



الهيئة السعودية للتخصصات الصحية
Saudi Commission for Health Specialties

Pediatric Surgery Board



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SAUDI BOARD

PEDIATRIC SURGERY CURRICULUM

2016

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INTRODUCTION

“The history of Pediatric Surgery in the Kingdom of Saudi Arabia (KSA) is interesting as prior to 1980 no pediatric surgery units existed in the country. Between 1980 and 1990, a small number of units appeared in the country; however, general surgeons have continued to perform pediatric surgery cases. The numbers of pediatric surgeons has risen from zero in 1980 to approximately 50 in 2003”.¹

To meet the high demands for pediatric surgery and to establish standardized health care for sick children, the Saudi Commission for Health Specialties (SCHS)—the organizing body for training and registration of health professionals in KSA—started the Pediatric Surgery Fellowship Training Program in 2003. The program is a 3-year training program following the completion of full training in general surgery. It is based on rotations to different hospitals, which are recognized for training annually. Unfortunately, since 2003, the program was unable to fill all its available training positions.² Until 2014, 20 qualified pediatric surgeons graduated from this program. The total number of qualified Saudi pediatric surgeons is around 50 with only about half of them located in Riyadh. Workforce shortage in pediatric surgery in KSA is not an exception to different parts of the world. Studies evidence shortage of pediatric surgeons in United States of America (USA),^{3, 4} including both numerical and distribution problems.⁴

“Little has been written about the education of the pediatric surgical trainee and how to better stimulate the best and brightest to pursue pediatric surgery specialty”.⁵ Although the number of applicants for pediatric surgery training programs continues to exceed the number of available training positions,⁶ the declining applicant pool for general surgery had a secondary impact on pediatric surgery as there are only two applicants per position.⁵ Pediatric surgery was not in the top five fellowship programs in general surgery resident choice for post residency training in USA.^{7,8} Specific factors affecting the selection of pediatric surgery were explored among Saudi general surgery residents. A survey examining interest of general surgery residents in pediatric surgery showed that an increasing exposure to pediatric surgery and making the training program a residency-training program rather than a fellowship program were important factors.⁹

The Kingdom of Saudi Arabia is a rich country with a young population; according to 2014 estimates, about 30% of its population of 27 million is < 14 years of age. Saudi Arabia is unique in certain congenital and hematological diseases and high trauma rates, thus requiring well trained pediatric surgeons. Based on the present and future development of the health care system, and the high number of existing or under construction medical cities and hospitals all over the Kingdom of Saudi Arabia, we believe that there is an authentic need for the training of pediatric surgeons.

In this new curriculum, CanMEDs framework is being implemented; it is an innovative, competency-based framework that describes the core knowledge, skills, and attitude of future surgeons. This curriculum is intended to provide a broad framework for residents and faculty staff to focus on teaching and learning as well as clinical experience and professional development during the training program. Residents are expected to acquire knowledge, skills, and develop an appropriate attitude and behavior throughout their training program while taking personal responsibility in learning. Prospective program graduates would attain proficiency as medical experts with skills as communicators, collaborators, health advocates, and scholars.

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OUTCOMES AND COMPETENCIES

Continuum of learning

R 1-3 (General surgery & Specialties)	R 4-6 (Senior Level)
<ul style="list-style-type: none"> Obtain fundamental knowledge related to core clinical problems of general surgery and other specialties. Apply knowledge to provide appropriate clinical care related to core clinical problems of pediatric general Develop clinical skills, such as physical examination and practical procedures related to general surgery. Analyze and interpret from clinical skills findings to develop an appropriate management plan and differential diagnosis in the best interest of the patient. 	<ul style="list-style-type: none"> Acquire advanced and up-to-date knowledge related to core clinical problems of the specialty Compare and evaluate challenging, contradictory findings, and develop an expanded differential diagnosis and management plan.

Top 10 common pediatric surgical emergencies in Saudi Arabia

Disease. Conditions
Irreducible inguinal hernia
Foreign bodies
Bleeding circumcision
Acute appendicitis
Trauma
Intestinal obstruction
Hirschsprung's disease
Lower GIT bleeding (LGIB)
Necrotizing enterocolitis
Peri-anal conditions

Top 10 procedures performed

Surgical procedure
Inguinal hernia repair
Orchiopexy
Central venous access
Laparotomy for neonatal intestinal obstruction, intestinal anastomosis, and stoma formation
Posterior sagittal anorectoplasty (PSARP)
Appendectomy
Endorectal pull-through
Oncological surgery
Gastroesophageal reflux disease (GERD) surgery
Esophageal surgery

Top 10 causes of outpatients consultation

Disease. Conditions
Hernias
Neck swelling
Undescended testis
Soft tissue and skin lumps
Abdominal stomas
Anorectal malformation
Hirschsprung's disease
Gall stones/Splenomegaly in hematological disease
Chronic constipation
Gastroesophageal reflux disease (GERD)

Top 10 causes of in-patient admission

Disease Conditions
Acute appendicitis
Complicated inguinal hernias
Acute scrotal swelling
Trauma
Intestinal obstruction/Malrotation
Hypertrophic pyloric stenosis
Intussusception
Bleeding circumcision
Peri-anal conditions
10.Lower GIT bleeding (LGIB)

Top tumors in children

Organ; Systems
Wilms' tumor
Neuroblastoma
Teratomas
Ovarian tumors
Soft tissue tumors
Liver tumors

Goals

Upon completion of the training period, residents are expected to demonstrate competence in the management of pediatric surgical patients as outlined in this document.

Residents must demonstrate the requisite knowledge, skills, and attitudes for effective patient-centered care and service to a diverse population. In all aspects of specialist practice, the resident must be able to address issues of gender, sexual orientation, age, culture, religion, ethnicity, and ethics in a professional and compassionate manner.

Surgical training must provide opportunities for residents to achieve the competencies outlined in these objectives. Training must provide the resident with graduated responsibility for the management of pediatric surgical patients under appropriate supervision.

Objectives

General Objectives

These 'Goals and Objectives' of the Pediatric Surgery training operationalize the national Objectives of Training within the context of Saudi Council for Health Specialties (SCHS). They provide a framework that builds on the competencies of a fully trained Pediatric General Surgeon to develop into a Pediatric Surgeon who can assume full responsibility for the preoperative, operative, and postoperative management of Pediatric Surgical problems. As important is the development of the skills and attitudes so they can interact appropriately with the patients, their families, and with allied colleagues involved in the care of pediatric patients. These skills will be built in a graduated manner so that, at the end of the six training years, the Resident in Pediatric Surgery will take on the Most Responsible Physician role. Interwoven within these objectives will be those of an ethical and academic nature that will reflect the conscience of modern Pediatric Surgery and help shape its future. The summary objectives are to ensure that pediatric surgeons maintain the leadership and direction of the profession of Pediatric Surgery.

Different geographic locations place different demands on pediatric surgeons. However, some educational objectives are considered mandatory and basic to the practice of Pediatric Surgery and will be referred to as Primary Objectives. Certain other objectives are considered desirable and appropriate to include under the umbrella of Pediatric Surgery, but are dependent on the trainee's personal objectives or those of the environment in which the resident intends to work. These will be referred to as Secondary Objectives.

For both sets of objectives, comprehensive and thorough understanding of the subjects listed will be expected. This will include, where appropriate, embryology, anatomy, physiology, pathology, natural history (both pre- and postnatal), diagnosis and management. Residents must demonstrate the knowledge, skills and attitudes relating to gender, culture and ethnicity pertinent to Pediatric General Surgery. In addition, all residents must similarly demonstrate an ability to incorporate gender, cultural and ethnic perspectives in research methodology, data presentation and analysis.

On completion of the program, the graduate physician will be competent to function as a consultant in pediatric surgery. Appropriate roles for the Pediatric General Surgeon include medical expert and clinical decision maker, communicator, collaborator, manager, health advocate, scholar, and research scientist. As a dedicated professional, and consistent with the obligations of a physician, the Pediatric Surgeon must endeavor to deliver highest quality of care with integrity, honesty and compassion, exhibit appropriate personal and interpersonal professional behavior, and practice medicine ethically giving priority to the needs of individual patients. Continuing education and evaluation are expected throughout the Pediatric Surgeon's professional life including an appreciation of the role of research and the need for critical analysis of current scientific and practice developments related to the specialty.

Table: Expected Level of Competency for Core Specialty Level Problems

Core Clinical Problem	Core Specialty Level	Mastery Level
Approaching the child and care giver (history taking, physical examination, and parental counseling)	Personality, attitude, medical ethics, & communication medical expert	Professionalism
Neonatal bilious vomiting	Necrotizing enterocolitis. Intestinal Obstruction. Sepsis. Malrotation. Gastroesophageal reflux disease (GERD)	Intestinal volvulus
Neonatal intolerance to feed	Gastroesophageal reflux disease (GERD). Upper GIT obstruction. Sepsis	Necrotizing enterocolitis (NEC)
Neonatal constipation	Meconium plug. Meconium ileus. Hypothyroidism. Anorectal malformation (ARM). Prematurity	Hirschsprung's disease.
Neonatal lower GIT bleeding (LGIB)	Anal Fissure. Rectal Polyps	Necrotizing enterocolitis (NEC)
Neonatal Respiratory Distress and Excessive Oral Secretions	Congenital Emphysema, CPAM. Pulmonary Sequestration. Diaphragmatic Hernia.	Esophageal atresia and Tracheo-Esophageal Fistula (E-TEF)
Neonatal Jaundice	Biliary Atresia. Primary Liver Disease	Choledocal cyst
Neonatal Abdominal Wall Defect	Omphalocele. Gastroschisis. Umbilical Cord Hernia.	Pentalogy of Cantrell. Ectopic vesicae. Ectopia Cordis

OUTCOMES AND COMPETENCIES

Core Clinical Problem	Core Specialty Level	Mastery Level
Radiology in Neonate	Plain X-Rays. USS. CAT Scan. MRI.	Contrast Study Interpretation
Infant with Abdominal Pain	Intussusception.	Malrotation
Infant with Bilious Vomiting	Intestinal Obstruction	Intestinal Volvulus
Infant with Repeated Vomiting	GERD	Hypertrophic Pyloric Stenosis
Toddler with Abdominal Pain	Acute Appendicitis. UTI. Lower Lobe Pneumonia	Ovarian Torsion. Abdominal Tumors
Toddler Lower GIT Bleeding	Anal Fissure. Rectal Polyp.	Meckel's Diverticulum
Respiratory Distress	Congenital Causes. Chest Infection. Emphysema. Pleural effusion	Foreign Body Inhalation
Abdominal masses in toddlers	Wilms' tumor. Neuroblastoma	Teratoma. Mesenteric cysts. Bowel duplications. Lymphangioma
Abdominal pain in neutropenic patient	Medical causes. Acute appendicitis.	Enterocolitis. Typhlitis
Upper GIT bleeding	Severe gastritis.	Esophageal varices. Portal hypertension

Specific Objectives

At the completion of training, the resident will have acquired the following competencies and will function effectively as:

A. Medical Expert (General Surgery Rotation and Specialties)

Knowledge of Principles of surgery

The resident should be able to:

- Perform a concise history of present illness and physical exam.
- Interpret the common laboratory & radiologic tests.
- Write clear & concise consultation reports, pre-op and post-op notes, progress notes, and discharge instruction plans.
- Comprehend the applied anatomy of the abdomen (Upper and Lower Gastrointestinal tract, Gallbladder, Liver, Extra Hepatic Biliary tree, Pancreas, and Spleen), Breast, Neck, Urinary system, Circulatory system, and Thorax.
- Discuss the physiology of the cardiac, respiratory, renal, gastrointestinal, hepatobiliary, pancreatic, immune, and vascular systems; and their clinical implications.
- Discuss pathology of common inflammatory, malignant conditions and their clinical implications.
- Identify different types of the SHOCK, their physiological and pathological consequences, and formulate a plan of management.
- Apply the principles of CPR
- Perform the lifesaving procedures, such as chest tube insertion for tension pneumothorax, pericardiocentesis for cardiac tamponade, according to the Advanced Trauma Life Support guidelines (ATLS)
- Triage and stabilize multi-trauma victims according to ATLS guidelines
- Provide the initial assessment and management of acute surgical emergencies

Knowledge of Clinical Surgery

The trainee should demonstrate ability to take a comprehensive history and physical examination, diagnose and understand the disease's pathophysiology, to order investigations, and manage different diseases in relation to pediatric surgery, including the following:

- Head and Neck (Lymphadenopathy, Neck Swelling, Neck trauma, Salivary glands, Tumors)
- Breast and Endocrine (Breast lumps, Breast cancer, Nipple discharge, Thyroid, Parathyroid, and Adrenal gland diseases)
- Chest wall, Lungs, and Pleura (Acquired and congenital diseases)
- Hernias and Abdominal Wall defects
- Upper GIT Surgical Diseases (Esophagus, Stomach, Small intestine)
- Lower GIT Surgical Diseases (Appendix, Colon, Rectum, and Anus)
- Gastrointestinal bleeding (Upper and Lower)
- Hepatobiliary (Liver, Pancreas, and Spleen)
- Acute abdomen
- Congenital diseases
- Soft Tissue tumors
- Surgical diseases in special situations (Surgical diseases in Sickle cells disease patients, neutropenic patient)

- Surgical management of obesity
- Surgical management of burns
- Reconstructive surgery (Skin and tissue loss substitutes, types of flaps, and grafts)

Technical and Soft Skills

Junior Resident (R1-R3) should (Perform safely):

- Demonstrate aseptic technique in performing operative and bedside procedures.
- Recognize the appearance of normal and abnormal tissues in the operating room.
- Gain proficiency in a variety of psychomotor skills, e.g., reduction of incarcerated inguinal hernia, wound closure, and knot tying.
- Understand the principles of laparoscopy.
- A complete examination of the anorectal region, including anoscopy, and proctoscopy.
- Chest tube insertion.
- Umbilical and inguinal hernia repair.
- Central vascular access under supervision.
- Circumcision.
- Excision of skin lumps and lymph node biopsy.
- Wound dressing (Surgical and Burn wounds).
- Cut wound suturing.
- Incision and drainage of abscesses.
- Incisional biopsy.
- Orchiopexy under supervision.
- Thoracotomy incisions.
- Laparotomy incisions.
- Laparoscopic techniques, including:
 - Trocar insertion by the open technique in different locations of the abdomen.
 - Trouble shooting of laparoscopic equipment.
 - Simple suturing using laparoscopic instruments.
 - Perform diagnostic laparoscopy.
 - Perform laparoscopic appendectomy.
 - Be familiar with the techniques of and use of harmonic scalpel, bipolar device, and monopolar cautery, including the pitfalls and potential risks.
- Effectively communicate with the medical team member, and care givers.
- Possess and practice the attributes of professionalism.

I Medical Expert (Pediatric Surgery 3 - 6 years)

General Requirements

As a Medical Expert, a resident in pediatric surgery is expected to develop the skills to utilize all the CanMEDS roles to provide patient and family centered care.

He/she is expected to take a comprehensive history, perform a thorough physical examination, order a relevant investigation test, and formulate a clear and appropriate medical plan.

It is expected that the resident will understand the embryology, pathologic, and differential diagnosis of the common pediatric & neonatal surgical diseases, and understand the indications for both operative and non-operative treatment. He/she needs to develop the surgical skills for treatment as well as understand the possible complications.

Resident must be able to perform a consultation. This will include both the presentation of an assessment and the recommendations for further care. This should be done both in a written and verbal form.

Specific Requirements

As a Medical Expert in core pediatric surgery, the resident should be able to know and show how to manage:

a) Musculoskeletal Skin and Soft Tissue conditions

- Benign lesions
- Necrotizing soft tissue infections
- Cutaneous manifestations of systemic diseases (i.e., inflammatory bowel disease syndrome)
- Lymphatic and vascular malformations

b) Head and Neck conditions

- Congenital lesions, especially thyroglossal duct cyst and branchial cleft cysts; sinuses and other remnants; cystic hygromas/lymphangiomas, hemangioma
- Salivary glands diseases, especially tumors; hemangiomas; inflammation/calculi
- Ranula
- Acquired neck masses
- Tumors
- Congenital torticollis
- Trauma specific to the head and neck
- Thyroid and parathyroid lesions
- Cervical lymphadenopathy

c) Chest conditions

- Esophageal atresia and tracheoesophageal fistula (TEF)
- Esophageal achalasia, webs, stenosis, and duplications
- Acquired esophageal conditions:
 - Gastroesophageal (GE) reflux
 - Barrett's esophagus
 - Hiatal hernia
 - Strictures
 - Perforations (cervical, distal)
 - Foreign bodies
- Congenital lung lesions
 - Congenital pulmonary adenomatoid malformations (CPAM)
 - Lobar emphysema
 - Congenital diaphragmatic hernia (CDH)
 - Pulmonary sequestration
- Acquired lung lesions
 - Abscess and empysema

- Pneumatocele
- Chylothorax
- Infiltrates in immunosuppressed patients
- Lung bullae and spontaneous pneumothorax
- Lung complications in cystic fibrosis (CF)
- Pleural effusions
- Foreign body aspiration
- Mediastinal lesions: cysts, thymic disorders, and tumors according to location (anterior, middle, posterior)
- Chest wall deformities
 - Pectus excavatum and carinatum
 - Chest wall reconstruction
- Diaphragmatic eventration and phrenic nerve palsy
- Cardiovascular conditions such as patent ductus arteriosus, pericardial effusions and/or tamponade
- Vascular rings
- Thoracic trauma

d) Abdomen

- Abnormalities in gastrointestinal physiology
 - Short bowel syndrome
 - Intestinal adaptation
 - Physiologic testing (manometry, pH study),
- Gastric conditions
 - Pyloric stenosis (including physiologic disturbances)
 - Antral web
 - Spontaneous perforation
 - Gastroesophageal reflux disease (GERD)
 - Gastric delayed emptying
 - Bezoars
 - Peptic ulcer disease
- Duodenal conditions
 - Atresia
 - Stenosis
 - Webs
 - Diverticula
 - Duplications
 - Other causes of duodenal obstruction
- Small intestinal conditions
 - Malrotation
 - Jejunioileal atresia/stenosis
 - Meconium ileus and equivalent
 - Meckel's diverticulum and related vitello-intestinal duct anomalies
 - Necrotizing enterocolitis (NEC)
 - Intussusception
 - Duplications
 - Mesenteric cysts
 - Neoplasms

- Inflammatory bowel disease (IBD); Crohns' disease
- Bowel obstruction (acquired and/or congenital)
- Colonic conditions
 - Appendicitis
 - Inflammatory bowel disease (IBD) ulcerative colitis.
 - Typhlitis
 - Meconium plug syndrome
 - Hirschsprung's disease and neuronal intestinal dysplasia
 - Colonic atresia
 - Polyps
 - Anorectal malformation: imperforate anus (and variants)
 - Perianal conditions: fissures, abscesses, fistulae, condylomata, and rectal prolapse
 - Constipation
 - Fecal incontinence
 - Intestinal pseudo-obstruction
 - Chronic constipation
- Hepatic and biliary conditions
 - Congenital and acquired liver cysts
 - Trauma
 - Tumors
 - Portal hypertension
 - Liver abscess
 - Biliary atresia, biliary hypoplasia, and bile duct perforation
 - Choledochal cyst
 - Gallstones/cholecystitis
 - Physiologic and pathological jaundice
 - Cholestatic syndromes
 - Liver transplantation (indications, complications, and results)
 - Splenic conditions: including hemolytic conditions, red blood count (RBC) enzyme deficiencies (pyruvate-kinase, hexose-kinase), idiopathic thrombocytopenic purpura (ITP), Gaucher's disease, splenic cyst/torsion, and wandering spleen
 - Lymphangioma
 - Abscess
- Pancreatic conditions
 - Cystic fibrosis
 - Divisum
 - Annular pancreas
 - Acute and chronic pancreatitis
 - Congenital cysts
 - Tumors
 - Hyperinsulinism
- Abdominal wall conditions
 - Gastroschisis
 - Omphalocele
 - Hernias
 - Umbilical granuloma
 - Umbilical discharge

e) Genitourinary tract

- Penis
 - Phimosis
 - Paraphimosis
 - Balanitis
 - Circumcision
- Inguinoscrotal area
 - Cryptorchidism
 - Varicocele
 - Hydrocele
 - Acute scrotum
- Urinary bladder
 - Extrophy (bladder, cloacal)
 - Urachal anomalies
 - Urogenital trauma
 - Neurogenic bladder
- Kidney
 - Congenital abnormalities
 - Non-functioning kidney
 - Hydronephrosis
 - Pyelonephritis
- Ureter
 - Pelviureteric junction (PUJ) obstruction
 - Hydroureter
 - Ureterocele
 - Congenital Anomalies
- Urethra
 - Posterior urethral valve (PUV)
 - Hypospadias

f) Gynecologic Conditions

- Congenital conditions
 - Vaginal atresia
 - Hemato/hydro(metro)colpos
 - Bifid vagina
 - Duplex uterus
 - Urogenital sinus
- Inflammatory conditions
 - Pelvic inflammatory disease
 - Vulvovaginitis
 - Vulvar abscess
 - Fused labia minora
- Traumatic/mechanical conditions
 - Vaginal laceration
 - Child abuse
 - Torsion (normal ovary, cyst, tumor)
- Neoplastic conditions
 - Ovarian cysts

- Ovarian solid tumors
- Vaginal and uterine tumors
- Vulvar lesions (cysts, nevi, hemangioma)

g) Disorders of Sex Development (DSD)

Pediatric Surgeons will manage children with DSD anomalies in collaboration with other health care professionals such as pediatric urologist, endocrinologist, psychologist, and genetic specialist (multidisciplinary approach). They must therefore demonstrate knowledge of and the capacity to manage patients with these conditions, based on knowledge of the differing patterns of disease, natural history, responses to treatment, and ethical implications of gender assignment. This will include patients with:

- 46,XY DSD
- 46,XX DSD
- Ovotesticular DSD
- 46,XX testicular DSD
- 46,XY complete gonadal dysgenesis

h) Endocrine Anomalies

In collaboration with other health care professionals, Pediatric Surgeons will care for children with endocrine anomalies.

- Thyroid problems
 - Thyroid nodule
 - Inflammation and abscesses
 - Tumors
 - Multiple endocrine neoplasia syndromes
- Parathyroid conditions
 - Hypoparathyroidism
 - Hyperparathyroidism (primary, secondary, tertiary)
 - Tumors
- Breast conditions
 - Neonatal hypertrophy
 - Mastitis/abscesses
 - Gynecomastia
 - Nipple discharge
 - Fibroadenoma
 - Fibrocystic disease
 - Premature thelarche
 - Tumors
- Pancreatic conditions
 - Hyperinsulinism (age dependent)
 - Functioning endocrine lesions
- Adrenal conditions
 - Adrenal hemorrhage
 - Adrenal insufficiency (congenital or acquired)
 - Adrenocortical tumors (virilizing tumors, pheochromocytoma, and neuroblastoma)
 - Cysts
 - Incidentaloma

i) Oncology

Pediatric surgery residents will learn to care for children with oncologic problems in collaboration with other healthcare professionals. They will learn:

General principles

- Tumors pathophysiology including molecular biology, tumor markers and cytogenetic, tumor specific risk stratification, genetic predisposition, and other risk factors.
- Paraneoplastic and tumor associated syndromes (e.g., opsoclonus ataxia syndrome). Tumors associated with syndromes such as Beckwith Weidemann and hemi-hypertrophy.
- Diagnostic imaging for tumor evaluation.
- Principles of tumor therapy including immunotherapy, radiation biology, immunosuppression.
- Opportunistic infections.
- Cancer chemotherapy and drug action.
- Surgical complications of chemotherapy.
- Bone marrow transplantation.
- Secondary neoplasia.

Specific tumors

- Renal tumors: Wilms' tumor, mesoblastic nephroma, nephroblastomatosis, adenocarcinoma, clear cell sarcoma, renal cell carcinoma, lymphoma and rhabdoid tumor. These are managed in a collaborative manner with the pediatric urology team.
- Adrenal tumors: neuroblastoma, ganglioneuroblastoma, carcinoma, and pheochromocytoma.
- Liver tumors
 - Benign: hemangioma, hemangiomatosis, hemangioendothelioma, hamartoma, adenoma, and focal nodular hyperplasia (FNH)
 - Malignant: hepatoblastoma, hepatocellular carcinoma, and liver metastasis.
- Abdominal and Pelvic tumors:
 - Carcinoid, lymphoma (GALT/MALT), and adenocarcinoma
 - Sarcomas/PNET: rhabdomyosarcoma, fibrosarcoma, leiomyosarcoma, liposarcoma, neurofibromas, and desmoplastic small round cell tumor
 - Teratomas: sacrococcygeal and gonadal tumors, familial teratomas
 - Germ cell and non-germ cell tumors, para testicular rhabdomyosarcoma, and metastatic tumors, i.e., leukemia.
 - Ovarian benign and malignant tumors including teratoma, carcinoma, serous, mucinous, yolk sac, teratoma, carcinoma, sertoli/lutein, Sertoli-Leydig tumors, and dysgerminoma
 - Vaginal and uterine tumors (yolk sac, rhabdomyosarcoma)
- Lymphoma: Hodgkin's disease, Non-Hodgkin's disease, post-transplantation, lymphoproliferative disease, and AIDS (acquired immunodeficiency syndrome)
- Bone tumors: Osteogenic sarcoma and Ewing's sarcoma (including peripheral neuroectodermal tumors (PNET) as they relate to pediatric surgical intervention (rib resection, lung metastases, etc.).

- Head and neck: salivary gland tumors; lymphoma, rhabdomyosarcoma, neuroblastoma, teratoma, and nasopharyngeal carcinoma
- Thoracopulmonary: pleuropulmonary blastoma, bronchoalveolar carcinoma, carcinoid

Role of pediatric surgeon in palliative care

Understand the approach to palliative care in pediatric surgery in situations such as trauma, oncology, neonatology, and complex medical diseases.

j) Critical Care

Critical care goals and objectives will be separately highlighted for rotations in the Neonatal Intensive Care Unit (NICU) and the Pediatric Intensive Care Unit (PICU). The Resident is required to comprehend and demonstrate mastery in various conditions that are needed for the care of critically ill and injured children. The critical care includes:

- Fluids and electrolytes management.
- Thermoregulation: physiologic effects and management of hypothermia and hyperthermia.
- Diagnosis and treatment of shock.
- Normal and abnormal pulmonary physiology in various age groups.
- Cardiac physiology: knowledge of cyanotic and non-cyanotic congenital anomalies, intra-cardiac shunts; transitional circulation and inotropic support.
- Transfusion therapy and coagulation.
- Anesthesiology: principles of airway management (including tracheostomy), inhalation agents, muscle relaxants, recognition and management of malignant hyperthermia.
- Differential diagnosis and treatment of cardiorespiratory arrest.
- Management of postoperative pain in infants and children.
- Principles of hemodynamic and respiratory monitoring.
- Principles of local anesthetic use.
- Extra-corporeal life support (ECLS): indications in neonates and older children. Techniques of cannulation, monitoring, and complications.

The pediatric surgery resident will gain extensive experience in the indications, techniques, and possible complications of the various types of central line insertion including intra-osseous, temporary and long-term, and implantable ports.

k) Trauma and Burns

- Trauma: demographics, epidemiology; recognizable patterns of injury (i.e., seat belt syndrome, patterns of child abuse); primary assessment; principles of operative and non-operative management of head, neck, chest, abdomen, pelvis, genitourinary, and extremity trauma.
- Burns: pathophysiology of burn injury; fluid resuscitation (initial and maintenance); nutritional management, sepsis.

Certain trauma-specific areas including

- Cranial: diagnosis and emergency management including the indications for increased intracranial pressure monitoring; use of Glasgow coma scale.

- Cervical & Thoracic: injuries to the esophagus, trachea, blood vessels; airway management including tracheostomy, recognition and emergency management of cervical spine fractures, lung contusion, pneumothorax, pleural effusion (hemato-pneumothorax), rib fractures, and widening of the mediastinum.
- Abdominal and genitourinary: intestinal trauma, lap belt injury; hepatic trauma (operative and nonoperative management), hemobilia; splenic trauma (nonoperative and operative management including repair, partial splenectomy use of vaccines and prophylactic antibiotics, splenectomy risks), the kidney, ureter, bladder and their relationship to pelvic fractures and urethral injuries

l) Nutrition

Normal caloric requirements by age groups; carbohydrate, fat and protein contributions and concentrations, vitamins, trace elements, minerals; nutritional assessment techniques; enteral vs. parenteral nutrition; enteral formulas, defined diets; parenteral nutrition (peripheral vs. central solutions, complications), influence of disease on nutritional requirements (trauma, burns)

The resident should know the indications, techniques and complications of the feeding tube and parenteral line insertion as well as the nutrition disorders including obesity and metabolic syndromes, malnutrition states, short bowel syndrome, and re-feeding syndrome.

m) Neonatology*

In collaboration with other health care professionals, surgeons will care for premature and ill newborns. They must demonstrate knowledge of:

- Physiology of the newborn and premature infant: comparison with small/large for gestational age infants, IUGR and very low birth weight (VLBW) newborns; complications, fluid and electrolyte requirements, thermoregulation, metabolic rate; cerebral, renal hepatic and cardiopulmonary function, formulas and caloric requirements.
- Hyperbilirubinemia: physiology, phototherapy, exchange transfusion, cholestasis.
- Intracranial bleeding: staging, techniques of diagnosis, site of blood, management, and outcome.
- Cardiopulmonary support of the newborn: principles on noninvasive and invasive techniques.
- Ventilatory support; congenital diaphragmatic hernia, pulmonary hypertension of the newborn (PPHN), meconium aspiration; inotropic support; principles of ECLS; surfactant use.
- Neonatal sepsis: etiology and risk factors, immune status, diagnostic workup, bacteriology, and treatment pharmacokinetics.

*See also objectives for NICU rotation.

n) Transplantation

In collaboration with other health care professionals, surgeons will care for children with organ transplants or awaiting transplantation. They must therefore demonstrate knowledge of the indications for liver, kidney, small bowel transplants, and of immunosuppressive agents (effects and complications).

II-Medical Expert – Technical and Soft Skills

By the end of the training, the resident should have acquired and demonstrate the following skills, as they apply to a pediatric surgical practice.

Surgical Skills

It is expected that over the six-year pediatric surgery residency the trainee will gain progressive experience from a technical, surgical, and soft skills point of view. During the junior years the pediatric surgery training, the resident must learn to perform the common and routine surgical procedures (hernia repairs, pyloromotomy). In the senior years of training, the pediatric surgery resident should learn and be able to demonstrate proficiency in advance pediatric surgery procedures (index cases), such as pediatric oncology surgery and neonatal surgery. In the final twelve months of the pediatric surgery training, the resident should be able to demonstrate progressive operative independence, teaching junior residents, counsel the sick children family (parents) in a timely and professional way, deliver the medical information that best describes the patient illness, involve the parents in their child management plan, gain their trust by being honest, reliable and professional, and maintain an ethical practice.

As a Medical Expert, the Resident should be able to do/demonstrate how to:

- Perform head and neck procedures (thyroglossal and branchial anomalies, lymph nodes, dermoid and epidermoid cysts excisions, and tumors)
- Perform thoracic cavity and lung procedures (diagnostic thoracoscopy, thoracotomy incisions, lobectomies, and repair of esophageal atresia, diaphragmatic hernia, and thoracic cage deformities)
- Perform abdomen procedures (diagnostic laparoscopy, laparoscopic orchiopexy, laparoscopic fundoplication, laparoscopic leveling biopsies for Hirschsprung's disease)
- Perform pelvis procedure (excision of teratoma, endorectal pullthrough for HD, posterior sagittal anorectoplasty (PSARP) for anorectal malformation (ARM))
- Apply the oncological surgical principles in resecting common pediatric surgical tumors

Trauma

As a Medical Expert the Resident should be able to do/demonstrate how to:

- Function as a Trauma team leader.
- Function as the operating surgeon for pediatric trauma patients, and as the supervising surgeon in an operating room in which several specialty groups may be working simultaneously.
- Provide operative and non-operative care for the trauma patient including major burns
- Obtain an airway and vascular access in the trauma patient, and perform appropriate diagnostic and therapeutic procedures.

Endoscopy

As a Medical Expert, the Resident should be able to do/demonstrate how to perform:

- Laryngoscopy, bronchoscopy
- Esophagoscopy/gastrosocopy/duodenoscopy
- Thoracoscopy
- Laparoscopy
- Proctosigmoidoscopy/colonoscopy
- Cystoscopy and vaginoscopy as applied to the treatment of ambiguous genitalia and imperforate anus.

Other Procedures

As a Medical Expert, the Resident should be able to do/demonstrate how to perform:

- Central line insertion (temporary and long-term, implantable ports)
- Tracheostomy.

Secondary Knowledge Objectives

1) Cardiac Surgery

As a Medical Expert, the Resident should be able to know how to manage:

- Coarctation of the aorta, arch anomalies, vascular ring/sling (more often the pediatric general surgical complications)
- Systemic/pulmonary shunts
- Pericardiectomy
- Pulmonary artery banding
- Atrial septal defect (ASD)
- Ventricular septal defect (VSD)
- Septum primum
- Tetralogy of Fallot
- Transposition of great vessels (TOGV)
- Arterio-venous (A-V) canal
- Hypoplastic left heart
- Cardiac transplantation

2) Vascular Conditions

As a Medical Expert, the Resident should be able to know how to manage:

- Vascular injuries
- Vascular rings
- Angiographic and Doppler imaging: indications and techniques
- Vascular access for hemodialysis.

3) Urology*

As a Medical Expert, the Resident should be able to know how to manage:

- Kidney
 - Hydronephrosis
 - Ureteropelvic junction (UPJ) obstruction
 - Duplex systems
 - Renal transplantation
- Ureter
 - Vesicoureteral reflux
 - Megaureter
 - Ectopic ureter
 - Ureterocele
 - Ureteral duplication and associated problems
 - Ureteroureterostomy
- Stones: kidney (open vs. endourologic therapy), ureteral, bladder including metabolic aspects
- Urinary bladder diverticulum, neurogenic bladder, bladder neck obstruction, bladder augmentation
- Tumors
- Urethra: hypospadias, epispadias, urethral valves (anterior and posterior)
- Urinary diversion: indications and techniques (vesicostomy, nephrostomy, ureterostomy, colonic conduit, continent diversions)
- Urinary tract endoscopy, urodynamics, evaluation of hematuria
- Peritoneal dialysis and hemodialysis access (central catheter, A-V fistula)

4) Plastic Surgery

As a Medical Expert, the Resident should be able to know how to manage:

- Head and neck: contractures, facial anomalies, wounds
- Skin: soft tissue injury, wound healing, wound management
- Hand: infection, lacerations (recognition of nerve and tendon injury)
- Burns: burn wound infection diagnosis and management (including wound biopsy techniques); burn wound excision; use of skin substitutes; burn rehabilitation, (including psychological effects and recovery)
- Techniques: skin grafting, microsurgery, use of flaps and Z-plasty

Secondary Skills Objectives

As a Medical Expert, the Resident should be able to know and know how to manage:

1) Other thoracic surgery

- Laryngotracheoplasty
- Tracheobronchial reconstruction
- Tracheo-bronchial foreign bodies

Table: Expected level of competency for Problems at a Master Specialty level

Competency	Level RY 1-3	Level RY 4-6
Take a focused history		
Perform a comprehensive physical exam		
Triage and prioritize the patient		
Render immediate/emergency management		
Describe the pathophysiological basis of common and serious diseases		
Rationalize, order, and interpret appropriate investigation		
Formulate a list of differential diagnosis and appropriate work plan		
Deliver a timely management and take an appropriate surgical decision in an emergency situation		
Recognize secondary complications/adverse events/severity		
Effectively deliver the breaking bad medical news to the patient parents in a proper scientific way.		
Poses a sound knowledge of the common used medications and their adverse effects		
Counsel patients/families/care-givers regarding the surgical plan/proposed future plan		
Effectively perform all minor, and intermediate surgical procedures		
Participated in all required simulation courses		
Teach students, fellow colleagues, and other health care professionals about the medical condition		
Can perform all major surgical procedures without assistance		
Perform all minor and intermediate laparoscopic procedures independently		
Perform all vascular access		

Table: Example of Rotation Specific Objectives

Rotation	Knowledge Objective <i>(The trainee should know/know how to)</i>	Skill Objective <i>(The trainee should show/show how to)</i>
Junior Years (R1-R3)		
Pediatric Surgery (Junior Years)	<ul style="list-style-type: none"> • Principles of Pediatric Surgery • Child as a patient • Approaching the sick child (history and physical exam) 	<ul style="list-style-type: none"> • Interpretation of laboratory and radiological tests • Practice the Basic Pediatric Surgical Techniques
General Surgery	<ul style="list-style-type: none"> • Basic surgical principles • Trauma management • Types of shock and their management • Antibiotics and other chemotherapy commonly used 	<ul style="list-style-type: none"> • Basic Operative Surgical Skills • Basic laparoscopy techniques • Aseptic techniques • Perform minor/intermediate procedures

OUTCOMES AND COMPETENCIES

Rotation	Knowledge Objective <i>(The trainee should know/know how to)</i>	Skill Objective <i>(The trainee should show/show how to)</i>
Emergency Medicine	<ul style="list-style-type: none"> • Common surgical emergencies in children and their management • Apply PALS guidelines appropriately • Ordering appropriate lab and radiology tests, and interpreting their results 	<ul style="list-style-type: none"> • ATLS • Suturing cut wounds • Airway management and intubation • Vascular access
Plastic Surgery	<ul style="list-style-type: none"> • Types of burns and their management • Flaps and grafts • Vascular malformation & their management 	<ul style="list-style-type: none"> • Skin grafts • Tissue flaps • Wound dressing
Vascular Surgery	<ul style="list-style-type: none"> • Vascular System anatomy • Vascular imaging • Vascular injuries 	<ul style="list-style-type: none"> • Vascular access surgery • Vascular reconstruction • Vascular grafts
Thoracic	<ul style="list-style-type: none"> • Lung physiology & anatomy • Mediastinum pathology • Management of acquired & congenital lung diseases • Management of acquired and congenital rib cage anomalies • Management of pneumothorax • Management of empyema thoracis 	<ul style="list-style-type: none"> • Principles of thoracoscopy • Principles of mediastinoscopy • Chest tube insertion
Senior Year (R4-R6)		
Urology	<ul style="list-style-type: none"> • Urinary tract infection (UTI) • Kidney stones • Urogenital tumors • Congenital urinary tract anomalies (hypospadias, posterior urethral valve, PUJ obstruction, congenital hydronephrosis) • Acute urological emergencies 	<ul style="list-style-type: none"> • Cystoscopy • Ureteric stent • Hypospadias repair • PUJ surgery • Circumcision • Phymosis • Neurogenic bladder surgery • Drainage procedures
NICU	<ul style="list-style-type: none"> • Neonate normal physiology • Fluid management • Nutrition • Mechanical ventilation <p>Management of:</p> <ul style="list-style-type: none"> • Inguino-scrotal swellings • Congenital lung anomalies (respiratory distress) • Congenital diaphragmatic h • Intersex • Intestinal obstruction • Jaundiced neonate • Abdominal mass • Ovarian cyst 	<ul style="list-style-type: none"> • Communication and counseling skills • Acquire NRP competencies • Intubation and airway management • Vascular access • Abdominal drains • Interpretation skills of neonatal radiological imaging • EXIT procedure • ECMO procedure

OUTCOMES AND COMPETENCIES

Rotation	Knowledge Objective <i>(The trainee should know/know how to)</i>	Skill Objective <i>(The trainee should show/show how to)</i>
	<ul style="list-style-type: none"> Abdominal wall defect Neonatal sepsis 	
PGICU	<ul style="list-style-type: none"> Child systemic physiology Critical care of sick child System failure management Fluid management Transfusion therapy Pain management Management of acute abdominal and thoracic emergency Commonly used drugs and chemotherapy Mechanical ventilation 	<ul style="list-style-type: none"> Acquire Pediatric Advance Life Support (PALS) competencies Airway management Vascular access
Pediatric Surgery (Senior Years)	<p>Management of acquired and congenital anomalies:</p> <ul style="list-style-type: none"> Head and neck (e.g., thyroglossal cyst, branchial cyst, and cystic hygroma) Thoracic (e.g., cystic lung lesions, pectus deformity, lung & pleural infection, and mediastinal masses) Abdomen (e.g., intestinal obstruction, malrotation, anorectal malformation, obstructive jaundice, and tumors) Intersex anomalies 	<ul style="list-style-type: none"> Advanced operative skills Advanced laparoscopy skills Advance thoracoscopy skills Perform common intermediate and major abdominal surgeries Perform common intermediate and major thoracotomy procedures Perform emergency life-saving procedures Acquire and show competencies of the Advanced Trauma Life Support (ATLS) Perform diagnostic procedures such as bronchoscopy, and endoscopy
Elective Rotation		
Endoscopy	<ul style="list-style-type: none"> Instrument types Indications Technique Complication 	<ul style="list-style-type: none"> Esophagoscopy Gastrosocopy Proctoscopy Sigmoidoscopy Colonoscopy
Oncology	<ul style="list-style-type: none"> Oncology principles Diagnostic imaging Principles of tumor therapy including immunotherapy, radiation biology, and immunosuppression Cancer chemotherapy Bone marrow transplantation 	<ul style="list-style-type: none"> Surgical management of chemotherapy complications
Radiology	<ul style="list-style-type: none"> Pediatric radiology Body imaging Interventional radiology 	<ul style="list-style-type: none"> USS (pyloric stenosis, intussusception, acute appendicitis, and trauma) Hydrostatic and/or pneumatic reduction of intussusception CAT Scan (trauma, and tumors)

OUTCOMES AND COMPETENCIES

Rotation	Knowledge Objective <i>(The trainee should know/know how to)</i>	Skill Objective <i>(The trainee should show/show how to)</i>
		<ul style="list-style-type: none"> MRI (Pelvic masses, vascular malformation, and pancreaticobiliary lesions)

B. Communicator

General Requirements

- Obtain and synthesize relevant history from patients, their families, and the community.
- Convey pertinent information from the history and physical examination in different circumstances.
- Listen effectively.
- Be able to communicate effectively with the patients and their families with respect to their medical conditions in the ER, clinic and ward.
- Establish a therapeutic relationship with the patients and their family, and discuss appropriate information with the health care team.
- Demonstrate an ability to be sympathetic and compassionate with the family and the patient.
- Be able to discuss the diagnosis and treatment plan in a way that fosters patient satisfaction and compliance.
- Discuss individual patients with the appropriate attending staff on a daily basis.
- Demonstrate the ability to cohesively and concisely present patients at weekly service rounds.
- Demonstrate the ability to present and discuss complications at weekly morbidity and mortality rounds.
- Be able to accurately document the patient's admission and progress while in the hospital, emphasizing the relevant issues.
- Be able to effectively interact with other health-care professionals.
- Participate in social services rounds and meetings with the family members to discuss the smooth transition plan from the hospital to home.
- Demonstrate good communication skills with the supervising surgeon and the extended healthcare team including nurses, physiotherapists, and occupational therapists (social workers for senior and chief residents in particular)
- Deliver information in a compassionate manner that is understandable and encourages discussion.
- Understand the importance of working in a health care team, and understand the impact of the community on the patient.

Specific Requirements

- Demonstrate an appreciation of the unique psychological needs of pediatric patients.
- Demonstrate an appreciation of the unique relationship between pediatric patients and their families, and be able to deal effectively and compassionately with family members by establishing therapeutic relationships

C. Collaborator

General Requirements

- Demonstrate effectively and well-thought out use of consultants in the management of the pediatric surgical patient.
- Be able to identify the need to and benefit of consulting other healthcare professionals, and be able to discuss patient management in a collegial way.
- Demonstrate a willingness to be consulted by other healthcare professionals and discuss patient management in a collegial way.
- Participate in the Tumor Board conferences and discuss newly diagnosed cancer cases with the radiation and medical oncologists; participate in interdisciplinary team activities.
- Demonstrate the ability to consult other health professionals, demonstrate respect for their opinions, and develop a care plan in collaboration with these professionals.
- Demonstrate a willingness to consult other physicians (such as hematologists and microbiologists) when managing their patients.
- Effectively present cancer cases to a Tumor Board and discuss the results with the patients and his/her family.
- Understand that in a community hospital, the collaboration with family physicians both inside and outside the OR is crucial.
- Understand the limitations in the potential to consult other services in a hospital.

Specific Requirements

Effectively use the team's approach in the management of critically and chronically ill patients, such as newborns with congenital anomalies and children with cancer, inflammatory bowel disease, short bowel syndrome, or transplantation.

D. Manager

General Requirements

- Effectively utilize the resources to balance patient care, learning needs, and outside activities.
- Demonstrate judicious use of expensive radiologic tests and interventions. As a senior or chief resident, demonstrate skill at running the team.
- As a junior resident, demonstrate the ability to manage his/her time appropriately between ward, emergency room, and OR responsibilities.
- Demonstrate the ability to wisely allocate finite health care resources.
- Demonstrate the ability to manage patients on the ward and in the emergency room with appropriate and efficient use of ancillary tests.
- For senior residents, demonstrate the ability to build a cohesive team that is punctual, and respects the personal life of all its members.
- Demonstrate the ability to use information technology whether it is a hospital clinical information system (CIS) or the Internet, to optimize patient management.
- Be able to prioritize problems appropriately, and be able to work efficiently and effectively.
- Make clinical decisions in the emergency room based on an efficient and effective use of healthcare resources.

- Understand how to utilize information technology to optimize patient care and continued self-learning.
- Demonstrate an understanding of the importance of properly utilizing finite healthcare resources in the management of diseases.
- Demonstrate an ability to utilize information technology to optimize patient care, life-long learning and other activities.
- Learn to manage patients within the limited resources of a community hospital. Learn when and how to transfer patients to tertiary faculties for care.
- Work effectively and efficiently in a health care organization.

Specific Requirements

- Demonstrate an appreciation of the economic factors that influence decision-making and the impact of such factors on families.
- Understand the principles and practice of quality assurance and improvement, and actively participate in hospital-based quality assurance and improvement programs.
- The chief pediatric surgery resident will be in charge of managing the pediatric surgery team, including assigning duties to the residents and medical students on the service and coordinating patient care rounds. In addition, the chief surgical resident will design the call schedule collaborative manner with the residents.
- The chief pediatric surgery resident should demonstrate effective management of the operating room, clinic, emergency consults, and the patient ward.

E. Health Advocate

General Requirements

- Identify determinants of health, unique to a hospital serving a multi-ethnic community (i.e., genetic diseases such as pediatric oncology, neonatal anomalies, and genetics factors leading to surgical problems).
- Identify the important risks of health affecting patients.
- Advise patients and their families regarding disease prevention methods, screening, and health maintenance.
- Demonstrate the ability to organize ancillary tests in a timely fashion manner.
- Disseminate the population screening guidelines for common pediatric surgery with genetics background.
- Disseminate the complications of excess body weight and identify those that can be reversed with significant weight loss.
- Respond to the particular community's health needs.
- Effectively contribute towards injury prevention and the patients and communities health improvement. Recognize and respond to those issues where advocacy is appropriate.

Specific Requirements

- Be knowledgeable about appropriate use of car safety restraints according to the child's size (i.e., rear-facing infant seats, forward-facing car seats, booster seats, lap-shoulder belts).

- Contribute to health-maintenance advocacy for children, including such areas as travel safety, helmet use, children operating machinery or motorized vehicles, and accessibility to firearms.
- Understanding of injury prevention and control of the pediatric surgeon in advocacy for injury prevention policies for children and youth.
- Identify the need and develop a plan for ongoing post-discharge care and support

F. Scholar

General Requirements:

- Develop, implement and monitor a personal continuing education strategy by using academic half-day activities including Journal club, chapter rounds and other presentations.
- Continuous development of new knowledge by education on a daily basis in the morning round, OR, or clinic.
- Critically appraise sources of medical information.
- Demonstrate the ability to use evidence-based medicine to address clinical dilemmas.
- Critical analysis of current literature and discussing at Surgical Grand Rounds.
- Facilitate learning of patients, hospital staff/students and other health care professionals through formal and informal teaching opportunities.
- Take on the role as the pediatric surgical teacher for the Junior residents and medical students on the pediatric surgery service.

1. Clinical

- Recognize areas of weakness in knowledge or skills
- Formulate a plan to correct the weakness: (e.g., spend more time in the Laparoscopic Skills Lab; perform structured literature search about a specific clinical question encountered on the service).
- Recognize and identify gaps in knowledge and expertise around the clinical question. Formulate a plan to fill the gap and present the newly acquired knowledge at General Surgery Rounds.
- Be able to critically appraise sources of medical information.

2. Research

- Based on their clinical exposure residents will have the opportunity to start the process of generating a research question (basic science, clinical, population health or some combination).
- Develop a proposal to answer the research question.
- Conduct an appropriate literature search.
- Assimilate and critically evaluate the literature.
- Propose appropriate methods for conducting the research.
- Perform and present the research results.

3. Education

- Demonstrate the desire and ability to teach others including Junior residents, non-general surgery residents, and medical students.

- Understand the principles of adult learning when teaching others.
- Demonstrate self-directed learning in the preparation of cases for Rounds or for the OR.
- Help the surgeons in the community hospital discuss the latest papers in the literature. Learn to bring evidence-based surgery into the community hospital
- Encourage evidence based review (Journal Club) presentations and appropriate use of the information technologies.

Specific Requirements

- Contribute to the development of new knowledge and foster the academic growth of the Pediatric Surgery specialty by participating in scholarly work, such as submitting original research for presentation and publication.

G. Professional

General Requirements

- Demonstrate professionalism (honesty, altruism, integrity, and compassion) in one's attitudes towards patients and other health-care professionals.
- Demonstrate a balance between personal professional roles and responsibilities, and ways of attempting to resolve conflicts and role strains.
- Know and understand the professional, legal, ethical codes to which physicians are bound. Demonstrate humility in one's approach to clinical practice.
- Demonstrate a level of professionalism consistent with the Practice of Surgery, particularly in areas of punctuality, politeness, availability, empathy, appropriate dress, and respectful of patients' privacy (Attributes of Professionalism).
- Demonstrate a sense of responsibility by ensuring continuity of care for patients.
- Demonstrate an understanding of own limitations and know when to call for help in difficult situations.
- Be able to recognize and resolve ethical issues as they arise in surgical care, including issues of informed consent, level of intervention discussions, and advance directives.
- Demonstrate an ability to interact with patients, nurses, pharmacists etc. with integrity, honesty, and compassion.
- Demonstrate self-evaluation and continued receptiveness to criticism Learn to practice medicine with integrity and honesty
- Learn to respect the particular needs of the community physicians and patients. Practice medicine ethically and consistent with the obligations of a physician.
- Learn to continuously assess one's medical practice in order to improve.
 - Commitment to lifelong learning by reading textbooks and journals, discussion of difficult/complex cases at rounds, and involvement in teaching and research.
 - Emphasis on honesty including full disclosure of iatrogenic complications, responsibility, collegial/collaborative relationships with all health care workers.
 - Sensitivity to age, gender, socio-economic status, and cultural differences on the perception of illness, outcome, and treatment by the patient and their family.

- Appreciation for the medico-legal aspects of detailed legible documentation, informed consent and complications occurring in the context of training.
- An understanding of the importance of cost-effective management of the available resources in the current healthcare industry.

Specific Requirements

- Demonstrate sensitivity to age, gender, culture and ethnicity in dealing with patients and their families.
- Understand the ethical principles as related to the complex issue of congenital abnormalities and as applied to children submitted to medical treatment, research, etc.
- Utilize the ethics modules in order to develop suitable and ethically-based approaches to difficult clinical problems.
- Recognize the importance of maintenance of competence and evaluation of outcomes.
- Understand the legal issues related to consent, confidentiality, and refusal of treatment.
- Maintain appropriate work-life balance.

LEARNING OPPORTUNITIES

General Principles

- a) A half day protected time should be reserved weekly for residents as an Academic day. They should be freed from all clinical duties to attend the activity. All activities should be planned with presenter, time slots, and venue.
- b) A monthly regional academic activity is also planned for all residents in all hospitals
- c) Residents are mandated to publish a paper/poster or to have at least two presentations in recognized international pediatric surgery conferences.

Examples of periodical education activities:

- Daily morning report if applicable.
- Weekly journal and evidence based review in Pediatric Surgery. The core Pediatric surgery journals are: Journal of Pediatric Surgery, Pediatric Surgery International, Seminars in Pediatric Surgery.
- Morbidity and mortality meeting.
- Radiology, pathology or tumor board meeting.
- Hospital Grand Rounds and other hospital sponsored CMEs.

Universal Topics (20 - 30%)

These are to be centrally delivered by the SCFHS to all trainees in all specialties. The modules that pertain mostly to Pediatric Surgery are recommended.

Intent

These are high value, interdisciplinary topics of utmost importance to the trainee. The reason for delivering the topics centrally is to ensure that every trainee receives high quality teaching and develops essential core knowledge. These topics are common to all specialties.

Topics included here meet one or more of the following criteria:

- Impactful: these are topics that are common or life-threatening
- Interdisciplinary: hence topics that are difficult to teach by a single discipline
- Orphan: topics that are poorly represented in the undergraduate curriculum
- Practical: topics that trainees will encounter in hospital practice

Development and Delivery

Core topics for PS curriculum will be developed and delivered centrally by the Commission through e-learning platform. A set of preliminary learning outcomes for each topic will be developed. Content experts, in collaboration with the central team, may modify the learning outcomes.

These topics will be didactic in nature with focus on the practical aspects of care. These topics will have more content-heavy as compared to workshops and other face-to-face interactive session planned.

The suggested duration of each topic is 1.30 hours.

Assessment

At the end of each Learning Unit, there will be on-line formative assessment. After completion of all topics, there will be a combined summative assessment in the form of context-rich MCQ. All trainees must attain minimum competency in the summative assessment. Alternatively, these topics can be assessed in a summative manner along with specialty examination.

Modules	Universal Topics
Introduction	<ol style="list-style-type: none"> 1. Safe drug prescribing 2. Hospital acquired infections 3. Sepsis; SIRS; DIVC 4. Antibiotic stewardship 5. Blood transfusion
Cancer	<ol style="list-style-type: none"> 6. Principles of management of cancer 7. Side effects of chemotherapy and radiation therapy 8. Oncologic emergencies 9. Cancer prevention 10. Surveillance. Follow-up of cancer patients
Diabetic and metabolic disorders	<ol style="list-style-type: none"> 11. Comorbidities of obesity
Medical and Surgical Emergencies	<ol style="list-style-type: none"> 12. Management of hypotension and hypertension * 13. Management of upper GI bleeding 14. Management of lower GI bleeding
Acute Care	<ol style="list-style-type: none"> 15. Pre-operative assessment 16. Post-operative care 17. Acute pain management 18. Chronic pain management 19. Management of fluid in the hospitalized patient 20. Management of electrolyte imbalances
Ethics and Healthcare	<ol style="list-style-type: none"> 21. Occupational hazards of HCW (Healthcare workers) 22. Patient advocacy 23. Ethical issues: transplantation/organ harvesting; withdrawal of care 24. Ethical issues: treatment refusal; patient autonomy 25. Role of doctors in death and dying

Core specialty topics (40 - 50%)

These are important common pediatric surgery problems. They are interactive; preferably, case based discussions supported with a recent update or review of relevant evidence based approaches. The following are examples of various topics and are not exhaustive:

SECTION	TOPIC	OBJECTIVES
General surgical topics	Fluids and electrolytes	<ul style="list-style-type: none"> • Physiology of normal and abnormal fluids and electrolytes • Diagnosis and management of electrolyte disturbances and acid-base imbalance • Principles of wound healing • Wound care strategies • Principles of enteral and parenteral feeding • Different types of formula and their indications
	Wound healing	
	Nutritional management	
Head and Neck	Congenital lesions	<ul style="list-style-type: none"> • Describe the embryology and anatomy of the neck and structures • Diagnosis and management of thyroglossal duct cysts • Dx and management of branchial cleft cysts • Aspects of tongue tie • Management of ranula • Diagnosis and management of torticollis
Breast and Endocrine	Breast	<ul style="list-style-type: none"> • Describe the embryology and development of breast tissue • Describe the normal and abnormal variations, and approach to diagnosis and management
	Adrenal	<ul style="list-style-type: none"> • Recognize pathophysiology of congenital and acquired adrenal insufficiency, cysts and tumors
	Thyroid and Parathyroid	<ul style="list-style-type: none"> • Describe causes, symptoms, diagnosis and management of thyroiditis, MEN syndromes and tumors
Chest	Tracheoesophageal and Esophageal atresia	<ul style="list-style-type: none"> • Embryology and related anatomy • Classification • Diagnosis and management
	Congenital lung lesions	<ul style="list-style-type: none"> • Understand the embryology, diagnosis and management of congenital pulmonary adenomatoid malformation (CPAM) • Describe the embryology, diagnosis and management of congenital lobar emphysema (CLE) • Describe the basis of lung sequestrations and approaches to diagnosis and treatment

LEARNING OPPORTUNITIES

SECTION	TOPIC	OBJECTIVES
	Congenital diaphragmatic hernias	<ul style="list-style-type: none"> Outline in detail the embryology, antenatal and postnatal diagnosis; management of Bochdalek and Morgagni hernias, and eventration.
	Acquired lung lesions	<ul style="list-style-type: none"> Cover aspects of lung abscess and empyema Management of pneumatoceles, chylothorax and infiltrates in immunosuppressed children.
	Vascular rings	<ul style="list-style-type: none"> Describe the embryology and anatomy of different types of vascular rings Diagnosis and symptoms Best approach management
	Chest wall deformities	<ul style="list-style-type: none"> Differentiate the different types of deformities and presentation Explore the history of treatment and current approaches to management
Hernias and Abdominal wall defects	Gastroschisis and Omphalocele	<ul style="list-style-type: none"> Detailed description of both disorders with management and potential complications.
	Abdominal hernias	<ul style="list-style-type: none"> Describe embryology, anatomy and clinical findings Management with controversies and complications, and their management
Upper GI (Esophagus – Stomach – Small Bowel)	Gastroesophageal reflux and Barret’s disease	<ul style="list-style-type: none"> Presentation and diagnosis Medical and surgical management
	Pyloric stenosis	<ul style="list-style-type: none"> Presentation and diagnosis Medical management Surgical treatment and complications
	Duodenal and small bowel atresia	<ul style="list-style-type: none"> Describe pathophysiology, presentation, classification, diagnosis, and management
	Malrotation and heterotaxy syndromes	<ul style="list-style-type: none"> Describe the embryology and anatomy of bowel fixation Diagnosis and management approach
	Neonatal intestinal obstruction	<ul style="list-style-type: none"> Provide the differential diagnosis and management of all possible causative factors.
	Short bowel syndrome	<ul style="list-style-type: none"> Define problems related and describe nutritional support and possible surgical management
Lower GI (Appendix – Colon –Rectum – Anus)	Appendicitis	<ul style="list-style-type: none"> Describe symptoms, diagnosis and management with potential complications
	Hirschsprung’s disease	<ul style="list-style-type: none"> Describe the pathophysiology, symptoms, diagnosis, management, complications, and controversies.
	Imperforate anus and cloaca	<ul style="list-style-type: none"> Describe the embryology, classification, diagnosis, and management.
	Inflammatory bowel disease	<ul style="list-style-type: none"> Epidemiology and presentation Investigations and diagnosis Medical and surgical management

LEARNING OPPORTUNITIES

SECTION	TOPIC	OBJECTIVES
		<ul style="list-style-type: none"> • Treatment of complications
	Constipation	<ul style="list-style-type: none"> • Definitions, history, workup, and differential diagnosis. • Knowledge of imaging and treatment plan formulation
Gastrointestinal Bleeding	Upper and lower GI bleeding in children	<ul style="list-style-type: none"> • Explore the different causes according to age group. Managing acute bleeding and differential diagnosis.
Hepatobiliary (Liver – Pancreas – Spleen)	Biliary atresia	<ul style="list-style-type: none"> • Define the relevant embryology and classification. • Diagnostic approach and differential diagnosis. • Surgical treatment and early and post-operative care • Follow up care and recognition and treatment of complications.
	Pancreatic disorders	<ul style="list-style-type: none"> • Broad exploration of congenital structural abnormalities of the pancreas. • Approach to management of patient with pancreatic disorders
	Indications for splenectomy	<ul style="list-style-type: none"> • Describe indications and pathophysiology of various hematological and metabolic diseases. • Surgical approach, potential complications and perioperative management
	Choledochal cysts	<ul style="list-style-type: none"> • Describe the embryology • Approach to management of patients with choledochal cysts
Acute Abdomen	Acute abdomen in children	<ul style="list-style-type: none"> • History taking and presentation • Diagnostic maneuvers • Imaging • Management of specific causative factors
	Necrotizing enterocolitis	<ul style="list-style-type: none"> • Pathophysiology and causative factors • Diagnosis • Medical management • Surgical management and controversies • Complications, prognosis, and outcomes.
Cancer	Neuroblastoma	<ul style="list-style-type: none"> • Pathophysiology of neuroblastoma • Clinical manifestations • Diagnosis • Staging system based on the latest INSS and risk groups • Prognosis and surgical approaches
	Renal tumors	<ul style="list-style-type: none"> • Describe the pathophysiology of various renal tumors • Diagnosis and approach to managements

LEARNING OPPORTUNITIES

SECTION	TOPIC	OBJECTIVES
		<ul style="list-style-type: none"> Describe different treatment protocols Detail approaches to complex presentations and prognosis
	Liver tumors	<ul style="list-style-type: none"> Develop detailed knowledge of management of liver masses in children, especially hepatoblastoma, including treatment protocols.
	Lymphomas	<ul style="list-style-type: none"> Explore approach to lymph nodes in children, diagnostic approach and management including treatment of post chemotherapy residual lymph node management.
	Germ cell tumors	<ul style="list-style-type: none"> Discuss the embryology and classification of germ cell tumors. Detailed knowledge of site specific management approaches (Gonads – Sacrococcygeal – Chest)
	Rhabdomyosarcoma	<ul style="list-style-type: none"> Definitions, epidemiology and pathological classification Clinical presentation and diagnosis Clinical staging and grouping systems Management and risk groups. Site specific management and complications
	Vascular access	<ul style="list-style-type: none"> Indications and approaches to temporary and permanent vascular access. Management of the difficult IV access in emergencies. Vascular access for hemodialysis. Peritoneal dialysis in children.
	Vascular anomalies	<ul style="list-style-type: none"> Definitions and presentations Classification and diagnosis Management approaches
Surgical management of obesity		<ul style="list-style-type: none"> Definitions and prevention Presentations, workup, and complications Medical and surgical approaches
Trauma Urogenital conditions	General management and prevention	<ul style="list-style-type: none"> Epidemiology and resuscitation Prevention strategies and advocacy
	Thoracic Injuries	<ul style="list-style-type: none"> Presentation and resuscitation Organ specific management approaches
	Abdominal Trauma	<ul style="list-style-type: none"> Diagnostic modalities Solid organ diagnosis and management Abdominal compartment syndrome Duodenal, pancreatic and other organ injuries
	Genitourinary trauma	<ul style="list-style-type: none"> Epidemiology and mechanisms of injury Clinical features and diagnostic evaluation Injury grading

LEARNING OPPORTUNITIES

SECTION	TOPIC	OBJECTIVES
		<ul style="list-style-type: none"> Management of specific injuries
	Burns	<ul style="list-style-type: none"> Definitions and diagnosis Approach to resuscitation Surgical management and complications
	Child Abuse and birth injuries	<ul style="list-style-type: none"> Epidemiology and presentation Specific management and multidisciplinary approach
	Congenital conditions: <ul style="list-style-type: none"> Vaginal atresia Hemato/hydro(metro)colpos Bifid vagina Duplex uterus Urogenital sinus 	<ul style="list-style-type: none"> Definitions and classification Pathophysiology Diagnosis and investigation Surgical management
	Inflammatory conditions: <ul style="list-style-type: none"> Pelvic inflammatory disease Vulvovaginitis Vulvar abscess Fused labia minora 	<ul style="list-style-type: none"> Pathophysiology Diagnosis and investigation Medical and surgical management
DSD	<ul style="list-style-type: none"> 46,XY DSD 46,XX DSD Ovotesticular DSD 46,XX testicular DSD 46,XY complete gonadal dysgenesis 	<ul style="list-style-type: none"> Definitions and classification Pathophysiology Diagnosis and investigation Medical and surgical management
Urology	Cryptorchidism	<ul style="list-style-type: none"> Definition and diagnosis Medical and surgical treatment
	Acute scrotum	<ul style="list-style-type: none"> Presentation and diagnosis Management of specific diagnosis
	Cloacal and bladder exstrophy	<ul style="list-style-type: none"> Embryology and pathology Management
	Urachal abnormalities	<ul style="list-style-type: none"> Definitions and embryology Diagnosis Surgical management
Circumcision	Techniques and complications	<ul style="list-style-type: none"> Describe different techniques of circumcision How to prevent and deal with complications

Proposed Master Rota for Pediatric Surgery Residency Training Program

W Y	1-12	13-24	25-36	37-48	49-52	
R1	Pediatric Surgery	General Surgery			Elective (Research)	
R2	Hepatobiliary Surgery	Emergency Medicine	Vascular Surgery	Plastic Surgery	Thoracic Surgery	Elective (Research)
R3	Pediatric Surgery			NICU	PICU	Elective (Research)
R4	Pediatric Surgery		Pediatric Urology	Electives (e.g., Radiology, Oncology, Endoscopy)		Elective (Research)
R5	Pediatric Surgery				Elective (Research)	
R6	Pediatric Surgery				Elective (Research)	

Table: List of mandatory Simulation courses during Resident Training Program Junior Years (R1 – R3)

Topics	Level	Description	Requirement
BLS	R1-2	One day adult learning course in basic life support	Mandatory
Basic surgical skills (BSSC) Basic Operative Surgical Skills course (BOSS)	R1,2	Hands-on 3-5 day workshop includes OR safety, instruments orientation, and handling, knotting, suturing, sterility, and principles of wound care	Mandatory
Basic Laparoscopic Workshop/Fundamentals of Laparoscopic Surgery	R1-3	Hands-on 3-day workshop in principles of laparoscopic surgery	Mandatory
ATLS	R1-3	Interactive 3-day course addressing Advanced Trauma Life Support	Mandatory
Research methodology	R1-3	Workshop on research methodology	Mandatory
FAST course	R1-3	Hands-on 1/2 day course in Focused Abdominal Sonography in Trauma (FAST)	Recommended
Central line course/Vascular Access under USS	R1-3	Hands-on 1-day course in central lines placement techniques	Recommended

Table: List of mandatory Simulation courses during Resident Training Program Senior Years (R4 – R6)

Topics	Level	Description	Requirement
Pediatric Advance Life Support (PALS)	R4-6	Hands-on 2 day course in advance children life support	Mandatory
Advanced Laparoscopic workshop	R4-5	Hands-on 3-day workshop in advance laparoscopic surgical techniques	Recommended
Anastomosis workshop	R4-5	Hands-on one day workshop in bowel, vascular, and other visceral anastomosis techniques	Recommended
Neonatal Resuscitation program (NRP)	R4-6	Hands-on 2 day course in Neonatal Resuscitation	Recommended

Trainee selected topics (20 - 30%)**Examples of skills and knowledge to be acquired**

- How to read a paper
- How to write a paper
- Research and grant preparation
- Communication skills
- Presentation skills
- Leadership and management
- Decision-making
- Stress coping and management
- Time management
- Breaking bad news
- Child psychology
- Exam taking skills
- Surgical simulation

Other educational activities

Laparoscopic Basic Courses	<ul style="list-style-type: none"> • Conducted periodically in Riyadh and Jeddah
National & Regional Meetings	<ul style="list-style-type: none"> • Annual Pediatric Surgery meetings under the Scientific Society of Pediatric Surgery • Updates in Pediatric Surgery meetings under the Ministry of Health
International courses and meetings	<ul style="list-style-type: none"> • British Association of Pediatric Surgery (BAPS) • European Association of Pediatric Surgery • Pacific Association of Pediatric Surgery (PAPS) • American Association of Pediatric Surgery (APSA) • Canadian Association of Pediatric Surgery (CAPS) • Section of Surgery of the American Academy of Pediatrics (SoSu) • International Pediatric Endoscopy Groups (IPEG) • IRCAD courses • Colorectal problems course, Cincinnati Children’s Hospital
Trainee	<ul style="list-style-type: none"> • Regular journal reading • Podcasts • WebSurg university and videos • Simulation box training • Manuscript preparation
Recommended textbooks	<ul style="list-style-type: none"> • Operative Pediatric Surgery, Seventh Edition by Lewis Spitz • Pediatric Surgery, 2-Volume Set: 7e by Arnold G. Coran • Ashcraft’s Pediatric Surgery 6e by George W. Holcomb III MD • Operative Pediatric Surgery by Moritz Ziegler • Newborn Surgery 3E by Prem Puri

ASSESSMENT

Throughout the program residents' evaluation and assessment is undertaken in accordance with the SCFHS training and examination rules and regulations. These include the following:

A. Annual Assessment

1. Continuous Evaluation

This assessment is conducted toward the end of each training rotation, throughout the whole academic year, and at the end of each academic year as continuous assessment in the form of formative and summative evaluation.

1.1 Formative Continuous Evaluation

To fulfill the CanMEDS competencies based on the end of rotation evaluation, the resident's performance will be evaluated jointly by relevant staff: for the following competencies:

- Performance of the trainee during daily work.
- Performance and participation in academic activities.
- Performance in a 10–20 minute direct observation assessment of trainee-patient interactions. Trainers are encouraged to perform at least one assessment per clinical rotation, preferably near the end of the rotation. Trainers should provide timely and specific feedback to the trainee after each assessment of a trainee-patient encounter.
- Performance of diagnostic and therapeutic procedural skills by the trainee. Timely and specific feedback for the trainee after each procedure is mandatory.
- The CanMEDS-based competencies end-of-rotation evaluation form must be completed within two weeks following the end of each rotation (preferably in an electronic format). The program director will discuss the evaluation with the resident, as necessary. The evaluation form will be submitted to the Regional Training Supervisory Committee of the SCFHS within four weeks following the end of the rotation.
- The assessment tools, in a form of educational portfolio (i.e., monthly evaluation, rotational Mini-clinical Evaluation Exercise [Mini-CEX] and Case-based Discussion [CBDs], Multisource, etc.).
- The academic or clinical assignments should be documented by an electronic tracking system (when applicable) on an annual basis. Evaluations will be based on accomplishment of the minimum requirements of the procedures and clinical skills as determined by the program.

1.2 Summative Continuous Evaluation

This is a summative continuous evaluation report prepared for each resident at the end of each academic year, which might also involve clinical, oral examination, OSPE, and OSCE.

2. Surgical Skills Assessment

The acquisition of technical skills is one of the fundamental goals of the pediatric surgery training program. Traditionally, the surgical skills have been assessed in the operating room by supervision and feedback, while subjectivity is a major drawback of such kind of assessment. To overcome this subjectivity, objective assessment tools will be used, such as Objective Structured Assessment of Technical Skills (OSATS) for common surgical procedures and Global Operative Assessment of Laparoscopic Skills (GOALS) for laparoscopic procedures (see appendices).

Log book will be used to ensure that a reasonable number of surgical procedures are performed by the trainee during his rotation. These should be reviewed and signed by the program director at the end of each rotation.

3. End-of-year Examination

The end-of-year examination will be limited to R1, R2, R3, R4, and R5. The number of exam items, eligibility, and passing score will be in accordance with the SCFHS training and examination rules and regulations. (See Exam Blueprint in Commission Web site: www.scfhs.org.sa).

B. Principles of Surgery Exam (Part – I Examination)

Resident should sit for this exam in the first three years of training. The exam is conducted in the form of a written examination with a MCQ format, and it is held at least once a year. The number of exam items, eligibility, and passing score will be in accordance with the SCFHS training and examination rules and regulations (See Exam Blueprint in Commission Web site: www.scfhs.org.sa).

C. Final In-training Evaluation Report (FITER)/Comprehensive Competency Report (CCR)

In addition to the approval of completion of the clinical requirements (resident's logbook) by the local supervising committee, the FITER is also prepared by the program's directors for each resident at the end of his/her final year in residency (R6). This might also involve clinical, oral exams, and completing other academic assignments.

D. Final Saudi Specialty Examination: Pediatric Surgery (Part II Examination)

The final Saudi Specialty Certificate Examination comprises two parts:

1. Written Examination

This examination assesses the theoretical knowledge base (including recent advances) and problem-solving capabilities of candidates in the specialty of pediatric surgery. It is delivered in a MCQ format and is held at least once a year. The number of exam items, eligibility, and passing score will be in accordance with the Commission's training and examination rules and regulations. (See Exam Blueprint in Commission Web site: www.scfhs.org.sa).

2. Clinical Examination

This examination assesses a broad range of high-level clinical skills, including data gathering, patient management, communication, and counseling skills. The examination is held at least once a year, preferably in an objective structured clinical examination (OSCE) format in the form of patient management problems (PMPs). The exam eligibility and passing score will be in accordance with the SCHS's training and examination rules and regulations. (See Exam Blueprint in Commission Web site: www.scfhs.org.sa).

Certification

Certificate of training completion will only be issued upon the resident's successful completion of all program requirements. Candidates passing all components of the final specialty examination are awarded the "Saudi Specialty Certificate in Pediatric Surgery".

APPENDICES

The following are examples of evaluation forms for assessing the various aspects of resident performance during the residency programs.

Appendix A - Educational Portfolio: Resident Assessment

RESIDENT NAME		TRAINING YEAR	R1 - R2 - R3 - R4 – R5 – R6				
ROTATION		ASSESSMENT PERIOD					
CONTRIBUTORS TO EVALUATION		HOSPITAL					
SCALE KEY	Please compare the resident with other residents at his/her training.						
LEVEL:							
N/A	Not applicable	There was no opportunity to enable evaluation of this item.					
2	Unsatisfactory*	Clearly inadequate in functioning and/or not improving.					
3	Borderline/Marginal*	Inconsistently meets expectations for domain being evaluated.					
4	Meets expectations	A solid performance at his/her level in the program—most residents will fit into this category.					
5	Exceeds expectations*	Performed in a fashion that exceeds your expectations for most residents in the program.					
Performance of advance residents and experienced practitioners.							
This rating should be given to only a small number of residents and would place them at > 90th percentile.							
*Written comments should accompany and support this rating.							
Please note that observed progress and evaluation should incorporate sequential integration of prior learning, new knowledge, and skills.							
		N/A	2	3	4	5	Comments
A. COMMUNICATION SKILLS							
1. Ability to elicit relevant, concise, and accurate history from patient/parent(s).							
2. Ability to present clinical data in an organized, problem-oriented manner at rounds.							
3. Ability to effectively discuss relevant information with attending, and health care team.							
4. Establishes a therapeutic relationship with patients/parent(s) and communicates well with the family.							
5. Adequate, appropriate, and organized documentation.							

B. MEDICAL EXPERTISE DEVELOPMENT: KNOWLEDGE/CLINICAL JUDGMENT/SKILLS/PERFORMANCE						
6. Basic science.						
7. Knowledge of common problems (related to subspecialty and level of training).						
8. Accurate and efficient in conducting a complete and problem-focused physical examination (must be witnessed even if partial; e.g., undescended testis, inguinal hernia, neck masses).						
9. Formulation of differential diagnoses, and ability to prioritize and solve problems.						
10. Interpretation of relevant laboratory and diagnostic imaging tests.						
11. Competency in performance of procedural tasks related to subspecialty.						
12. Recognition and performance in acute and emergency situations.						
C. HEALTH CARE ADVOCATE						
13. Identifies important determinants of health affecting patients. (e.g., poverty, socio-economic status).						
14. Recognizes opportunity for and provides health promotion and anticipatory guidance (e.g., trauma prevention, recommending safety measures).						
	N/A	2	3	4	5	Comments
D. COLLABORATOR and MANAGER						
15. Uses resources effectively where appropriate (e.g., evaluates need for and appropriately orders lab/diagnostic tests)						
16. Displays appropriate time management skills. Prioritizes tasks and performs procedural interventions in a timely and efficient manner.						
17. Understands own limitations, seeks help when required, receptive to constructive criticism, and able to adequately handle feedback.						
18. Ability to function in a multidisciplinary team setting.						
19. Ability to follow up outstanding issues in a timely fashion.						
E. SCHOLARLY ACTIVITY						
20. Ability to execute a systematic search for evidence (literature review, chart audit, etc.) in order to optimize clinical decision making and clinical care.						
21. Ability to critically appraise sources of medical information.						

APPENDICES

22. Teaching ability (formal/informal, e.g., medical students, interns, juniors).						
F. PROFESSIONAL ATTITUDE AND PERFORMANCE						
23. Demonstrates initiative in achieving educational objectives (e.g., preparation for rounds, reading around cases, discussion on how to improve).						
24. Courteous and respectful (to patients/parents and staff). Open minded to the needs and expectations of parents. Active listener.						
25. Displays empathy for sick patients and their families.						
26. Demonstrates gender and cultural sensitivity.						
27. Displays dedication/enthusiasm, sense of responsibility, and punctuality.						
28. Delivers highest quality of care with integrity, honesty, and compassion.						
29. Displays and is able to handle appropriate level of responsibility for level of training.						
30. Establishes effective relationship with seniors, peers, and health professionals.						
G. OVERALL COMPETENCE						
31. Overall assessment for rotation.						
Strengths						
Areas requiring further work						
Other comments:						
Resident comments:						
Official Use						
Total score						x
	20% =					
No. of evaluated items						

Mini-CEX

Pediatric surgery residents will be responsible for conducting at least one Mini-CEX session completed during each rotation. The process will end with a structured discussion with the supervisor or assessor:

- A selected case from the in-patient or outpatient setting to be interviewed under direct supervision.
- The case should be presented with a conclusion. It should take no longer than 15 minutes.
- This should be followed immediately by a 15 minutes feedback, which includes actions undertaken correctly and those that need improvement.
- A Mini-CEX form should be completed in the presence of the residents.
- The assessment form should be part of the educational portfolio.

Case-based Discussion (CBD)

Competence in patient investigation, patient management, health promotion and disease prevention, and some aspects of both attitudes/ethics and continuing professional development is assessed using a CBD form. These forms can be completed by trainers in the following circumstances:

- During an outpatient clinic. Trainers and trainees may wish to allocate 5 – 10 minutes to discuss the management of a patient seen during an outpatient clinic.
- Case selection would be determined by either the trainee or trainer. The trainee should have had some direct clinical role with the patient (e.g., history taking, clinical examination, investigations ordered or interpreted, management decisions, management of complications, critical incidents, etc.).
- At the end of an outpatient clinic. Trainers and trainees may wish to allocate some time at the end of clinic to review a small number of case notes where the trainee has had a significant role in the management of the patient.
- Case presentations during postgraduate teaching. Trainees are often asked to present cases at local or regional postgraduate teaching sessions. A nominated trainer should complete a CBD form after the presentation.
- During a designated teaching session. Trainers and trainees may wish to allocate a period of one-to-one teaching or small group teaching where cases are discussed and a CBD form is completed.

A list of Clinical Scenarios that cover most of the pediatric surgery curriculum will be developed. Trainees should aim to cover all these scenarios in their case-based discussions if possible so that their portfolio reflects a wide range of clinical management situations. It is recommended that about half the cases for CBDs be chosen by the trainee and half by the trainer. As a guide, trainees should ensure that a minimum of one case per annual quarter is discussed and a CBD form completed. By the end of training, a trainee's portfolio should contain at least 20 CBD forms.

CBD Scenarios

The pediatric surgery resident is expected to manage a range of clinical scenarios. This may involve referrals from other health professionals, patient self-referrals, or screening for pediatric surgery disease.

Competencies Assessed in Mini-CEX

- Professional approach to patient.
- History-taking skills.
- Physical examination skills.
- Clinical diagnostic skills.
- Clinical judgment and synthesis.
- Patient management skills.
- Communication skills.
- Overall clinical competences.

* See Appendix B

Appendix B - Educational Portfolio Mini-CEX Form

Resident's Name					
Clinical Setting					
Title of Procedure					
Clinical Problem Category					
Thoracic	Abdomen	Oncology	Neck	Limb	Neonatology
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If Other, please specify					
New or FU?					
Focus of clinical encounter					
History	Diagnosis	Management	Explanation		
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		
Number of times patient seen before by trainee:					
Complexity of case:					
Assessor's position:					
Number of previous mini-CEX observed by assessor with any trainee:					
Please grade the following area using the scale below:					
<i>Please mark as "Insufficient Evidence" if you have not observed the behavior and feel unable to comment</i>					
History Taking					
Insufficient evidence	Below expectations	Borderline for completion	Meets expectations for completion	Above expectation	
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Physical Examination Skills					
Insufficient evidence	Below expectations	Borderline for completion	Meets expectations for completion	Above expectation	
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Communication Skills					
Insufficient evidence	Below expectations	Borderline for completion	Meets expectations for completion	Above expectation	
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Clinical Judgment					
Insufficient evidence	Below expectations	Borderline for completion	Meets expectations for completion	Above expectation	
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Professionalism					
Insufficient evidence	Below expectations	Borderline for completion	Meets expectations for completion	Above expectation	
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Organization/Efficiency					
Insufficient evidence	Below expectations	Borderline for completion	Meets expectations for completion	Above expectation	
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Overall Clinical Care					
Insufficient evidence	Below expectations	Borderline for completion	Meets expectations for completion	Above expectation	
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	

Anything especially good	
Suggestions for development	
Agreed action	
Time taken for observation: (in minutes)	
Assessor's Name:	

Competencies Assessed in Case-based Discussion

- Professional approach to patient.
- Data gathering and interpretation.
- Making diagnosis and decisions.
- Clinical management.
- Managing medical complexity.
- Working with colleagues and in teams.
- Maintaining an ethical approach.
- Fitness to practice.

* See Appendix C

Appendix C - Form Educational Portfolio: CBD Form

Trainee's Name:					Date (dd/mm/year)						
R1	<input type="radio"/>	R2	<input type="radio"/>	R3	<input type="radio"/>	R4	<input type="radio"/>	R5	<input type="radio"/>	R6	<input type="radio"/>
Assessor's Name:											
Assessor's Status:		Consultant		Residents (R1, R2, R3, R4, R5, R6)				Other (specify)			
		<input type="radio"/>		<input type="radio"/>				<input type="radio"/>			
Clinical scenario (see study guide)											
Brief description of case:											
Overall difficulty of case:		Simple			Intermediate			Difficult			
		<input type="radio"/>			<input type="radio"/>			<input type="radio"/>			
Topic		Poor	Fair	Good	V. Good	N/A					
Medical Record Documentation											
Clinical Assessment											
Investigation and Referrals											
Treatment											
Follow-up and Future Planning											
Professionalism											
Clinical Judgment											
Leadership/Manager Issues											
Overall performance in this assessment		Poor	Fair	Good	V. Good						
		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>						
Meets expectations/Does not meet expectations (for stage of training)											
Anything especially good?						Suggestions for development:					
Signature of Assessor:											
Signature of Trainee:											

Appendix D - Educational Portfolio Reflection Form

Rotation (____): General Pediatric Surgery
Clinical Management
Strength:
Areas of Improvement:
New Skills:
Medical Practice
Strength:
Areas of Improvement:
New Skills:
Professionalism
Strength:
Areas of Improvement:
New Skills:
Communication Skills
Strength:
Areas of Improvement:
New Skills:
Leadership and Teamwork
Strength:
Areas of Improvement:
New Skills:

Appendix E - OSATS

Objective Structured Assessment of Technical Skills (OSATS)									
Name:		Postgraduate year of training: 1 2 3 4 5 6							
Assessor:		Date:							
Operation:									
<u>Global Rating Scale</u>									
Domain 1: Indication for Surgery									
4	5	6	7	8	9	10			
No understanding of pathology		Basic understanding of pathology				Excellent understanding of pathology			
Domain 2: Respect for Tissue									
4	5	6	7	8	9	10			
Frequently used unnecessary force on tissue or caused damage by inappropriate use of instrument		Careful handling of tissue but occasionally caused inadvertent damage				Consistently handled tissues appropriately with minimal damage			
Domain 3: Time and Motion									
4	5	6	7	8	9	10			
Many unnecessary moves		Efficient time/motion but some unnecessary moves				Clear economy of movement and maximum efficiency			
Domain 4: Knowledge & Handling of Instruments									
4	5	6	7	8	9	10			
Repeatedly awkward and unsure, inappropriate use of instruments		Occasionally stiff and awkward, mostly appropriate choice and use of instruments				Fluid moves and obviously familiar with the instruments			
Domain 5: Use of Assistants									
4	5	6	7	8	9	10			
Consistently placed assistants poorly or failed to use assistants		Appropriate use of assistants most of the time				Strategically used assistants to the best advantage at all times			
Domain 6: Flow of Operation									
4	5	6	7	8	9	10			
Frequently stopped operating and seemed unsure of next move		Demonstrated forward planning with reasonable progression of the operation				Obviously planned course of the operation with effortless flow from one move to the next			
Domain 7: Knowledge of Specific Procedure									
4	5	6	7	8	9	10			
Deficient knowledge and needed specific instruction at most steps		Knew all important steps of the operation				Demonstrated familiarity with all aspects of the operation			
Domain 8: Perioperative Management									
4	5	6	7	8	9	10			
Chaotic and incomplete		Performed well but needs instructions				Independently, carefully and complete			
<u>Overall Performance Scale</u>									
Overall judgment Assessor	Below Expectation		According to Expectation			Above Expectation			
	4	5	6	7	8	9	10		
Overall judgment Resident	Dissatisfied		Neutral			Satisfied			
	4	5	6	7	8	9	10		
Alphabetic Summary Scale									
A	Competent to assist adequately								
B	Competent to perform the operation under strict supervision								
C	Competent to perform the operation under limited supervision								
D	Competent to perform the operation unsupervised								
E	Competent to supervise and educate the operation								
<u>Feedback</u>									

OSATS instrument used by the Association of Surgeons of the Netherlands (from Hopmans JH, den Hoed PT, van der Laan L, et al. Assessment of Surgery residents' operative skills in the operating theater using a modified Objective Structured Assessment of Technical Skills (OSATS): A prospective multicenter study. Surgery 2014;156:1078-88

Appendix F - GOALS

Domains	1	2	3	4	5
Depth perception	Constantly overshooting target, hits backstop, wide swings, slow to correct	Some overshooting or missing plane, but corrects quickly	Accurately directs instruments in correct plane to target		
Bimanual dexterity	Use of 1 hand, ignoring non-dominant hand, poor coordination between hands	Use of both hands, but does not optimize interactions between hands to facilitate conduct of operation	Expertly utilizes both hands in a complementary manner to provide optimal working exposure		
Efficiency	Uncertain, much wasted effort, many tentative motions, constantly changing focus of operation, or persisting at a task without progress	Slow, but planned and reasonably organized	Confident, efficient, and safe conduct of operation, maintaining focus on component of procedure until better done by another approach		
Tissue handling	Rough, tears tissue by excessive traction, injures adjacent structures, poor control of coagulation device (recoil), grasper frequently slip off	Handles tissues reasonably well, with some minor trauma to adjacent tissues: e.g., coagulation of liver, causes unnecessary liver bleeding, occasional slipping of grasper	Handles tissues very well with appropriate traction on tissues and negligible injury of adjacent structures. Uses energy sources appropriately but not excessively		
Autonomy	Unable to complete entire procedure, even in a straightforward case and with extensive verbal guidance	Able to complete operation safely with moderate prompting	Able to complete operation independently without prompting		

From: Hogle NJ, Liu Y, Ogden T, Fowler DL. Evaluation of surgical fellows' laparoscopic performance using Global Operative Assessment of Laparoscopic Skills (GOALS). Surg Endosc 2014;28:1284-90

Appendix G - Examiner Evaluation Sheet for each candidate

SAUDI COMMISSION FOR HEALTH SPECIALTIES		
Pediatric Surgery Oral Examination		
Final Board Examination		
Name of Candidate:		
Number:		
Grades: R = 40% (missing essential action), F= 60% (fail), Bp = 70% (barely pass), P = 71% – 80% (pass) V = 80% – 90% (very good), O = 90% (outstanding)		
Case Number	Grade	Comments
1		
2		
3		
4		
5		
6		
7		
8		
Name of the Committee:		
Name of Examiner:		
Signature:		

Appendix H - Committee Evaluation Sheet for each candidate

SAUDI COMMISSION FOR HEALTH SPECIALTIES	
Saudi Board of Pediatric Surgery	
Final Board Exam	
Date (Day, Month DD, YYYY):	
Name of Candidate:	
Exam Subject:	
Comment on weaknesses and defense of red flag or high score:	
SCORE GUIDE	
Above average	71 – 100
Pass	70
Fail	< 70
Red flag	< 40
Marks Secured in Percentage: _____%	
Examiner's Name:	
Signature:	



الهيئة السعودية للتخصصات الصحية
Saudi Commission For Health Specialties
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