history of apneas. These infants had lower weights both at birth (1.08 kg vs. 1.73 kg) and at the time of surgery (3.37 kg vs. 4.4 kg). They also were ten times more likely to have had an intraventricular hemorrhage (IVH), 3.1 times as likely to have ASA scores 3 or 4, and 2.6 times as likely to have history of bronchopulmonary dysplasia. High risk infants also had lower gestational ages and more complicated hospitalizations after birth.

Conclusion: Post-operative apnea in premature infants following inguinal hernia repair is much less common than previously reported. Infants with prior history of apneas are at highest risk. Other risk factors appear to include gestational age, birth weight, weight at time of surgery, and a complicated neonatal course. Selective use of post-operative ICU monitoring for high risk patients could result in significant cost savings.

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THORACOSCOPIC REPAIR OF TRACHEO-ESOPHAGEAL FISTULAS (TEF): A CASE MATCHED COMPARATIVE STUDY

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BACKGROUND: To date there is no comparative study of thoracoscopic repair (TR) vs. conventional open repair (COR) for TEF. The aim of the study was to compare the two techniques in neonates with TEF.

METHODS: A Multi-institutional case control study cases of TEF was undertaken. The minimum follow up was 6 months. Patients were considered for TR based on surgeon's preference. Cases were frequency matched on 1:1 ratio, based on gestational age and weight. Outcomes of interest were: operative time, post-operative leaks, and post-operative stricture development. Statistical analysis using univariate analysis was performed.

RESULTS: Twenty three neonates underwent TR. There were no differences between TR and COR groups with regard to weight and gestational age. The distribution of associated anomalies was similar in both groups. The mean operative time was 149.4 and 178.9 minutes in the TR and COR respectively (p=0.089). Three patients were converted to COR. There were 4 leaks in the TR and 1 in the COR (p=0.346). Inversely, 1 patient in the TR developed a stricture necessitating dilation as compared to 4 patients in the COR group (p=0.187). Table-1.

CONCLUSIONS: Thoracoscopic repair of TEF is safe and comparable to conventional open repair.

Table-1: Comparison between study groups

<table>
<thead>
<tr>
<th></th>
<th>Thoracoscopic (TR)</th>
<th>Open (COR)</th>
<th>P value *</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gestational Age</td>
<td>36.3</td>
<td>36.3</td>
<td>0.168</td>
</tr>
<tr>
<td>Weight(mean +/- SD)</td>
<td>2735(+/-744.3)</td>
<td>2427(+/-726.7)</td>
<td>0.985</td>
</tr>
<tr>
<td>Associated anomalies (%)</td>
<td>7 (30.4%)</td>
<td>2 (9%)</td>
<td>0.335</td>
</tr>
<tr>
<td>OR time Mean (+/- SD)</td>
<td>149.4(+/-47)</td>
<td>179(+/-65.6)</td>
<td>0.089</td>
</tr>
<tr>
<td>Leak (%)</td>
<td>4(17.3%)</td>
<td>14(65.3%)</td>
<td>0.346</td>
</tr>
<tr>
<td>Strictures (%)</td>
<td>1(4.3%)</td>
<td>4(18.2%)</td>
<td>0.187</td>
</tr>
</tbody>
</table>

SD= standard deviation
* two tailed p value statistically significant at P< 0.05

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THORACOSCOPIC-ASSISTED CENTRAL LINE PLACEMENT FOR A THROMBOSED SVC

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BACKGROUND: In children who require prolonged central venous access, the superior vena cava (SVC) and ilio-femoral veins may become occluded making central venous access difficult. We report an innovative technique of catheter insertion percutaneously through the neck into the right atrium traversing a thrombosed SVC using video assisted thoracoscopic surgery (VATS).

METHODS: Two children had three central venous catheter insertions using this technique. Both children had intestinal failure and were dependant on parenteral nutrition. The major central veins were thrombosed as a result of multiple catheterizations. Image guided techniques—performed by radiologists and cardiologists—failed to establish central access.

RESULTS: A 9-year-old boy has had the central access catheter functioning now for 5 months. In an 18-month-old girl, the line was accidentally dislodged 6 weeks post insertion. It has since been re-inserted using the same technique.

CONCLUSION: Thoracoscopic assisted central catheter placement is a viable and safe option when other conduits are unavailable or impossible. This technique can be life saving in children dependant on parenteral nutrition.

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Central venous occlusion in children is a challenging problem which can occur after a central venous catheter (CVC) insertion. Long-term catheter related complications are sepsis and venous thrombosis and consequent loss of central access. We describe two cases of children less than one-year old who were dependent on a CVC for total parenteral nutrition (TPN). They developed a chronic extensive obstruction of the right and left brachiocephalic veins with a superior vena cava (SVC) syndrome. Several CVC's had been implanted since birth, and the last catheters inserted through the left subclavian veins were totally obstructed. The patients survival was dependent on the restoration of a central venous access until the planned intestinal transplantation could be performed. Retrograde recanalizations of the SVC were successfully achieved using a pathway created under general anesthesia from the femoral vein to respectively the right thyroid vein and the right sub-clavian vein.
Laparoscopic Placement of Peritoneal Dialysis Catheters

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PURPOSE
Peritoneal dialysis (PD) is preferred over hemodialysis. It has fewer incidences of serious complications. It is easier to manage in an outpatient setting, is less expensive and improves patient nutrition and independence.

METHODS
Twenty-one children were treated with laparoscopic placement of PD catheter and omentectomy. Ages varied from 3 months to 16 years old. Five children had previous major abdominal surgery and required extensive lysis of adhesions. Other surgical procedures done during the same intervention included umbilical hernia repair in 3, bilateral inguinal hernia repair in 3, repair of ventral hernia in two, laparoscopic gastrostomy in four, laparoscopic kidney biopsy in two, and laparoscopic cholecystectomy in one.

RESULTS
Eleven children received successful kidney transplantation and no longer need dialysis. Four children still have functioning PD catheters. One patient developed membrane failure. Four patients recovered enough renal function and no longer need dialysis. There were no complications related to the laparoscopic procedure.

CONCLUSIONS
Laparoscopy is ideal for placement of PD catheters. It facilitates omentectomy. The catheter is placed in the proper position under direct vision. It allows for lysis of adhesions to increase peritoneal surface. Other abdominal procedures can be performed laparoscopically at the same time as PD catheter placement.

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UTILIZATION OF INTERNET-BASED ANIMATIONS TO UNDERSTAND PROCEDURES

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Background: Medical practitioners struggle with the issue of informed consent. Informed consent is a key factor in medical malpractice. Surgeons are particularly invested in optimizing the informed consent process due to the invasive nature of the specialty. EMMI provides procedure specific information.

Methods: Patients undergoing selected outpatient surgical procedures at our hospital in 2006 and 2007 received an internet access code for EMMI. EMMI (Expectation, Management and Medical Information) is a patient-focused, internet-based, interactive tool which is procedure specific. Content is determined by an expert panel and includes animations, anatomy, complications and peri-operative course. The family controls timing and viewing of the material. Patient satisfaction data was reviewed.

Results: 267 families accessed the EMMI specific to their procedure. 246 families (92%) completed a post EMMI survey. Of the respondents, 100% stated that EMMI had improved their understanding of the surgery. 97%: EMMI had increased their comfort level. 93%: EMMI had provided new information. 89%: EMMI had covered risks they didn't know about previously. 100%: EMMI had improved understanding of what to expect after procedure.

Conclusion: EMMI has proven a valuable asset in improving patient understanding of invasive procedures. Patient satisfaction data indicates that EMMI is viewed quite positively.

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The Increasing Incidence of Snowboard-Related Trauma
John R. Hayes PhD and Jonathan I. Groner MD

The Trauma Program, Columbus Children’s Hospital, and The Division of Pediatric Surgery of the Ohio State University College of Medicine

**Purpose:** To investigate injuries among children and adolescents who participate in downhill sports.

**Methods:** We collected trauma registry data (Jan 1999 - May 2006) from a Level 1 pediatric trauma center with an average snowfall of 28 inches (71 cm) /year. Cases were analyzed for injury mechanism, injury type, organ injured, ISS, age, gender, and whether or not an operation was required.

**Results:** There were 57 snowboarders and 22 skiers admitted during the study period. 41 (72%) of snowboarders and 16 (73%) of skiers required operations; 32 (56%) of snowboarders and 9 (41%) of skiers sustained abdominal injuries. (p=NS for all comparisons) Serious splenic injuries were more common in snowboarders (14% vs 4%), but the difference was not statistically significant. All skiing injuries occurred at recreational facilities (commercial skiing areas) while 12% of snowboard injuries occurred at home, other residence, or public parks (p=.08). The most striking finding is the rising number of snowboarding injuries in the face of relatively stable rate of skiing injuries (see graph).

**Conclusions:** As the popularity of snowboarding rises, snowboarding injuries in children are increasing. Pediatric surgeons should wary of the “snowboard spleen.”

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The Impact of Surgical Excision in Chest Wall Rhabdomyosarcoma

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Background: In rhabdomyosarcoma, age, size, histology and site of the tumor are primary determinants of prognosis. We aim to determine the impact of surgical excision in chest wall rhabdomyosarcoma.

Methods: A retrospective chart review was conducted of all 130 pediatric patients enrolled in the Intergroup Rhabdomyosarcoma Study (IRS) with chest wall rhabdomyosarcoma from the first (I) through fourth (IV) IRS. Median follow up was 12.1 years.

Results: There was no significant difference in 5 year FFS or OS in patients who had a complete resection (group I) complete resection with positive microscopic margins (group II) or biopsy or incomplete resection (group III). In group I-II patients the local and regional failure rate at 5 years is 25% and 6%. Five year FFS of group I, II, and III patients was 52%, 52%, 45% and OS was 65%, 60%, and 59%. All patients who presented without metastasis had a FFS and OS of 49% and 61% compared to metastatic patients, 7% and 7%. (p<0.001 for each)

Conclusions: The most significant impact on outcome in chest wall rhabdomyosarcoma patients is metastatic disease at diagnosis. The loco-regional failure rate is high, but does not appear to impact survival. Aggressive surgical excision prior to chemo-radiotherapy may not improve survival.

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Using multiple imputation and propensity scores to test the effect of car seats and seat belt usage on injury severity from trauma registry data.

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Background/Methods: Missing data and the retrospective, non-randomized nature of trauma registries can decrease the quality of registry-based research. Therefore, we used multiple imputation and propensity scores to test the effect of car seats and seat belt usage on injury severity in children injured in motor vehicle crashes.

Methods: All children admitted following injury in motor vehicle crashes who had complete data on seat belt or car seat usage 2003-2006 were included in the study. The sample was divided into children <5 (n = 130) or ≥ 5 (n = 575) years old and analyzed for seat belt usage, car seat usage, injury severity score (ISS), revised trauma score (RTS), and Glasgow Coma Score (GCS). Data was analyzed before and after matching on propensity scores after multiple imputations.

Results: There were no outcome differences between car seat users and non-car seat users. However, there were significant improvements in ISS (7.0 vs. 10.1, p=0.002) and RTS (7.6 vs. 7.3, p=0.013 for seat belt users (compared to non-users) even after matching on propensity score.

Conclusion: Multiple imputation and propensity scores demonstrated the efficacy of seat belts, but not car seat in this preliminary study. This statistical method can strengthen registry-based research.

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Gastro-esophageal reflux in caustic stenosis of the esophagus in children

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Purpose: A 10 year prospective double blind study using radiological and histological assessments to evaluate evidences of potentiation by gastroesophageal reflux (GER) of caustic esophageal stenosis.

Method: From 1996 to 2006, we have performed 93 esophagoplasties for caustic burns. Among them, 73 were fed through gastrostomies allowing to perform a retrograde esophagogram to evidence GER in 65 cases. 54 total esophagectomies were performed during esophagoplasties and histology of the lower esophagus was possible in 46 of them. Radiologists and pathologists were independently required to look for evidence of GER in the lower esophagus.

Results: 54/65 showed radiologic evidence of GER and 40/46 had intra-mucosal eosinophilic infiltrate, hyperplasia and thickening of the basal layer, all features compatible with GER. 30/37 cases showed both radiological and histological signs.

Conclusion: It seems that esophageal stenosis following caustic ingestion is frequently associated with a GER, reaching the level of the lesion and potentially could worsen the stenosis. It is possibly related to the shortening of the scarring esophagus and to the lack of esophageal clearance in the distal third due to reduced motility. Therefore, we recommend the use of anti-GER medications such as PPI, as soon as possible after caustic ingestion.

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PRIMARY ANTERIOR CRICOID SPLIT, THE BETTER ALTERNATIVE TO TRACHEOSTOMY, CAN ALSO BE PERFORMED BY PAEDIATRIC SURGEONS

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Background: Iatrogenic subglottic stenosis can prevent extubation especially in premature babies. This condition can be treated either with primary laryngoplasty or tracheostomy. I report the results of primary laryngoplasty in neonates.

Patients and methods: Seventeen neonates underwent primary anterior cricoid split (Cotton operation) during 1991 - 2006 because of subglottic stenosis preventing extubation. The aetiology of the stenosis was: prolonged endotracheal intubation because of prematurity in 12 patients, endotracheal intubation for other reasons in 3, and congenital in 2 patients. All underwent primary anterior cricoid split without tracheostomy. In 7 patients, the split was combined with costal cartilage graft. The follow-up of the patients was 1.1 - 13.1 yrs.

Results: There was no operative mortality nor operative complications. One patient died at the age of 1 year of unrelated cause. At autopsy, the subglottic space was free. Of the remaining 16 patients 14 were without tracheostomy at the end of the follow-up period, although one had underwent a redo laryngoplasty. Two patients were with tracheostomy.

Conclusions: Anterior cricoid split is a better alternative to tracheostomy in neonatal subglottic stenosis. The operation can be performed by paediatric surgeons.

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Non-interventional treatment of selected head and neck lymphatic malformations

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Background: Indications for treatment of lymphatic malformations include disfigurement, symptoms, and infection. Patients with lymphatic malformations often undergo resection or sclerotherapy to prevent possible complications, as it has been thought lymphatic lesions do not regress.

Methods: A retrospective analysis of all head and neck lymphatic malformations over the past 5 years was performed.

Results: 24 patients with lymphatic malformations were treated, all underwent CT or MRI for evaluation. 14 patients had macrocystic lesions, others were considered mixed or microcystic. 17 patients underwent intervention. 10 patients underwent surgical resection alone, 4 patients underwent sclerotherapy and 3 patients had both sclerotherapy and surgical resection. 15/17 patients who underwent intervention suffered complications, including recurrence and nerve damage. 7 patients with predominantly macrocystic lesions were managed with close observation, they presented at a mean age of 3.35 versus 2.24 months (p<0.05) and were generally asymptomatic. With follow-up of 33.4 months, in 3/7 patients the lesion significantly decreased in size, 4/7 patients continue to be asymptomatic.

Conclusions: Patients who undergo intervention have a high complication and recurrence rate. Selected patients with asymptomatic macrocystic lymphatic malformations of the head and neck can often be managed by observation alone. These patients should be followed closely in a multi-disciplinary clinical setting.

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Patients with severe chronic intestinal pseudo-obstruction (CIPO) are often resistant to many forms of medical and surgical treatment. We present a new technique of extensive longitudinal stapled tapering of dilated small bowel in a patient with CIPO refractory to treatment.

An eight-year-old male with severe CIPO previously had multiple surgical procedures including bowel resections and release of intestinal obstructions. At the time of surgery he was unable to tolerate any enteral nutrition and had severe cholestatic jaundice secondary to TPN. We performed an extensive longitudinal stapled tapering of the dilated small bowel. He has been followed postoperatively for 1 year in regard to bowel function, nutritional status, liver function and quality of life.

After recovery from surgery the patient showed significant improvement. He was able to increase his oral and g-tube intake and reduce his dependency on TPN. His cholestatic jaundice completely resolved and liver function tests returned to normal. Frequency of hospital admissions reduced significantly leading to an improved quality of life.

Extensive tapering of dilated small bowel represents a novel surgical management option for patients with CIPO refractory to other treatment measures. Long-term follow-up is needed to adequately assess the efficacy of this technique.
EXPERIENCE WITH A NON-LAPAROSCOPIC, TRANS-UMBILICAL, INTRA-CAVITARY PYLOROMYOTOMY

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Background: Ramstedt’s pyloromyotomy is elegant, effective and time-honored. Although its basic principle remains unchanged, considerable debate exists concerning the access to the pylorus and the splitting technique.

This communication reviews a 7-year experience with an approach combining the ease and safety of the “open” pyloromyotomy with minimal invasiveness.

Methods: An umbilical rim incision is made and the linea alba transected transversally. The pylorus is lifted to the incision, but not delivered. Two 3:0 guy sutures placed in the pylorus maintain it in place. A serosal incision is made and deepened to 2-3mm. Two double pronged skin-hooks are placed, one on each partially separated edge, and gentle upward traction applied until complete splitting is achieved. The mucosa is not touched.

Results: This approach was employed in 76 infants (mean age: 39.7d; mean weight: 3.7kg; 77% boys). Average operating time: 28 minutes. The splitting was performed by general surgical residents in 69. There were no mucosal injuries.

Conclusion: Transumbilical intracavitary pyloromyotomy is safe and reproducible, combining the advantages of the traditional “open” and the laparoscopic approaches. Because the pylorus is not delivered, a smaller incision is used. The scar is virtually invisible. The procedure’s safety renders it well suited for the teaching setting.

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Is intraabdominal abscess commoner after laparoscopic appendicectomy in children?
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Background: The laparoscopic appendicectomy (LA) is the technique of choice for the management of acute appendicitis. The sparse literature is unclear about the risk of intra-abdominal abscess (IAA) after LA. The aim of the study was to evaluate postoperative IAA after LA and open appendectomy (OA) in pediatric age group.

Methods: In the period 1998-2006, all patients ≤ 16 years, who developed IAA post appendectomy within 4 weeks after LA or OA, were studied. Parameters studied include perforation and IAA. The statistical analysis was performed using Chi test and p value ≤ .05 was considered significant.

Results: A total of 620 appendectomies were performed (339 OA and 221 LA) with 172 (28%) perforated at the time of surgery. Perforated appendicitis was seen in 145 OA and 27 LA (36 % vs 12%). 10 patients after the OA and 5 after LA formed IAA (2.5 vs 2.3% [NS]). IAA formation didn’t differ among the perforated and nonperforated appendicitis in OA and LA (6.2 vs 7.4 % and 0.4 vs 1.5% [NS]).

Conclusion: There is no difference in the development of IAA after LA or OA. LA does not lead to more IAA than OA.

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Thoracoscopic sympathectomy in youngsters with palmar hyperhidrosis
-Eleven years of experience-

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Background:
Hyperhidrosis can cause significant social handicaps in youngsters. Although treatments such as oral medication, botox, and iontophoresis are available, surgical sympathectomy is being increasingly utilized.

Purpose:
To evaluate the long term outcome and value of transaxillary single-port thoracic sympathectomy for the treatment of palmar hyperhidrosis.

Methods:

Results:
Mean operative time per side was 18 min; no conversions, 95% of the patients were discharged the next day. Complications included unilateral transient Horner's syndrome in 1 (0.67%); pneumothorax requiring chest drainage in 2 patients (1.35%); and segmental atelectasis of the lung in 7 patients (4.72%). Complete relief of symptoms was observed in all patients (mean follow-up 5.03 SD ± 1.76 y), 38% experienced some form of compensatory hyperhidrosis.

Conclusions:
Single-port thoracoscopic sympathectomy produces excellent medical and cosmetic results in patients with palmar hyperhidrosis, and is associated with a short hospital stay and a low risk of complications. Although overall satisfaction rate is high, patients should be fully informed about the high potential for compensatory sweating.

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Ten Things We Knew “For Sure” 50 Years Ago

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Background/Purpose:
In 1957 a graduating Chief Resident at Toronto's Hospital for Sick Children thought he knew everything. This paper compares what was known “for sure” 50 years ago with what paediatric surgeons think we know today.

Methods:
We record a conversation between a CAPS Founding Member and a next generation pediatric surgeon. They discuss 10 facts the older surgeon knew “for sure” when he started practice, all of which have since proven untrue.

Results:
The 10 facts were: 10) most newborns with intestinal atresia won't survive; 9) babies don't feel pain; 8) infectious diseases will be eradicated; 7) children need to stay in hospital for a week after hernia repair; 6) parents are bad for hospitalized children; 5) kids will be kids – accidents can't be avoided; 4) a traumatized spleen must be removed – it's not needed anyway; 3) radical surgery is the only treatment for tumours; 2) the best way to learn to operate is “see one, do one, teach one”; and 1) don't be a keyhole surgeon!

Conclusion:
Many of the assumptions of paediatric surgeons in 1957 have proven untrue in 2007. This raises the question – what do we know “for sure” in 2007?

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