PEDIATRIC SURGERY SERVICE
LEARNING OBJECTIVES

Preamble

The rotation in Pediatric Surgery enables the General Surgery resident to appreciate the special needs of infants and children as surgical patients. Many of the surgical disorders encountered in children are similar in their presentation, management and outcome as in adults. The fundamental principles of surgical care are the same as those that govern surgical practice in older age groups. Additional issues that must be considered in dealing with pediatric surgical patients include:

- The importance of understanding natural history of disease in this age group
- The recognition that many pediatric surgical problems are more appropriately managed where there are special pediatric facilities providing expertise in anesthesia, critical care, diagnostic imaging, laboratory services and nursing care
- Appreciation of the unique emotional and ethical issues surrounding care of the ill child

General Objectives

Upon completion of the Pediatric Surgery rotation, the General Surgery resident is expected to:

- Demonstrate knowledge, clinical skills and decision-making capabilities pertinent to the management of many pediatric surgical problems
- Demonstrate knowledge, clinical and technical skills and decision-making capabilities pertinent to the management of those pediatric surgical conditions encountered in a general surgical practice in a community lacking the immediate availability of a pediatric surgeon

Specific Objectives

At the completion of the Pediatric Surgery rotation, the General Surgery resident will have acquired the following competencies and will function effectively as:

**Medical Expert**

- Establish and maintain clinical knowledge, skills and attitudes appropriate to the Pediatric Surgery rotation
  - Apply knowledge of the clinical, socio-behavioural and fundamental biomedical sciences relevant to the Pediatric Surgery rotation

The resident in General Surgery is required to attain sufficient knowledge as follows:

- Understand the principles of neonatology, including:
  - Physiology of the premature infant, including:
    - Fluid requirements
    - Thermal neutrality
    - Response to cold
➢ Metabolic rate
➢ Hepatic immaturity
➢ Renal function
➢ Nutritional management

➢ Hyperbilirubinemia in the neonate
➢ Intracranial bleeding in the neonate
➢ Newborn respiratory distress syndrome
➢ Neonatal sepsis, including:
  ➢ Immune status
  ➢ Diagnostic workup
  ➢ Microbiology
  ➢ Pharmacokinetics

• Understand the principles of pediatric critical care, including:
  ➢ Fluids and electrolyte management
  ➢ Acid-base equilibrium
  ➢ Shock
  ➢ Pulmonary physiology
  ➢ Nutrition in pediatric critical care
  ➢ Anesthesia for the pediatric patient
  ➢ ECMO

• Understand the logical approach to the following common symptom presentations:
  ➢ Bilious vomiting
  ➢ Non-bilious vomiting
  ➢ Acute abdominal pain
  ➢ Chronic abdominal pain
  ➢ Constipation
  ➢ Rectal bleeding

• Demonstrate a thorough knowledge of the conditions that he/she should be able to manage as a general surgeon, including:
  ➢ Head and neck lesions, including:
    ➢ Acute/chronic lymphadenitis
    ➢ Thyroglossal duct cyst
    ➢ Dermoid cyst
    ➢ Congenital torticollis
    ➢ Branchial cleft cyst/sinus
    ➢ Lymphangioma/hemolymphangioma
    ➢ Tongue tie
  ➢ Skin and subcutaneous lesions, including:
    ✓ Nevi
    ✓ Pilomatrixoma
    ✓ Juvenile melanoma
    ✓ Lipoma
    ✓ Ingrown toenails
    ✓ Paronychia
    ✓ Pilonidal sinus disease

  ➢ Abdominal problems, including:
- Umbilical hernia
- Umbilical granuloma
- Inguinal hernia
- Pyloric stenosis
- Intussusception
- Meckel’s diverticulum
- Acute appendicitis

- Scrotal lesions, including:
  - Hydrocele
  - Undescended testicle
  - Testicular torsion
  - Torsion of the appendix testes
  - Epididymitis

- Understand the management of conditions that are ideally managed in a special pediatric facility and may demand initial management and occasionally definitive management locally because of urgency or distance, including:
  - Incarcerated inguinal hernia in the neonate
  - Aspirated/ingested foreign bodies/bezoars
  - Acute abdomen in the neonate, including:
    - Necrotizing enterocolitis
    - Bowel obstruction
    - Bowel perforation (drainage)
  - Acute gastrointestinal bleeding
  - Pediatric trauma, including:
    - Initial assessment/priorities
    - Principles of operative and non-operative management of the following:
      - CNS trauma
      - Neck trauma
      - Chest trauma
      - Abdominal/pelvic trauma
      - Genitourinary trauma
      - Extremity trauma
      - Thermal injuries

- Demonstrate a fundamental knowledge of conditions and problems likely to be seen initially by a general surgeon, but ideally managed in a specialty pediatric facility, including:
  - Congenital lesions of the lung and mediastinum, including:
    - Cystic adenomatoid malformation
    - Pulmonary sequestration
    - Lobar emphysema
    - Blebs and spontaneous pneumothorax
    - Hypoplasia
    - Pulmonary hypertension
    - Mediastinal cysts
    - Mediastinal neoplasia
  - Diaphragmatic hernia
- Surgical management of gastroesophageal reflux
- Pectus excavatum/pectus carinatum
- Solid neoplasms of childhood, including:
  - Renal neoplasms, including:
    - Wilm’s tumour
    - Mesoblastic nephroma
  - Adrenal neoplasms, including:
    - Neuroblastoma
    - Ganglioneuroblastoma
    - Carcinoma
  - Liver neoplasms, including:
    - Hemangioma
    - Hamartoma
    - Adenoma
    - Focal nodular hyperplasia
    - Hepatoblastoma
    - Hepatoma
  - Soft tissue tumours, including:
    - Neurofibroma
    - Rhabdomyosarcoma
    - Fibrosarcoma
    - Liposarcoma
    - Leiomyosarcoma
  - Teratomas
  - Lymphomas
  - Gonadal tumours including:
    - Testicular
    - Ovarian
- Understand the presentation, natural history, principles of management and outcome of conditions that should be treated exclusively in a specialized pediatric surgical facility, including:
  - Diaphragmatic hernia
  - Tracheoesophageal fistula
  - Gastroschisis
  - Omphalocele
  - Intestinal atresias
  - Biliary Conditions, including:
    - Biliary atresia
    - Biliary hypoplasia
    - Choledochal cyst
  - Pancreatic conditions, including:
    - Cystic fibrosis
    - Pancreas divisum
    - Annular pancreas
    - Congenital cysts
Neoplasia

- Splenic conditions, including:
  - Hereditary spherocytosis
  - Thalassemia
  - ITP
  - Gaucher’s disease
  - Splenic cyst
  - Splenic abscess
  - Overwhelming post-splenectomy infection

- Hirschsprung’s disease
- Imperforate anus
- Intestinal malrotation
- Major pulmonary parenchymal disease
- Intersex anomalies, including ethical implications of gender assignment with respect to the following:
  - Adrenogenital syndrome
  - Mixed gonadal dysgenesis
  - True and pseudo-hermaphroditism
  - Testicular feminization syndrome and its variants

Endocrine Conditions, including:

- Thyroid problems, including:
  - Hyperthyroidism
  - Thyroiditis
  - Neoplasia
  - Management of thyroid mass following irradiation

- Parathyroid conditions, including:
  - Hypoparathyroidism
  - Hyperparathyroidism

- Breast conditions, including:
  - Neonatal hypertrophy
  - Mastitis
  - Gynecomastia
  - Nipple discharge
  - Fibroadenoma
  - Phyllodes tumours
  - Premature thelarche

- Functional pancreatic tumours
- Adrenal conditions
- Testicular conditions, including:
  - Cryptorchidism
  - Tumours

- Perform a complete and appropriate assessment of the pediatric surgical patient

  - Elicit a history that is relevant, concise and accurate
• Perform a focused physical examination that is relevant and accurate
• Select medically appropriate investigations in a resource-effective and ethical manner
• Demonstrate effective clinical problem solving and judgment to address the pediatric surgical problems, including interpreting available data and integrating information to generate differential diagnoses and management plans

• Use preventive and therapeutic interventions effectively
  • Implement an effective and prioritized management plan for the pediatric surgical patient, including appropriate and expeditious patient disposition in the acute care setting
  • Demonstrate effective, appropriate and timely application of therapeutic interventions relevant to the Pediatric Surgery rotation
  • Ensure appropriate informed consent is obtained for therapies

• Demonstrate proficient and appropriate use of procedural skills
  • Demonstrate effective, appropriate and timely performance of diagnostic procedures relevant to the Pediatric Surgery rotation
  • Demonstrate effective, appropriate and timely performance of therapeutic procedures relevant to the Pediatric Surgery rotation
  • Ensure appropriate informed consent is obtained for procedures
  • Appropriately document and disseminate information related to procedures performed and their outcomes
  • Ensure adequate follow-up is arranged for procedures performed
  • Compile and maintain an accurate and complete electronic data base for all operative procedures performed on the Pediatric Surgery rotation

Having completed the Pediatric Surgery rotation, the General Surgery resident will be able to demonstrate knowledge and technical competence in performing the following procedures:
• ATLS principles and procedures
• Venous cutdown
• Central venous catheter insertion
• Portacath insertion
• Tracheostomy
• Incision/drainage of subcutaneous abscess
• Excision of simple skin/subcutaneous lesion
• Open appendectomy
• Laparoscopic appendectomy
- Reduction of intussusception
- Reduction of incarcerated inguinal hernia
- Repair of indirect inguinal hernia
- Repair of hydrocele
- Repair of umbilical hernia
- Repair of epigastric hernia
- Pyloromyotomy
- Cervical lymph node biopsy
- Gastrostomy
- Colostomy
- Bowel resection
- Principles and techniques of the following endoscopic procedures:
  - Esophagogastroduodenoscopy
  - Proctosigmoidoscopy
  - Colonoscopy

- Seek appropriate consultation from other health professionals
  - Demonstrate insight into his/her own limitations of expertise by self-assessment
  - Demonstrate effective, appropriate and timely consultation of another health professional as needed for optimal care of the pediatric surgical patient
  - Arrange appropriate follow-up care services for the pediatric surgical patient

**Communicator**

At the completion of the Pediatric Surgery rotation, the General Surgery resident will be able to:

- Develop rapport, trust and ethical therapeutic relationships with patients and families
  - Establish positive therapeutic relationships with patients and their families that are characterized by understanding, trust, respect, honesty and empathy
  - Respect patient confidentiality, privacy and autonomy
  - Listen effectively

- Accurately elicit and synthesize relevant information and perspectives of patients and families, colleagues and other professionals
  - Seek out and synthesize relevant information from other sources such as the patient’s family, caregivers and other professionals

- Accurately convey relevant information and explanations to patients and families, colleagues and other professionals
• Deliver information to the pediatric surgical patient and family, colleagues and other professionals in a humane and understandable manner

• **Convey effective oral and written information**
  
  • Maintain clear, accurate, appropriate and timely records of clinical encounters and operative procedures involving the pediatric surgical patients
  
  • Maintain an accurate, complete and up-to-date electronic database (log) of operative procedures performed during the Pediatric Surgery rotation
  
  • Effectively present verbal reports of clinical encounters and medical information during the Pediatric Surgery rotation

**Collaborator**

At the completion of the Pediatric Surgery rotation, the General Surgery resident will be able to:

• **Participate effectively and appropriately in an interprofessional healthcare team**
  
  • Recognize and respect the diversity of roles, responsibilities and competences of other professionals (e.g. nurses/ET nurses, nursing assistants, dieticians and physiotherapists) in the management of the pediatric surgical patient
  
  • Work with others to assess, plan, provide and integrate care of the pediatric surgical patient
  
  • Demonstrate leadership in the day-to-day running of resident/student team activities on the Pediatric Surgery rotation

**Manager**

At the completion of the Pediatric Surgery rotation, the General Surgery resident will be able to:

• **Manage his/her professional and personal activities effectively**
  
  • Set priorities and manage time to balance professional responsibilities, outside activities and personal life
  
  • Employ information technology effectively (e.g. electronic surgical procedure database)

• **Demonstrate an understanding of cost-effectiveness in patient management**
  
  • Utilize hospital resources wisely when managing pediatric surgical patients

• **Serve in leadership roles, as appropriate**
- Participate effectively at teaching rounds and other meetings
- Lead the **Pediatric Surgery team** effectively and efficiently

**Health Advocate**

At the completion of the Pediatric Surgery rotation, the General Surgery resident will be able to:

- **Respond to the needs of the pediatric surgical patient**
  - Identify the health needs of an individual patient
  - Identify opportunities for child health advocacy, health promotion and disease prevention (e.g. travel safety; helmet use)

**Scholar**

At the completion of the Pediatric Surgery rotation, the General Surgery resident will be able to:

- **Maintain and enhance professional activities through ongoing learning**
  - Pose an appropriate learning question
  - Access and interpret the relevant evidence
  - Integrate new learning into development as a general surgeon
- **Critically evaluate medical information and its sources and apply this appropriately to clinical decisions**
  - Critically appraise the evidence in order to address a clinical question
  - Integrate critical appraisal conclusions into clinical care
- **Facilitate the learning of students and residents**
  - Demonstrate an effective presentation while assigned to the Pediatric Surgery rotation
  - Provide effective feedback to faculty, residents and students

**Professional**

At the completion of the Pediatric Surgery rotation, the General Surgery resident will be able to:

- **Demonstrate a commitment to patients through ethical practice**
- Exhibit appropriate professional behaviours, including honesty, integrity, commitment, compassion, respect and altruism
- Appropriately manage conflicts of interest
- Recognize the principles and limits of patient confidentiality
- Maintain appropriate relations with patients

- **Demonstrate a commitment to physician health**
  - Balance personal and professional priorities
  - Strive to heighten personal and professional awareness and insight