**Core procedures**:

1. [**Abdominal exploration for trauma**](#ukwxvtdcgz96)
2. [**Adhesiolysis**](#yo1bq08gwwyl)
3. [**Amputations - lower extremity**](#lvqwu3e0uoc0)
4. [**Anal sphincterotomy**](#72zyfqbkktz2)
5. [**Anesthesia, General - agents and techniques**](#3a8v5615gsah)
6. [**Anorectal abscess - drainage**](#rjqbyc5m8uqq)
7. [**Anorectal fistula - repair**](#tal80wwzvwd5)
8. [**Antireflux procedures**](#fqp9ciowlv2r)
9. [**Appendectomy**](#ejw7zrfq7adj)
10. [**Arteriovenous Graft/Fistula**](#tr9zpujuxesc)
11. [**Axillary sentinel lymph node biopsy and lymphadenectomy**](#6oxt4ko82yvx)
12. [Bronchoscopy and bronchoalveolar lavage](#bdj5t1qn4go)
13. [Cardiac injury - repair](#tg9mo7o3m3w1)
14. [**Cholecystectomy with or without cholangiography**](#jcudkfrf9b3m)
15. [Cholecystostomy](#9a6t1ukk0c8o)
16. [Choledochoenteric anastomosis](#fjkkfv8r3i15)\*\*\*
17. [**Colectomy - partial**](#cji8y0jnx8qf)
18. [**Colectomy - total and subtotal**](#qkugmtb45jav)
19. [**Colostomy and colostomy closure**](#pd7c78lj4hzh)
20. [Common bile duct exploration and choldochoscopy](#ka4swygx13wg)
21. [Complex wound closure](#vuhg43l7ho0q)
22. [**Crohn disease - surgical management**](#1neizv4lhqlu)
23. [Cystostomy](#z0vua3b9dpso)
24. [Duct excision](#s3lnsq6grq5r)
25. [Duodenal and pancreatic injury - operations](#8jpnwloyz78)
26. [Embolectomy/thrombectomy - arterial](#nv5f0ogyt9ms)
27. [Esophageal injury - repair](#dcwbcbkcika4)
28. [Esophagogastroduodenoscopy](#fduq81eal5sd)
29. [Excisional breast biopsy and partial mastectomy](#3juy8d8ft1gr)\*\*\*
30. [Exploratory thoracotomy - open and thoracoscopic](#jrkx756r8oip)
31. [Fasciotomy](#59aix27e34w0)
32. [Focused assessment with sonography for trauma (FAST)](#jycnk2yetyi8)
33. [Gastrectomy - partial/total](#57jssvxgtidi)
34. [Gastroduodenal perforation - repair](#70p9h738icnk)\*\*\*
35. [Gastrointestinal tract injury - repair](#xsuknfgawhv1)
36. [Gastrostomy](#jijtnbgyhl5x)
37. [**Hemorrhoids - management**](#lhyeupgeg92i)
38. [Hepatic abscess - drainage](#t37obkjaek83)
39. [Hepatic biopsy](#14u6lz9kpezt)
40. [Hepatic injury - packing and repair/resection](#31mt1h4p5ap4)
41. [Hysterectomy and salpingo-oophorectomy](#y91dsvconlq9)
42. [**Ileostomy and ileostomy closure**](#kz8jqfbwsm4u)
43. [**Inguinal and femoral hernia - repair**](#hbmqn7b3hb8)
44. [Inguinal hernia - repair (pediatric)](#rny44ko9sszq)
45. [Intubation and difficult airway](#l15d0ji0am1z)
46. [Intussusception - operation (pediatric)](#m6eono2a1upt)
47. [**Lower GI endoscopy**](#6vb0ir1xzlrc)
48. [Lymph node biopsy](#t6q3owx44ur0)
49. [Malrotation - operation](#hj82ovvtm6ew)
50. [Mastectomy - simple, modified radical, and radical](#93lr0nbnazr2)
51. [Meckel diverticulum - excision (pediatric)](#o4aqg2o1er90)
52. [Melanoma - wide excision](#gvfnvoth241f)
53. [Miscellaneous hernias - repair](#75jwnsd7df3m)
54. [Neck injuries - management](#rjugz9nztpb8)
55. [Nephrectomy](#2zwqzm8lp7mp)
56. [Nutritional support](#lmj6ulpxfi6k)
57. [Pancreatectomy - distal](#6uno3x6nk2aq)
58. [Pancreatic debridement](#s3hc7d9yhc5m)
59. [Pancreatic pseudocyst - drainage](#xcl95shjwgsn)
60. [**Parathyroidectomy**](#l5kz4b3jxsoe)
61. [Partial pulmonary resections - open and thoracoscopic](#wnp3g7jsorbw)
62. [Percutaneous breast biopsy and cyst aspiration](#m0j12e1oanta)
63. [**Perianal condylomas - excision**](#zazzchthdz9y)
64. [Peritoneal dialysis catheter insertion](#2sp90j3108iq)
65. [**Pilonidal cystectomy**](#ot4l0uyp8lih)
66. [Pyloromyotomy](#e02hv53j9m40)
67. [Sentinel lymph node biopsy for melanoma](#xzkur1899a2e)
68. [Skin grafting](#e6q9v893f3dy)
69. [Skin/soft tissue lesions - excisional and incisional biopsy](#exshhtyc905k)
70. [Small intestinal resection](#4qsu3ncqu4xo)
71. [Soft tissue infections - incision, drainage, debridement](#4u664mae22ph)
72. [Splenectomy](#qytnjrot70c0)
73. [Splenectomy/splenorrhaphy](#2ph0ammvz5a7)
74. [Surgical consideration in the pregnant patient](#ly5khgpj3scy)
75. [**Thyroidectomy - partial or total**](#wxxl3qt9i1tz)
76. [**Tracheostomy**](#vatkarir1v5w)
77. [Tube thoracostomy and thoracentesis](#gyymdd75mgy0)
78. [**Ulcerative colitis - surgical management**](#9iu1ho4zwbl)
79. [Ultrasound use for intravascular access](#79l5c5yfvl7z)
80. [Umbilical hernia - repair (pediatric)](#h5rirx1fl8qk)
81. [Urinary tract injuries - operations](#11lfvvfz52h7)
82. [Vagotomy and drainage](#u4lai8edp5yj)
83. [Vascular access](#qn2nqbe3o5ag)
84. [Vascular exposure - principles](#v2bb4by4klde)
85. [Vascular injuries - operations](#kgldnoqmmhu1)
86. [Vena cava filter insertion](#xpvqpuuyo6sp)
87. [Venous access devices - insertion](#ccxfvst1nztr)
88. [Venous insufficiency/varicose veins - operation](#cuyqrt568j0m)
89. [Ventral hernia - repair](#9aro4nbptifv)
90. [Wounds, major - debride/suture](#sl1ukk9edi2a)

**Advanced procedures:**

1. [**Abdominal and aortoiliac aneurysm - repair**](#j2kt7d6d4y0f)
2. [**Adrenalectomy**](#duvkstx0czbu)
3. [Ampullary resection for tumor](#sdtztrtkf2kb)
4. [Anal cancer - excision](#70qmevmhnvk7)
5. [Anorectal malformations - operation](#l9zg7pnddl8a)
6. [Aortoiliac reconstruction for occlusive disease](#x59ypvimi9ze)
7. [Bile duct cancer - operation](#1mjem7qb0xtc)
8. [Bile duct injury, iatrogenic - acute repair](#15gfaakkjmtr)
9. [Bile duct neoplasms - operation](#w8msa0jsjufo)
10. [Branchial cleft anomaly - excision](#yasg99xvy474)
11. [Carotid endarterectomy](#40xneqdirerb)
12. [Cesarean section](#djxqyp2aj98d)
13. [Chest wall deformity - repair](#cec0l0xnuq0)
14. [Congenital diaphragmatic hernia - repair](#r02dayf95omr)
15. [Cricopharyngeal myotomy with zenker diverticulum - excision](#mg3phuo2jryz)
16. [Diaphragmatic hernia - repair](#bcwwoxz8gfzr)
17. [En block abdominal organ retrieval](#9z9cfrieble2)
18. [Endovascular intervention principles](#lwbjiawy98ys)
19. [Esophageal atresia/tracheoesophageal fistula - repair](#iv2giznqeu6u)
20. [Esophageal perforation - repair/resection](#5lypqwrczue4)
21. [Esophagectomy/esophagogastrectomy](#mc9pcgk3603u)
22. [Esophagomyotomy (heller)](#oam2bmmv4tvo)
23. [Extra-anatomic bypass](#5lqayn9w4vzy)
24. [Gallbladder cancer - operation](#ldcskp3k639w)
25. [Gastroschisis/omphalocele - repair](#xa1eb4yoacmv)
26. [Graft-enteric fistula - management](#63k2jltmdbe9)
27. [Hand tendon repairs](#yu7f2vk0fnup)
28. [Hepatic ultrasound - intraoperative](#51hpjnz7l4kv)
29. [Hirschsprung disease - operation](#j8kn0vptv50n)
30. [Ilioinguinal-femoral lymphadenectomy](#iormgapkr93t)
31. [Intestinal atresia/stenosis - repair](#rkg6xwvc4v23)
32. [Live donor hepatectomy](#6cdgwemk8jdw)
33. [Live donor nephrectomy](#6cdgwemk8jdw)
34. [Liver transplantation](#4bab0s54df7z)
35. [Lower extremity bypass](#qdfty1cjt4ap)
36. [Meconium ileus - operation](#lt7zj9cwjg1t)
37. [Mesenteric occlusive disease - operation](#hf0bc1d4gdwf)
38. [Modified neck dissection](#mljp74ky26z)
39. [Morbid obesity - operation](#1lp3aqn9l5ca)
40. [Necrotizing enterocolitis - operation](#d9k7cffr58aw)
41. [Noninvasive and invasive cardiac pacing](#bb0johro67o3)
42. [Orchiopexy](#350ti46b6c4r)
43. [Pancreas transplantation](#fewsqwauxryt)
44. [Pancreatectomy - total](#a6xqd0pauub6)
45. [Pancreatic ultrasound - intraoperative](#hqq5i4iae0x7)
46. [Pancreaticoduodenectomy](#jeccdng014ai)
47. [Pancreatitis, chronic - operative management](#6es9ai3d1974)
48. [Paraesophageal hernia - repair](#cmj5blf13aq1)
49. [Parotidectomy](#fqva8qd0b5r1)
50. [Peripheral aneurysms - repair](#snuf5q7perbo)
51. [Postgastrectomy syndrome - revisional procedures](#gtr02yiexzj3)
52. [Rectal cancer - abdominoperineal resection and pelvic exenteration](#vurumcwznolf)
53. [Rectal cancer - transanal resection](#wyk4zq2m54d9)
54. [Rectal prolapse - repair](#uomy2mhovrut)
55. [Segmentectomy/lobectomy](#tgyxt66vnrqv)
56. [Soft tissue sarcoma - resection](#birp0qg2cn4y)
57. [Superior mesenteric artery embolectomy/thrombectomy](#gzc5mu2c7e6q)
58. [Thermal injuries - operations](#nconq6ddapqv)
59. [Thyroglossal duct cyst - excision](#2hewatj91cxi)
60. [Ultrasound in the diagnosis and management of vascular diseases](#90j47bv15h6s)
61. [Ultrasound of the biliary tree](#ptrx89kndpzg)
62. [Ultrasound of the thyroid](#awhj98ety2if)

Other procedures:

**Core procedures**

**Abdominal exploration for trauma**: I would position the patient supine and arms out and prep from the chin to bilateral knees laterally to the bed with betadine. I would ensure I had too peripheral access and blood products available before proceeding to make a midline incision from the xiphoid to the pubis. I would pack all four quadrants and the pelvis before inspecting these areas starting with areas of lowest concern for injury. I would inspect Zones 1, 2, and 3, for any hematomas. I would inspect the bowel for any visceral or mesenteric injuries. I would open the lesser sac to evaluate the pancreas. I would palpate and inspect the liver, spleen and diaphragm for any injuries. I would check for evidence of potential urological injury and explore the ureters if there was any. I would also perform a rectal exam, and if there was any blood I would follow that up with rigid proctosigmoidoscopy or flexible endoscopy.

* Mattox Maneuver (left medial visceral rotation): exposes the aorta and celiac trunk. Rotate up the left colon, kidney, spleen, and pancreas.
* Modified mattox maneuver: leaves the kidney down but lifts up the spleen and pancreas, this allows you to also see the SMA and left renal pedicle
* Cattell Braasch maneuver: Dissect along the white line of toldt on the right colon. I would then lift up the colon to expose the aortic bifurcation, IVC, gonadal vessels, ureter, and kidney.
* Kocher maneuver: exposes the inferior IVC

**Adhesiolysis**: I would position the patient supine with both arms out. After ensuring that I have adequate peripheral access, I would ask anesthesia to place an NG tube if one was not already in place. I would also place a foley to decompress the bladder. I would then prep the abdomen and made a midline laparotomy. I would take care not to create any enterotomies while entering the abdomen. I would then begin to perform my adhesiolysis using metzenbaum scissors taking not to injure the mesentery or bowel. I would perform my adhesiolysis all the way to the gutters. Once the bowel was freed up I would then run the bowel from the ligament of treitz to the ileocecal valve carefully taking down adhesions as I went searching for any point of obstruction. Once I found the point of obstruction I would fix it, evaluate the bowel, and resect any obviously non viable bowel.

**Amputations - lower extremity:**

1. **Below knee amputation**:
   1. Supine with both arms out with a proximal tourniquet
   2. Outline and incise skin and subcutaneous tissues down to fascia
   3. Ligate greater saphenous vein
   4. Divide the muscles and fascia at the same level as the anterior skin incision
   5. Divide the muscles in the anterior and lateral compartments
   6. Ligate the anterior tibial vessels
   7. Divide the interosseous membrane
   8. Incise the tibial periosteum as the same level as the skin and muscle division
   9. Strip the tibial periosteum for 2 cm and divide it with an anterior bevel
   10. Expose and transect the fibula 2 cm proximal to the tibial division
   11. Transect the soleus/gastrocnemius obliquely at the same level as the posterior flap.
   12. Ligate and oversew any bleeding soleal veins and posterior tibial and peroneal vessels
   13. File any sharp bony wedges
   14. Approximate the fascia of the anterior and posterior muscle flaps with interrupted absorbable sutures
   15. Close the skin with interrupted non absorbable sutures.
2. **Above knee amputation**:
   1. Supine with both arms out with a tourniquet
   2. Place a tourniquet and outline the anterior and posterior skin flaps (fish mouth pattern)
   3. Incise the skin and subcutaneous tissues down to the fascia
   4. Ligate and divide the greater saphenous vein on the medial thigh
   5. Divide the fascia and the muscles as the same level as the skin flaps
   6. Locate the superficial femoral/proximal popliteal artery and vein on the deep posteromedial aspect of the thigh and suture ligate the artery and vein separately.
   7. Locate the sciatic nerve posterior to the vessels, pull, ligate, and divide it.
   8. Make a circular incision on the periosteum of the femur and free it proximally
   9. Divide the femur with a saw at least 5 cm proximal to the level of the soft tissue transection
   10. File any sharp bony edges
   11. Close the periosteum over the transected femur
   12. Approximate the deep investing fascia of the anterior and posterior muscle flaps with interrupted absorbable sutures
   13. Close the skin with interrupted non absorbable sutures.
3. **Transmetatarsal amputation**
   1. Supine with both arms out with a tourniquet
   2. Perform non-invasive studies to confirm this will likely heal
   3. Mark the skin incisions and perform transverse skin incision over the level of the mid metatarsal bones
   4. Deepen the incision to the bone
   5. Elevate the periosteum 1.5 cm proximal to the level of the skin incision
   6. Divide the bone
   7. Bend the divided bones and create a plantar flap
   8. Obtain hemostasis and irrigate the wound
   9. Close the wound without tension
4. **Ray amputation**
   1. Supine with both arms out with a tourniquet
   2. Perform non invasive studies to confirm this will heal
   3. Perform a skin incision between the toes
   4. Divide all attached tendons
   5. Elevate the periosteum to the level of the amputation and divide the bone
   6. Close the skin without tension
5. **Digital amputation**:
   1. Supine with both arms out with a tourniquet
   2. Obtain non invasive studies to show that this will heal
   3. Perform an elliptical incision perpendicular to the axis of the toe
   4. Elevate the periosteum to the level of the amputation and divide the bone
   5. Close the skin without tension

**Anal sphincterotomy**:

1. Prone jackknife
2. Perform a rectal exam
3. Inject local anesthetic
4. Perform anoscopy
5. Identify the fissure and curet the base
6. Identify the interphincteric groove and make an incision
7. Elevate and divide the fibers of the internal sphincter
8. Achieve hemostasis
9. Close the wound
   1. **Closed technique**: I would position the patient in the prone jackknife position, and tape the buttocks laterally, before prepping with betadine. I would then perform an exam under anesthesia and inject local anesthetic in the subcutaneous tissues and perform a bilateral pudendal nerve block. I would then insert a Pratt speculum and identify the internal sphincter and make a stab incision in the intersphincteric groove on the right lateral side using a beaver blade. I would then rotate the knife medially before incising the internal sphincter to the proximal extent of the fissure, taking care not to violate the mucosa. I would then hold pressure to control hemostasis before palpating to ensure I created a defect in the internal sphincter.
   2. **Open technique**: I would position the patient in the prone jackknife position, and tape the buttocks laterally, before prepping with betadine. I would then perform an exam under anesthesia and inject local anesthetic in the subcutaneous tissues and perform a bilateral pudendal nerve block. I would then insert a Pratt speculum and identify the internal sphincter. I would then make a 1 cm circumanal incision over the right intersphincteric groove before using a hemostat to exteriorize the internal sphincter corresponding to the depth of the fissure before dividing it with cautery. I would then excise any associated skin tags. I would close the incision with simple chromic stitches. I would then cauterize the fissure base.

Anesthesia, General - agents and techniques:

**Anorectal abscess - drainage**

1. **Infralevator, perirectal, or perianal**: I would ensure that I have adequate peripheral access before placing the patient prone and jackknife position. I would tape the buttocks laterally for exposure before prepping the area with betadine. I would then perform an exam under anesthesia and anoscopy. I would then make a radial incision over the area of greatest fluctuance, while also excising an ellipse of skin. I would then bluntly dissect through the tissues with a hemostat until I encountered the abscess. I would evacuate all purulent fluid and gently break up any loculations prior to irrigating and packing the wound.
2. **Submucosal**: I would ensure that I have adequate peripheral access before placing the patient prone and jackknife position. I would tape the buttocks laterally for exposure before prepping the area with betadine. I would then perform an exam under anesthesia and anoscopy. I would then incise the overlying mucosa and evacuate all the purulent fluid before gently breaking up any loculations with a hemostat. I would then obtain hemostasis and leave the wound open.
3. **Horseshoe (Henley procedure)**: I would ensure that I have adequate peripheral access before placing the patient prone and jackknife position. I would tape the buttocks laterally for exposure before prepping the area with betadine. I would then perform an exam under anesthesia and anoscopy. I would begin by making counterincisions laterally along the anal verge. I would use a hemostat to bluntly separate the tissues until I encountered the abscess. I would then make an incision posterior to the anus and use a hemostat to enter the postnatal space. I would then irrigate and obtain hemostasis prior. Lastly, I would place a seton to connect both lateral incisions to the posterior midline incision.

**Anorectal fistula - repair**:

1. Supine, candy cane stirrups
2. Rectal exam
3. Identify the external opening
4. Inject local anesthetic
5. Anoscopy/anal retraction
6. Identify the internal opening
7. Pass a chicago probe from the external to the internal opening
8. Unroof the fistula and cauterize the base of it
9. Identify any sidetracks and unroof
10. Biopsy the tract and send to pathology
11. Obtain hemostasis
    1. **Procedure**: I would ensure that I have adequate peripheral venous access before positioning the patient supine with both arms out and the legs in candy-cane stirrups. I would then prep and drape the area before injecting local. I would perform a perianal block as well as bilateral pudendal nerve blocks. I would then perform an exam under anesthesia and isolate the fistulous tract using a chicago probe taking care not to create any false tracts. I would then assess for any sphincter involvement prior to performing a fistuolotomy by cauterizing over the probe.

Antireflux procedures:

1. **Laparoscopic nissen fundoplication:**
   1. Supine, arms tucked, split legs, footboard, insert ports, place in steep trendeleburg, OG/foley
   2. Set liver retractor, reduce the stomach, and divide gastrohepatic ligament
   3. Dissect out the right crus
   4. Carry dissection circumferentially around esophagus and place penrose
   5. Completely reduce any hiatal hernia
   6. Ensure there is enough intra-abdominal esophagus, then repair hiatal defect
   7. Take down short gastrics
   8. Insert 56 Fr Bougie and perform wrap
      1. **Procedure**: Position supine with foot board, OG, and Foley. Insufflated with Veress at Palmar’s point. Place 10 mm port for camera left of umbilicus. Then place 5 mm port lateral RUQ for liver retractor, 5 right abdomen for left hand, 10 mm in LUQ/subxiphoid for right hand and 5 mm assistant in right lateral abdomen for assistant. Place steep reverse Trendelenburg position. Retract the liver. Divide the gastrohepatic ligament looking for a potential replaced left hepatic artery. If needed, you can divide it but try to preserve it. Identify the right crus and open the phrenoesophageal ligament and continue that dissection around to the left crus protecting the esophagus, stomach, and vasu nerves.Then make a posterior window behind the esophagus, then place a penrose around the esophagus. Dissect to ensure adequate esophageal length in the abdomen (at least 2.5 cm), then repair the crural defect using interrupted permanent sutures under low insufflation pressure of 8-9 mm Hg. Then take down the short gastrics. I would then make the wrap by first inserting a 56 Fr Bougie then placing a permanent stitch to approximate the wrap edges. Then I would remove the bougie before placing two additional permanent suture incorporating both stomach and esophagus ensuring the wrap extends for 2 cm. I would then perform an EGD to evaluate the wrap before closing.

Appendectomy:

1. **Laparoscopic appendectomy**: I would position the patient supine with the left arm tucked. I would place a foley catheter and prep and drape the entire abdomen. I would then obtain pneumoperitoneum by using a Veress needle technique at Palmer's point. I would then place a 5 mm port above the pubis, a 5 mm port above the umbilicus, and a 12 mm port in the left lower quadrant under direct visualization. I would then rotate the patient to the left and place in Trendelenburg position. I would expose the appendix and identify the base. I would evaluate the tissue to ensure the base was healthy before creating a window in the mesoappendix with a maryland. I would then staple the appendix at the base with a 45 mm blue staple load, I would then divide the mesoappendix using a bipolar energy device. I would then place the appendix in an endocatch bag and remove it through the 12 mm port. I would then ensure I have hemostasis before closing the 12 mm port with an 0 vicryl suture. I would then remove the ports under direct vision and desufflate the abdomen.
2. **Open appendectomy**: I would position the patient supine, with the right arm tucked. I would ensure that a foley catheter was placed. I would prep and drape the entire abdomen. I would identify my landmarks and make a Rocky-Davis incision (transverse) over McBurney’s point over the area of greatest tenderness. I would dissect down the fascia and divide it transversely and divide the muscles parallel to the fibers. I would then deliver the appendix and cecum through the wound and inspect the base of the appendix before crushing it with a clamp then moving the clamp distally on the appendix 1 cm. I would then create a window at the base and suture ligate the appendix at the base proximal to where it was crushed. I would then invaginate the base of the appendix into the cecum using a purse string suture. I would then suture ligate the mesoappendix. I would then gently irrigate the operative field, ensure adequate hemostasis and close the incision in layers (transversalis and internal oblique, then close the external oblique as a second layer. I would close the skin if the appendix was not perforated.

Arteriovenous Graft/Fistula

1. **Radiocephalic fistula**
   1. Intraoperative ultrasound
   2. Transverse incision over the artery and vein
   3. Develop skin flaps
   4. Identify and mobilize 2 cm of the artery and vein, ligate venous branches
   5. Heparinize the patient
   6. Obtain proximal and distal control of the artery
   7. Longitudinal arteriotomy
   8. Perform end to side anastomosis
   9. Check for thrill and distal pulse/doppler signals
   10. Confirm hemostasis and close incision
       1. Procedure: After performing an extremity block I would prep and drape then make a transverse incision over the radial artery and cephalic vein just proximal to the wrist. I would then mobilize the vein and suture ligate side branches using 4-0 silk. I would mark the vein for orientation and flush it with heparinized saline. I would then identify the radial artery and heparinize the patient before obtaining proximal and distal control. I would then make an ateriotomy and irrigate the artery with heparinized saline before performing an end to side anastomosis using a running 7-0 prolene suture. I would then confirm hemostasis and check for distal pulses and doppler signals prior to irrigating the wound and closing with interrupted 3-0 Vicryl and interrupted 3-0 Nylon sutures.
2. **Brachiocephalic fistula**
   1. Intraoperative ultrasound
   2. Skin incision or AC fossa
   3. Expose and circumferentially dissect the cephalic vein then the brachial artery
   4. Heparanize then obtain proximal and distal control and transect vein
   5. Perform arteriotomy and flush artery and vein with heparinized saline
   6. Construct end to side anastomosis
   7. Check for thrill and distal pulse/doppler signal
   8. Confirm hemostasis and close.
      1. Procedure: Position arm on an arm board and perform ultrasound to map out vessels and assess pulses and doppler signals. Prep and drape then make transverse incision in the AC fossa. Dissect out the cephalic vein and brachial artery. Heparinize the patient, then obtain proximal and distal control of the artery before transecting the vein. Then I would make an arteriotomy and flush the artery and vein with heparinized saline. I would then construct an end to side anastomosis using 7-0 prolene. I would confirm hemostasis and then check for a thrill and distal pulses/doppler signals. I would then close the wound with interrupted 3-0 Vicryls in the dermis and 3-0 Nylon sutures for the skin.
3. **Forearm graft**
   1. Use ultrasound to map out the artery and veins
   2. Make a transverse incision over the artery and vein
   3. Create flaps and dissect out the vessels
   4. Ligate small vascular tributary branches.
   5. Obtain proximal and distal control with vessel loops.
   6. Make a counter incision on the forearm.
   7. Create a tunnel for the graft making sure it wasn’t twisted.
   8. Heparinize the patient before making a longitudinal arteriotomy
   9. Anastomose spatulated end of heparinized graft to the artery followed by the vein
   10. Check for thrill and distal pulse/doppler signal
   11. Confirm hemostasis and close

Axillary sentinel lymph node biopsy and lymphadenectomy

1. **SLN biopsy:**
   1. Inject technetium-99 in the dermis in preop
   2. Induce anesthesia without paralytics and check for radioisotope signal
   3. Inject 2 mL isosulfan blue dye subareolar
   4. Prep and drape
   5. Make curvilinear incision along hair-bearing line
   6. Dissect through clavipectoral fascia
   7. Identify my sentinel node and dissect it out making sure to protect all nerves and vascular structures
   8. Obtain radioisotope counts and look for any additional nodes with 10% that signal or obviously palpable nodes or blue nodes
   9. Determine need for completion axillary lymph node dissection
   10. Close the wound
2. **Axillary lymphadenectomy**
   1. Induce anesthesia and confirm no paralytics
   2. Prep and drape with the arm freely mobile
   3. Curvilinear incision and hair bearing region in axilla
   4. Dissect through the clavipectoral fascia and onto the lateral edge of the pectoralis major muscle
   5. Carry my dissection cephalad until I encountered the axillary vein protecting the medial pectoral nerve, thoracodorsal bundle, and axillary vein.
   6. Carry that dissection lateral to the lattissimus muscle and inferiorly until I identified the insertion of the thoradodoral nerve.
   7. Carry this dissection posterior until I reach the subscapularis muscle, preserving the long thoracic nerve.
   8. I would ensure that I removed all nodal tissue deep to the pectoralis minor muscle as well.
   9. I would then irrigate, confirm hemostasis, place a drain, and close in layers.

**Bronchoscopy and bronchoalveolar lavage**

1. Intubate patient
2. Insert bronchoscope
3. Inspect for proper ETT position
4. Inspect the airway and instill saline then aspirate it into a trap

**Cardiac injury - repair**

1. Use pledgeted 3-0 prolene suture
2. Place a foley in the hold
3. Staple it closed

**Cholecystectomy with or without cholangiography**

1. **Laparoscopic cholecystectomy**
   1. Position supine with both arms out, prep and drape
   2. Place 12 mm port via open Hassan technique above umbilicus and insufflate
   3. I would then place an 11 mm step port in subxiphoid region and two 5 mm ports along right subcostal margin
   4. Position reverse trendelenburg and retract gallbladder cephalad
   5. Dissect out the neck and obtain critical view of safety
   6. Perform trans-cystic cholangiogram before dividing the cystic duct and artery
   7. Remove the gallbladder from the hepatic fossa
   8. Obtain hemostasis, irrigate the abdomen and approximate the fascia at the subxiphoid incision before desufflating the abdomen and closing the incisions.
2. **Open cholecystectomy**
   1. Make a right subcostal incision and dissect through the tissues suture ligating the epigastric artery.
   2. Set up a bookwalter retractor
   3. Expose the gallbladder and dissect it from liver bed
   4. Identify the cystic artery and duct
   5. Clip and divide those structures and remove the gallbladder
   6. Obtain hemostasis and close the abdomen

**Cholecystostomy**

Choledochoenteric anastomosis

1. **Choledochoduodenostomy**
2. **Hepaticojejunostomy**

Colectomy - partial

1. **Laparoscopic right colectomy**: I would ensure that a foley catheter and OG were placed and that I have adequate peripheral access prior to positioning the patient supine with both arms tucked and secured to the bed. I would then prep the abdomen and insufflate using a Veress needle at palmer’s point, then place a 12 mm port above the umbilicus. I would then insert two additional ports in the left abdomen and one in the left upper quadrant. I would then inspect the abdomen for any evidence of metastatic disease. I would then place the patient in trendelenburg position and roll them to the left. I would then flip the omentum up, move the small bowel to the patient’s left and place the ileocolic pedicle on tension. I would incise the mesentery adjacent to the pedicle and isolate it before coming across it with a bipolar energy device. I would then perform a medial to lateral dissection taking care to avoid injury to the duodenum. I would then divide the mesentery ensuring that I stay lateral to the pancreas, and continue until I identified the right branch of the middle colic. I would then mobilize the cecum and divide the peritoneal attachments, making sure to identify and protect the right ureter and major vascular structures. I would then divide the lateral peritoneal attachments to the ascending colon and work my way up to the hepatic flexure. I would then separate the attachments between the transverse colon and mesentery before enlarging my supraumbilical port site. I would then place a wound protector and extract the specimen through it. I would then divide the ileum 10 cm from the cecum and divide the colon in between the left and right branches of the middle colic artery. I would then perform a side-to-side functional end to end stapled ileocolonic anastomosis prior to proceeding with closure of the abdomen.
2. **Sigmoidectomy**: I would ask Urology to place ureteral stents and I would ensure a foley catheter and OG were placed and that I have adequate peripheral access prior to placing the patient in lithotomy with both arms tucked. I would then prep the abdomen and perineal region and start by insufflating the abdomen using a Veress needle placed at Palmar’s point. I would then insert a camera in the RUQ and inspect for any evidence of disease. I would then place an additional supraumbilical port then proceed to make a Pfannensteil incision for a hand port. Finally I would place an additional 12 mm port in the LLQ. I would then place the patient in Trendelenberg and rotate to the right. I would then perform a lateral to medial mobilization of the colon and mobilize the splenic flexure taking care to identify and preserve the ureter and gonadal vessels. I would then identify the base of the IMV lateral to the ligament of treitz and at the inferior border of the pancreas, and divide it with bipolar device. I would then identify the IMA and transect that in a similar manner taking care to identify and protect the hypogastric nerve trunks and the superior hypogastric plexus. I would then divide the mesentery before dissecting the proximal rectum circumferentially, again, taking care to identify and preserve the ureters, then divide it with an Endo GIA 60 mm Blue staple load. I would then exteriorize the bowel and divide it proximally ensuring adequate margins. I would then secure an anvil device proximally and create a colorectal anastomosis using a 28 mm EEA stapler. I would then perform a leak test prior to closing.
3. **Laparoscopic left colectomy**: I would obtain consent prior to the procedure. I would position the patient in lithotomy with the right arm tucked. I would place a foley catheter and ensure I have adequate peripheral access. I would then ask anesthesia to place an OG tube. I would begin by insufflating the abdomen with CO2 using a Veress needle. I would then insert a 10 mm trocar near the umbilicus. I would then make a Pfannensteil incision and place a wound protector with gel port. I would then place a 12 mm port in the RLQ, and 5 mm trochars on each side of the umbilicus. I would position the patient in trendelenberg position and roll the patient to the right. I would then place the sigmoid colon on tension and incise the peritoneum overlying the promontory. I would then perform a medial to lateral dissection in the avascular place making sure to identify and protect the left ureter and gonadal vessels. I would then identify and divide the IMA using a vascular stapler load. I would then continue the medial to lateral dissection cephalad making sure to protect the hypogastric nerve bundles. I would identify and divide the IMV at the inferior border of the pancreas and complete the lateral mobilization of the colon along the white line of Toldt. I would take down the splenic flexure. Once adequately mobilized, I would divide the colon distally at the level of the promontory using an endo GIA 80 mm blue staple load. I would then extract the specimen and divide the colon proximally and ensure there is good blood supply to the remaining colon prior to inserting a 28 mm anvil and securing it to the colon. I would then place the colon back into the abdomen and perform an end to end anastomosis using an EEA stapler. I would ensure I have two complete rings of tissue and then perform a leak test. I would remove the trochars under direct visualization before closing the incisions.

Colectomy - total and subtotal

**Colostomy and colostomy closure**:

1. **Laparoscopic transverse loop colostomy:** I would have the patient marked for a stoma prior to surgery. I would position supine with both arms tucked. I would insufflate the abdomen using a Veress needle then place a 5 mm port below the umbilicus. I would then remove a disc of skin at the planned ostomy site, and dissect to the fascia. I would score the anterior fascia vertically, then spread the muscle and retract it laterally before scoring the posterior sheath vertically as well. I would ensure this would accommodate two fingers. I would then insert a babcock and grasp the transverse colon and retract it through the wound. I would score the mesentery adjacent to the bowel and place a rod through it. I would then perform a colostomy across the antimesenteric 2/3rds of the bowel and secure the bowel to the skin. I would also secure the rod to the skin with permanent sutures before applying a stomal device.
   1. Mark the location of the colostomy
   2. Perform transverse incision through planned colostomy site making sure to create an adequate fascial opening
   3. Decompress the colon if needed
   4. Deliver the transverse colon through the incision
   5. Mobilize the hepatic flexure if needed
   6. Create a mesenteric window
   7. Place a rod through the mesenteric window
   8. Close the fascia and skin around the colon to assure secureness of position
   9. Mature the colostomy and place an ostomy device.
2. **Colostomy takedown**: similar to loop ileostomy takedown and stapled anastomosis.
   1. Make an incision around the mucocutaneous border of the colostomy
   2. Carry dissection through the fascia into the peritoneum
   3. Free adhesions around the fascial defect and mobilize the bowel
   4. Assess and freshen edges of bowel
   5. Perform anastomosis
   6. Close the abdominal wall and
   7. Pack the wound.

Common bile duct exploration and choldochoscopy

Complex wound closure

**Crohn disease - surgical management:** Stricturoplasty and ileocecectomy

Cystostomy

Duct excision

Duodenal and pancreatic injury - operations

Embolectomy/thrombectomy - arterial

Esophageal injury - repair

Esophagogastroduodenoscopy

Excisional breast biopsy and partial mastectomy:

Exploratory thoracotomy - open and thoracoscopic

**Fasciotomy**:

1. **Lower extremity**: I would position the patient supine with the arms out circumferentially prepping the lower extremity then ensure I have good peripheral access. I would make a lateral incision, 1 cm anterior to the fibula, and extend this from 3 cm above the malleolus to 3 cm below the fibular head. I would then deepend this incision to the fascia and score it to clearly identify both the anterior and lateral compartments before incising both compartments superiorly and inferiorly to release them. I would then make a medial incision 1 cm posterior to the tibia, extending from 3 cm above the malleolus to 3 cm below the knee. I would incise down to the fascia, taking care not to injure the saphenous vein. I would then score the fascia adjacent to the tibia, and cut it superiorly and inferiorly, then I would push the soleus down to identify the fascia of the deep posterior compartment and open that as well, taking care to preserve the neurovascular bundles. I would then pack the wounds with gauze.
   1. Make a longitudinal incision from the upper leg to the ankle 3 cm lateral to the tibia
   2. Make skin flaps over the anterior and lateral compartments
   3. Longitudinal incision in the fascia of the anterior compartment followed by lateral compartment
   4. Longitudinal incision from the upper leg to the ankle 3 cm medial to the tibia
   5. Incise the superficial fascia
   6. Incise soleus muscle longitudinally until the posterior fascia is identified and incised
2. **Upper extremity and hand**:

Focused assessment with sonography for trauma (FAST)

**Gastrectomy - partial/total**

* **Total gastrectomy with D1/D2 LN dissection:** Large midline exlap. Assess for metastatic disease. Mobilize the GEJ and distal esophagus. Take down gastrocolic ligament and short gastrics. Dissect LNs from celiac, splenic and common hepatic vessels. Ligate the gastric and gastroepiploic arteries at their bases. Divide the esophagus and stomach (2-3 cm distal to pyloric vein, including the pylorus) distally, send frozens. Bring up a loop of jejunum to reconstruct it. Distal panc and splenectomy performed only if needed to get an R0 resection.Place a J tube. Leave drains and NG tube.

Gastroduodenal perforation - repair

1. Perforated duodenal ulcer repair:

Gastrointestinal tract injury - repair

Gastrostomy

Hemorrhoids - management

1. Internal (rubber band ligation). I would do this procedure in the clinic with the patient placed prone with the knees up on a special exam table. Then I would identify the hemorrhoid and grasp it with a clamp. After confirming that this didn't cause the patient pain, I would then place a rubber band on it. I would then inspect for bleeding before withdrawing the anoscope.
   1. Position prone jackknife
   2. Perform digital exam
   3. Perform anoscopy and identify the internal hemorrhoid
   4. Grasp the redundant mucosa with a clamp and place a rubber band on it
   5. Inspect for bleeding then withdraw scope
2. External (surgical excision): I would place the patient in the prone jackknife position, prep and drape the area, and perform a digital exam prior to injecting local and perform a pudendal nerve block. I would then serial dilate the anus before placing a Hill-Fergeson retractor and a clamp on the anal skin to expose the hemorrhoid. I would then make an elliptical incision from the perianal skin to the vascular pedicle and excise the hemorrhoid and mucosa associated with the hemorrhoid taking care not to injure the underlying sphincter muscles prior to placing a 3-0 Chromic stitch proximal around the vascular pedicle. I would then carefully make small mucosal flaps to facilitate closure and excise any additional hemorrhoidal tissue. I would then run this stitch distally to approximate the mucosa and leave a small open area distally to facilitate drainage. I would then inspect for bleeding and pack the anus with lidocaine jelly.
   1. Position prone jackknife
   2. Perform digital exam and serial dilate the anus
   3. Place my retractor and retract the hemorrhoid for visualization
   4. Excise the hemorrhoidal tissue and free up the mucosal edges, taking care not to injure the underlying sphincter or normal mucosa.
   5. Place a stitch around the vascular pedicle and run it distally to approximate the skin edges leaving a small distal opening to facilitate drainage. I would then apply topical lidocaine.

Hepatic abscess - drainage

Hepatic biopsy

Hepatic injury - packing and repair/resection

Hysterectomy and salpingo-oophorectomy

**Ileostomy and ileostomy closure**:

1. **Ileostomy**: I would have the patient marked for a stoma prior to surgery by an enterostomal nurse. Once in the operating room, I would position the patient supine with both arms out. I would ensure I have adequate peripheral access before prepping and draping the abdomen. I would start by making a lower midline incision, enter the abdomen, and inspect the bowel. I would identify the distal ileum and confirm that I have enough mobility to bring up a loop ileostomy. I would then create a small mesenteric window adjacent to the bowel and place a penrose through it. I would then place stitches on the bowel serosa to orient it. I would then excise a disc of skin overlying the planned ostomy site, dissect down to the fascia and incise the anterior rectus fascia vertically prior to separating the muscles with a peyon to identify the posterior rectus sheath. I would then score the posterior sheath with cautery vertically. I would ensure that I am able to fit 2 fingers through the stomal aperture prior to bringing the bowel up through the stoma using the penrose. I would ensure that the bowel is not twisted or on tension prior to closing the midline incision in layers. I would then replace the penrose with a plastic rod to support the stoma prior to making a 2/3rds circumferential incision along the bowel wall on the antimesenteric side. I would then brooke the small bowel and place interrupted absorbable sutures and secure the rod to the skin with a permanent suture prior to placing a stomal appliance.
   1. Mark the patient for a stoma
   2. Obtain laparoscopic access
   3. Choose a location on the bowel that will easily reate
   4. Create the stoma site: excise skin disc, divide and spread anterior and posterior rectus sheaths and peritoneum to accommodate two fingers.
   5. Grasp the terminal ileum and deflate the abdomen
   6. Bring the bowel through the stoma and confirm orientation
   7. Check for hemostasis
   8. Close the port sites
   9. Mature the ostomy
2. **Ileostomy closure**: I would position the patient supine with the right arm tucked. I would ensure I have adequate peripheral access before prepping and draping the entire abdomen. I would incise along the mucocutaneous junction and carry that down to the subcutaneous fat. Then I would gently dissect the tissue surrounding the bowel circumferentially. I would carry this dissection down to the level of the fascia and free the bowel from the fascia with care not to injure the bowel or its associated mesentery. I would then lift the bowel up through the stoma. Once I felt like I had adequate length I would staple off both ends of the loop ileostomy prior to creating a side-to-side functional end to end stapled anastomosis using a GIA 60 mm blue staple load for the common channel and a TA 60 mm blue staple load to close the common enterotomy after inspecting the inner staple line to confirm it wasn’t bleeding. I would then place the bowel back into the abdomen and close both the anterior and posterior fascia. I would approximate the skin edges using a purse string suture and pack it with gauze.
   1. Verify anal sphincter competency by physical exam and confirm distal patency of the bowel with a contrasted enema
   2. Make an incision around the stoma and dissect circumferentially until the fascia is reached and the peritoneal cavity is entered
   3. Clearly identify the proximal and distal limbs
   4. Freshen the edges of the enterotomy
   5. Perform a side to side functional end to end anastomosis
   6. Close the fascia
   7. Pack the wound

Inguinal and femoral hernia - repair

1. **Bassini repair**: Position the patient spine with both arms out. Then proceed to expose and reduce the sac as you would for a McVay repair. II would then approximate the conjoint tendon to the shelving edge of the inguinal ligament using interrupted non-absorbable sutures. I would then ensure I have adequate hemostasis before approximating the external oblique and closing the wound in layers. At the end of the case I would ensure that both testicles were positioned appropriately in the scrotum.
2. **McVay repair**: I would proceed to expose it similar to a Bassini repair. Position the patient spine with both arms out. I would prep and drape the patient and mark out the pubis and ASIS. I would make a transverse incision over the cord and expose the external oblique (approximately 2 cm above the inguinal ligament). I would then incise the external oblique laterally and connect that to the external ring in line with the fibers. I would identify and protect the ilioinguinal nerve before mobilizing superiorly and inferiorly around the cord. I would then gently encircle the spermatic cord (or round ligament) with a penrose drain. I would then identify and expose the hernia sac and dissect it free of surrounding structures taking care to preserve the vas deferens and testicular vasculature. I would reduce the contents and assess the floor of the inguinal canal. I would then make a relaxing incision in the anterior rectus sheath and open the posterior wall of the inguinal ligament to expose cooper’s ligament. I would then suture the conjoint tendon to cooper’s ligament with interrupted sutures beginning at the pubic tubercle and working laterally. At the femoral canal, I would place a transition stitch incorporating the conjoint tendon, cooper’s ligament, the femoral sheath, and the shelving edge of the inguinal ligament. I would then continue the repair with interrupted sutures approximating the conjoint tendon to the shelving edge of the inguinal ligament. I would then close the external oblique aponeurosis and close the wound in layers. Lastly I would ensure the testicle is in an appropriate position.
3. **Lichtenstein repair:** I would proceed to expose it similar to a Bassini repair. Position the patient spine with both arms out. I would prep and drape the patient and mark out the pubis and ASIS. I would make a transverse incision over the cord and expose the external oblique (approximately 2 cm above the inguinal ligament). I would then incise the external oblique laterally and connect that to the external ring in line with the fibers. I would identify and protect the ilioinguinal nerve before mobilizing superiorly and inferiorly around the cord. I would then gently encircle the spermatic cord (or round ligament) with a penrose drain. I would then identify and expose the hernia sac and dissect it free of surrounding structures taking care to preserve the vas deferens and testicular vasculature. I would reduce the contents and assess the floor of the inguinal canal. I would then fashion a piece of mesh and secure it medially with 2 cm overlap on the pubis with permanent sutures and then secure it to the shelving edge of the inguinal ligament inferiorly and conjoint tendon superiorly. I would then suture both tails to the shelving edge of the inguinal ligament and ensure that the cord was not too tight before closing the external oblique aponeurosis, followed by the wound in layers. Lastly I would ensure the testicle is in an appropriate position.
4. **Laparoscopic totally extraperitoneal IHR (TEP)**: Position supine, foley in, both arms tucked. Prep and drape and make an incision just off midline 2 cm below the umbilicus. Dissect down to the ipsilateral anterior rectus sheath and incise it transversely. Bluntly develop space between the rectus sheaths and mobilize the muscle medially. I would then insert my 10 mm balloon dissector, direct it towards the pubic symphysis, and insufflate the preperitoneal space under direct vision. I would then reinsert the laparoscopy and place two 5 mm ports in the midline below that. I would then place the patient in trendelenburg position and then work to reduce any herniated contents and complete the dissection taking care not to injure any neurovascular structures. Once the dissection was complete and all herniated contents were reduced I would insert a large piece of lightweight macroporous permanent mesh and secure it superiorly and laterally to the ileopubic tract and inferiorly and medially to cooper’s ligament with absorbable sutures after ensuring that I have adequately covered the direct and indirect defect spaces as well as femoral space. I would then ensure hemostasis before desufflating. I would close the fascial defect and close the skin incisions.
5. **Laparoscopic transabdominal preperitoneal repair (TAPP)**: I would first begin by positioning the patient supine with both arms tucked. I would place a foley. I would prep and drape the abdomen, then insufflate the abdomen and make an incision near the umbilicus. I would place a 10 mm port there, then place an additional 5 mm port in the midline below this and another 5 mm on the ipsilateral side lateral to the rectus. I would then incise the peritoneum and develop the preperitoneal space. The rest is the same as a TEP. I would close the peritoneal flap before desufflating.

Inguinal hernia - repair (pediatric)

Intubation and difficult airway

Intussusception - operation (pediatric)

**Lower GI endoscopy:** After obtaining consent I would administer procedural sedation using a combination of propofol and fentanyl. I would ensure that I have appropriate monitoring including a functional pulse oximeter.I would position the patient in the left lateral decubitus position with the knees up. I would insert the colonoscope and advance it to the cecum, making sure that I keep the lumen in view the whole time with appropriate pressure applied to the scope. I would then enter the ileum to confirm my position and then withdraw the scope taking at least 6 minutes to withdraw the scope. I would biopsy or remove any polyps of concern along the way.

Lymph node biopsy

Malrotation - operation

Mastectomy - simple, modified radical, and radical

Meckel diverticulum - excision (pediatric)

Melanoma - wide excision

Miscellaneous hernias - repair

Neck injuries - management

Nephrectomy

Nutritional support

Pancreatectomy - distal

Pancreatic debridement

Pancreatic pseudocyst - drainage

**Parathyroidectomy**: I would tuck both arms at the sides and place a soft roll under the shoulders. I would then position the patient in the modified beach chair position with the next extended and prep the neck and upper chest. I would start by drawing a PTH level before incision. I would then make a transverse incision in a skin crease two fingerbreadths above the sternal notch. I would divide the subcutaneous tissues and platysma with cautery and create subplatysmal flaps. I would then divide the strap muscles in the midline and retract them laterally. I would then retract the thyroid lobe medially. I would then search for an abnormal parathyroid gland and divide the middle thyroid vein if needed to facilitate exposure. I would then gently dissect the gland from the surrounding tissues down to its pedicle. I would then measure another PTH before clamping the pedicle with a 3-0 silk suture before excising it and sending it to pathology. I would then drawn another PTH ten minutes later and confirm that I had performed an adequate excision. I would then irrigate the wound and obtain hemostasis. Then I would reapproximate the strap muscles and platysma loosely with interrupted 3-0 vicryl suture. I would then inject local into the subcutaneous tissues and reapproximate the skin with a running 4-0 monocryl suture and apply glue.

* Position arms tucked, modified beach chair position, with a shoulder roll, and neck extended and measure a PTH
* Make an incision two fingerbreadths above sternal notch
* Divide subcutaneous tissues and platysma with cautery
* Create subplatysmal flaps and divide strap muscles in the midline
* Retract the thyroid medially, identify the gland, and dissect down to the pedicle taking care to preserve the inferior thyroid artery and recurrent laryngeal nerve
* Measure PTH then excise the gland.
* Wait ten minutes and check another PTH
* If <50% of highest value, irrigate, obtain hemostasis, and loosely approximate the strap muscles and platysma with interrupted 3-0 vicryl
* Close skin with running 4-0 monocryl suture

Partial pulmonary resections - open and thoracoscopic

Percutaneous breast biopsy and cyst aspiration

**Perianal condylomas - excision**: I would ensure that I and my OR staff wear appropriate equipment including an N95 mask. position the patient in the prone jackknife position and prep and drape the patient. I would perform anoscopy to delineate the area of involvement. I would then serially dilate the anus and place a hill ferguson retractor. I would then excise the lesions of concern, taking care to preserve as much tissue as possible to reduce the risk of anal stenosis. I would excise lesions down to the level of the deep dermis. Prior to finishing I would inject local and perform a pudendal nerve block.

* Position prone jackknife
* Serial dilate the anus and place retractor
* Identify the area of interest and excise tissue of concern to the level of the deep dermis
* Take care to preserve as much normal anal tissue as possible
* Inject local and perform pudendal nerve block

Peritoneal dialysis catheter insertion

**Pilonidal cystectomy**:

1. **Marsupialization of the sinus tract**: I would place the patient in the prone jackknife position, prep, and drape the buttocks, gently spreading the buttocks with tape. Then I would inject methylene blue into the track. Then I would insert a probe through the pits to identify the sinus tracts and open them up with cautery. I would then excise a thin band of skin lateral to these pits, ensuring that all tissue stained with methylene blue was removed. After debriding the wound with a curette, I would then suture the skin edge to the base of the wound to prevent premature closure using 2-0 vicryl sutures.
   1. Position prone jackknife
   2. Tape, prep, drape
   3. Inject methylene blue
   4. Open up sinus tracts using probe and cautery
   5. Excise all tracts and pits and debride base with curette
   6. Marsupialize skin to wound base.
2. **Excision and primary closure of pilonidal sinus**: I would position in the prone jackknife position and tape the buttocks apart. I would then prep and drape. I would then make an elliptical incision around the openings of the entire tract with a 1 cm margin. I would then deepend this incision until it reached the presacral fascia. I would then create subcutaneous flaps to ensure no tension on the skin flaps prior to closing the wound in layers.
   1. Position prone jackknife
   2. Insert a probe to identify tracts
   3. Excise tracts down to sacral fascia
   4. Create subcutaneous flaps
   5. Close wound with layers

Pyloromyotomy

Sentinel lymph node biopsy for melanoma

Skin grafting

Skin/soft tissue lesions - excisional and incisional biopsy

Small intestinal resection

Soft tissue infections - incision, drainage, debridement

Splenectomy

Splenectomy/splenorrhaphy

Surgical consideration in the pregnant patient

**Thyroidectomy - partial or total**: I would position the patient in semi-Fowler position (20 degrees of trendelenburg) supine with the arms tucked and the neck extended with a shoulder roll prior to setting up my intraoperative nerve monitor and confirming with anesthesia not to use paralytics. I would make a transverse (Kocher) incision two fingerbreadths above the sternal notch. I would dissect through the subcutaneous tissues and platysma using cautery then raise subplatysmal flaps superiorly to the tracheal cartilage and inferiorly to the sternal notch. I would then divide the strap muscles in the midline and retract them laterally. I would then mobilize the thyroid lobe from its areolar attachments using a hemostat and cautery. I would then retract the thyroid medially and identify and ligate the middle thyroid vein with 3-0 silk sutures. I would then retract the lobe inferomedially and identify and ligate the superior pole vessels with 3-0 silk suture being careful not to injure the external branch of the superior laryngeal nerve. I would then retract the gland medially and the muscles laterally to identify the inferior thyroid artery. I would then identify the recurrent laryngeal nerve and preserve it. I would then ligate the vessels to the thyroid in this vicinity with 3-0 silk suture. I would then identify and carefully mobilize the superior and inferior parathyroid glands and preserve their blood supply. I would then mobilize the inferior pole of the thyroid, then divide the isthmus and ligate it with 2-0 silk ties. I would then send the specimen to pathology. I would irrigate the wound and reapproximate the strap muscles with interrupted 3-0 Vicryl sutures. I would do the same for the platysma muscle. Then I would inject local and reapproximate the skin with a running 4-0 monocryl suture.

* + 1. Position 20 degrees reverse trendelenburg, neck extended, arms tucked, shoulder roll
    2. Set up intraoperative nerve monitoring and say no paralytics
    3. Make a transverse incision two fingerbreadths above the sternal notch
    4. Develop subplatysmal flaps
    5. Divide the strap muscles in the midline
    6. Ligate and divide the middle thyroid vein
    7. Preserve the external branch of the superior laryngeal nerve
    8. Ligate and divide the superior pole vessels
    9. Mobilize the inferior pole of the thyroid
    10. Identify and preserve the recurrent laryngeal nerve
    11. Divide the inferior thyroid artery and branches distally
    12. Identify and preserve the superior and inferior parathyroid glands
    13. Dissect the thyroid free of the trachea
    14. Divide the thyroid lobe at the isthmus
    15. Obtain meticulous hemostasis and close without a drain

**Tracheostomy (open)**: I would position the patient supine with the arms tucked with the neck extended with a shoulder roll and place in reverse trendelenburg. I would ensure I have additional tracheostomy tubes available. I would then prep and drape the neck and make a vertical incision two fingerbreadths above the sternal notch in the midline. I would dissect down to the level of the trachea using blunt dissection and cautery. Once the trachea was adequately exposed I would identify the 2nd and third tracheal rings. I would then have anesthesia preoxygenate the patient prior to deflating the endotracheal balloon and subsequently reduce the oxygen in their ventilatory circuit. and I would then insert a cricoid hook to facilitate retraction prior to making a T incision between the 2nd and third tracheal rings. I would then use a tracheal spreader to dilate the opening. I would then visualize the ETT and ask anesthesia to retract it until I was able to insert the tracheostomy tube. I would then connect the ventilator to the tracheostomy and evaluate for breath sounds, end-tidal CO2, and fogging in the circuit. Once the airway was secured I would ensure hemostasis and secure the tube.

1. Position supine arms tucked, reverse trendelenburg, with neck extended and shoulder roll
2. Identify landmarks and make vertical incision 1-2 fingerbreadths above sternal notch
3. Dissect down to trachea and clear it off
4. Deflate cuff, place cricoid hook
5. Coordinate with anesthesia tracheotomy and placement of tracheostomy tube
6. Confirm ventilation
7. Secure trach to neck

Tube thoracostomy and thoracentesis

Ulcerative colitis - surgical management

Ultrasound use for intravascular access

Umbilical hernia - repair (pediatric)

Urinary tract injuries - operations

Vagotomy and drainage

Vascular access

Vascular exposure - principles

Vascular injuries - operations

Vena cava filter insertion

Venous access devices - insertion

Venous insufficiency/varicose veins - operation

Ventral hernia - repair

* Component separation
  + Complete adhesiolysis to paracolic gutters
  + Elevate lipocutaneous flaps 2 cm lateral to linea semilunaris
  + Incise the external oblique fascia and separate the external/internal obliques
  + Continue this for 3-4 cm above the costal margin and inferiorly to the inguinal lig
  + Release the posterior rectus sheath by making an incision 1 cm lateral to linea alba
  + Develop retromuscular plane out to the linea semilunaris while preserving the neurovascular bundles to the rectus muscle
  + Place a mesh as an underlay then place drains over the mesh
  + Approximate midline fascia
  + Close skin over multiple drains

Wounds, major - debride/suture

**Advanced procedures**

**Abdominal and aortoiliac aneurysm - repair**

1. Open repair: Midline incision. Confirm and mark pulses preop. Move colon cephalad and small bowel to the right. Mobilize the ligament of treitz and 3rd and 4th portions of the duodenum. Expose the aorta up to the left renal vein. Then I would expose the common iliac arteries. I would first heparinize the patient prior to clamping distally first on the common iliac arteries followed by clamping the infra-renal aorta. I would then decompress the aneurysm sac prior to opening it with scissors. I would transect the proximal aorta and distally as well on either the aorta of the iliacs. I would then place an appropriately sized dacron tube soaked in rifampin and suture it to the aorta using a running 3-0 Prolene proximally first and 3-0 Prolene distally (aorta) or 5-0 Prolene iliacs. I would then first release my clamps proximally first, and then distally. Then reverse with protamine I would then close the aneurysm sac over the graft prior to closing the abdominal fascia and superficial tissues in layers.

**Adrenalectomy**:

1. **Laparoscopic right adrenalectomy**: I would position the patient in the left lateral decubitus position with a roll behind the back on a beanbag and jackknife the patient. I would prep the right flank and abdomen and ensure I have adequate peripheral access. I would place a Veress needle just anterior to the anterior axillary line below the ribs and insufflate the abdomen. I would then place a port here. I would then place three additional ports along the subcostal margin. I would first begin by mobilizing the right lobe of the liver with cautery, taking down the triangular ligament using hook cautery, before placing my liver retractor. I would then dissect the tissue medial to the adrenal gland to separate it from the IVC. I would then identify the adrenal vein and clip it twice towards the IVC and once towards the gland before dividing it. I would then free the gland from its inferior and lateral attachments before removing the adrenal gland using an endocatch bag.
   1. Optimize the patient medically
   2. Position the patient in the full left lateral decubitus position with appropriate padding
   3. Establish pneumoperitoneum and place trocars along the subcostal margin
   4. Explore the abdomen
   5. Mobilize the triangular ligament of the liver and elevate the right lobe of the liver
   6. Dissect the right border of the IVC
   7. Identify, dissect, secure, and divide the right adrenal vein
   8. Dissect all the right supra-renal tissues, including right adrenal gland and perform en bloc resection of retroperitoneal fat from the superior pole of the right kidney to the diaphragm
2. **Laparoscopic left adrenalectomy**: I would place the patient in the right lateral decubitus position on a bean bag with a roll behind the back before placing the patient in jackknife position. I would ensure I had adequate peripheral access and prep the patient’s left flank and abdomen. I would then place a Verees needle just anterior to the anterior axillary line and inferior to the costal margin prior to insufflating the abdomen. I would place a port there, then place an additional two ports along the subcostal margin. I would begin by mobilizing the splenic flexure and divide the splenorenal ligament to mobilize the spleen medially. I would then develop a plane between the pancreas and kidney taking care not to injure the pancreas before mobilizing it medially. I would continue this dissection cephalad making sure not to injure the diaphragm. I would then identify the adrenal gland and divide the tissue medial and lateral to it. I would then identify the adrenal vein and clip it once on the adrenal side and twice on the other before dividing it. I would then divide the remaining attachments and remove the adrenal gland using an endocatch bag.
   1. Optimize the patient medically
   2. Position patient right lateral decubitus position with appropriate padding
   3. Establish pneumoperitoneum and place trocars along the subcostal margin
   4. Explore the abdomen
   5. Mobilize the splenic flexure of the colon
   6. Mobilize the spleen and tail of the pancreas
   7. Dissect retroperitoneal structures including Gerota’s fascia, left renal hilum, and para-aortic space
   8. Identify, ligate, and divide the left adrenal vein
   9. Dissect all the left suprarenal tissues, including the left adrenal gland with en bloc resection of retroperitoneal fat from the superior pole of the left kidney to the diaphragm

Ampullary resection for tumor

Anal cancer - excision

Anorectal malformations - operation

Aortoiliac reconstruction for occlusive disease

Bile duct cancer - operation

Bile duct injury, iatrogenic - acute repair

Bile duct neoplasms - operation

Branchial cleft anomaly - excision

Carotid endarterectomy

Cesarean section

Chest wall deformity - repair

Congenital diaphragmatic hernia - repair

Cricopharyngeal myotomy with zenker diverticulum - excision

Diaphragmatic hernia - repair

En block abdominal organ retrieval

Endovascular intervention principles

Esophageal atresia/tracheoesophageal fistula - repair

Esophageal perforation - repair/resection

Esophagectomy/esophagogastrectomy

Esophagomyotomy (heller)

Extra-anatomic bypass

Gallbladder cancer - operation

Gastroschisis/omphalocele - repair

Graft-enteric fistula - management

Hand tendon repairs

Hepatic ultrasound - intraoperative

Hirschsprung disease - operation

Ilioinguinal-femoral lymphadenectomy

Intestinal atresia/stenosis - repair

Live donor hepatectomy

Live donor nephrectomy

Liver transplantation

Lower extremity bypass

Meconium ileus - operation

Mesenteric occlusive disease - operation

Modified neck dissection

**Morbid obesity - operation**

* **LSG:**
  + Mobilize the greater curvature of the stomach, take down short gastrics
  + Expose left crus
  + Evaluate hiatus for a hernia and repair if present
  + Lyse retrogastric adhesions
  + Pass bougie along lesser curve
  + Perform longitudinal gastrectomy with linear cutting stapler
  + Test for leak
* **REY bypass**

Necrotizing enterocolitis - operation

Noninvasive and invasive cardiac pacing

Orchiopexy

Pancreas transplantation

Pancreatectomy - total

Pancreatic ultrasound - intraoperative

Pancreaticoduodenectomy

* Bilateral subcostal incision and abdominal exploration to rule out mets
* Mobilize the right colon and kocherize the duodenum
* Open the lesser sac, assess for resectability, and clear off the anterior surface of the SMV
* Perform cholecystectomy, portal dissection and ligate the GDA after performing a test clamp
* Divide the proximal jejunum, duodenum, pancreas, and bile duct
* Dissect uncinate process from the SMV/SMA
* Send frozen section of the margins on the bile duct and pancreatic duct
* Reconstruct with end to side PJ and HJ and perform retrocolic loop gastrojejunostomy
* Place drains and close

Pancreatitis, chronic - operative management

**Paraesophageal hernia - repair:** Minimally invasive access with patient in steep reverse trendelenburg and split legs. Take down the short gastrics and then mobilize the esophagus and take down the hernia sac entirely taking care to protect the vagus nerve, IVC and take care not to get into the chest. I would mobilize the esophagus until I had 4 cm of intra-abdominal esophagus without tension. I would then repair the crura using interrupted silk sutures without mesh. I would then perform a Nissen fundoplication over a 60 French bougie using silk sutures placing them 1 cm apart to cover 2 cm of repair. I would take full thickness bites of stomach and partial thickness bites of the esophagus, if doing a Toupet, each side would be sutured individually.

Parotidectomy

Peripheral aneurysms - repair

Postgastrectomy syndrome - revisional procedures

**Rectal cancer - abdominoperineal resection and pelvic exenteration**: I would position the patient in lithotomy and ensure that I have adequate peripheral access before asking my Urology colleagues to place ureteral stents. I would then prep the patient from the xiphoid to the upper knees, including the perineal region. I would begin my making an incision from the pubis to just above the umbilicus. I would then perform a lateral to medial mobilization of the sigmoid colon, taking care to identify and protect the left ureter. I would then perform a high ligation of the inferior mesenteric artery and divide the sigmoid colon before performing a total mesorectal excision down to the level of the levator ani muscle. During this process I would identify and preserve the autonomic nerve plexus. I would then begin the perineal phase the dissection by making an elliptical incision extending from the perineal body anteriorly, the coccyx posterity, and ischium laterally. I would then deepend this incision to the ischiorectal fossa and divide the anococcygeal ligament. I would then perform circumferential dissection taking care to protect the prostate/vagina before removing the specimen. I would then create an omental pedicle flap and place that in the pelvis prior to creating an end colostomy.

1. Position supine lithotomy
2. Lower midline incision
3. Explore the abdomen for metastatic disease
4. Perform rigid sigmoidoscopy and DRE to confirm level of the lesion and sphincter involvement
5. Incise the line of Toldt to free the rectosigmoid colon from the peritoneal attachment
6. Identify and protect both ureters
7. Transect the bowel proximally
8. Ligate the mesenteric vessels
9. Incise the peritoneum and elevate from the hollow of sacrum, circumferentially to levators
10. Working from below, incise the skin around the anus
11. Enter the peritoneal cavity in posterior midline, incise levators anteriorly
12. Pass the specimen through posteriorly
13. Complete anterior dissection taking care to protect the vagina and prostate
14. Place omental pedicle flap in the pelvis
15. Place drains
16. Make an opening for the colostomy and deliver the colon
17. Close the abdomen and perineum
18. Mature the colostomy

Rectal cancer - transanal resection

Rectal prolapse - repair

Segmentectomy/lobectomy

Soft tissue sarcoma - resection

Superior mesenteric artery embolectomy/thrombectomy

Thermal injuries - operations

Thyroglossal duct cyst - excision

Ultrasound in the diagnosis and management of vascular diseases

Ultrasound of the biliary tree

Ultrasound of the thyroid

**Other procedures**