

Component	KSA	PGY			
		1	2	3	4-5
Head and Neck	Knowledge	A detailed understanding of the anatomy, the head and neck with particular attention to the cranial nerves. An understanding of the lymphatic drainage of the head and neck and their surgical significance.	The diagnosis and treatment of disorders of the pharynx and larynx. Morphologic anomalies, infection, trauma and tumors of the external ear, nose, paranasal sinuses and mouth.	The utilization of surgery, radiation and chemotherapy in the treatment of neoplasm of the head and neck.	
	Skills	Perform a thorough exam of the head and neck, including thyroid, nose, mouth, pharynx, larynx and cervical lymphatics.	Airway management, bag valve mask ventilation, direct laryngoscopy and endotracheal intubation, tracheotomy.	Rigid and fiberoptic endoscopy of the upper and lower airway. Benign tumors of the salivary glands.	Parotidectomy. Neck dissection.
	Abilities		Diagnostic workup of benign and malignant conditions of the head and neck. Recognize and manage airway obstruction, trauma to head, neck and airway.	Manage emergencies including hemorrhage, airway obstruction, major trauma and brims of the upper airway.	Management of neck neoplasms.
Breast	Knowledge	Define the anatomy and the hormonal regulation of the breast. Genetic markers and epidemiology of breast cancer and risk factors involved and the overall incidence of breast cancer	Differential diagnosis of breast masses including fibroadenoma, cysts, abscess, fibrocystic disease and cancer. Indications, usage and limitations of mammography including marking mammograms. Breast cancer staging and micropathology. Sentinel lymph node interpretation and its significance.	Options for treatment of breast cancer. Less common lesions of the breast including inflammatory carcinoma, Paget's disease, Mondor's disease and male breast cancer. Breast reconstruction options.	Diagnosis and management of advanced breast cancer, including chemotherapy.
	Skills	Detailed breast and nodal examination.	Office-based breast procedures: fine needle aspiration, cyst aspiration.	Surgical diagnostic procedures: ultrasound, marking mammography, breast biopsy, sentinel node biopsy	Surgical removal of breast cancer: lumpectomy, quadrantectomy, mastectomy, axillary dissection.
	Abilities		Diagnostic workup of breast mass, management of benign breast conditions and infections.	Diagnostic workup of patients with breast cancer. Ultrasound, mammographic, and radiological interpretation.	Management of patients with breast cancer based on stage, micropathology, biochemical and genetic markers. Coordinates care with oncology and radiation therapy. Informed discussions with patient.
Skin and Soft Tissue	Knowledge	Normal wound healing. Wound and surgical infections (abscess, necrotizing infections). Suture material and needles. Processes that impede healing: nutrition, metabolic stage, hematologic status, immune response and infection. Antibiotic use. Wound classification and site infection risk. Surgical site infection prophylaxis. Multiply-resistant organisms, tetanus, rabies, gangrene.	Melanoma pathology, basal and squamous cell carcinomas. Differential diagnosis of skin lesions. Diagnostic workup of patient with melanoma. Techniques for covering soft tissue defects. Basic plastic surgical techniques: local rotation and advancement flaps.	Soft tissue sarcoma. Diagnosis and treatment of necrotizing soft tissue infections.	Adjuvant chemotherapy and radiation therapy for advanced skin and soft tissue malignancy.
	Skills	Wound closure. Examination of postoperative wounds. Examination of traumatic wounds. Timing of suture removal. Incision and drainage of soft tissue abscess. Routine dressing management.	Skin biopsy. Skin graft. Debridement. Vacuum-assisted systems. Complicated dressing management. Complicated facial lacerations in emergency department.	Wide local excision for cancer. Sentinel node biopsy in context of melanoma and skin cancer. Basic plastic surgical techniques: local rotation and advancement flaps.	Advanced plastic surgical techniques: free flap, microsurgery, etc.
	Abilities	Manages postoperative incisions. Recognizes and manages surgical site infections. Diagnosis and management of soft tissue abscess. Timely and appropriate use of perioperative antibiotics.	Manages complicated wounds (VAC drains, large defects, wounds requiring debridement, compromised patients). Diagnostic management of patients with benign skin and soft tissue lesions.	Diagnosis and management of patients with skin cancer and melanoma. Recognizes and manages necrotizing soft tissue infections.	Management of advanced stage melanoma and soft tissue sarcoma based on stage and micropathology.

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Alimentary Tract	Knowledge	Anatomy of the alimentary tract from the cervical esophagus to the anus with emphasis on systemic blood supply, portal venous drainage, innervation and lymphatic drainage. Deglutition, esophageal and intestinal motility, and defecation. Physiology of GI secretion, absorption, and hormonal regulation. Mucosal acid-base and enzyme secretion. GI hormones and their actions. Pathology, diagnosis and principles of management of GI tract emergencies: hemorrhage, perforation, obstruction. Appendicitis and differential diagnosis of the acute abdomen. Appropriate antibiotic management for GI disease and operations.	Pathology and pathophysiology of benign GI diseases, including peptic ulcer disease, GERD, obesity, malabsorption, inflammatory bowel disease, enterocutaneous fistula. Symptomatology and presentations of GI disease. Indications and appropriate application of diagnostic tests: laboratory, radiological, endoscopic. Basic principles and complications of intestinal anastomosis, suture and stapled.	Gastric and colorectal cancer: staging, micropathology; diagnostic workup and surgical management. Anatomy of cancer operations of the GI tract, with margins and nodal anatomy. Surgical operations for benign GI disease (anti-reflux, gastric resection, short bowel syndrome, bariatric, enterocutaneous fistula, etc) and their physiological effects. Anastomotic complications (leak, fistula, intraabdominal abscess).	Esophageal and anal cancer: staging, micropathology; diagnostic workup and surgical management. Adjuvant and neoadjuvant protocols for advanced GI cancers, all sites. Unusual GI malignancies: e.g. carcinoid, GIST, APUD, sarcoma and lymphoma. Approaches to advanced GI diseases: unresectable GI malignancy, intractable enterocutaneous fistula, short bowel syndrome.
	Skills	Detailed examination of the anterior abdominal wall and gastrointestinal tract. Placement of gastric and rectal tubes for decompression.	Open small bowel resection. Open appendectomy. Anal procedures for benign disease (hemorrhoid, fistula, abscess, etc). Gastrostomy and feeding enterostomy.	Upper and lower GI endoscopy. Open colon resection for cancer. Enterostomy and colostomy construction and closure. Laparoscopic appendectomy. Lysis of adhesions to free bowel obstruction.	Resections for GI malignancy, all sites. Laparoscopic intestinal resection. Laparoscopic antireflux procedures. Esophageal and distal anorectal surgery. Gastric operations for peptic ulcer disease.
	Abilities	Recognizes patients with peritonitis through the physical examination. Institution of appropriate antibiotic therapy.	Recognition and stabilization of patients with acute GI disease: hemorrhage, obstruction, perforation. Diagnostic workup of suspected GI disease, benign and malignant. Interpretation of laboratory and radiological tests.	Recognition of GI pathology by endoscopy. Diagnosis and management of benign and malignant GI disease involving the stomach, small intestine, colon and rectosigmoid. Enterocutaneous fistula management.	Management of advanced GI disease, esophageal and distal anorectal neoplasms, unusual GI neoplasms, short bowel syndrome, complicated fistulas, and peptic ulcer disease. Complicated anorectal disease (e.g. Crohn's, incontinence)
	Knowledge	Anatomy of the abdomen and its contents, specifically the liver (lobes, segments, vascular anatomy and anomalies), biliary tract (triangle of Calot, ductal anomalies), pancreas (ducts and ductal anomalies), spleen, portal vascular system, abdominal wall (esp ref. hernias), peritoneal cavity (greater and lesser sac, sulcuses, and foramina), and omentum. Vascular anatomy, lymphatic drainage, and innervation of various components. Physiology of secretion of bile and pancreatic juice. Hormonal and digestive system control of gall bladder and pancreatic function (both exocrine and endocrine). Hematological and immunological functions of the spleen. Bacteriology of the biliary tract and immunological consequences of splenectomy, with antibiotic and vaccination protocols. Accessory spleens.	Pathology and pathophysiology of benign biliary disease: gallstone formation, chronic and acute cholecystitis, common duct stones, and cholangitis. Acute and chronic pancreatitis and complications. Diagnostic workup using clinical history and exam, laboratory and radiological tests. Pathology of hernia formation, underlying conditions, predisposition to recurrence, management of recurrent hernia. Intra-abdominal abscess and sepsis. Laparotomy incisions and closure techniques. Use of electrocautery. Basic laparoscopic principles and techniques: equipment, instruments, supplies, set up. Mechanism of peritoneal dialysis, complications associated with PD. Prosthetic material used in hernia repair.	Liver disease, liver failure, cirrhosis and portal hypertension. Splenic pathology. Diagnostic workup using clinical history and exam, laboratory and radiological tests. Morbidity of patients with chronic liver failure. Ductal anatomy of the pancreas and anomalies.	Pancreatic, hepatic, biliary cancer staging, diagnosis, and management.
Abdomen	Skills	Drain management. Open inguinal and umbilical hernia repair.	Laparotomy and closure. Open liver biopsy. Open hernia repair. Basic laparoscopic cases: straight-forward chronic cholecystitis. Intra-abdominal abscess management. Placement of peritoneal dialysis catheters.	Continued straight-forward laparoscopic cases (gall bladder, appendectomy), begin advanced laparoscopic cases (hernia, ventral hernia). Open splenectomy. Recurrent hernia.	Advanced laparoscopic cases (splenectomy, adrenalectomy). Pancreatic, liver resections. Recurrent-reoperative laparoscopic cases.
	Abilities	Diagnoses patients with inguinal hernia, starts appropriate workup, and prepares for operation. Diagnosis and management of patients with benign biliary disease (chronic cholecystitis). Begins diagnostic management of patients with acute abdomen (see above), considering non GI tract causes. Begins appropriate resuscitation and antibiotic management of patients with suspected acute hepatic, biliary and pancreatic disease. Recognizes esophageal variceal bleeding as a cause of GI hemorrhage.	Diagnosis and management of patients with acute cholecystitis and pancreatitis. Diagnosis and management of intra-abdominal abscess. Placement, management, and management of complications of peritoneal dialysis.	Diagnosis and management of patients with portal hypertension and complications of acute cholangitis and pancreatitis. Manages diseases and conditions requiring splenectomy (e.g., ITP).	Diagnosis and management of patients with pancreatic, biliary, and hepatic cancer. Unusual hepatic, pancreatic, and biliary conditions.

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Vascular	Knowledge	Anatomy of the peripheral arterial vascular system, including collateral pathways. Pathogenesis of arterial occlusive, aneurysmal, and embolic disease. Pathogenesis of cerebrovascular disease and thromboembolic mechanisms of stroke. Symptomatology and clinical manifestations of lower and upper extremity, cerebral, and visceral ischemia, and renovascular hypertension. Venous anatomy especially with regard to central venous access. Pathogenesis of thromboembolism, chronic and acute venous insufficiency. Pathophysiology of pulmonary embolism. Pharmacology of anticoagulation, thrombolysis, and antiplatelet therapy. Deep venous thrombosis (DVT) prophylaxis. Antibiotic prophylaxis in vascular surgery. Hemodynamics of arteriovenous fistulas. Lymphatic anatomy and disease. Compartment syndrome. Fascial compartment anatomy.	Diagnostic workup of patients with suspected arterial occlusive and aneurysmal disease. Application and interpretation of noninvasive vascular laboratory tests. Acute vascular emergencies. Management of complications of vascular surgery (e.g., thrombosis, restenosis, graft infection, wound infection). Management of venous thromboembolism and pulmonary embolism. Management of chronic venous insufficiency. Recognition of patients with complications of anticoagulation and hypercoagulable states. Techniques for placement of temporary hemodialysis access. Techniques for vascular anastomosis. Radiation safety.	Endovascular techniques: grafts, introduction systems, catheters and balloons. Interpretation of arteriography and venous studies. Techniques for embolectomy. Diagnosis and management of vascular traumatic injuries. Surgical anatomy of major peripheral arteries and veins. Diagnosis and management of acute and chronic visceral insufficiency. Diagnosis and management of acute venous ischemia (phlegmasia cerulial dolens).	Diagnosis and management of endovascular complications. Management of graft infection. Surgical anatomy of visceral and renal branches of the aorta. Pathogenesis of visceral aneurysms and unusual arterial disease (eg Takayasu, fibromuscular dysplasia, neurofibromatosis, mycotic aneurysm).
	Skills	Physical examination of arteries, veins and lymphatics, with gradation of pulse exam. Recognition and diagnostic measures for pulmonary embolism. Placement of central venous access using subclavian, internal jugular, and femoral approaches. Use of anticoagulation and anti-platelet therapies, use of laboratory tests to monitor responses.	Familiarity with Seldinger technique. Placement of IVC filters. Application and interpretation of noninvasive vascular laboratory testing. Use of thrombolytic therapy. Placement of temporary dialysis access. Vascular anastomosis with construction of arteriovenous fistulas. Use of embolectomy catheters. Compartment pressure measurements. Fasciotomy.	Vascular anastomosis of major arteries to grafts. OR setup for endovascular surgery. Exposure of femoral, popliteal, and distal trifurcation branches. Preparation of saphenous vein for harvest or in situ grafting. Selection, use, and surgical techniques using vascular prostheses for AV fistulas.	Selection of endovascular prostheses. Surgical exposure of abdominal aorta and its branches. Surgical exposure of extracranial branches of the carotid. Surgical expose of thoracic outlet. Open vascular surgery techniques: instruments and techniques to control major blood vessels and perform arterial reconstructions (anastomosis, endarterectomy).
	Abilities	Recognizes patients with acute and chronic arterial and venous insufficiency. Institutes appropriate interventions to preserve skin integrity in at-risk patients. Management of central venous access, including complications of placement. Institution and adjustments of anticoagulation and anti-platelet therapies, including routine DVT prophylaxis. Institutes appropriate antibiotic prophylaxis.	Stabilizes patients with acute vascular emergencies (eg AAA, acute ischemia, pulmonary embolism). Manages patients with postoperative complications of vascular surgery and pharmacological therapies (anticoagulation, anti-platelet, thrombolytic). Placement, management and care of IVC filters. Placement, management, and management of complications of hemodialysis access and renal failure patients. Observes standard radiation safety practices. Manages wound infections in vascular patients.	Manages patients undergoing distal bypass procedures. Manages patients with acute vascular emergencies. Management of patients with "last chance" venous access. Diagnoses and manages traumatic vascular injuries. Wound management in patients with potential limb-loss situations. Management of patients with life-threatening pulmonary embolism.	Diagnosis and management of patients with acute and chronic vascular insufficiency and aneurysmal disease. Ruptured AAA. Endovascular and open procedures. Management of patients with graft infection and graft failure (eg endoleak, graft collapse).
Endocrine	Knowledge	Anatomy, histology, pathology and pathophysiology of the pancreas, adrenals, thyroid and parathyroid, including neural and biochemical mechanisms of feedback and control. Clinical and laboratory manifestations of disease conditions. Differential diagnosis and workup of thyroid nodule and hypercalcemia. Radiological imaging. Perioperative glucose management, diabetic patient and insulin management, and hyperglycemic complications. Perioperative management of steroid-dependent patients.	Provocative and functional tests of hyper- and hypofunction (eg ACTH stimulation tests). Specialized imaging techniques (eg Sestamibi scans) and localizing tests (eg selective venous sampling). Complications of thyroidectomy and parathyroidectomy.	Preoperative preparation, intra- and postoperative care of patients with hyperfunctioning states (eg hyperthyroidism, hyperparathyroidism, Cushing's, pheochromocytoma, hyperaldosteronism, gastrinoma). Multiple endocrine neoplastic syndromes. Carcinoid and unusual GI hormone states. Surgical anatomy of the thyroid and parathyroid. Thyroid cancer staging, micropathology, and treatment.	Surgical approaches to adrenal disease, endocrine disorders of the pancreas, and hyperparathyroidism (adenoma, hyperplasia, multiple glands, ectopic glands). Management of gastrinoma. Management of MEN with multiple glandular hyperfunction. Management of acute endocrine emergencies (thyroid storm, malignant hypercalcemia, hypertensive crises, Addisonian crises).
	Skills	History and physical examination of patients with a thyroid nodule.	Drains postoperative neck hematoma.	Thyroidectomy	Parathyroidectomy, (incl intraoperative localization techniques), adrenalectomy, pancreatotomy
	Abilities	Postoperative management of thyroidectomy and parathyroidectomy patients. Management of postoperative hypocalcemia. Perioperative management of diabetic and steroid-dependent patients.	Preoperative evaluation of patients with thyroid nodule, hyperthyroidism, and hyperparathyroidism. Management of hypercalcemic crisis, hyperglycemia, Addisonian crisis, hypertensive crisis	Management of patients with thyroid cancer, hyperthyroidism, hyperparathyroidism, carcinoid.	Management of patients with recurrent hyperparathyroidism, adrenal adenoma, pheochromocytoma, gastrinoma. Management of patients with unusual GI hormone pathology.

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Trauma and Emergency Medicine	Knowledge	Anatomy and pathophysiology of acute responses to injury, shock, and head injury. Physiology of resuscitation, use of crystalloid solutions and blood products. ATLS protocols. Use of tetanus prophylaxis and antibiotics. Clinical manifestations of life-threatening and serious injuries. Laboratory and radiological evaluations of the injured patient. Basic pre-hospital care. Simple laceration care and closure. Care of open wounds. Basic orthopedic fracture management.	Evaluation and management of specific injuries to torso, pelvis and contents, and extremities. Evaluation and management of injuries to head, neck and neuraxis. Care of complicated wounds: vacuum-assisted devices, role of plastic surgical techniques. Non-operative approaches to injury, including CT interpretation. FAST exam. Management of compound fractures and those complicated by neurovascular compromise.	Evaluation and management of trauma in special populations: pediatric, pregnant patient, elderly. Coordination of trauma care by a team. Techniques to repair hollow viscus injury, non-exsanguinating bleeding to solid organs. Techniques that address the initial and definitive management of major extremity injuries (degloving, amputation).	Coordination of multi-victim trauma care: triage, disaster situations, transfer of patients to specialized units (eg burn units). Techniques to repair major injuries to the major blood vessels, liver, pancreas, kidneys, retroperitoneum and pelvis. Techniques that address chest, heart.
	Skills	Clinical evaluation of injured patient. Peripheral intravenous placement. Placement of central venous catheter by subclavian, internal jugular, or femoral routes. Clean and contaminated wound management and closure. Splint and cast management.	Detection of injuries through clinical examination, laboratory and radiological tests including CT. Conducts FAST exam. Applies VAC dressings. Laparotomy in stable patients with hollow viscus injury. Acute airway management, including endotracheal intubation and surgical airway (tracheotomy).	Leads trauma resuscitations for unstable patients and those from special populations. Laparotomy in stable patients, open splenectomy, control of hepatic lacerations in stable patients.	Leads trauma resuscitations for multiple victim situations. Operative management in unstable patients involving both thoracotomy and laparotomy. Complicated exposure of vessels and structures of the base of neck and thoracic inlet, thoracoabdominal area, and retroperitoneum.
	Abilities	Productive and reliable member of trauma team. Initiates intravenous resuscitation and blood transfusions. Places chest tubes. Manages stable patients not requiring critical care. Manages clean fresh lacerations and simple closed fractures. Manages closed head injuries GCS 13-15.	Productive and reliable member of trauma team. Takes primary care of patients with acute injury through ER to discharge. Manages patients undergoing non-operative approaches to torso injuries. Manages closed head injuries and postoperative head injured patients with GCS <=12. Manages complicated wounds, open fractures.	Leads trauma team in care of unstable patients requiring critical care and operation. Performs laparotomy, organ removal and repair with senior assistance.	Leads service in multi-victim situations. Decides when surgery is required and conducts operative management.
	Knowledge	Physiology and pathophysiology of respiratory, cardiovascular, renal, metabolic, endocrine, and neurological systems in the context of critical care. Diagnosis and management of patients with chronic respiratory failure who require surgery. Heart failure and ischemic heart disease. Acute and chronic renal insufficiency. Malnutrition; management of enteral and parenteral nutrition support. Endocrinopathy (see Endocrine above). Infectious complications of critical care (nosocomial infections, VAP, multiply resistant organisms). Fluid, electrolyte, and metabolic homeostasis and derangements. Coagulopathy and DIC.	Airway anatomy and management of acute airway obstruction. Respiratory physiology, pathophysiology and pharmacology. Ventilatory support equipment, instruments, monitoring devices, and safety systems. Cardiovascular physiology, pathophysiology and support. Pharmacological and mechanical cardiac support. Monitoring equipment, devices, and safety systems. Pathophysiology and management of ARDS and SIRS. Nutritional support. Renal function, pathophysiology, acute renal failure and renal dialysis. Metabolic and toxic derangements and their management.		
Surgical Critical Care	Skills	Central line placement. Chest tube placement. Laboratory and blood gas interpretation.	Bronchoscopy. Endotracheal intubation. Tracheotomy. Gastrostomy. Feeding jejunostomy. Ventilator management. Pharmacological cardiovascular support.		
	Abilities	Recognizes acutely ill patients who require intensive care. Institutes appropriate respiratory support and chest physiotherapy on ward patients. Manages noncritical metabolic, fluid, electrolyte and infectious conditions.	Manages acutely ill patients who require intensive care, with ventilatory and cardiac support. Manages life-threatening derangements of metabolism, fluid and electrolytes, infectious conditions, and coagulopathies and DIC.		
Cardiothoracic	Knowledge			Anatomy and pathophysiology of surgical cardiac diseases, including atherosclerotic coronary vascular and valvular disease. Management of lung abscess and thoracic empyema.	Pathology, anatomy and lymphatic drainage of lung cancer, including staging and micropathology. Workup and management of pulmonary nodule and lung cancer. Esophageal cancer and motility pathology (see Alimentary Tract above).
	Skills			Clinical evaluation of patient with ischemic heart disease and heart failure. Mediastinoscopy, median sternotomy.	Lung biopsy, lobar resection, pneumonectomy. Esophageal resection, esophageal myotomy (see Alimentary Tract above). Video-assisted thoracoscopic surgery.
	Abilities			Management of surgical patients with associated ischemic heart disease and heart failure.	Diagnosis and management of patients with pulmonary nodule, lung cancer, esophageal pathology.

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Pediatric Surgery	Knowledge		Anatomy and physiology of newborn infants and children with reference to perioperative management and trauma care. Injuries and responses to injuries unique to pediatric age groups. Dosing and interval changes of commonly used medications, including narcotics and antibiotics. Differential diagnosis of the acute abdomen in children. Malrotation. Intussusception. Acute scrotal pain. Inguinal hernia. Umbilical hernia. Undescended testis.	Surgical diseases and conditions unique to newborns, infants and children. Perioperative care of newborn infants. Childhood cancer.	
	Skills		Incision and drainage of soft tissue abscess in children. History and physical examination of the injured child and children with acute abdomen. Inguinal hernia and umbilical hernia repairs. Appendectomy. Gastrostomy and enterostomy care.	Pyloromyotomy. Infant laparotomy. Placement and removal of central venous catheters.	
	Abilities		Diagnosis and management of injured children. Soft tissue infections and abscess. Acute appendicitis. Inguinal hernia, umbilical hernia. Work-up of infants with vomiting, abdominal pain, gastrointestinal hemorrhage. Postoperative pain management.	Diagnosis and management of pyloric stenosis. Perioperative management of surgical infants.	
Plastic Surgery and Burns	Knowledge	Local anesthetics and conscious sedation techniques. Skin incisions and wound healing (see Skin and Soft Tissues above). Dressings and splints. Treatment and prevention of pressure sores and decubitus ulcer. Pathophysiology of burns, carbon monoxide poisoning and inhalational injury. Resuscitation goals and indices for patients with major burns. Antibiotic management in burn patients.	Basic plastic surgical techniques: split thickness skin grafts, local rotation and advancement flaps (see Skin and Soft Tissues above). Minor burn care (partial thickness, <5% full thickness). Airway management in patients with thermal burns of the airway and inhalation injury.	Myocutaneous and free flap anatomy. Techniques used in immediate breast reconstruction. Management of facial trauma and fractures, major injuries involving degloving and tissue loss. Tangential excision and grafting of burns.	
	Skills	See Skin and Soft Tissues above. Wound closure. Routine dressing management.	Skin graft. Basic plastic surgical techniques: local rotation and advancement flaps.	Participates in advanced plastic surgical techniques: free flaps, microsurgery, etc. Diagnostic evaluation of trauma. Care of major burns (escharotomy, excision, grafting)	Advanced plastic surgical techniques: free flap, microsurgery, reimplantation, etc.
	Abilities	See Skin and Soft Tissues above. Management of clean traumatic lacerations.	Management of complicated wounds, minor burns. Critical care of patients with major burns.	Diagnosis and management of patients with facial trauma and injuries involving degloving and major tissue loss. Major burns.	Participates in major plastic surgery reconstructions (breast, deformities, major tissue coverage, reimplantation).
	Knowledge	Protocols that involve brain death and organ donation. MCCG procedures and personnel to support organ donation. Legal and ethic issues that surround organ donation.	Clinical evaluation of organ donors and recipients. Surgical immunology. Immunosuppression and pharmacological agents. Organ preservation. Histocompatibility and cross matching. Organ procurement. Transplant anatomy of the liver, kidney, and pancreas. Postoperative management including rejection. General surgical complications and conditions that arise in transplant patients.		
Transplantation	Skills	Approach to potential organ donors.	Surgical techniques, pre- and postoperative management.		
	Abilities		Obtains permission from organ donors. Evaluation of potential organ donors. Participation in perioperative management and transplant operations. Management of postoperative care. Management of general surgical conditions that arise in transplant patients.		

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Endoscopy	Knowledge	Indications and diagnostic and therapeutic roles for upper and lower gastrointestinal endoscopy. Screening colonoscopy. Bronchoscopy.	Equipment, instrument use and maintenance. Required supplies for endoscopy.		
	Skills		Conscious sedation and monitoring. Colonoscopy, EGD, bronchoscopy. Troubleshooting equipment, instruments, and supplies.	Endoscopic procedures: Biopsy, polypectomy, measures to control bleeding. ERCP.	
	Abilities		Management of patients requiring screening endoscopy. Pulmonary toilet using bronchoscopy.	See Alimentary Tract above. Diagnosis and endoscopic management of patients with tumors and hemorrhagic lesions of the GI tract.	
Minimal Access Surgery	Knowledge	See Alimentary Tract and Abdomen above. Principles of laparoscopic and minimal access surgery.	Equipment, instrument use and maintenance. Required supplies for laparoscopy: graspers, dissectors, electrocautery, scissors, etc. Areas of attention in laparoscopic surgery: port placement injury, thermal injury, etc. Potential complications specific to laparoscopic equipment and instrumentation and their management (e.g., hypoventilation, hypotension, pneumothorax, gas embolism).	Specialized supplies for laparoscopy: endoscopic stapling and clipping devices, retractors, etc. Positioning required for laparoscopic and thoracoscopic procedures, including intraoperative adjustments to facilitate exposure. Required supplies for thoracoscopy.	Issues in application of new products and instruments.
	Skills		Equipment and instrument set-up. Initial port placement. Camera handling and control. Video-assisted instrument handling and control: dissection, tissue manipulation, hemostasis.	Equipment and instrument troubleshooting. Advanced tissue dissection. Use of endoscopic suturing techniques and devices. Mechanical clipping and stapling devices.	Use of specialized equipment, instruments and devices, e.g., cholangiography, Lap Band, balloon dissection, hand-assist ports, morcellators, etc.
	Abilities		Set-up, port placement, and conduct for routine procedures (cholecystectomy, appendectomy).	Set-up, port placement, and conduct for advanced procedures (Nissen, enterectomy and anastomosis, ventral hernia, etc.). Trouble shoots problems with equipment and instruments that occur during case.	Conduct of complex minimal access procedures (colon resections for cancer, pancreatectomy, adrenalectomy, common duct exploration). Manages intraoperative complications (unintentional organ injury, hemorrhage).
Urology	Knowledge	Anatomy of kidney, ureters, and lower urinary tract, including associated vessels and nerves. Diagnosis and management of urological trauma. Renal stones. Hematuria. Urinary infections and antibiotics. Prostatic hypertrophy and carcinoma. Undescended testis. Radiological imaging of urological conditions. Role of endoscopic procedures. Management and care of urethral and vesicostomy catheters.			
	Skills	Urethral catheterization.	Vesicostomy.		
	Abilities	Obtains appropriate urological consultations. Diagnosis and initial management of urological trauma. Management of urinary drainage systems. Diagnosis and management of urinary tract infections. Recognition of urological disease as a cause of acute abdominal pain.			
Gynecology	Knowledge	Anatomy of the ovaries, uterus, vagina, and lower genital tract, including vascular anatomy and relationships to pelvic and urological anatomy. Diagnosis and management of gynecological trauma. Trauma in pregnancy. Pelvic inflammatory disease and infections and antibiotic management. Understanding of ovarian, uterine, cervical malignancies. Physiology and endocrinology of the hypophyseal-pituitary-ovarian axis. Indications and surgical anatomy for hysterectomy and ovariectomy.			
	Skills	History and pelvic exam, including speculum examination and obtaining microbiological specimens. Understanding of basic obstetrical monitoring.			
	Abilities	Obtains appropriate gynecological and obstetrical consultations. Recognition of pelvic infections and pathology as potential causes of acute abdominal pain.			

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Neurological Surgery	Knowledge	Anatomy of the cranial vault and vertebral column. Brain, brain stem, spinal cord, cranial nerves and brachial plexus. Pathophysiology of brain and spinal cord trauma. Clinical examination of the CNS, including Glasgow Coma Score, radiological evaluation. Mechanisms of spinal and cord injuries, methods of spine stabilization. Scalp anatomy. Anatomy of radicular pain syndromes, pharmacological, non-operative, and surgical strategies in the management of chronic neck, back, and sciatic pain.	Pathophysiology of increased intracranial pressure, intracranial hemorrhage, and measures to control ICP. Pharmacological strategies to minimize cord damage. Brain death criteria.		
	Skills	Closure of scalp wounds. Immobilization of the spine.			
	Abilities	Assessment of neurotrauma, including closed head injury, decreased GCS, spine injury. Evaluation of patients with radicular, neck and back pain.	Management of patients with increased intracranial pressure, partial and complete spinal cord injuries. Recognition of brain death.		
Orthopaedic Surgery	Knowledge	Diagnosis of fractures and sprains. Basic management, including splinting and casting. Recognition of compartment syndrome within casts, forearm and leg fractures. Diagnosis and initial management of open fractures, including antibiotics.	Diagnosis and management of major fractures causing blood loss (femur, pelvis) and neurovascular compromise (eg supracondylar fracture of humerus, dislocations of knee).	Diagnosis and management of mangled extremity and fractures with major tissue loss.	Diagnosis and management of open pelvic fractures involving disruptions and injuries to pelvic organs.
	Skills	Spint application. Bivalve and removal of casts.	Noninvasive vascular imaging and Doppler evaluation.	Vascular anastomosis using autologous and synthetic grafts. Techniques of nerve repair.	Control of major pelvic hemorrhage. Repair and management of associated colorectal, urological, and gynecological injuries.
	Abilities	Examination and recognition of fractures and sprains. Immobilization of injured extremities. Initial management of open fractures. Spine immobilization (see Neurological Surgery above).	Resuscitation of patients with multiple orthopedic and pelvic fractures. Initiation of vascular imaging procedures. Neurological evaluation of injured extremities.	Diagnosis and management of mangled extremity and fractures with major tissue loss.	Diagnosis and management of open pelvic fractures involving disruptions and injuries to pelvic organs.
Anesthesia	Knowledge	Airway anatomy as referable to bag valve mask ventilation and endotracheal intubation. Pharmacology of anesthetic induction, paralytic agents, local anesthetics. Side effects and hazards of general anesthesia and local anesthetics. Spinal anatomy referable to epidural and intraspinal anesthesia. Malignant hyperthermia. Anesthetic monitors, eg pulse oximetry, ECG, end-tidal CO <sub>2</sub> , arterial and central lines. Preoperative evaluation of patients with cardiac, respiratory, hepatic and renal insufficiency and failure. Preoperative routines that prevent complications, incl n.p.o., antibiotics, DVT prophylaxis. Blood ordering.	Stabilization of injured patients requiring surgery.		
	Skills	Bag valve mask ventilation. Application of monitoring devices.	Endotracheal intubation.		
	Abilities	Recognition of patients at increased risk for anesthesia and surgery. Appropriate use of local anesthetics. Bag valve mask ventilation.	Preoperative stabilization of injured patients. Direct laryngoscopy and endotracheal intubation.		
Radiology	Knowledge	Anatomy and pathological anatomy referable to the chest and abdominal plain films. Computed tomography of the chest and abdomen. Ultrasonography of the biliary tract and abdomen. Pharmacology and side effects of radiological contrast agents.	Ultrasonography referable to trauma (FAST examination). Computed tomography for benign disease and injuries of the head, spine, chest, abdomen, and pelvis. Extremity imaging for trauma, esp fractures with significant risk (see Orthopedic Surgery above). Application and use of interventional radiological techniques.	Vascular anatomy referable to aneurysmal and occlusive arterial disease (see Vascular Surgery above).	Imaging studies referable to oncological disease and workup for primary and metastatic tumors, including mammography, CT and MRI (see Skin and Soft Tissue, Breast, Alimentary Tract, and Abdomen above).
	Skills	MCCG procedures to obtain routine and emergency studies, eg n.p.o. routines, renal function studies, etc.	MCCG procedures to obtain specialty radiological images.	Vascular ultrasonography.	Stereotactic breast biopsy and breast ultrasonography. Intraoperative ultrasound.
	Abilities	Makes preliminary interpretations of radiological findings and obtains confirmation from staff radiologists.	Performs FAST exams. Interprets trauma CT images and obtains confirmation from staff radiologists. Obtains appropriate interventional radiological consultation for intraabdominal abscess, etc.	Recongizes vascular disease on basis of exam and radiological images and obtains confirmation from staff vascular surgeons.	Diagnoses and participates in management of oncological patients on basis of clinical exam and radiological studies.

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Research	Knowledge		Basic science: cell biology and physiology. Cell culture. Clinical research: retrospective reviews, prospective studies. Institutional Review Board and informed consent. Statistical tests for significance. Reporting of data. Preparation of manuscripts.		
	Skills		Data collection.		
	Abilities		Formation of hypothesis and research question. Data analysis and presentation. Preparation of manuscripts.		
Hand Surgery	Knowledge	Surgical anatomy of the hand and upper extremity. Physical diagnosis of the hand and upper extremity. Injuries. Immobilization and splinting techniques. Rehabilitation principles.			
	Skills	Examination of the hand and upper extremity. Splinting.			
	Abilities	Diagnosis and management of hand and upper extremity injuries.			
Surgical Oncology (see specific regions above)	Knowledge	Melanoma and skin cancer pathology and tumor cell biology (see Skin and Soft Tissue above).	Tumor cell biology. Pathological features of common neoplasms. TNM staging systems for major epithelial neoplasms. Basic cancer operations, resection margins and regional lymphadenectomy. Biological markers and clinically significant genetic mutations. Multimodal therapies for common cancers; i.e., common radiotherapeutic and chemotherapeutic regimens for locally advanced and metastatic disease. Management of precancerous lesions (eg, adenomatous polyps, Barrett's esophagus, ulcerative colitis). Selection of different therapies based upon patient preferences	Advanced, recurrent and metastatic cancer. Familial and genetic neoplastic syndromes (eg MEN, familial polyposis, BRCA-associated cancers). Unusual neoplasms (eg soft tissue sarcoma, GIST, etc.).	
	Skills	Melanoma excision, sentinel node procedures, lymph node dissections for melanoma and skin cancer.	Basic cancer operations: breast resections, colon resections, sentinel node procedures, axillary and inguinal lymph node dissections for breast cancer. Endoscopic procedures (EGD and colonoscopy) with biopsy.	Major cancer operations involving the esophagus, stomach, pancreas, anorectum and extremity sarcomas. Major resections, eg abdominal perineal resection, Whipple operation, pelvic exenteration.	
	Abilities	Diagnosis and management of melanoma and skin cancer.	Diagnosis and management of breast and colon cancers. Informed consent of patients undergoing breast cancer surgery.	Diagnosis and management of esophageal, gastric, pancreatic, anorectal cancers and extremity sarcomas. Contributes to tumor board discussions.	
	Knowledge	Scope of practice of surgeons in rural practices (endoscopy, trauma, emergencies). Resources in critical access hospitals. Relationships with providers in rural regions. Referral criteria to tertiary hospitals. Professional and social relationships of surgeons in rural areas.			
Rural Surgery	Skills	See specific regions above. Upper and lower endoscopy, basic laparoscopic (cholecystectomy, appendectomy) and open operations (bowel resection, trauma). Evaluations of basic emergency conditions and trauma patients.			
	Abilities	See core competencies. Management of patients in critical access hospitals. Consultation for referring physicians practicing in rural areas. Followup of patients in rural/sparsely populated areas.			