# The Pediatric General Surgery Unit

At McMaster Children’s Hospital, Hamilton

<table>
<thead>
<tr>
<th>MONDAY</th>
<th>TUESDAY</th>
<th>WEDNESDAY</th>
<th>THURSDAY</th>
<th>FRIDAY</th>
</tr>
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</table>
| AM 09:00 – 12:00 2Q clinic  
(Dr. Cameron/Dr. Flageole) | 8 - 3 OR | 9 – 3 OR 11 – 3 OR (every other week) | 9:00 – 11:00 Teaching Rounds (4E10) | 8 – 3 OR |
| PM 12:00 – 13:00 Pediatric Surgery Rounds (4E20)  
13:00 – 16:00 2Q Clinic  
(Dr. Cameron/Dr. Flageole) | OR 13:00 – 16:00 2Q Clinic  
(Dr. Walton) | OR | 12:00 - 13:00 Pediatric Grand Rounds (4E20) | OR |

**Pediatric Surgery Team**

- Dr. P. Fitzgerald 2340 75227 13607
- Dr. B. Cameron 2317 75222 13050
- Mary Lovas (Secretary) 75231
- Dr. M. Walton 2626 75228 13401
- Dr. H. Flageole 2627 73552 13117
- Dr. K. Al-Harbi 2623 75230 13116
- Denise Allen (Secretary) 75244

**Important Phone numbers:**

- 3CN = 76345/76344  Short Stay Unit = 75564 / 75565
- 3CS = 65971/76972  Lida Jones = 75545 / 73618
- 3B = 76120/76123  2Q Clinic = 75094 / 73457 / 75772
- ER = 75020  Radiology = 75279
- OR = 75645  Ultrasound = 75316
- PICU = 75693  Film Library = 73351
- NICU = 76146  Interventional = 75288 / 73729
- Level 2 = 73753  G.I. xray area = 75321
- Admitting = 75100  Pathology = 76419
- Bed Booking = 75106  Pharmacy = 75019

**Information Access:**

Meditech  use Fellow’s access codes

The Meditech patient list is to be maintained up-to-date, and includes only patients admitted or consulted by the Pediatric General Surgery service.
Radiology:
Reports can be heard through the RTAS system, x75077, code 4345.
CENTRICITY – get and use your own password.

Daily Work:

1) Rounds
   a. To start no later than 0700 and expected to finish before going to OR.
   b. Obtain handover from the person on call, including admissions / problems.
   c. Update patient list on the Meditech system.

2) OR
   a. Elective MUMC OR days are Tuesdays and Fridays at 0800 and Wednesdays at 0900 and 1100.
   b. Check the OR schedule a day before the OR so you can be prepared.
   c. Assigned personnel is to report to the OR no later than 0755.
   d. Familiarize yourself with the patient’s condition / history prior to scrubbing in, and examine the patient if practical.
   e. Be aware of any ER / Standby cases- on “add list ” whiteboard in OR.

3) Clinics
   a. Check above schedule for days and time.
   b. Located at the 2Q clinic by the Emergency Department.

4) Academic Activity
   a. Monday 12:00 to 13:00
      i. Pediatric Surgery Rounds – 4E20
      ii. Rotating schedule involving all residents.
      iii. Topics to be discussed / Reviewed in advance with one of staff.
      iv. Use current cases and clinical examples, and gear towards medical students, and Residents (Surgery/Pediatrics) - guidelines appended.
   b. Thursday 9:00 –11:00 am
      i. Review patients with staff and team, present cases and be prepared to answer questions! Bring a relevant reference and educate us.

5) Booking O.R. Cases:
   a. Be sure that there are Pre-op orders, consent is signed, and patient is NPO.
   b. Emergent cases: [NB only Staff or Fellow can book OR cases]
      i. Go to or call the OR desk (x75645) with patient information including birthdate, NPO status, and admission plans.
      ii. Speak to the Anesthetist directly (generally done by Attending).
      iii. Ensure patient has an inpatient bed (bed-booking x75106)
   c. Elective cases are booked through Mary Lovas (x 75231), secretary to Drs Fitzgerald and Cameron or Denise Allen (x75244), secretary to Drs. Walton, Flageole and Al-Harbi, Division of Pediatric General Surgery.
6) Admissions:
   a. Emergent cases:
      i. Book a bed with bed-booking (x 75106) or (x 75100- after hrs ).
      ii. Write up History and Physical with admission Orders.
      iii. Speak directly to nurses on 3C if special or urgent orders.
   b. All Elective cases need a History and Physical note on the chart, old charts reviewed, and admission or pre-op Orders.

7) Discharges:
   Discharge planning should begin when the patient is admitted. Home care and/or nutritional services that will be needed should be arranged well in advance of planned discharge. Ensure that adequate follow-up arrangements are clear, reasonable, and understood by the patients. Discharge plans to be written on the Order sheet should include instructions re diet, bathing, sutures, wound care, pain medicine, antibiotics, and office follow-up. Their family doctor or pediatrician away may follow uncomplicated patients from some distance; if there is a question confirm with the Attending surgeon. **The discharge face-sheet must be completed;** a summary must be dictated within 24 hrs for all patients with copies to the referring doctors.

8) Ward Records:
   There should be a brief note on the chart each morning for each patient. It should summarize any new symptoms and signs, current lab work, x-ray and pathology results, and plans for new orders. Notes need to be legible, signed and dated.
   NB Read the other notes on the chart including nurses notes!!

9) Dictating:
   1. Elective admissions well-known to the service need just a written H&P
   2. DICTATE all Consultations whether Inpatient or E.R.
   3. Dictate ALL dictations as ‘Inpatient’ (otherwise transcription is delayed)

10) O.R. Consents:
    Make sure that the patient/family understands what they are consenting to. That is why it is known as Informed Consent. The Attending surgeon should be directly involved in obtaining consent if the patient/parents seem to be confused or in doubt. Make sure you use Plain English and not medical lingo. Use translators if the family does not appear to understand.
    1. Consent must be obtained from the child if over age 16, and may be obtained from a younger child who has a full understanding of the implications of the consent. Otherwise the legal guardian/parent must give consent.
    2. Explain the procedure or draw a diagram (you may leave the diagram in the chart).
    3. Describe the type of anesthetic, i.e. general vs. local / epidural.
    4. Explain the reason for the procedure, the alternatives to surgery, and the benefits and risks.
    5. Inform about possible complications including those that are more frequent (ex. infection, bleeding) or potentially serious (ex. ostomy, bowel obstruction).
    6. Discuss complications of the disease process as well.
7. Telephone consent may be obtained, but details of the conversation should be recorded in the chart and a second witness must listen to confirmation of the consent and sign the consent form as well (on the back of the form).

11) PARENTS: Remember!! Always listen to the family. Mothers are usually right. Be diplomatic and be careful not to confuse the issues or contradict other team members.

12) ON – CALL ISSUES:
   1. Call the Fellow or Attending after seeing a new patient. Do not send a patient home from the E.R. without discussing with the Attending.
   2. If there is a problem with a patient on the ward, do not hesitate to call the person senior to you for advice or just to inform.
   3. The E.R. must know who to call for day-time consults (make a schedule).

13) Pediatric Trauma and the Pediatric Trauma Team

The pediatric trauma team at the Children's Hospital consists of the pediatric intensive care unit resident (pager 1000=Peds 1000), the pediatric surgery resident or the general surgery resident on call, the pediatric intensivist, the pediatric general surgeon, emergency room physician, ER nurse, a respiratory technologist, pediatric intensive care unit transport nurse, and the emergency room social worker when available. The on-call radiology technician is also paged in the pediatric trauma fan out.

The pediatric trauma team will be called either by the emergency department or by the intensive care unit when a call is received about an injured child being en route. The pediatric trauma team is activated by calling the paging system and asking for the pediatric trauma team. The guidelines are to adopt an 'overcall policy', in other words to call more frequently than perhaps needed as consequences of injuries are hard to predict with children. You should not accept trauma referrals from other hospitals and instead these calls should be referred through the staff people. If you do get these calls by mistake from Critical or paging please take the referring doctors name and number and immediately contact the pediatric surgeon on call in order to coordinate the care. If you do get warning from the pediatric intensive care unit resident about an incoming trauma you should let the pediatric surgeon know on call and also other possible surgical specialties that may need to be involved.

If you are on call and receive a pediatric trauma team fan out page you will see a number of possible codes. The location of where the child is going will also appear on your pager and will either be the emergency department or the intensive care unit.

**Pediatric trauma team** *2* = that the child is coming in (usually by ambulance) within 6 to 15 minutes.
**Pediatric trauma team** *1* = that the child is coming in five minutes or less
**Pediatric trauma team** *0* = that the child is in the emergency department or ICU any need to proceed immediately.
The TTL (trauma team leader) is either the Pediatric Intensivist or the Pediatric General Surgeon. When you arrive at the trauma identify yourself to the TTL. Your role in the trauma is to perform an assessment in the ATLS manner and coordinate the surgical aspects of care. This means the timely involvement of neurosurgery, general surgery, orthopedics surgery, plastic surgery, urology as well as maxillofacial surgery. Remember that this is a team effort and cooperation will make the initial assessment and resuscitation work of the best. Contact specialists early as it may lead to some modification of the radiologic investigations (ie the CT scan technique). Whether you have done the ATLS course or not you will have timely backup from the pediatric general surgeon as well as the pediatric general surgery fellow.

Please assign a pediatric trauma score and Glasgow coma score in your assessment note:

**PEDIATRIC TRAUMA SCORE (PTS)**

<table>
<thead>
<tr>
<th>Size</th>
<th>+2</th>
<th>+1</th>
<th>-1</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;20kg</td>
<td></td>
<td>10-20kg</td>
<td>&lt;10 kg</td>
</tr>
<tr>
<td>Airway</td>
<td>normal</td>
<td>maintainable</td>
<td>unmaintained</td>
</tr>
<tr>
<td>Systolic BP</td>
<td>&gt;90 mm</td>
<td>50-90</td>
<td>&lt;50</td>
</tr>
<tr>
<td>CNS</td>
<td>awake</td>
<td>obtunded</td>
<td>coma</td>
</tr>
<tr>
<td>Open wound</td>
<td>none</td>
<td>minor</td>
<td>major</td>
</tr>
<tr>
<td>Skeletal</td>
<td>none</td>
<td>closed</td>
<td>open/multiple</td>
</tr>
</tbody>
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ADD up the scores from the six categories max=12; min -6

**Indications to Call the Pediatric Trauma Team**

Any injured child whom:
- has serious one system injury (for instance moderate head injury - GCS ≤13)
- 2 system injury (for instance head injury and fractured arm)
- is brought in by a code 4 ambulance trip (lights and siren on) after a trauma
- is admitted to the pediatric intensive care unit for trauma
- worrisome mechanism of injury in which high kinetic energy is involved or when another person has died in the collision.
**Common Surgical Problems:**

NB: Always ensure patient is NPO and consent is signed

1) **Hernias**
   a. Normally patient operated upon directly from short stay and then D/C’ed home when stable with analgesics.
   b. Admission warranted if patient is premature, less than 1 month old and/or requires cardiopulmonary monitoring.
   c. Other exception is a complicated case involving incarceration, strangulation etc. which may necessitate overnight monitoring
   d. DO NOT forget pain control in the form or Tylenol (or Codeine).
   e. Most are discharged with instructions and no scheduled follow-up.

2) **Pyloric Stenosis**
   a. Prior to surgery:
      i. Naso-gastric decompression
      ii. ADEQUATE hydration and correction of any electrolyte abnormality (Cl, HCO3)
   b. Post OR may start feeds in the form of pedialyte within 6-12 hours.
   c. Schedule Follow up appointment prior to D/C.

3) **Gastrostomy / PEG tubes**
   a. Start off by asking yourself:
      i. What is the indication for insertion? Are they appropriate?
      ii. Are further investigations / Assessments required? ie. PH probe, Upper GI study to rule out malrotation and hiatus hernia?
      iii. Which device may be more appropriate (laparoscopic assisted MICKEY tube insertion vs. PEG)?
   b. Normally recommend a 18-24 hour period prior to start of feeding tube use, followed by commencement of pedialyte.
   c. Be sure to assess the tube site a day following insertion. Pay special attention to tension placed between the skin and the T bar.
   d. Arrange for adequate follow up prior to D/C

4) **Laparoscopic Appendectomy**
   a. Pre op: IV Antibiotics and Consent
   b. Post op Perforated Appendix: maintain IV antibiotics for a minimum of 5 days then assess based on ?persistent fever, WBC on top of patients general state.
   c. Prior to D/C assess need for ?PO antibiotics as well as Follow Up

5) **Port or Broviac insertion**
   a. Check platelet count and hemoglobin – may need transfusion preop.
   b. Preop Protocol is on the Ward (back of 3B).
   c. Postop check Chest x-ray (if subclavian) and check patient next day.
Some Medications Commonly Used on the Pediatric Surgery Rotation:

NB Always Triple-Check Pediatric Doses!!!!!

1) Antibiotics:
   a. Ancef 25-50 mg/kg/dose IV Q8H (50 mg/kg preop dose for line insertion)
   b. Flagyl 10 mg/kg/dose IV Q12H Max. 1 gm/day
   c. Gent 2.5 mg/kg/dose IV Q8-12H or 5mg/kg/dos Q24HRS (Not to exceed 400mg) [Not to be used in children with Renal Impairment]
   d. Cefuroxime 30 (25-50)mg/kg/dose IV Q8H Max. 750 mg/dose
   e. Ampicillin 25-50 mg/kg/dose IV Q6H Max. 2 gm/dose
   f. Keflex 12.5 mg/kg/dose PO QID
   g. Clavulin  a. <40kg a. 10 mg/kg/dose PO TID
      OR b. 15 mg/kg/dose PO BID
      ii. >16 yrs 500 mg q 12hrs
   h. Clindamycine  a. PO : 10-20mg/kg/day divided q 6-8 hrs Max dose 450 mg/dose
      ii. IV or IM: 25-40 mg/kg/day divided q 6-8 hrs Max dose 900 mg/dose
   i. Biaxin (clarithromycin) 7.5 mg/kg/dose PO q 12h Max. 1 gm/day

2) Analgesics:
   a. Morphine is the preferred parenteral analgesic in children [NO Demerol]:
      i. Infusion or PCA – as per protocol
      ii. Individual dose - 0.1 mg/kg/dose Q3H +/- PRN
   b. Codeine 0.5 – 1.0 mg/kg/dose Q4H PRN
   c. Toradol 0.5-1.0 mg/kg/dose IV/PO Q4-6H +/- PRN [NB kidneys]
   d. Tylenol 15 mg/kg/dose Q4-6H PO or 20-40 mg/kg Q4-6H PR (supp = 120 mg)
   e. Ibuprofen 5-10 mg/kg/dose PO Q6-8 H

3) Laxatives and Bowel Prep:
   a. Golytely bowel prep: 20-30 cc/kg/hr by NGT for 6 hours/until clear
   b. Citro Mag 4cc/kg/dose X 2-3 doses for bowel prep
   c. Colace:
      a. 0-3 years 10-40mg/day (divided Q8H)
      b. 4-6 years 20-60 mg/day (divided Q8H)
      c. 7-12 years 40-120 mg/day (divided Q8H)
   d. Lactulose 0.5cc/kg/dose BID PO
   e. Senekot 1-2 tabs or 1-2 tsp PO once daily

4) Others:
   a. Anti Emetic
      Gravol 1.0-1.5 mg/kg/dose (max 50 mg) Q4-6H PO or IV
      [avoid Stemetil, Compazine, and Maxeran]
      Ondansetron: 0.15 mg/kg/dose q 8h Max. 8mg/dose
      4-11 yrs 4 mg PO TID
      >11 yrs 8 mg PO TID
   b. H2- Blockers: Zantac
      i. PO: 2-5 mg/kg/dose BID Max. 300 mg/day
      (DU: 1-2 mg/kg/dose BID)
      (GERD: 2-5 mg/kg/dose BID)
      ii. IV: 1-2.5 mg/kg/dose Q6-8H Max. 50 mg q 6-8h
      iii. cont. infusion – initial – 1mg/kg/dose for 1 dose then
      0.08-0.17 mg/kg/hr – or 2-4 mg/kg/day
   c. PPI:
      Omeprazole: 1 (0.7-1.4) mg/kg/day OD or BID Max. 40 mg/day
      <20kg: 10 mg PO OD
      >20kg: 20 mg PO OD
      Pantoloc: po/iv 1mg/kg q 24 hrs

Reviewed by Dr. W. Alfadli, Jan 2007
Appendixes:

1. Feeding Tubes:

Guidelines for Feeding Tube Changes or Replacements

Introduction

Feeding tubes may be either gastrostomy tubes, jejunostomy tubes or G-J tubes (see below). Gastrostomy tubes are the most common feeding tube used. Gastrostomy tube changes should ideally be done electively and done by a pediatric surgeon if the gastrostomy site is less than 6 weeks old. When a gastrostomy tube falls out it must be replaced as soon as possible as otherwise the tract will close quickly. Thus a call from a parent regarding a displaced gastrostomy tube should lead to an immediate replacement of the G-tube either by the parent if they have been appropriately trained or a visit to an ER department. Gastrostomy tube problems commonly lead to visits to the Emergency Room. NB Sometimes the g-tube is not in the stomach.

Gastrostomy tube changes – recommendations for contrast studies

1. No need for contrast study if LONG-STANDING G-TUBE OLDER THAN 6 weeks - Easy tube replacement with balloon/non-balloon gastrostomy tube with good gastric returns from the gastrostomy tube.

2. Mandatory g-tube contrast study if:
   a. Fresh gastrostomy tube (ie<6weeks from insertion) insertion easy or difficult.
   c. Difficult gastrostomy tube replacement with a balloon or non-balloon type, with or without gastric returns visible.
   d. If any doubt about whether the g-tube is in the stomach, the child should not be sent home and urgent gastrostomy tube study to be done in radiology.

Problems that do not require a gastrostomy tube change are

1. Leaking connector on the end of the feeding tube – this can simply be taped or the connector changed with a ‘male’ white connector.

2. Breakdown of the feeding tube near the end – trimming the gastrostomy tube and insertion of a suitable connector can temporize until a replacement tube can be placed in the pediatric surgery clinic

3. Blocked Feeding tube – these can be flushed with saline, cranberry juice, or Coke to try and un-block them. As a last resort the G-tube can be replaced.
Types of gastrostomy tubes

1. Foley catheter—these are the same catheters that are used for bladder catheterization and and vary in size from 8 to 24 French (and larger). These are probably the best catheter to be inserted in the emergency department, as they are not as soft as the Mic-key gastrostomy tube and are available. These can often be placed into the stomach, and if it is a Mickey that has fallen out, then a Mickey gastrostomy tube can be replaced at the following pediatric surgery clinic. A tape or mark should be placed on the catheter next to the skin, with the balloon pulled up to the abdominal wall level – since the balloon may otherwise migrate down into the duodenum and cause obstruction.

2. Mic-key gastrostomy tubes—these are Foley catheter type gastrostomy tubes which are ‘skin level' and so are usually placed in those children than have long-term gastrostomy tubes. These tubes are quite soft and, if the gastrostomy site has constricted, will be difficult to insert. They vary in length but most commonly are of the 14 French diameter. These are not available in the Emergency department.

3. Bard ‘Button' gastrostomy tubes—these were more widely used previously and have a mushroom end that keeps the catheter in the stomach. These are more difficult to insert and require a straightener to get them into the stomach. Only physicians who are experienced in their insertion should insert these.

4. Percutaneous endoscopic gastrostomy tubes—these types of tubes are placed in the operating room with endoscopic guidance. They vary in length but usually are approximately 15 cm and come in 12, 16, 20 French sizes. They have a crossbar that sits close to the skin. The end of the gastrostomy tube that is within the stomach age usually makes it quite difficult to pull out of the stomach. If they fall out they can be replaced with a foley catheter as a temporary measure.

5. Pezzer (mushroom) catheters. These are generally only inserted in the O.R. – they have a single lumen with no balloon, but on the outside otherwise look similar to a Foley.

Other types of feeding tubes include:

1. G-J tubes or transgastric feeding jejunostomy tubes. Feeds via these tubes are usually given continuously. These are usually long tubes that have been radiologically converted to a jejunostomy tube by passing a tube through the gastrostomy site and duodenum into the jejunum. They are used in children with gastroesophageal reflux or motility disorders of the stomach. If these become blocked they will need to the either replaced or assessed by a radiologist. Sometimes the installation of Cranbury juice or Coke can help clean these tubes out. If they become displaced or thought to be displaced a plain x-ray should be obtained and compared to old films to assess where the end of the catheter is positioned. On occasion contrast must be instilled through these catheters to confirm their position.

2. Jejunostomy tubes—these are feeding tubes that are surgically created and are used to provide enteral nutrition on a more continuous basis. In the jejunum there is not the same amount of room as there is in the stomach then care must be taken in replacing these tubes. For instance a Foley catheter can be placed but the balloon cannot be fully inflated as it would occlude the jejunum creating a bowel obstruction. However a Foley catheter can be inserted and well taped as a temporary measure to keep the jejunostomy sites open.
Appendixes:

2. PEDIATRIC SURGERY ROUNDS: Monday 1200 hours, Room 4E20

Instructions to presenter:
1. Select a topic 2 weeks before the date of your presentation.
2. The topic may be from the attached list, an interesting case and review, or a pediatric surgery topic of your own choosing.
3. Discuss your topic with one of the staff surgeons.
4. Identify and write down 3-4 “learning objectives”.
5. Give the title and objectives to Fidelma at least 10 days before.
6. Your presentation should take no longer than 45 minutes, allowing at least 15 minutes for discussion.

Each resident will be assigned one or more topics to present each month. You will be assigned a staff surgeon who will help you find appropriate resources for the presentation (textbooks, articles, slides). Overheads and limited photocopying will be available through Fidelma, our secretary in the Department of Surgery.

The rounds are attended by clinical clerks, residents, staff surgeons/pediatricians and occasionally nursing staff. The presentation should contain material relevant to all levels of learners, but be focused mostly at the clerk/junior resident level.

The format for the rounds is as follows:

- Case presentation, with appropriate x-rays and slides if available.
- Review of the appropriate embryology, anatomy and pathophysiology for the problem.
- Review of the medical and surgical management of the problem.
- Review of “what’s new” in the management of this problem.
- Five minutes at the end for general discussion.

The presentation should be interactive. You have to ask questions!! A one hour didactic talk by the speaker, without any questions to the audience is unacceptable. If you have no “volunteers” to answer your questions you must ask individuals directly. You may not know the names of the individuals attending so you will have to point at an individual to indicate you wish them to answer the question. If that individual cannot answer the question, try one additional person and if they don’t know the answer, then answer it yourself. Feel free to ask staff surgeons about controversial aspects of the problem.

Be early for your presentation and organize your overheads, slides and x-rays.

Speak to the audience and not to your overheads or slides.

Be aware of the time and if you are running late, and if key elements of your presentation are at the end, then delete some of the less essential material from your talk and get to the key elements.
3. Memorandum to paging

Re: Pager 1685 and Wednesday Academic Half Days

The Academic Half Days for the surgery residents is from 0730 hours until 1200 hours. Thus, during this period the pediatric surgery resident pager #1685 should be covered by the pediatric resident that is assigned to the Pediatric General Surgery service. The pediatric resident’s half day is the afternoon on Wednesday and so as of 1200 hours, the general surgery resident on the Pediatric Surgery service will then take the calls for the Pediatric Surgery service and be assigned the default pager of #1685.

If there is no general surgery resident from the Pediatric Surgery service available in the afternoon on Wednesdays, then the pager should be signed out until 1700 hours when the on-call resident starts. Either the pediatric surgery staff or the pediatric surgery fellow will take these calls. Likewise if there is no pediatric resident available for Wednesday morning, then the pediatric surgery pager #1685 should be signed out and the pediatric surgery staff or pediatric surgery fellow will accept these calls.

4. Clinical Clerk On-call Responsibilities

DATE: January 14th, 2004

TO: Surgery Residents

FROM Dr. Devin Peterson
CTU Undergraduate Director

RE: Clinical Clerk On-call Responsibilities

With each new rotation of clinical clerks, a call schedule is made up and clerks are assigned either General Surgery call or Orthopedic call, depending on which rotation they are in.

When a clerk is assigned Orthopedic call, their first priority is to Orthopedics. They are not expected to take call for General Surgery. However, if the clerk is not busy with Orthopedic call, they are welcome to contact the General Surgery resident and help out to gain more surgical experience. However, it must be understood that they may need to leave when Orthopedics resumes activity.