

DEPARTMENT OF SURGERY  
**SECTION OF PEDIATRIC SURGERY**  
PEDIATRIC SURGERY ROTATION (DSP)

C.S. Mott Children's Hospital  
Von Voigtlander Women's Hospital

House Officer I  
House Officer II  
House Officer III

Curriculum/Rotation Goals and Objectives for  
Surgery Residents

# Pediatric Surgery Service

## House Officer I

**Goal:** The goal of the HO I Pediatric Surgery rotation is to build on the residents' overall general surgical knowledge and operative experience and provide more concentrated exposure to pediatric surgical conditions, including hernias, congenital anomalies, pathophysiologic conditions of the newborn, and to begin the residents' introduction to basic open and laparoscopic surgery techniques unique to pediatric surgery.

### Learning Objectives:

#### Patient Care:

By the end of the Pediatric Surgery rotation, the HO I resident will be able to:

1. Communicate effectively and demonstrate caring and respectful behaviors when interacting with patients and their families
2. Gather essential and accurate information about their patients, especially regarding inguinal hernias, acute abdominal pain, gastro-esophageal reflux, and appendicitis
3. Suggest or initiate (with appropriate fellow and attending supervision) diagnostic and therapeutic interventions based on patient information and preferences, up-to-date scientific evidence, and clinical judgment
4. Counsel and educate patients and their families, under the guidance and direction of senior residents and faculty
5. Use information technology effectively to support patient care decisions and patient education
6. Assist and perform portions of basic pediatric surgical procedures, including inguinal hernias, umbilical hernias, and appendectomy. This will include minimally invasive procedures or open surgery (under supervision), with particular attention to basic surgical skills, understanding of anatomy and differences between pediatric surgical and adult approaches to these procedures  
*PRE-REQUISITE: completion of basic laparoscopic skills curriculum to Silver Level is required to serve in Surgeon Junior role in a laparoscopic case*
7. Collaborate with health care professionals, including those from other disciplines, to provide patient-focused care, with a particular attention to the multidisciplinary care of the pediatric surgery patient which includes interactions with pediatricians, other pediatric surgical specialists, pharmacists, dietitians, and mid-level providers from the clinic and inpatient service

#### Medical Knowledge:

By the end of the Pediatric Surgery rotation, the HO I resident will be able to:

##### 1. Inguinal and Umbilical Hernia

*Refer to SCORE modules: Inguinal hernia, Inguinal Hernia Repair, Umbilical Hernia and Umbilical Hernia Repair*

- a. Explain the anatomy and physiology of a pediatric inguinal and umbilical hernias, including the anatomy and differences between adults and children
- b. Categorize the common treatment options for inguinal and umbilical hernias, including both open and laparoscopic approaches
- c. Delineate the intra-operative risks of both types of hernia repair

- d. Demonstrate safe and effective post-operative management of uncomplicated hernia repairs, including provision of adequate pain control and wound management
- e. Delineate post-operative complications, both short and long term for hernia repair
- f. Demonstrate safe and effective management of post-operative complications, including hematoma, urinary retention, and surgical site infection

## **2. Appendicitis**

*Refer to SCORE modules: Abdominal Pain – Acute and Adult Appendicitis*

- a. Explain the anatomy and pathophysiology of acute appendicitis
- b. Develop a differential diagnosis of the acute abdomen
- c. Demonstrate an adequate history and physical, with particular unique features related to the pediatric patient
- d. Develop a competent and complete diagnostic work up of the pediatric patient with abdominal pain, including laboratory and radiologic work up, and clinical treatment plan
- e. Delineate a safe and appropriate plan for preparing the child for surgery, including those with acute and ruptured appendicitis
- f. List the common treatment options for appendicitis including non-operative and operative, as well as the technical aspects, including both open and laparoscopic approaches
- g. Demonstrate safe and effective management of post-operative complications, including infections, pain, and other wound complications

## **3. Congenital Anomalies and Neonatal Anomalies**

- a. Explain the anatomy and function of the neonatal cardiopulmonary physiology circulation, and how this is upset with the development of a congenital diaphragmatic hernia
- b. Explain how to diagnose and care for a neonate with necrotizing enterocolitis (NEC)
- c. Outline the appropriate non-operative care of a neonate with NEC, and indications for operative intervention
- d. Outline the appropriate care of a neonate abdominal wall defects (Gastroschisis and omphalocele)
- e. Explain the common treatment options for abdominal wall defects.
- f. Describe the potential intraoperative complications that can occur with NEC and abdominal wall defects, including, bleeding, septicemia and compromised blood flow to intra-abdominal contents
- g. Identify post-operative complications and demonstrate safe and effective management (in conjunction with senior residents and faculty) for conditions including intestinal ischemia, intestinal strictures or atresia, and feeding dysfunction

## **Systems-Based Practice:**

By the end of the Pediatric Surgery rotation, the HO I resident will be able to:

1. Explain the role of systems in delivering optimal health care, including how “system problems” contribute to quality problems
2. Explain how his or her patient care and other professional practices affect other health care professionals, the health care organization, and the larger society and how these elements of the system affect their own practice
3. Explain how types of medical practice and delivery systems differ from one another, including methods of controlling health care costs and allocating resources
4. Practice cost-effective health care and resource allocation that does not compromise quality of care
5. Advocate for quality patient care and assist patients in dealing with system complexities
6. Collaborate with health care managers and health care providers to assess, coordinate, and improve health care and know how these activities can affect system performance

## **Practice-Based Learning and Improvement:**

By the end of the Pediatric Surgery rotation, the HO I resident will be able to:

1. Analyze practice experience and perform practice-based improvement activities using a systematic methodology
2. Locate, appraise, and assimilate evidence from scientific studies related to their patients' health problems
3. Conduct an effective literature search about a given pediatric surgery topic
4. Describe a systematic approach to evaluate the results of one's own practice after attending Quality Improvement curriculum sessions
5. Outline the basic tenets of the Scientific Method as applied to clinical research and outline the steps in the generation or statement of a research hypothesis from clinical questions or observations, including basic
6. Use information technology to manage information, access on-line medical information; and support self-directed education

## **Professionalism:**

By the end of the Pediatric Surgery rotation, the HO I resident will be able to:

1. Demonstrate respect, compassion, and integrity; a responsiveness to the needs of patients and society that supersedes self-interest; accountability to patients, society, and the profession; and a commitment to excellence and on-going professional development
2. Demonstrate appropriate sensitivity to the pediatric patient population and parents, and understand how their needs may be different from other patients
3. Recognize the importance of timely record keeping and its impact on the quality of pediatric surgery care
4. Demonstrate a commitment to ethical principles pertaining to provision or withholding of clinical care, confidentiality of patient information, informed consent, and business practices
5. Demonstrate sensitivity and responsiveness to patients' culture, age, gender, and disabilities and to parental anxiety

## **Interpersonal and Communication Skills:**

By the end of the Pediatric Surgery rotation, the HO I resident will be able to:

1. Create and sustain a therapeutic and ethically sound relationship with patients
2. Demonstrate effective listening skills and elicit and provide information using effective nonverbal, explanatory, questioning, and writing skills
3. Collaborate effectively with others as a member or leader of a health care team or other professional group
4. Demonstrate the ability to interview and evaluate the patient, especially the acute abdominal pain pediatric surgery patient

# Pediatric Surgery Service

## House Officer II

**Goal:** The goal of the HO II Pediatric Surgery rotation is to build on the residents' overall general surgical knowledge and operative experience and provide more concentrated exposure to pediatric surgical conditions, including hernias, congenital anomalies, pathophysiologic conditions of the newborn, and to begin the residents' introduction to basic open and somewhat more advanced laparoscopic surgery techniques unique to pediatric surgery. Operative opportunities will increase during this year as you actively manage your learning experience by coordinating with Dr. Peter Ehrlich.

### Learning Objectives:

#### Patient Care:

By the end of the Pediatric Surgery rotation, the HO II resident will be able to:

1. Communicate effectively and demonstrate caring and respectful behaviors when interacting with patients and their families
2. Gather essential and accurate information about their patients, especially regarding inguinal hernias, acute abdominal pain, gastro-esophageal reflux, complicated appendicitis, and congenital anomalies
3. Make informed decisions about diagnostic and therapeutic interventions based on patient information and preferences, up-to-date scientific evidence, and clinical judgment
4. Counsel and educate patients and their families, under the guidance and direction of senior residents and faculty
5. Use information technology effectively to support patient care decisions and patient education
6. Assist and perform portions of basic pediatric surgical procedures, including inguinal hernias, umbilical hernias, and appendectomy. This will include minimally invasive procedures or open surgery (under supervision), with particular attention to basic surgical skills, understanding of anatomy and differences between pediatric surgical and adult approaches to these procedures
7. Collaborate with health care professionals, including those from other disciplines, to provide patient-focused care, with a particular attention to the multidisciplinary care of the pediatric surgery patient which includes interactions with pediatricians, other pediatric surgical specialists, pharmacists, dietitians, and mid-level providers from the clinic and inpatient service

#### Medical Knowledge:

By the end of the Pediatric Surgery rotation, the HO II resident will be able to:

##### 1. Gastro-esophageal Reflux

*Refer to SCORE modules: Anti-Reflux Procedure*

- a. Explain the anatomy and physiology of contributing to gastroesophageal reflux disease (GERD) in a pediatric patient, including the anatomy and differences between adults and children
- b. Categorize the common complications of GERD in children, including respiratory complications (asthma and pneumonia), esophagitis, failure to thrive, and Barrett's changes)
- c. Discuss the treatment options for the medical management of GERD in children
- d. Explain the technical approaches to the open and laparoscopic approaches to a fundoplication in children
- e. Outline the indications of a feeding tube placement in a child undergoing a fundoplication.

- f. Delineate the intra-operative risks of fundoplication
- g. Demonstrate safe and effective post-operative management of a fundoplication, including provision of adequate pain control, feeding issues and wound management

## **2. Complicated Appendicitis and Less Common Etiologies of Acute Abdomen**

*Refer to SCORE modules: GI Bleeding, Meckel's Diverticulum, Meckel's Diverticulum – Excision, Tracheal/Esophageal Foreign Bodies, and Adult Appendicitis*

- a. Explain the anatomy and pathophysiology of acute appendicitis
- b. Delineate a safe and appropriate plan for preparing the child for surgery, including those with acute and ruptured appendicitis
- c. Delineate the etiologies of GI bleeding that are unique to the pediatric patient, and correlate these to the age of the child, including, anal fissures, Meckel's diverticulum, malrotation, juvenile polyps and portal hypertension
- d. Outline the work up and surgical management of Meckel's diverticulum
- e. Outline the diagnostic work up of a child with an esophageal versus airway foreign body
- f. Discuss the surgical and endoscopic management of a child with an esophageal versus airway foreign body, including considerations for airway management, dealing with complex objects (e.g., needles and disc batteries) and endoscopic devices unique for the safe retrieval of these objects
- g. Demonstrate safe and effective management of post-operative management complications, including airway and respiratory distress, esophageal perforation or injury, and risk of tracheal-esophageal fistula

## **3. Chest Wall Deformities**

*Refer to SCORE module: Chest Wall Deformity – Repair*

- a. List the theoretical etiologies of pectus excavatum and pectus carinatum
- b. List the potential complications associated with an uncorrected chest wall deformity
- c. List the indications for surgical management of pectus deformities
- d. Outline the non-operative approach to care for pectus carinatum (i.e., bracing devices)
- e. Explain the two main surgical approaches for the care of pectus excavatum (Ravitch- open approach versus MIS, Nuss procedure)
- f. Explain a rationale for selecting one procedure over another, including the advantages and disadvantages of each
- g. Describe the technique for each of these operative approaches
- h. Demonstrate safe and effective post-operative management of a child undergoing pectus surgery, including respiratory care, pain management and post-operative physical restrictions
- i. Explain post-operative complications of pectus surgery
- j. Identify post-operative complications and demonstrate safe and effective management (in conjunction with senior residents and faculty) of conditions including pneumonia, hematoma and wound infections

## **Systems-Based Practice:**

By the end of the Pediatric Surgery rotation, the HO II resident will be able to:

1. Explain the role of systems in delivering optimal health care, including how "system problems" contribute to quality problems
2. Explain how their patient care and other professional practices affect other health care professionals, the health care organization, and the larger society and how these elements of the system affect their own practice
3. Explain how types of medical practice and delivery systems differ from one another, including methods of controlling health care costs and allocating resources
4. Practice cost-effective health care and resource allocation that does not compromise quality of care
5. Advocate for quality patient care and assist patients in dealing with system complexities
6. Collaborate with health care managers and health care providers to assess, coordinate, and improve health care and know how these activities can affect system performance

### **Practice-Based Learning and Improvement:**

By the end of the Pediatric Surgery rotation, the HO II resident will be able to:

1. Analyze practice experience and perform practice-based improvement activities using a systematic methodology
2. Locate, appraise, and assimilate evidence from scientific studies related to their patients' health problems
3. Conduct an effective literature search about a given pediatric surgery topic
4. Describe/design a systematic approach to evaluate the results of one's own practice
5. Outline the basic tenets of the Scientific Method as applied to clinical research and outline the steps in the generation or statement of a research hypothesis from clinical questions or observations, including basic
6. Use information technology to manage information, access on-line medical information; and support self-directed education

### **Professionalism:**

By the end of the Pediatric Surgery rotation, the HO II resident will be able to:

1. Demonstrate respect, compassion, and integrity; a responsiveness to the needs of patients and society that supersedes self-interest; accountability to patients, society, and the profession; and a commitment to excellence and on-going professional development
2. Demonstrate appropriate sensitivity to the pediatric patient population and parents, and understand how their needs may be different from other patients
3. Recognize the importance of timely record keeping and its impact on the quality of pediatric surgery care
4. Demonstrate a commitment to ethical principles pertaining to provision or withholding of clinical care, confidentiality of patient information, informed consent, and business practices
5. Demonstrate sensitivity and responsiveness to patients' culture, age, gender, and disabilities

### **Interpersonal and Communication Skills:**

By the end of the Pediatric Surgery rotation, the HO II resident will be able to:

1. Create and sustain a therapeutic and ethically sound relationship with patients
2. Demonstrate effective listening skills and elicit and provide information using effective nonverbal, explanatory, questioning, and writing skills
3. Collaborate effectively with others as a member or leader of a health care team or other professional group
4. Demonstrate the ability to interview and evaluate the patient and parents, especially the work up of a pediatric surgery patient with GERD, complex abdominal issues, including GI bleeding and chest wall anomalies

# Pediatric Surgery Service

## House Officer III

**Goal:** The goal of PGY III Pediatric Surgery rotation is to build on the residents' overall general surgical knowledge and operative experience and provide more concentrated exposure to pediatric surgical conditions, including hernias, congenital anomalies, pathophysiologic conditions of the newborn, and to begin the residents' introduction to basic open and somewhat more advanced laparoscopic surgery techniques unique to pediatric surgery. Operative opportunities and complexity will further increase during this year as residents actively manage their learning experience by coordinating with Dr. Peter Ehrlich to assure at least 20 index cases (pediatric surgery category) at the conclusion of this rotation.

### Learning Objectives:

#### Patient Care:

By the end of the Pediatric Surgery rotation, the HO III resident will be able to:

1. Communicate effectively and demonstrate caring and respectful behaviors when interacting with patients and their families
2. Gather essential and accurate information about their patients, especially regarding abdominal masses, congenital atresia of the GI tract and malrotation
3. Make informed decisions about diagnostic and therapeutic interventions based on patient information and preferences, up-to-date scientific evidence, and clinical judgment
4. Counsel and educate patients and their families, under the guidance and direction of senior residents and faculty
5. Use information technology effectively to support patient care decisions and patient education
6. Assist and perform portions of basic pediatric surgical procedures, including abdominal masses, congenital atresia of the GI tract and malrotation. This will include minimally invasive procedures or open surgery (under supervision), with particular attention to basic surgical skills, understanding of anatomy and differences between pediatric surgical and adult approaches to these procedures
7. Collaborate with health care professionals, including those from other disciplines, to provide patient-focused care, with a particular attention to the multidisciplinary care of the pediatric surgery patient which includes interactions with pediatricians, radiologists other pediatric surgical specialists, pharmacists, dietitians, and mid-level providers from the clinic and inpatient service

#### Medical Knowledge:

By the end of the Pediatric Surgery rotation, the HO III resident will be able to:

##### 1. Abdominal Masses

Refer to SCORE modules: Abdominal Mass, Neuroblastoma and Wilms' Tumor

- a. Explain the typical history and physical examination in a child presenting with an abdominal mass
- b. Outline the diagnostic work up, including laboratory and imaging studies needed to manage a child who presents with an abdominal mass
- c. List a differential diagnosis of a child with an abdominal mass, including neoplastic, infectious trauma and congenital-based etiologies



- d. Discuss the treatment options for the surgical management of a child with a neuroblastoma versus a Wilms' tumor
- e. Delineate the intra-operative risks of these surgical procedures, including bleeding, injury to adjacent structures and tumor rupture
- f. Demonstrate safe and effective post-operative management of a fundoplication, including provision of adequate pain control, feeding issues, intussusception and wound management
- g. Understand the basics of chemotherapy and radiation therapy as adjuncts to the care of an infant with a malignant abdominal mass

## **2. Congenital Atresias of GI Tract**

*Refer to SCORE modules: Duodenal Atresia/Stenosis, Esophageal Atresia/Tracheoesophageal Fistula, Imperforate Anus)*

- a. Explain the embryogenesis of atresias of the GI tract
- b. Describe the work up of a neonate with a potential obstruction of their GI tract, and discuss what diagnostic imaging studies should be performed and the urgency and order of these studies
- c. Outline the differential diagnostic list in an infant with neonatal GI obstructions.
- d. Delineate a safe and appropriate plan for preparing the child for surgery, including hydration and electrolyte balance
- e. Outline the need for a colostomy versus primary pull through in a child with various atresias of the anorectal canal
- f. Demonstrate safe and effective management of post-operative management complications, including airway and respiratory distress, and timing of enteral feeding
- g. Explain the long-term implications of a GI atresia, including feeding and digestive disorders in a child with a TEF/EA and stooling problems in a child with an imperforate anus

## **3. Emesis in Infancy**

*Refer to SCORE modules: Malrotation-Operation and Pyloric Stenosis*

- a. Discuss the ways that one can begin to differentiate an infant with malrotation versus pyloric stenosis via a history and physical examination
- b. Explain the embryogenesis of malrotation of the GI tract
- c. Outline the work up of a neonate with a potential malrotation versus pyloric stenosis.
- d. Discuss what diagnostic imaging studies should be performed and the urgency and order of these studies
- e. Outline the differential diagnostic list in an infant with neonatal GI obstructions
- f. Delineate a safe and appropriate plan for preparing the child for surgery, including hydration and electrolyte balance, NG decompression, IV antibiotics, and the differences in anticipated electrolyte abnormalities between these two disorders
- g. Discuss and demonstrate knowledge of the surgical management of malrotation and pyloric stenosis, including open and laparoscopic approaches
- h. Demonstrate safe and effective management of post-operative management complications, including ischemia and or infarction of intestine, need for additional surgery, and timing of enteral feeding

## **Systems-Based Practice:**

By the end of the Pediatric Surgery rotation, the HO III resident will be able to:

1. Explain the role of systems in delivering optimal health care, including how "system problems" contribute to quality problems
2. Explain how his or her patient care and other professional practices affect other health care professionals, the health care organization, and the larger society and how these elements of the system affect their own practice
3. Explain how types of medical practice and delivery systems differ from one another, including methods of controlling health care costs and allocating resources
4. Practice cost-effective health care and resource allocation that does not compromise quality of care

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| 5. Advocate for quality patient care and assist patients in dealing with system complexities  |
| 6. Collaborate with health care managers and health care providers to assess, coordinate, and improve health care and know how these activities can affect system performance |

### **Practice-Based Learning and Improvement:**

By the end of the Pediatric Surgery rotation, the HO III resident will be able to:

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| 1. Analyze practice experience and perform practice-based improvement activities using a systematic methodology   |
| 2. Locate, appraise, and assimilate evidence from scientific studies related to their patients' health problems   |
| 3. Conduct an effective literature search about a given pediatric surgery topic   |
| 4. Describe/design a systematic approach to evaluate the results of one's own practice  |
| 5. Outline the basic tenets of the Scientific Method as applied to clinical research and outline the steps in the generation or statement of a research hypothesis from clinical questions or observations, including basic |
| 6. Use information technology to manage information, access on-line medical information; and support self-directed education  |

### **Professionalism:**

By the end of the Pediatric Surgery rotation, the HO III resident will be able to:

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| 1. Demonstrate respect, compassion, and integrity; a responsiveness to the needs of patients and society that supersedes self-interest; accountability to patients, society, and the profession; and a commitment to excellence and on-going professional development |
| 2. Demonstrate appropriate sensitivity to the pediatric patient population and parents, and understand how their needs may be different from other patients   |
| 3. Recognize the importance of timely record keeping and its impact on the quality of pediatric surgery care  |
| 4. Demonstrate a commitment to ethical principles pertaining to provision or withholding of clinical care, confidentiality of patient information, informed consent, and business practices   |
| 5. Demonstrate sensitivity and responsiveness to patients' culture, age, gender, and disabilities   |

### **Interpersonal and Communication Skills:**

By the end of the Pediatric Surgery rotation, the HO III resident will be able to:

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| 1. Create and sustain a therapeutic and ethically sound relationship with patients   |
| 2. Demonstrate effective listening skills and elicit and provide information using effective nonverbal, explanatory, questioning, and writing skills                             |
| 3. Collaborate effectively with others as a member or leader of a health care team or other professional group   |
| 4. Demonstrate the ability to interview and evaluate the patient, especially the work up of a pediatric surgery patient with GI atresias, abdominal masses, and pyloric stenosis |