

Curriculum for the Stanford Program for Pediatric Surgery Residency

PEDIATRIC GENERAL SURGICAL ROTATION

CONTACTS

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REQUIRED READINGS

1. Pediatric Surgery Rotation Handbook
2. LPCH Call/Rounding policy

RECOMMENDED READINGS

1. Pediatric Surgery textbooks (available in pediatric Surgery office)
2. Online sources

EDUCATIONAL GOALS

The goal is NOT to develop an encyclopedic knowledge of pediatric surgery, but rather to develop a familiarity and working knowledge of pediatric surgical conditions that a general surgical practitioner in the community may encounter in their practice. The resident will therefore understand basic management of these conditions, and when it is appropriate to refer patients to pediatric surgical specialists.

LEARNING OBJECTIVES

The objectives of residency training in Pediatric Surgery are to develop a familiarity for the preoperative, operative, and postoperative management of the problems relegated to this area of special expertise, and to learn to interact appropriately with allied colleagues involved in the care of pediatric patients. Additionally, it is expected that the resident in Pediatric Surgery will develop the sensitivity required to deal not only with pediatric patients, but also with their families while maintaining the attitude and deportment commensurate with the primary care of pediatric patients. Interwoven with these objectives will be those of an ethical and academic nature that will reflect the conscience of modern Pediatric Surgery.

Medical Knowledge & Patient Care

Head and Neck:

At the end of training, the resident will be knowledgeable of the clinical presentation, management, natural history and responses to treatment of head and neck disease in children. This will include:

- congenital lesions: thyroglossal duct cyst, branchial cleft cysts; sinuses and other

remnants; lymphangiomas, hemangiomas

- cranial trauma: diagnosis and emergency management including indications for increased intracranial pressure (ICP) monitoring, Glasgow Coma Scale (GCS)
- cervical trauma: injuries to the esophagus, trachea, blood vessels; airway management; tracheostomy; recognition and emergency management of cervical spine fractures

Non-Cardiac Thoracic Surgery

At the end of training, the resident will be knowledgeable of the clinical presentation, management, natural history, and responses to treatment of non-cardiac chest conditions in children. This will include:

- esophageal atresia and tracheoesophageal fistula (TEF): embryology, classification, diagnosis, treatment, complications with their treatment
- esophageal achalasia, webs, stenosis (congenital and acquired), duplications
- acquired esophageal conditions: gastroesophageal (GE) reflux, Barrett's esophagus, hiatal hernia; strictures, perforations (cervical, distal), foreign bodies, lye ingestion
- congenital lung lesions: cystic adenomatoid malformation (CCAM), pulmonary sequestration, lobar emphysema, blebs and spontaneous pneumothorax; hypoplasia and pulmonary hypertension
- acquired lung lesions: emphysema, abscess/pneumatocele, empyema, chylothorax, pulmonary metastases, infiltrates in immunosuppressed patients, lung complications in cystic fibrosis (CF).
- congenital airway lesions: stenosis, broncho- and tracheomalacia
- acquired airway lesions: bronchial adenoma (e.g. carcinoids); recognition of foreign body aspiration
- mediastinal lesions: cysts, tumors according to location (anterior, middle, posterior)
- chest wall conditions: pectus excavatum and carinatum; tumors; reconstruction
- diaphragmatic conditions: congenital diaphragmatic hernia (Bochdalek, Morgagni); diaphragmatic eventration and phrenic nerve palsy; trauma

Abdomen

At the end of training, the fellow will be knowledgeable of the clinical presentation, management, natural history, and responses to treatment of abdominal disease in children. This will include:

- gastrointestinal physiologic issues: continence, defecation; short bowel syndrome, intestinal adaptation; physiologic testing (manometry, pH study)
- gastric conditions: pyloric stenosis (including physiologic disturbances)
- duodenal conditions: atresia, stenosis, web (including windsock variant); diverticula, duplications
- small intestinal conditions: malrotation, jejunileal atresia / stenosis, meconium ileus and equivalent; Meckel's diverticulum and related vitelline duct anomalies; necrotizing enterocolitis (NEC); intussusception; duplications, mesenteric cysts; neoplasms; Crohn's

- disease; congenital bands, mesenteric defects, bowel obstruction
- colonic conditions: appendicitis; inflammatory bowel disease, typhlitis; meconium plug syndrome, intestinal pseudo-obstruction; Hirschsprung's disease; colonic atresia, polyps (juvenile, familial, adenomatous)
- anorectal conditions: imperforate anus (and variants); fissures, abscesses, fistulae, condylomata, rectal prolapse; constipation, fecal incontinence
- hepatic conditions: congenital and acquired liver cysts, trauma, tumors (see oncology section); portal hypertension; liver abscess
- biliary conditions: biliary atresia, choledochal cyst; gallstones, acute/chronic cholecystitis; physiologic jaundice, cholestatic syndromes; splenic conditions: hereditary spherocytosis, thalassemia, sickle cell disease
- pancreatic conditions: cystic fibrosis; pancreas divisum, annular pancreas; pancreatitis [(trauma, lipid, steroid, drug and gallstone induced), ductal anomaly]; hyperinsulinism
- abdominal wall conditions: gastroschisis, omphalocele and variants; hernias (umbilical, inguinal, epigastric, femoral, etc.); vitelline duct remnants; umbilical granuloma
- abdominal trauma (operative and non-operative): intestinal trauma, lap belt injury; hepatic trauma; splenic trauma (indications for surgery, splenorrhaphy, partial splenectomy, vaccines, prophylactic antibiotics, splenectomy risks)

Genitourinary/Gynecologic Conditions

At the end of training, the resident will be knowledgeable of the clinical presentation, management, natural history, and responses to treatment of genitourinary conditions in children. This will include:

- penis: phimosis, paraphimosis, balanitis, circumcision (indications and contraindications, including complications and their treatment)
- inguinoscrotal area: cryptorchidism, varicocele, hydrocele, acute scrotum (torsion, epididymitis)
- bladder: urachal anomalies
- trauma: kidney, ureter, bladder with adequate knowledge of pelvic fractures and urethral injuries
- neoplastic conditions: ovarian cysts (follicular, teratomatous, carcinomatous, serous, mucinous); ovarian solid tumors (yolk sac, teratoma, carcinoma, theca/lutein, arrhenoblastoma, dysgerminoma); vaginal and uterine tumors (yolk sac, rhabdomyosarcoma); vulvar lesions (cysts, nevi, hemangioma)

Oncology

The resident will, in collaboration with other health professionals, care for children with cancer. They will be knowledgeable of the clinical presentation, management, natural history, and responses to treatment of pediatric oncologic conditions. This will include:

- renal tumors: Wilms' tumor
- adrenal tumors: neuroblastoma, ganglioneuroblastoma, carcinoma
- liver tumors: benign (hemangioma, hemangiomatosis, hemangioendothelioma,

- hamartoma, adenoma, focal nodular hyperplasia [FNH]); malignant (hepatoblastoma, hepatocellular carcinoma)
- soft tissue sarcomas: rhabdomyosarcoma (all sites; principles of therapy according to site/histology), fibrosarcoma, leiomyosarcoma, liposarcoma, neurofibromas
 - teratomas: sacrococcygeal and gonadal tumors with embryology, pathology, familial teratomas, associated syndromes; other teratoma sites
 - lymphoma: Hodgkin's Disease; Non-Hodgkin's Disease, including pathology (surface markers), sites, patterns of presentation including post-transplantation lymphoproliferative disease and acquired immunodeficiency syndrome
 - bone tumors: osteogenic sarcoma and Ewing's sarcoma (including peripheral neuroectodermal tumors) as they relate to pediatric surgical intervention (rib resection, lung metastases, etc.)
 - gonadal tumors: testicular: benign and malignant, including teratoma, other germ cell and non-germ cell tumors, paratesticular rhabdomyosarcoma, metastatic (e.g. leukemia)
 - ovarian: see gynecology section

Skin and Subcutaneous Tissues

The trainee will be knowledgeable of the clinical presentation, management, natural history, and responses to treatment of cutaneous and subcutaneous conditions in children. This will include skin and subcutaneous lesions (nevi, nevus sebaceous, pilomatrixoma, juvenile melanoma; hemangioma, lymphangioma, lipoma; dermoid and epidermoid cyst); ingrown toenails and paronychia; burns; and pilonidal sinus and abscess.

Interpersonal and Communication Skills

The trainee will:

- 1) Demonstrate an appreciation of the unique relationship between pediatric patients and their families and be able to deal effectively and compassionately with family members.
- 2) Learn to collaborate with other health professionals in the care of children (for example with other subspecialists, nursing, social work, discharge planners, etc.); areas in which this may occur include but are not limited to fetal medicine, intestinal rehabilitation, transplantation, oncology, and intersex anomalies.
- 3) Demonstrate an appreciation of the unique psychological needs of pediatric patients.

Systems-Based Practice

The trainee will:

- 1) Recognize the need for referral to appropriate subspecialists.

- 2) Make efficient use of medical resources including awareness of the benefits of pediatric care for the child and parents, and awareness of the cost to society of pediatric care, including rational use of laboratory and radiologic studies.
- 3) Demonstrate an appreciation of the economic factors that influence decision-making and the impact of such factors on families.

Professionalism

The trainee will:

- 1) Understand the ethical principles governing decisions to initiate, terminate or modify surgical care; exhibiting facility in speaking with families about the appropriate or inappropriate application of technology; supporting families in such situations.
- 2) Demonstrate sensitivity to age, gender, culture and ethnicity in dealing with patients and their families.
- 3) Understand the ethical implications of caring for pediatric patients (eg. Gender assignment in Intersex Anomaly, children with conditions such as Trisomy 18 and 13).
- 4) Understand the legal issues related to consent, confidentiality and refusal of treatment.

Practice-Based Learning & Improvement

The trainee will:

- 1) Provide evidence of continuing review of contemporary medical literature as indicated by comments on rounds, in conferences and other settings, and by demonstration with an electronic journal library in their learning portfolio.
- 2) Demonstrate enthusiasm for fostering medical education among trainees and colleagues.
- 3) Recognize the need to remain academically current and to foster the academic growth of the specialty of pediatric surgery.
- 4) Recognize the importance of maintenance of competence and evaluation of outcomes.

TECHNICAL SKILLS OBJECTIVES

By the end of training, the resident will be able to demonstrate the following generic technical skills, as they apply to a pediatric surgical practice

1. Appropriate handling of pediatric and neonatal tissues.
2. Appreciation of the unique issues related to minimal access surgery in pediatric patients.

PROFESSIONAL DEVELOPMENT

The pediatric surgical resident will achieve professional development through active participation in the weekly Pediatric Surgery Division meeting. Informal interaction will educate the trainee in issues related to

- Malpractice and litigation avoidance.
- Effective leadership and communication skills.
- Practice management

Specific goals and objectives for residents

PGY-1 Residents

GOALS Core Competencies	PGY-1 OBJECTIVES	INSTRUCTIONAL ACTIVITIES	EVALUATION
Knowledge: To acquire and apply knowledge of established and evolving basic and applied clinical sciences that relate to the practice of pediatric surgery.	Gain experience in physical examination, diagnostic imaging studies, pre-operative evaluation and risk assessment, peri-procedural management of common pediatric surgical disorders, and post-operative patient monitoring.	Teaching by attending faculty, fellow, and senior residents. Independent reading Weekly Conferences Daily inpatient rounds with fellow and/or attending surgeon Participating as first assistant and surgeon junior in the operating room (appropriate level cases).	Weekly feedback by nurses, residents, fellow, and attendings, and rotation evaluation by the pediatric surgery team. Monthly written assessment of knowledge. (https://stanford.medhub.com)
Patient Care: To provide compassionate, appropriate, and effective care to pediatric surgery patients.	Evaluate and manage all inpatient pediatric surgical patients in conjunction with the chief resident, fellow, and attending surgeon. Perform complete directed history and physical examinations and progress notes on pediatric surgery inpatients and outpatients, review all accompanying clinical and image-based information regarding patients with appropriate resident/fellow/faculty supervision	Twice daily rounds with the pediatric surgery team and daily inpatient rounds with an attending surgeon Participating as first assistant and surgeon junior in the operating room (appropriate level cases).	Weekly feedback by nurses, residents, fellow, and attendings, and rotation evaluation by the pediatric surgery team. Monthly written assessment of knowledge. (https://stanford.medhub.com)

GOALS Core Competencies	PGY-1 OBJECTIVES	INSTRUCTIONAL ACTIVITIES	EVALUATION
Effective Interpersonal and Communication skills: Interns must communicate in a way that leads to effective information exchange of a pediatric surgery care plan to patients, their families, and professional associates.	Interact with nurse practitioners on routine floor responsibilities including rounding, patient note writing, orders, computed requisitions, and hospital protocols. Discusses significant peri-operative concerns with team & consultants. Work effectively with nurses to communicate care plan.	Twice daily rounds with the pediatric surgery team. Daily inpatient rounds with an attending surgeon.	Weekly feedback by nurses, residents, fellow, and attendings, and rotation evaluation by the pediatric surgery team. Monthly written assessment of knowledge. (https://stanford.medhub.com)
Practice based learning and improvement: In order to improve patient care practices, residents must be able to critically evaluate their own performance as well as appraise and incorporate clinical scientific evidence.	To become proficient using the Goodman Surgical Simulator for basic general surgery procedures. Identify complications and determine impact on recovery. Use information technology to rapidly assimilate current medical literature as it relates to patient care.	Daily rounds with the pediatric surgery team. Weekly Conferences.	Weekly feedback by nurses, residents, fellow, and attendings, and rotation evaluation by the pediatric surgery team. Monthly written assessment of knowledge. (https://stanford.medhub.com)
Professionalism: Residents must show a commitment to professional responsibilities, adherence to ethical principles and sensitivity to diversity.	Learn to manage complex patient problems specifically related to relaying information to families regarding unexpected outcomes in a quaternary care hospital. Acts with sensitivity and responsiveness to patient's culture, age, gender and disabilities. Maintains accountability to patients, medical profession and society. Obtains proper consent and confirm advanced directives, if present.	Daily rounds with the pediatric surgery team. Weekly multidisciplinary meetings such as GI, Radiology, and Pathology conferences.	Weekly feedback by nurses, residents, fellow, and attendings, and rotation evaluation by the pediatric surgery team. Monthly written assessment of knowledge. (https://stanford.medhub.com)

GOALS Core Competencies	PGY-1 OBJECTIVES	INSTRUCTIONAL ACTIVITIES	EVALUATION
Systems-based Practice: A resident must be able to demonstrate an awareness of and responsiveness to the system of health care and the ability to effectively call on system resources to provide optimal care.	Be introduced to outpatient assessment, risk stratification and surgical planning for complex surgical procedures. Learn to use care protocols and pathways to improve quality of care. Act as an organizational problem solver for patients. Understands how efficient patient care enables the hospital to deliver a wide range of patient care. Understands how care practice affects staffing and health care costs.	Daily rounds with the pediatric surgery team. Attendance in clinic with senior residents, fellow and attending surgeon.	Weekly feedback by nurses, residents, fellow, and attendings, and rotation evaluation by the pediatric surgery team. Monthly written assessment of knowledge. (https://stanford.medhub.com)

PGY-3 Residents

GOALS Core Competencies	PGY-3 OBJECTIVES	INSTRUCTIONAL ACTIVITIES	EVALUATION
Knowledge: To acquire and apply knowledge of established and evolving basic and applied clinical sciences that relate to the practice of pediatric surgery.	Gain experience in physical examination, diagnostic imaging studies, pre-operative evaluation and risk assessment, peri-procedural management of common pediatric surgical disorders, and post-operative patient monitoring.	Teaching by fellow and attending faculty. Independent reading Weekly Conferences including:M&M, Journal club, and multidisciplinary meetings Daily inpatient rounds with Fellow and/or attending surgeon Participating as first assistant and surgeon junior in the operating room (appropriate level cases).	Weekly feedback by nurses, residents, fellow, and attendings, and rotation evaluation by the pediatric surgery team. Monthly written assessment of knowledge. (https://stanford.medhub.com)
Patient Care: To provide compassionate, appropriate, and effective care to pediatric surgery patients.	Evaluate, triage, staff and manage all inpatient and outpatient pediatric surgery consults. Evaluate and manage all inpatient pediatric surgical patients in conjunction with the chief resident, fellow, and attending surgeon. Evaluate and correct complete directed history and physical examinations and progress notes on pediatric surgery inpatients and outpatients, review all accompanying clinical and image-based information regarding patients with appropriate fellow/faculty supervision. Manage patients intra-operatively with the fellow and attending surgeon.	Twice daily rounds with the pediatric surgery team and daily inpatient rounds with an attending surgeon Participating as first assistant and surgeon junior in the operating room (appropriate level cases).	Weekly feedback by nurses, residents, fellow, and attendings, and rotation evaluation by the pediatric surgery team. Monthly written assessment of knowledge. (https://stanford.medhub.com)

GOALS Core Competencies	PGY-3 OBJECTIVES	INSTRUCTIONAL ACTIVITIES	EVALUATION
Effective Interpersonal and Communication skills: Residents must communicate in a way that leads to effective information exchange of a pediatric surgery care plan to patients, their families, and professional associates.	Instruct interns and medical students on basic general surgical techniques in the surgical simulation center. Deliver teaching sessions for interns and students either before or after rounds on a weekly basis. Provide family members an update of patient's condition. Discusses appropriate peri-operative concerns with team & consultants. Works effectively with team members (attending, interns and NP) to communicate care plan and discuss with attendings.	Twice daily rounds with the pediatric surgery team. Daily inpatient rounds with an attending surgeon.	Weekly feedback by nurses, residents, fellow, and attendings, and rotation evaluation by the pediatric surgery team. Monthly written assessment of knowledge. (https://stanford.medhub.com)
Practice based learning and improvement: In order to improve patient care practices, residents must be able to critically evaluate their own performance as well as appraise and incorporate clinical scientific evidence.	Serve as team leader as the PGY-3. Works effectively with team inpatient census, reporting requirements, team schedules, vacation coverage, daily clinical assignment, patient management tasks and morbidity and mortality conference. Master and teach all general surgery scenarios on the Goodman Simulator. Identify complications and determine their impact on recovery. Present them at the M&M conference. Use information technology to rapidly assimilate current medical literature as it relates to patient care.	Daily rounds with the pediatric surgery team. Weekly Conferences.	Weekly feedback by nurses, residents, fellow, and attendings, and rotation evaluation by the pediatric surgery team. Monthly written assessment of knowledge. (https://stanford.medhub.com)
Professionalism: Residents must show a commitment to professional responsibilities, adherence to ethical principles and sensitivity to diversity.	Learn to manage complex patient problems specifically related to relaying information to families regarding unexpected outcomes in a quaternary care hospital. Learn to interact with a wide range of patient age ranges. Learn to interact with multiple subspecialty groups in consultation as well as multidisciplinary conferences. Displays appropriate demeanor, even in adverse situations. Acts with sensitivity and responsiveness to patient's culture, age, gender and disabilities.	Daily rounds with the pediatric surgery team. Weekly multidisciplinary meetings such as GI, Radiology, and Pathology conferences.	Weekly feedback by nurses, residents, fellow, and attendings, and rotation evaluation by the pediatric surgery team. Monthly written assessment of knowledge. (https://stanford.medhub.com)

GOALS Core Competencies	PGY-3 OBJECTIVES	INSTRUCTIONAL ACTIVITIES	EVALUATION
Systems-based Practice: A PGY-3 resident must be able to demonstrate an awareness of and responsiveness to the system of health care and the ability to effectively call on system resources to provide optimal care.	Act as an organization problem solver for pediatric surgery patients. Understand how care for patients affects the hospital's ability to deliver patient care. Understands how care practice affects staffing and health care costs.	Twice daily rounds with the pediatric surgery team and daily rounds with surgery attendings.	Weekly feedback by nurses, residents, fellow, and attendings, and rotation evaluation by the pediatric surgery team. Monthly written assessment of knowledge. (https://stanford.medhub.com)

TABLE 1. ROTATION SPECIFIC LEARNING ACTITIVIES.

LEARNING ACTIVITIES	MEDICAL KNOWLEDGE	PATIENT CARE	COMMUNICATION AND INTERPERSONAL SKILLS	PROFESSIONALISM	SYSTEMS-BASED PRACTICE	PRACTICE-BASED LEARNING & IMPROVEMENT
Journal Club	√	√				√
Quality Assurance Rounds	√	√		√		√
Radiology/GI/Pathology Rounds	√	√	√		√	√
Pediatric Surgery Clinic	√	√	√	√	√	
Core course	√		√			√
Tumor Board	√	√			√	

Journal Club (60 minutes)

The resident will assist in defining topics and administering the monthly pediatric surgery journal review seminars.

Quality Assurance Rounds (60 minutes) & Quality Improvement Committee

The resident will present cases at the monthly pediatric surgery quality assurance (morbidity and mortality) rounds and review relevant issues. The resident is responsible for completing and presenting a practice-based improvement log for each morbidity/mortality case discussed.

Surgery/Radiology/Gastroenterology/Pathology Combined Rounds (60 minutes)

The resident will be responsible for organizing and presenting cases at the monthly combined clinical rounds.

Tumor Board (60 minutes)

The resident will attend regularly scheduled meetings of the multidisciplinary oncology board.

TABLE 2. ASSESSMENT PORTFOLIO.

PORTFOLIO ITEM	MEDICAL KNOWLEDGE	PATIENT CARE	COMMUNICATION AND INTERPERSONAL SKILLS	PROFESSIONALISM	SYSTEMS-BASED PRACTICE	PRACTICE-BASED LEARNING & IMPROVEMENT
Case Log		✓		✓		✓
Knowledge Exam (MCQ)	✓					
Mid and End-Rotation Evaluation	✓	✓	✓	✓	✓	✓

Case Log

The resident will keep a running case log of surgical cases.

Knowledge Exam

Adequacy of medical knowledge will in part be assessed using the yearly in-training exam for surgery.

Mid and End-Rotation Evaluation

The Division of Pediatric Surgery will provide the resident with a mid and end of rotation evaluation summarizing the faculty impressions of progress in all the core competencies.