Surgical Specimen Dissection and Tissue Procurement Manual

Version 1.0

Cooperative Human Tissue Network
Midwestern Division

A program of the
National Cancer Institute at the National Institutes of Health

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This document was developed to increase the understanding of procuring tissue used in research. Collection procedures are outlined and are reviewed periodically and revised to incorporate improved application and research findings that would affect tissue procurement. The reader is advised to check the OSU Knowledge Bank web site (https://kb.osu.edu/) to ensure that the most recent version is available for use.

If you have other needs (higher resolution images, etc.) or would like to contribute to this work, please contact the Cooperative Human Tissue Network (CHTN) Midwestern Division:

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Contents

Concepts

Although there are many resources that describe surgical procedures and preparation of clinical tissues, there is little published guidance on procurement practices for research samples. This manual covers various human anatomic systems and organs most involved in research procurement with sections illustrating and describing:

1. Anatomy – normal anatomy
2. Tumors – typical locations and types of disease conditions
3. Procedures – lists surgeries indicating which are more or less likely to produce research samples
4. Procedure – selected key surgeries
5. Procurement – selected specific research procurement steps
6. Tips – expert advice

Navigation links are underlined and in blue/purple color (ex. unused link or used link) and allow ready navigation within the document.

There are several key concepts that guide research tissue procurement activity:

- Clinical needs always have priority over research needs. Even after tissue has been procured for research, it may be recalled to be used for clinical purposes.
- Tracking the time removed from the body and the time until preservation is critical.
- Weigh, measure, and ink excised tissue before sectioning and then weigh and measure the sections before further processing.
- Quality control involves determining how much of the sample is tumor (or otherwise of interest) and how much is necrotic along with confirming the initial/preliminary diagnosis, primary anatomic site, whether metastatic (procured anatomic site) and various molecular markers.

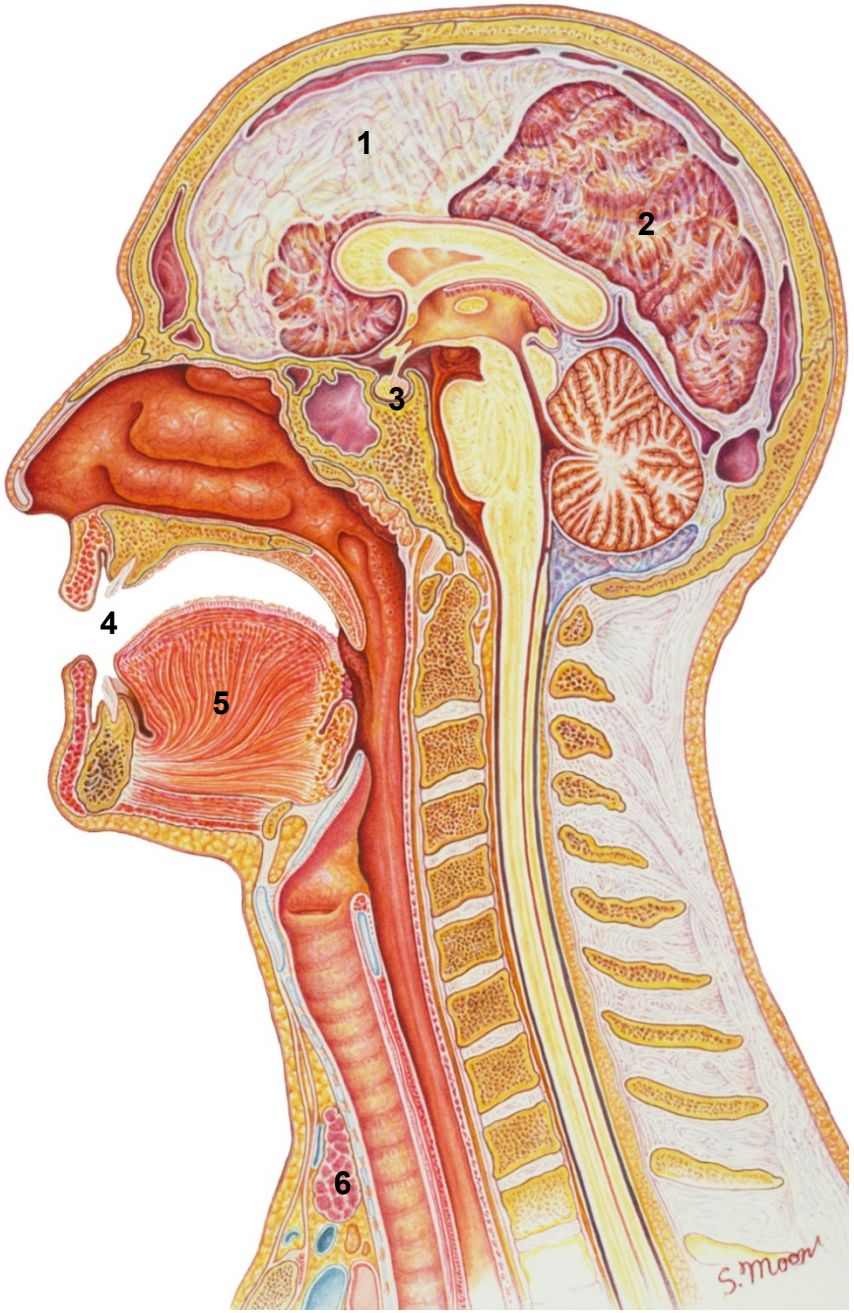
Instruments

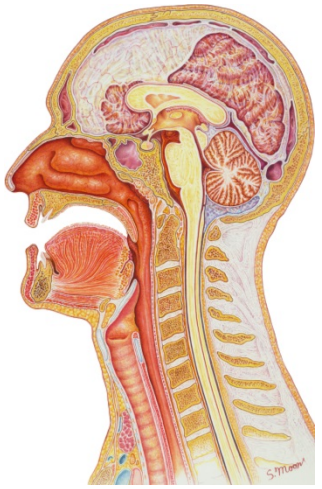
General Technical Guidance

1. ink
2. long knives
3. knife
4. scissors
5. probe
6. scalpel
7. blade
8. tongs
9. ruler
10. swab
11. forceps
12. small scoop

Head & Neck

Anatomy

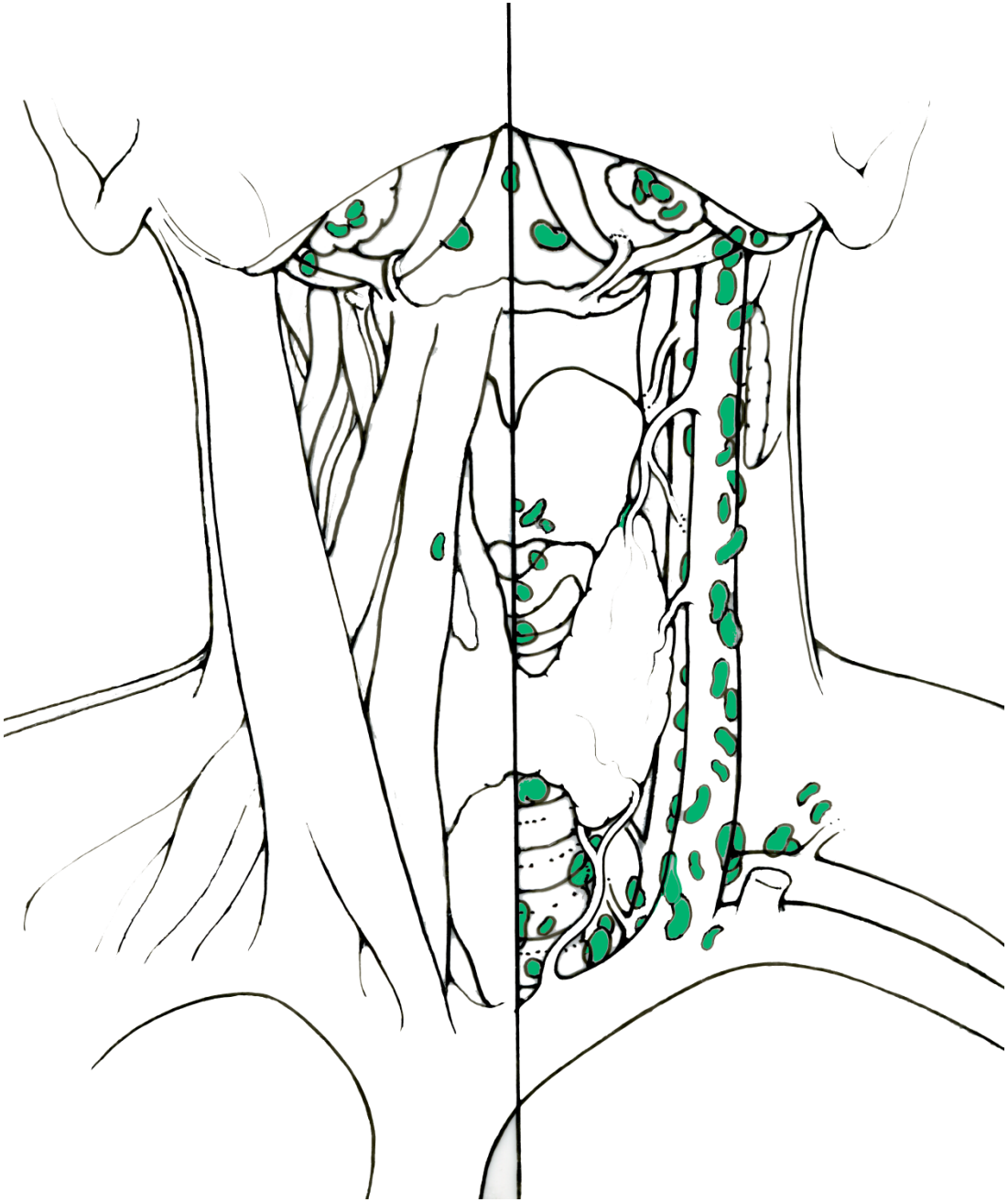


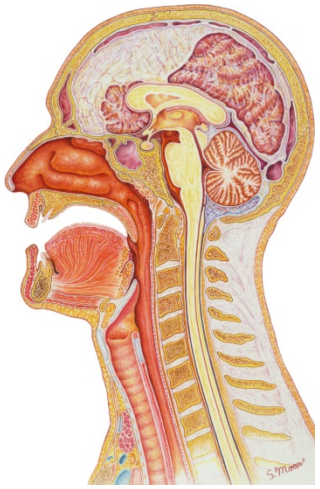


1. dura mater
2. brain
3. pituitary
4. mouth
5. tongue
6. thyroid, parathyroid

Head & Neck

Anatomy





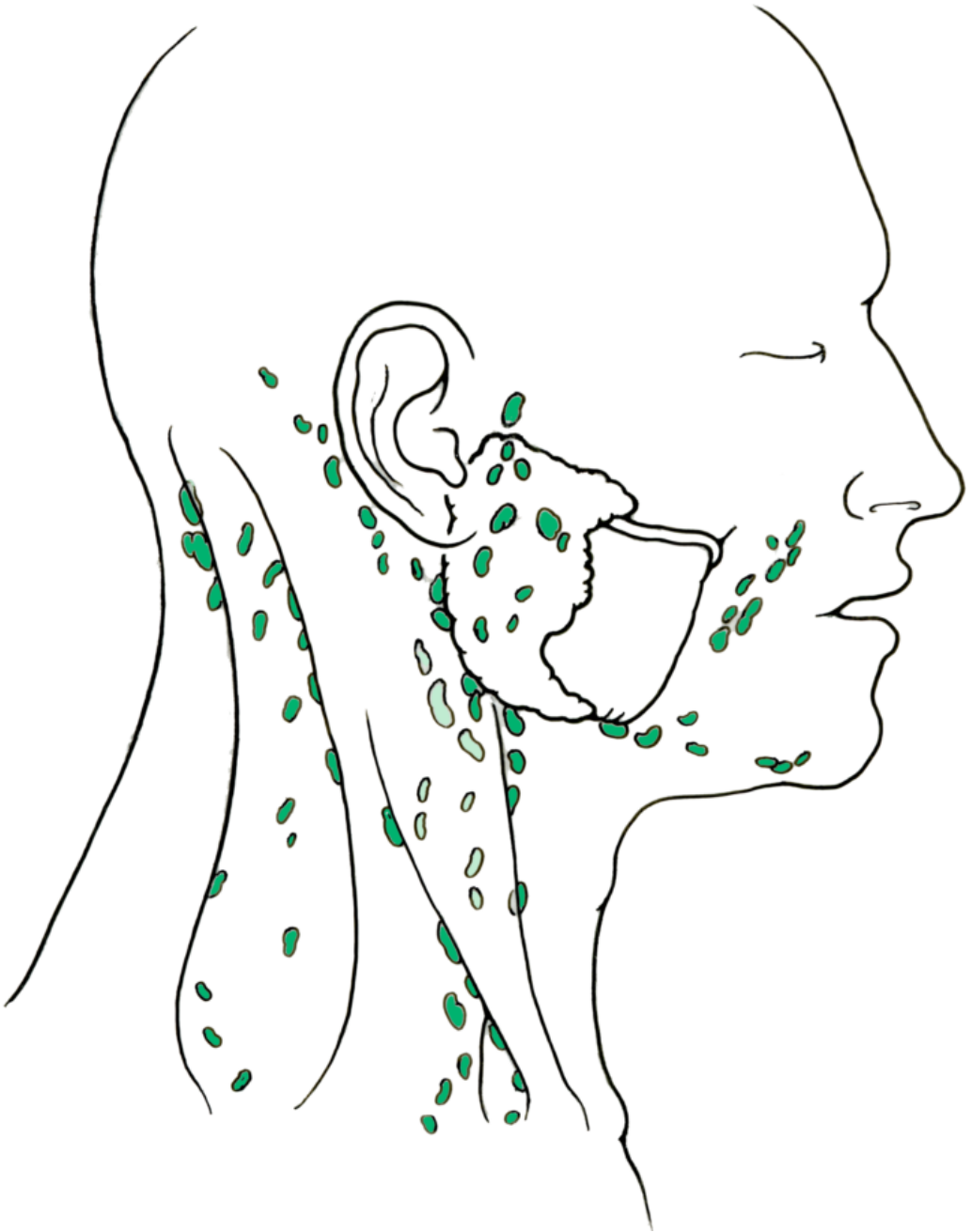
Anterior lymph nodes in neck

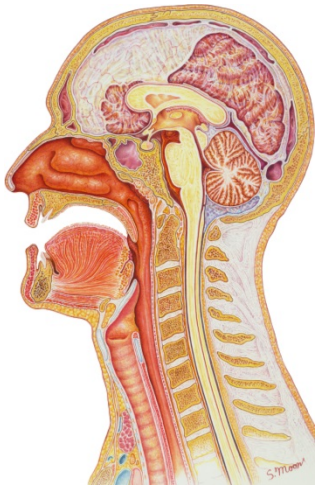
Lymph node anatomy in other sections

- Lung
- Stomach
- Colon & Rectum
- Pancreas
- Spleen
- Female Reproductive
- Lymphatic System

Head & Neck

Anatomy





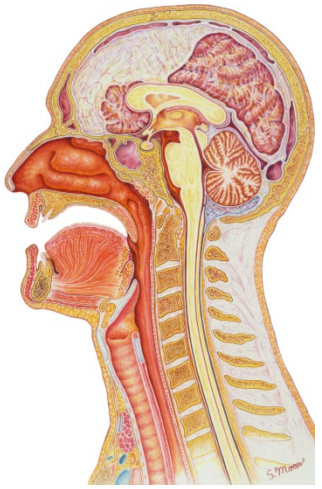
Lateral superior lymph nodes in neck

Lymph node anatomy in other sections

- Lung
- Stomach
- Colon & Rectum
- Pancreas
- Spleen
- Female Reproductive
- Lymphatic System

Head & Neck

Anatomy



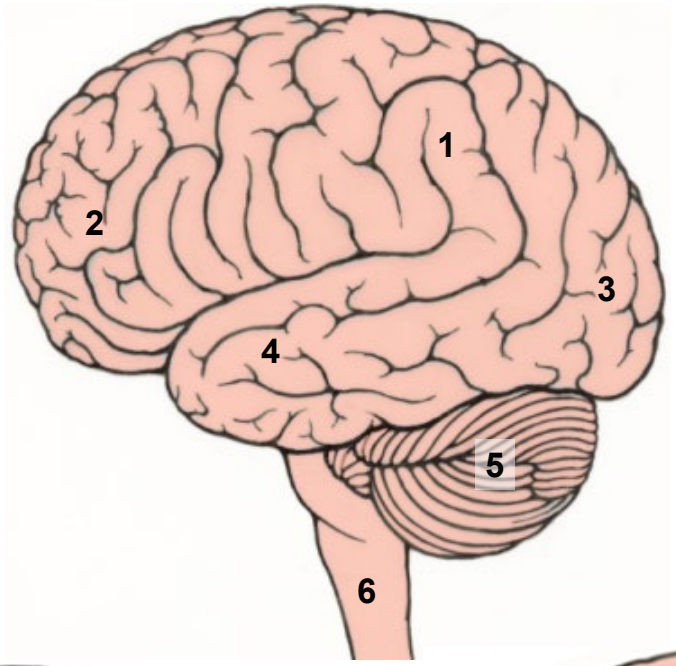
Lateral lymph nodes in neck

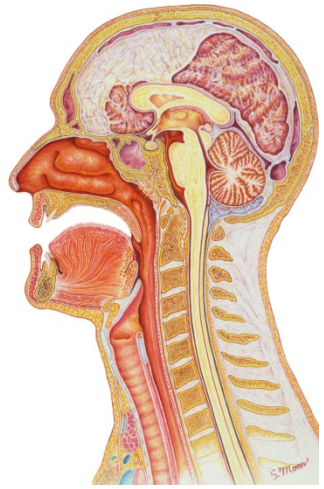
Lymph node anatomy in other sections

- Lung
- Stomach
- Colon & Rectum
- Pancreas
- Spleen
- Female Reproductive
- Lymphatic System

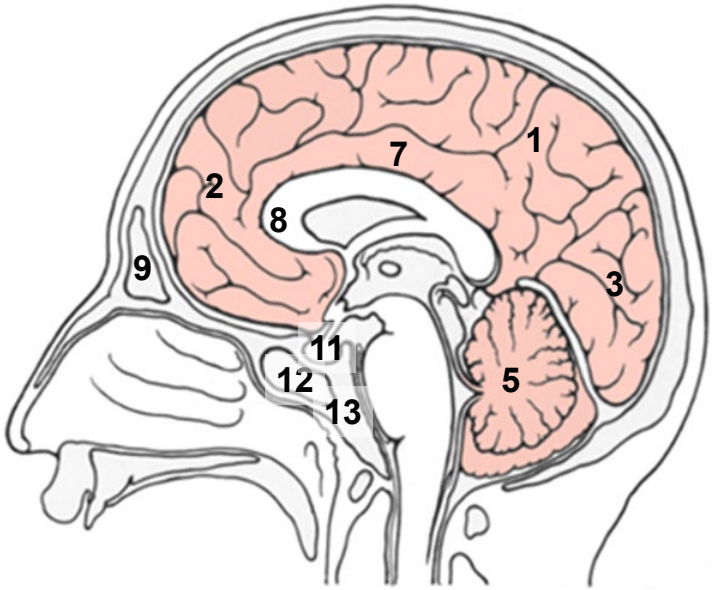
Brain

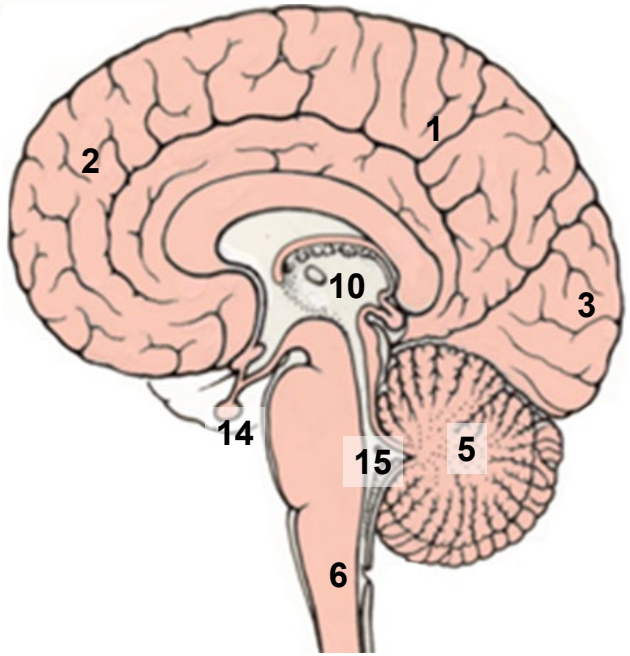
Anatomy





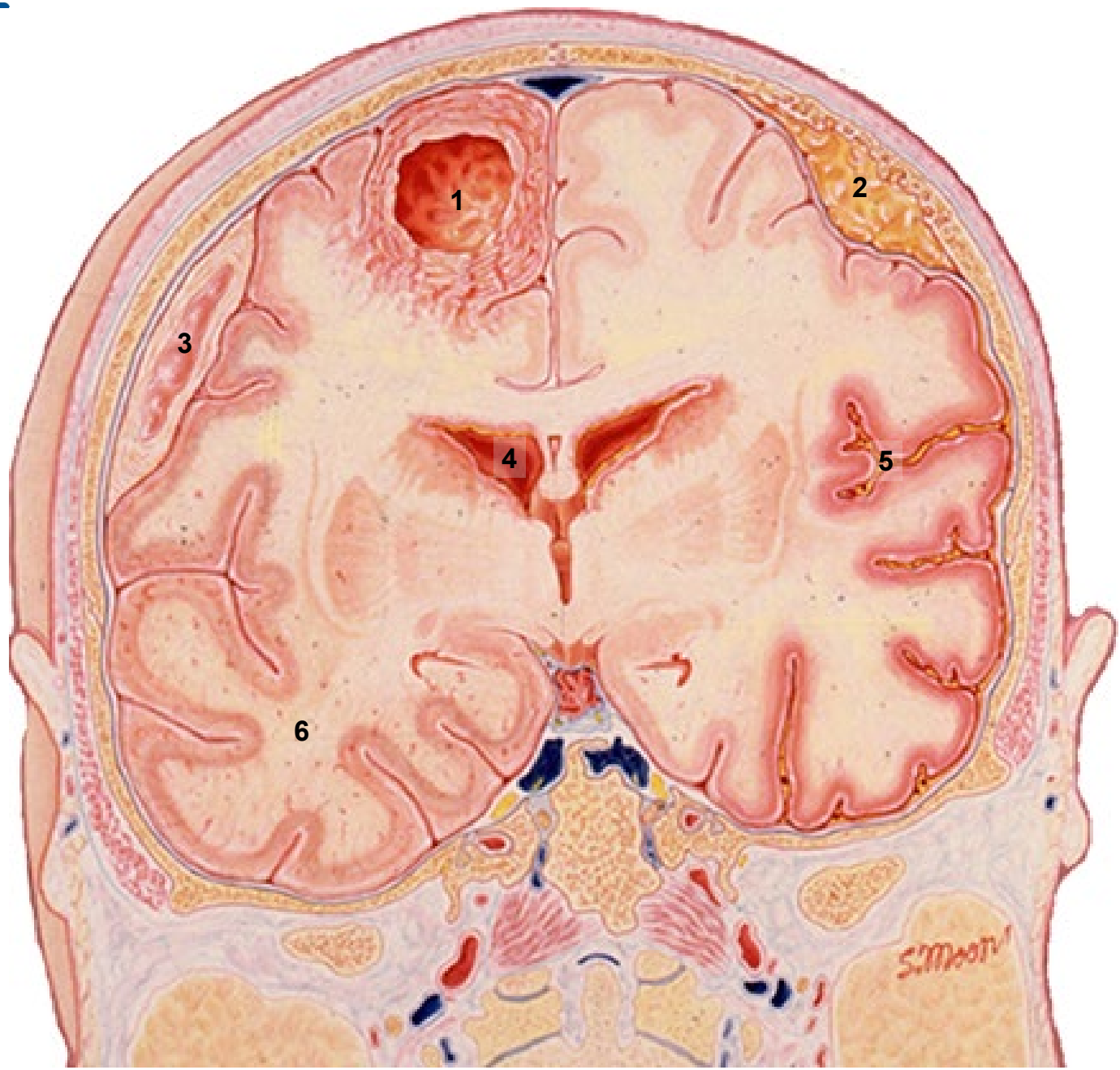
1. parietal lobe
2. frontal lobe
3. occipital lobe
4. temporal lobe
5. cerebellum
6. brain stem
7. limbic lobe
8. corpus callosum
9. frontal sinus
10. 3rd ventricle
11. pituitary
12. sphenoid sinus
13. sphenoid bone
14. pituitary gland
15. 4th ventricle

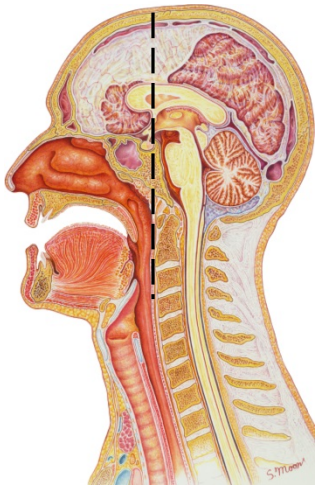




Brain

Tumors

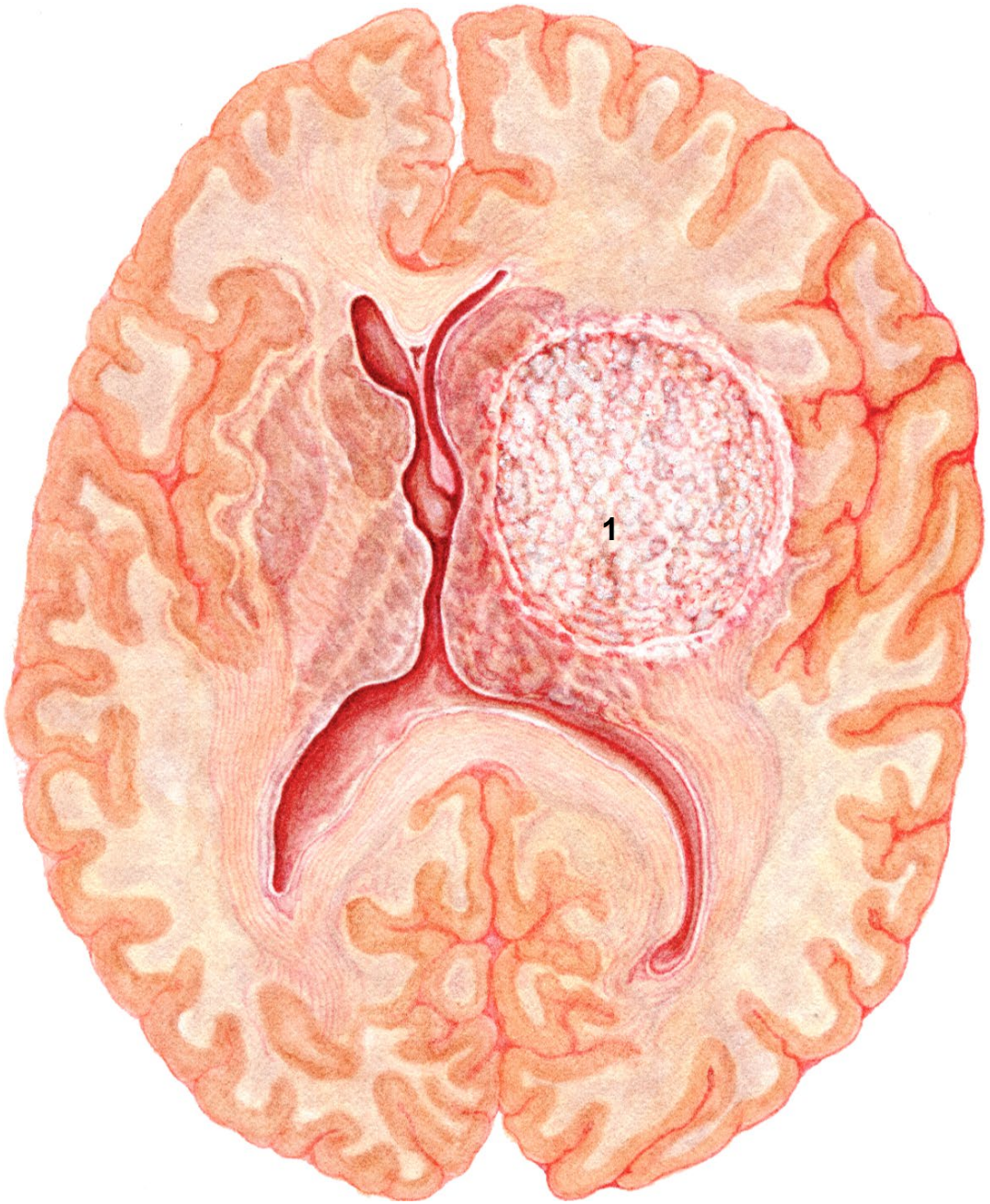


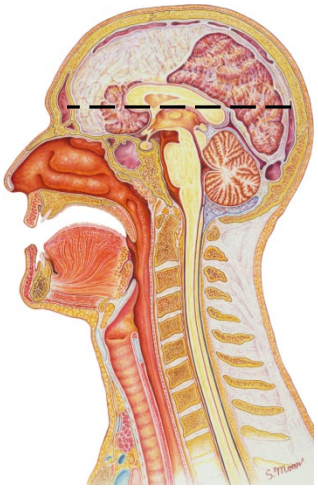


infections, pathogens mid coronal section

1. abscess
2. epidural abscess
3. subdural empyema
4. ventriculitis
5. meningitis
6. encephalitis

Brain

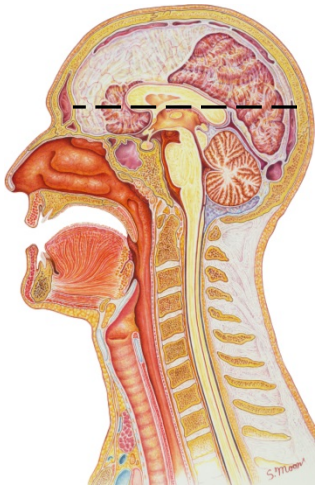




1. tumor metastasis from breast, lung, bone, etc.

Tumors

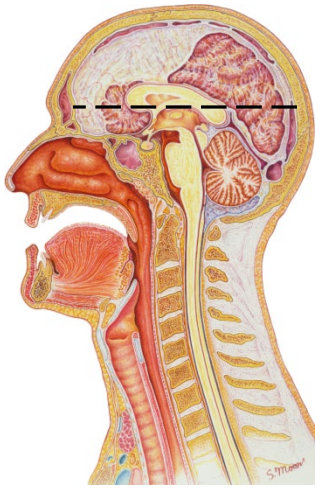
Brain



1. glioblastoma multiforme

Tumors

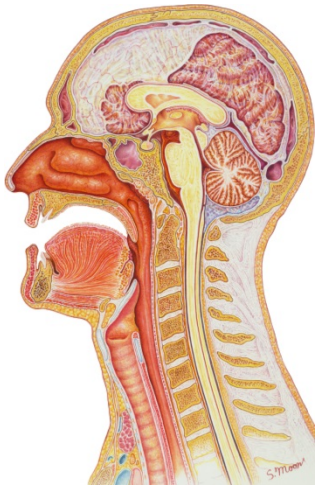
Brain



1. pigmented metastatic melanoma

Tumors

Brain



Procedures

More likely to support procurement:

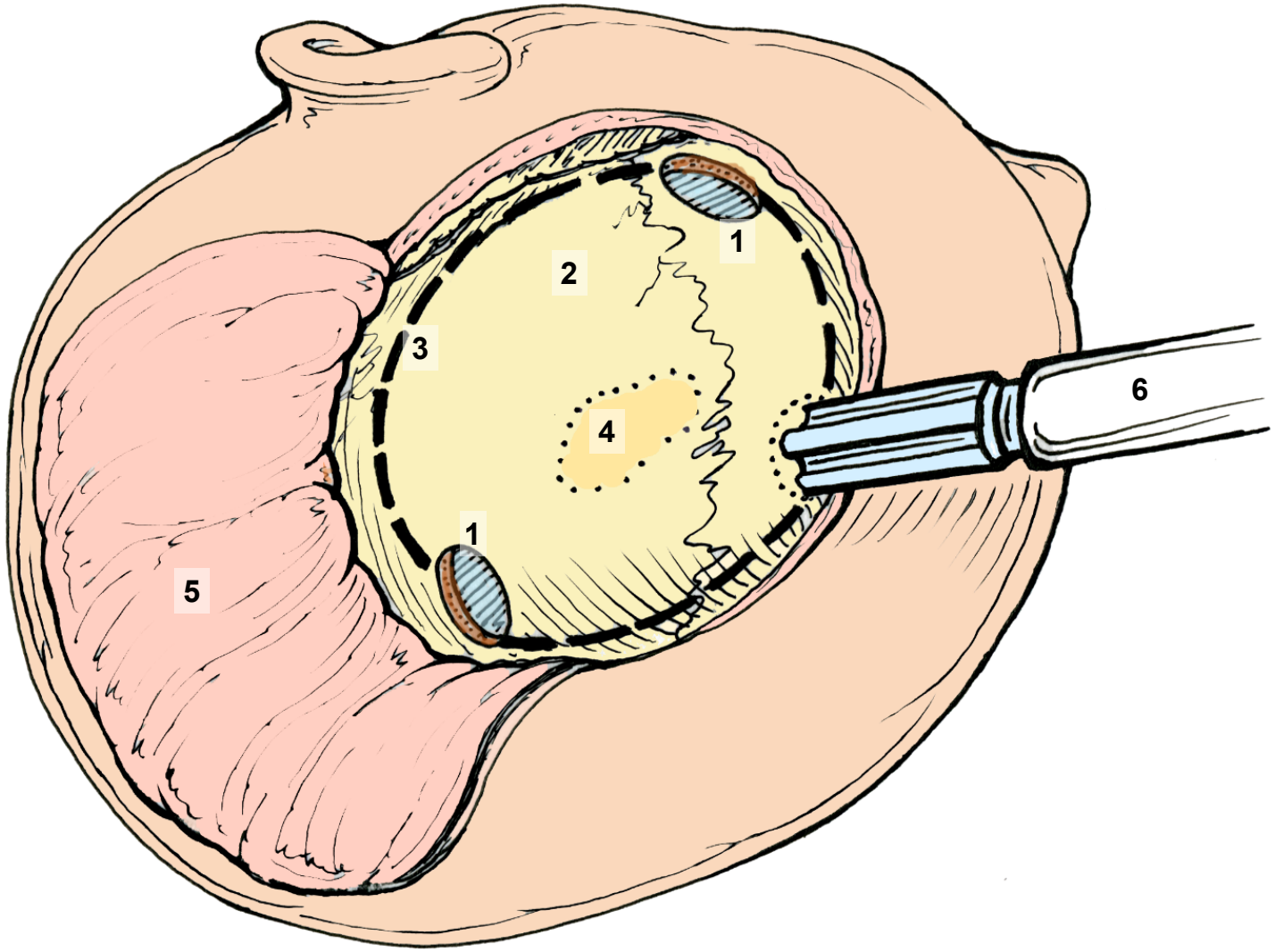
- autopsy
- craniotomy - surgical removal of part of the bone from the skull to expose the brain. This part (bone flap) is subsequently replaced after the brain surgery has been done.
- CPA (cerebellopontine angle)

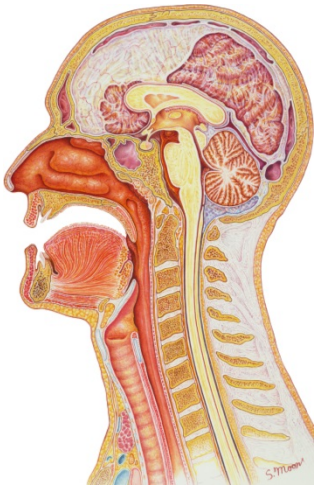
Less likely to support procurement:

- none

Brain

Procedure



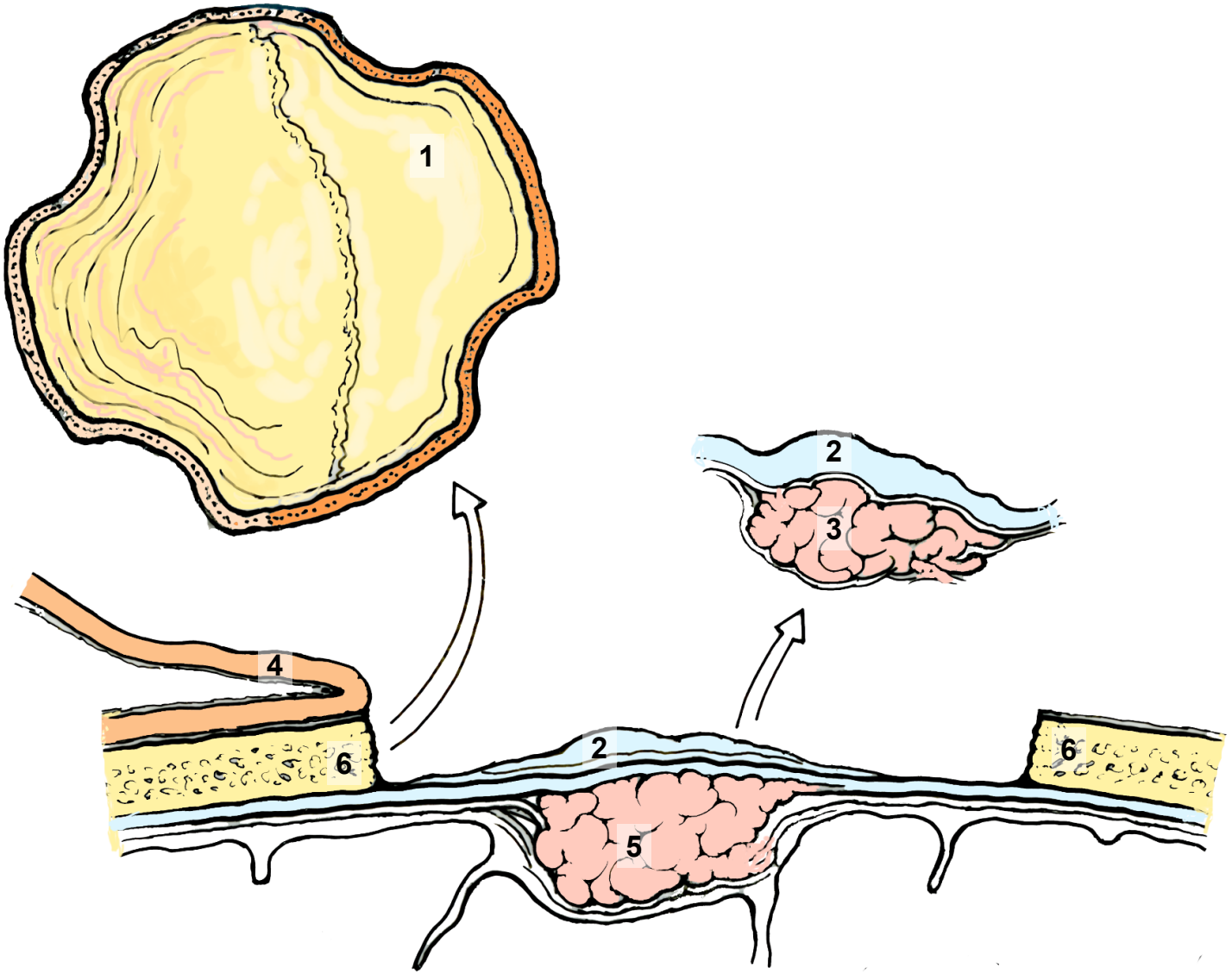


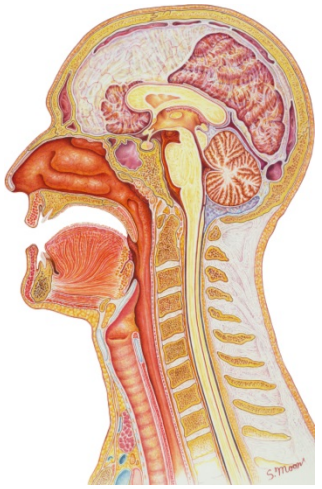
Craniotomy (part 1)

1. bore holes drilled into cranium not dura
2. cranial bone
3. cut bone line
4. tumor (located under top of skull and dura)
5. skin scalp flap
6. drill

Brain

Procedure

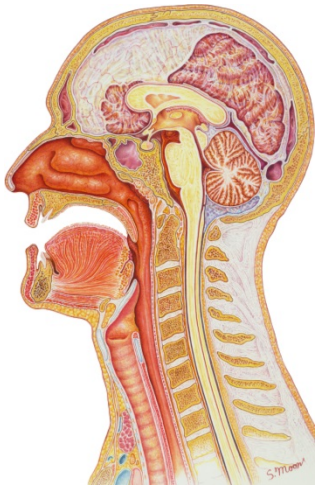




Craniotomy (part 2)

1. removed cranial “cap”
2. dura
3. tumor
4. skin scalp flap
5. tumor (located under dura)
6. cranium

Brain

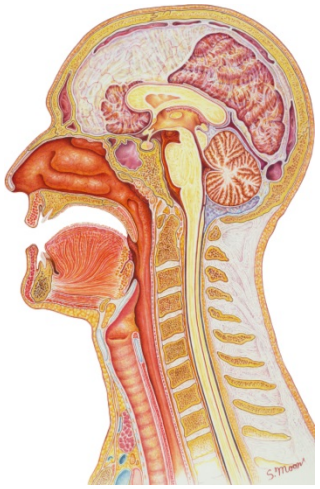


To be added

Procurement

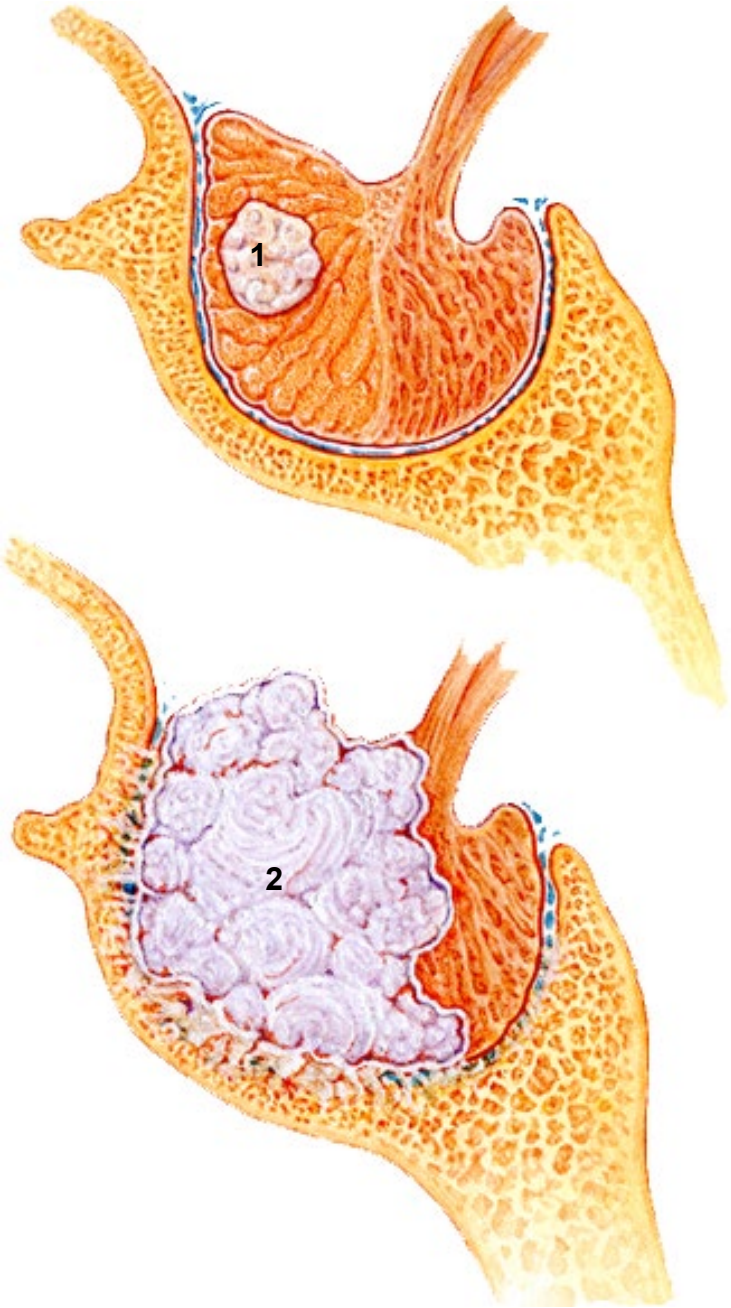
Pituitary

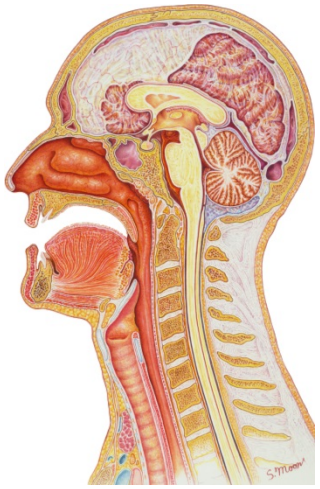
Anatomy



1. pituitary in situ
2. anterior
3. posterior
4. sphenoid bone

Pituitary

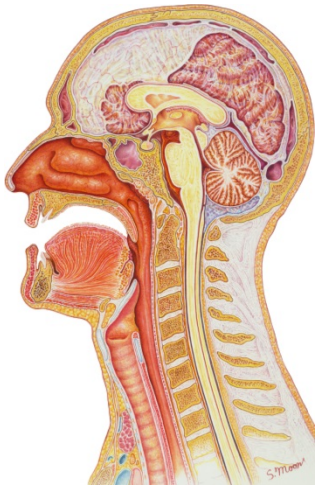




1. small anterior adenoma
2. large anterior adenoma

Tumors

Pituitary



More likely to support procurement:

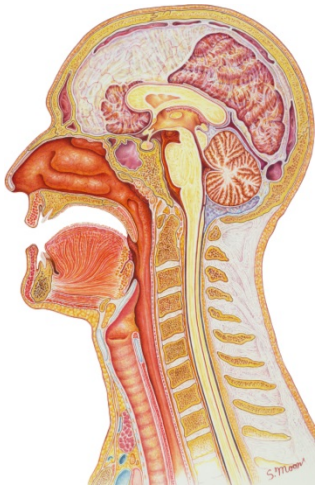
- autopsy
- transnasal excision – removal of part or all of the pituitary gland (via nostrils).
- transsphenoidal surgery for pituitary adenomas – removal of a pituitary tumor.

Less likely to support procurement:

- none

Procedures

Pituitary

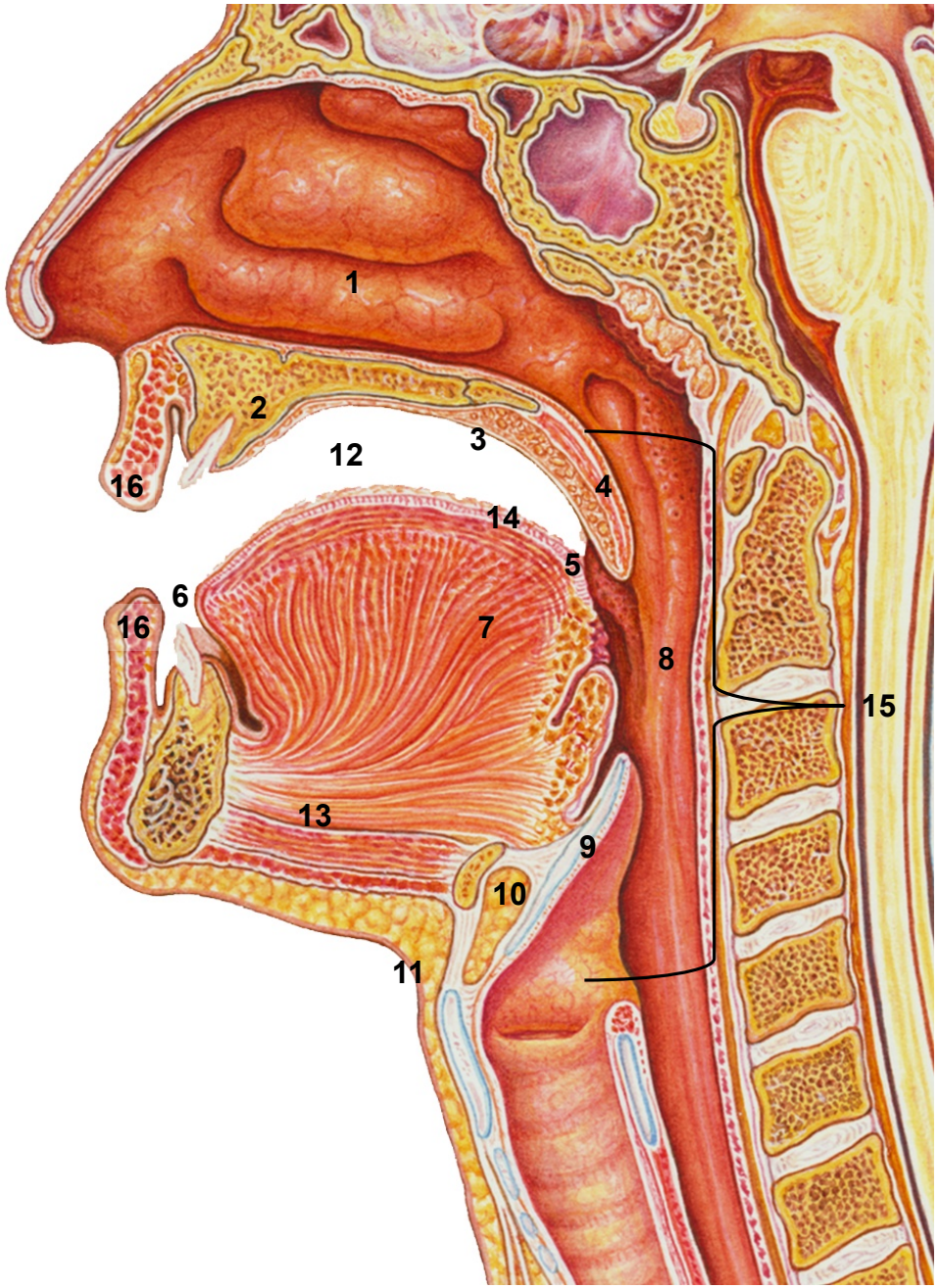


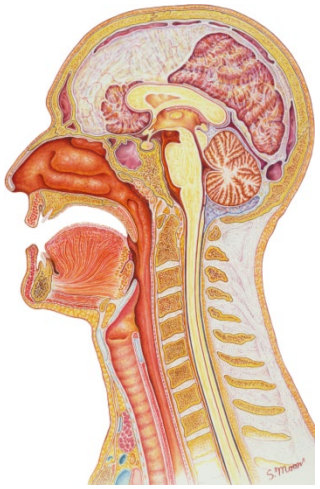
To be added

Procurement

Mouth & Tongue

Anatomy

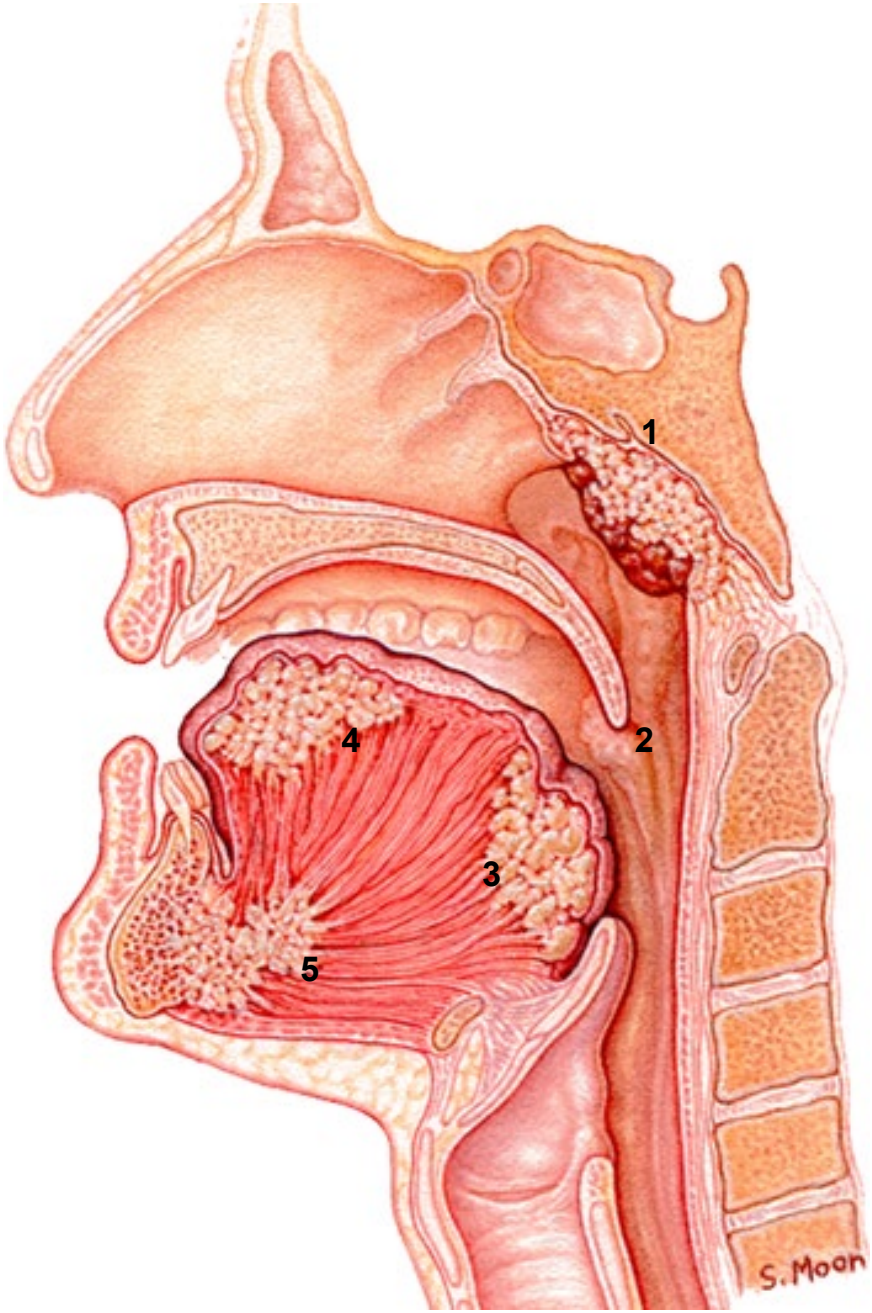


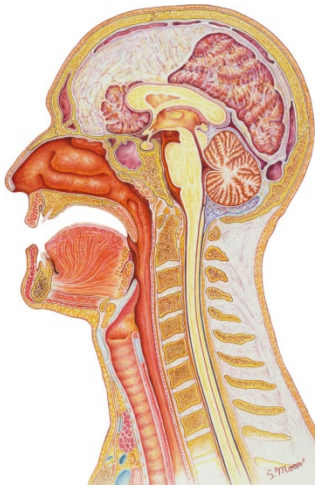


1. nasal cavity
2. hard palate
3. soft palate
4. nasopharynx
5. uvula
6. anterior tongue
7. posterior tongue
8. oropharynx
9. laryngopharynx
10. glottis
11. larynx
12. gum
13. floor of mouth
14. oral cavity
15. pharynx
16. lips

Mouth & Tongue

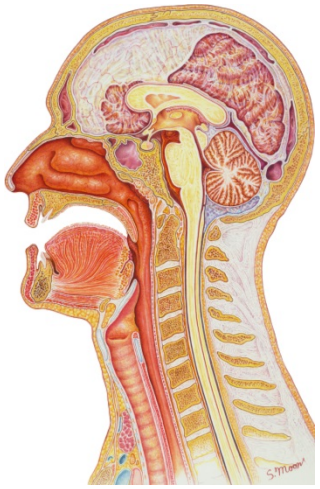
Tumors





1. pharyngeal tonsil carcinoma
2. palatine tonsil carcinoma
3. root of tongue carcinoma
4. carcinoma of anterior/superior tongue
5. carcinoma of floor of mandible invasion

Mouth & Tongue



More likely to support procurement:

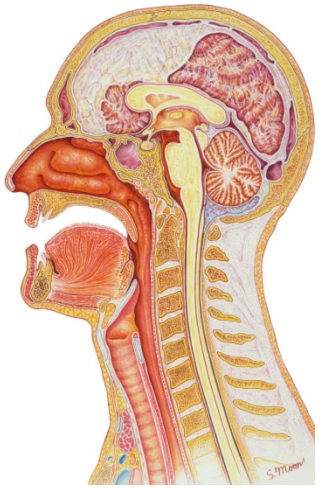
- glossectomy - surgical removal of part (partial) or one side (hemi) of the tongue.

Less likely to support procurement:

- none

Procedures

Mouth & Tongue

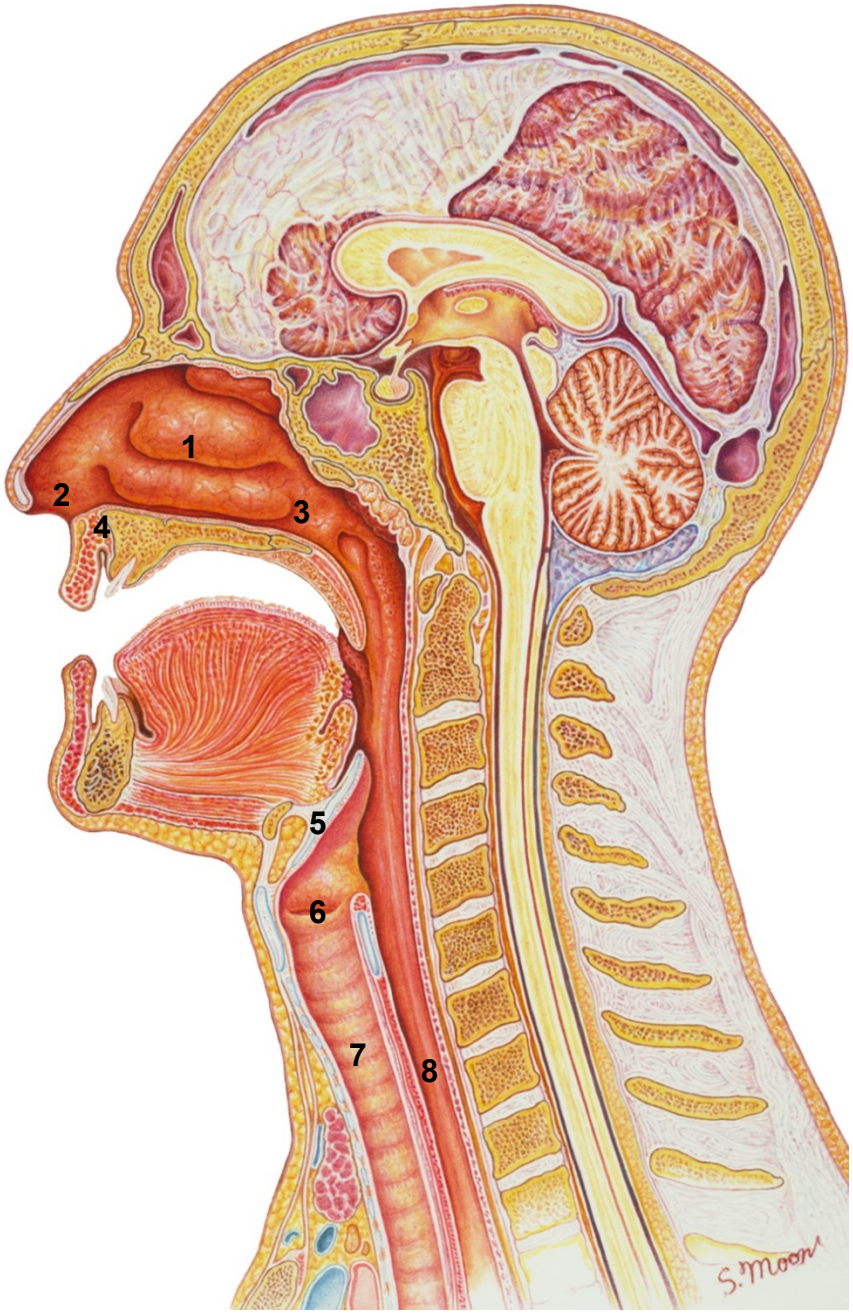


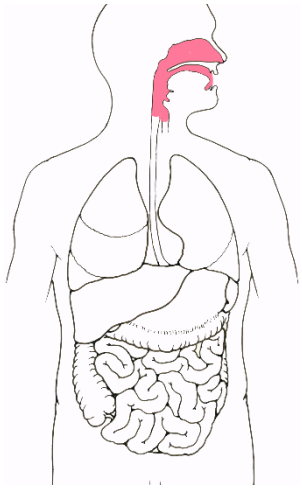
To be added

Procurement

Nasopharynx

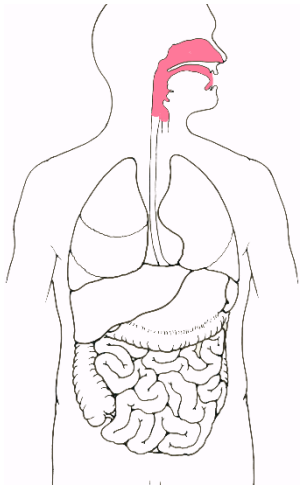
Anatomy





1. nasal cavity/conchae
2. nasal vestibule
3. nasopharynx
4. anterior nasal spine
5. epiglottis
6. larynx
7. trachea
8. esophagus

Nasopharynx



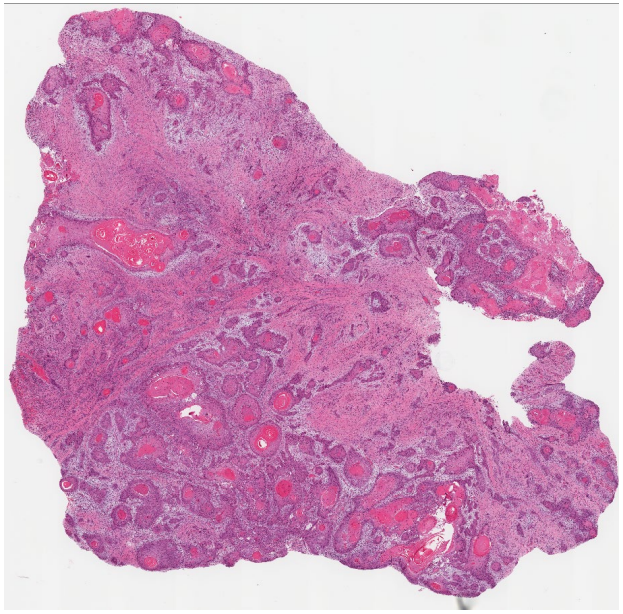
1. nasopharyngeal carcinoma
2. laryngeal carcinoma (at base of tongue)
3. laryngeal carcinoma (at top of larynx)
4. laryngeal postcricoid carcinoma

Tumors

Nasopharynx

Tumors

1



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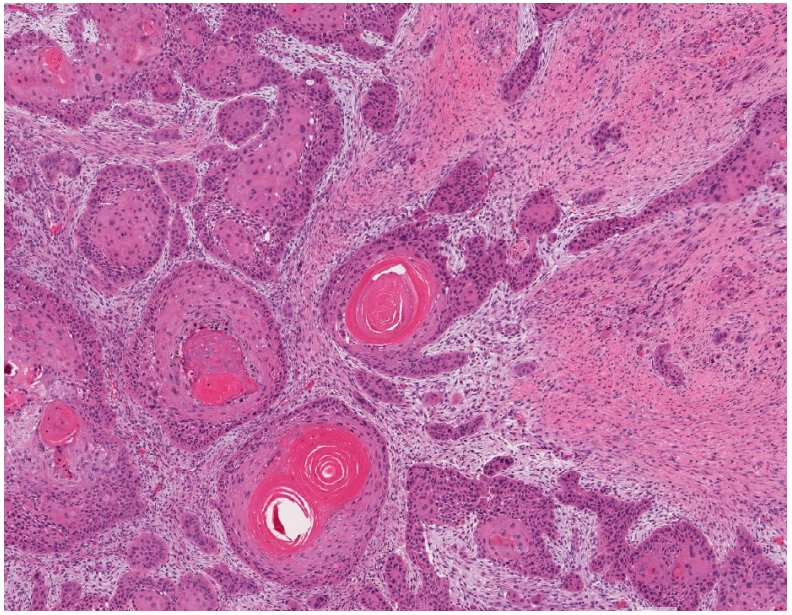
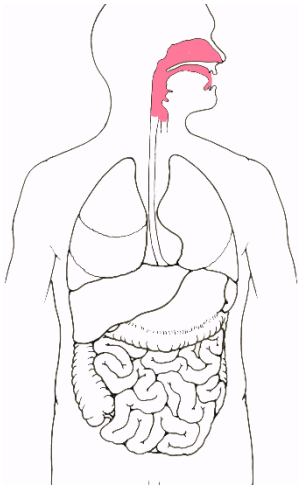
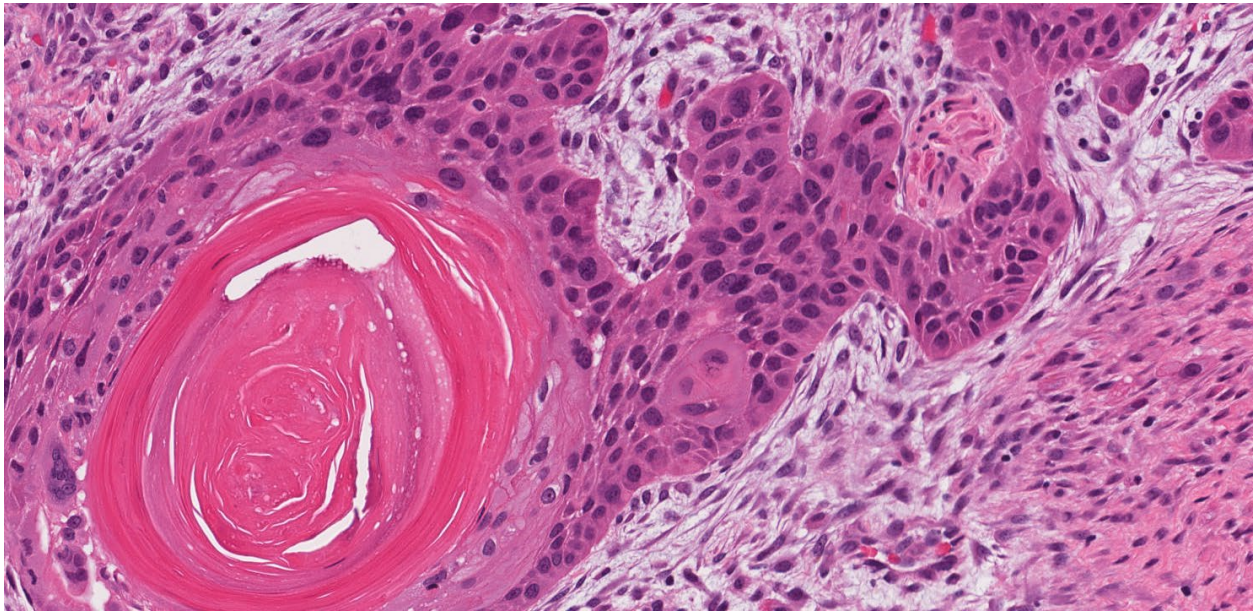




Squamous cell carcinoma in oropharynx, well differentiated. Note that morphology is clear at various magnifications.

1. 0.8X
2. 5X
3. 20X
4. 40X

3



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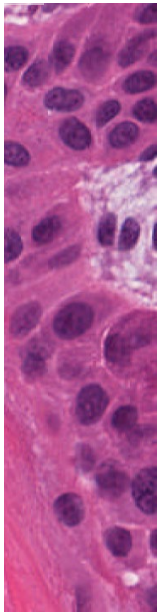
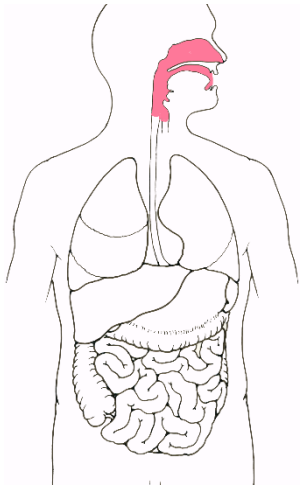


Nasopharynx



More likely to support procurement:

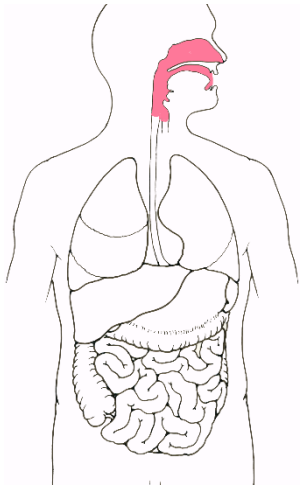
- nasopharyngectomy - endoscopic or open surgical resection of the nasopharynx.

Less likely to support procurement:

- rhinoseptoplasty (rhinoplasty) - is surgery on the nose to change its shape or improve its function.

Procedures

Nasopharynx

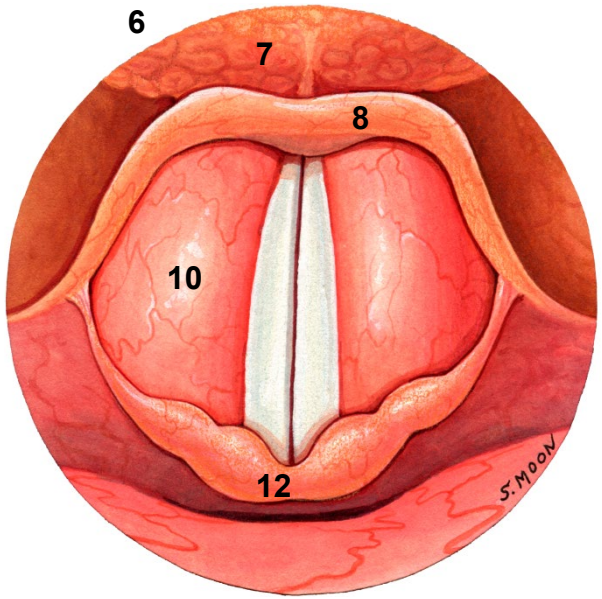


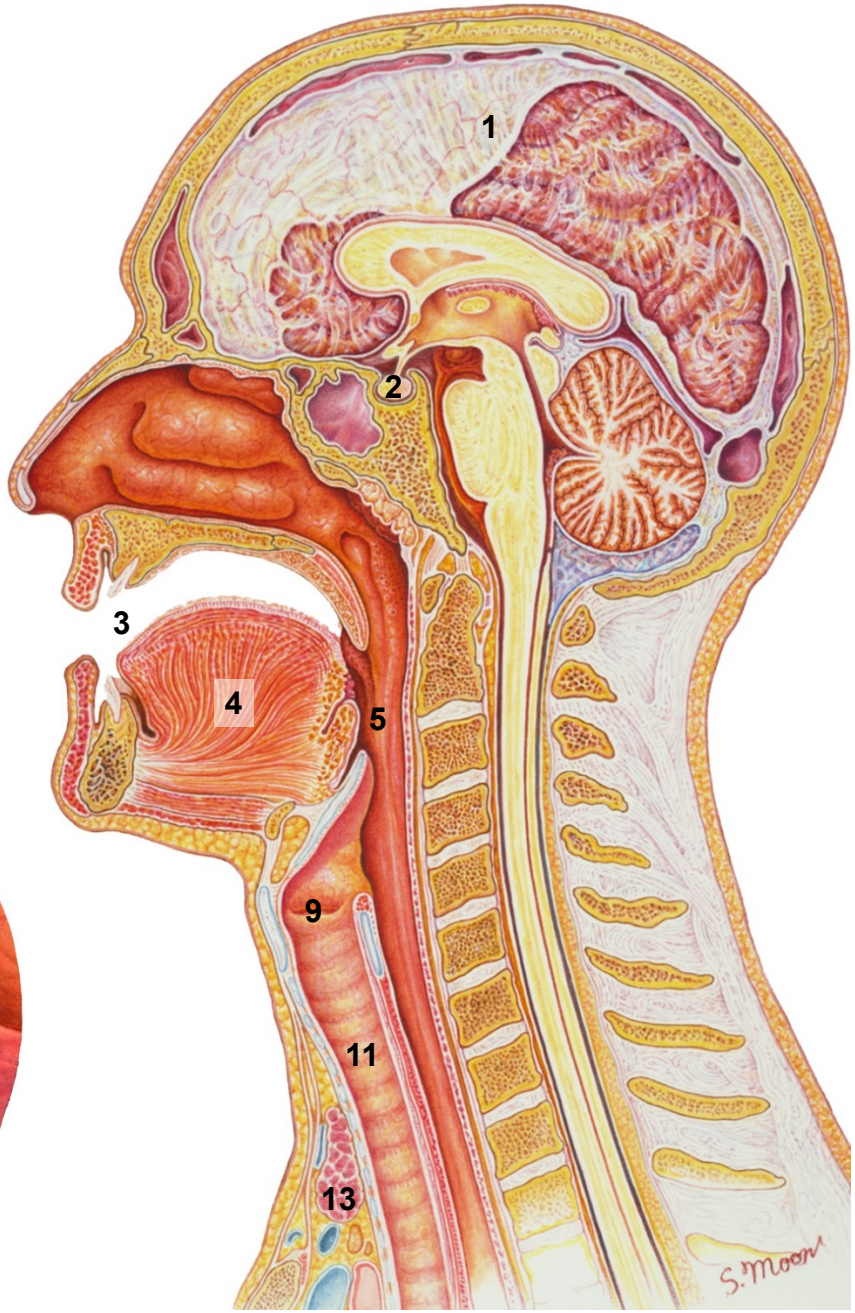
To be added

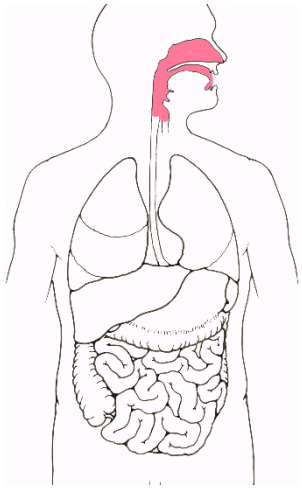
Procurement

Larynx

Anatomy



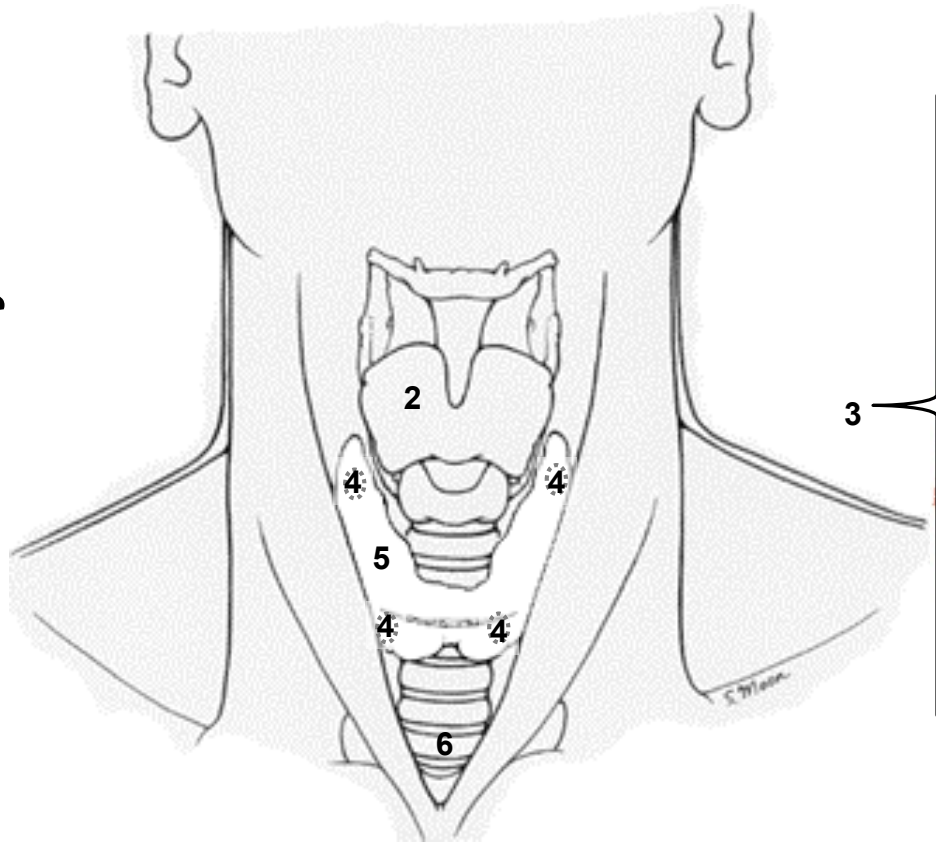


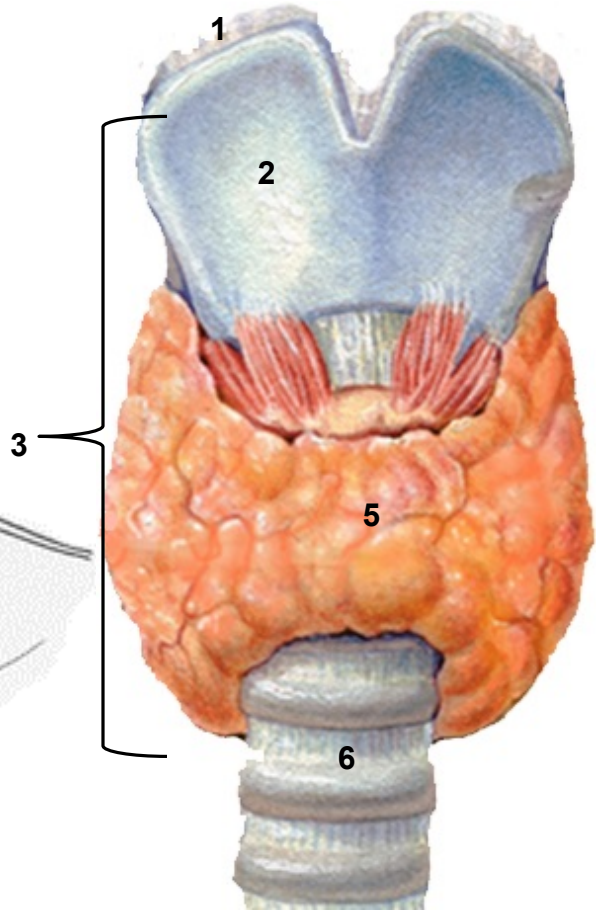


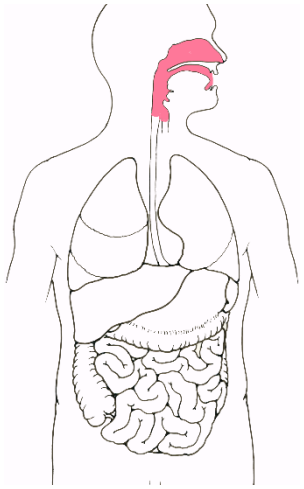
1. brain
2. pituitary
3. mouth
4. tongue
5. oropharynx
6. larynx viewed from above (superior view)
7. lost tongue glosso-epiglottic (hyoepiglottic) ligament
8. epiglottis
9. larynx
10. false cords
11. trachea
12. interarytenoid erasure
13. thyroid, parathyroid

Larynx

Anatomy



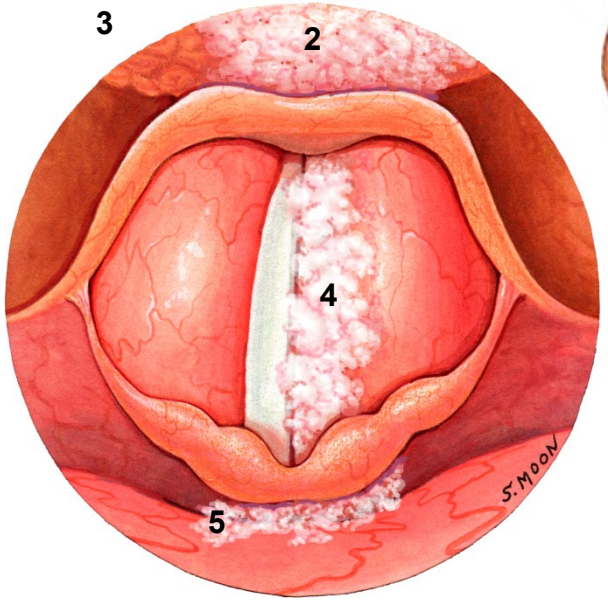


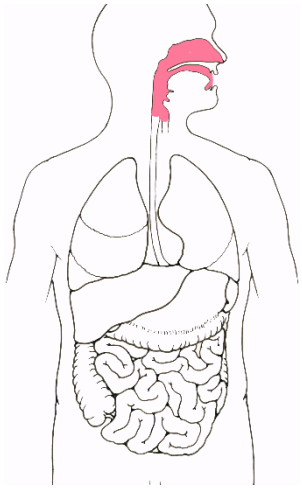


1. thyroid membrane
2. thyroid cartilage
3. larynx
4. parathyroid (on back side)
5. thyroid (front view)
6. trachea

Larynx

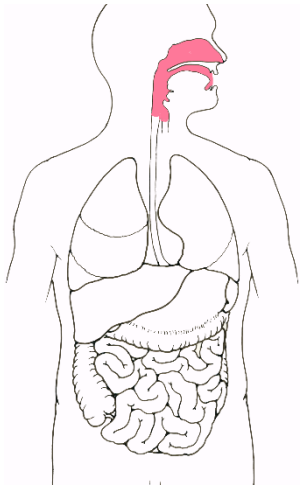
Tumors





1. nasopharyngeal carcinoma
2. laryngeal carcinoma (at base of tongue)
3. larynx viewed from above (superior view)
4. extensive laryngeal carcinoma of left vocal arytenoid region (at top of larynx)
5. laryngeal postcricoid carcinoma

Larynx



More likely to support procurement:

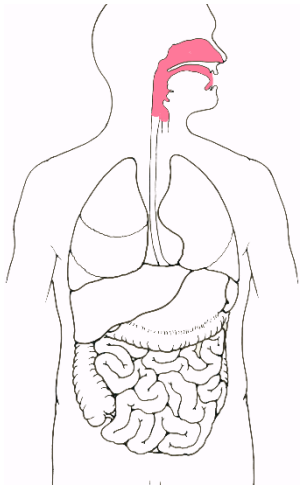
- open partial laryngectomy - surgical procedure on the voice box designed to preserve the voice. Part of the voice box (one vocal cord, part of a cord, or the epiglottis) is removed.

Less likely to support procurement:

- none

Procedures

Larynx

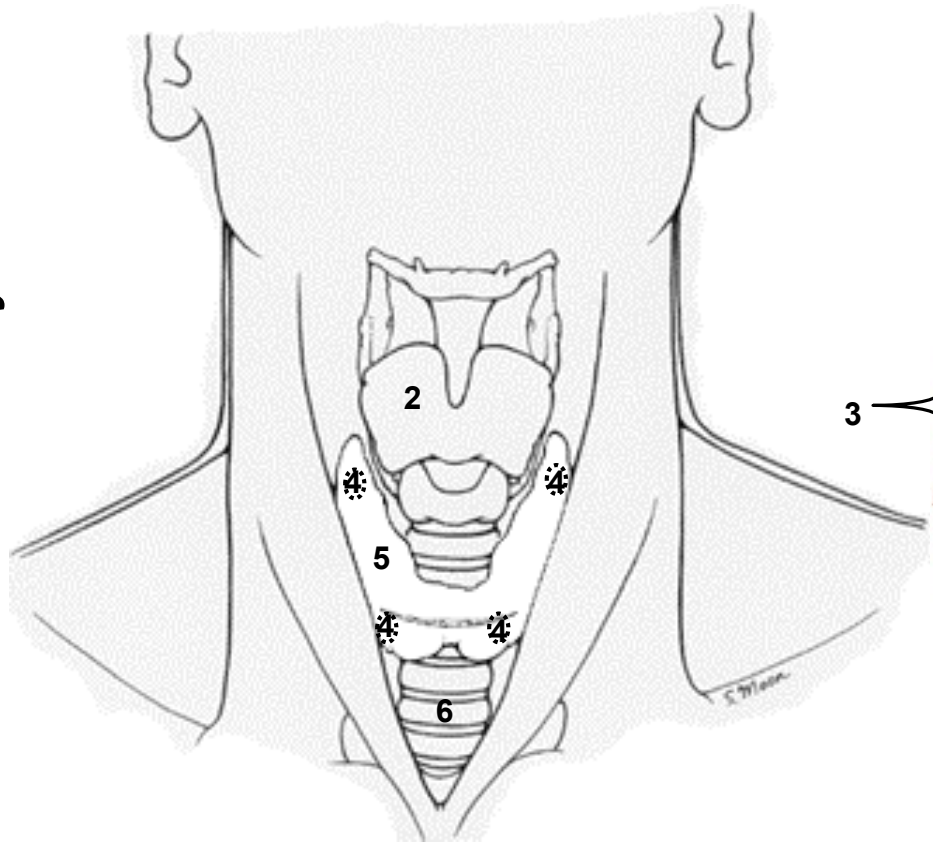


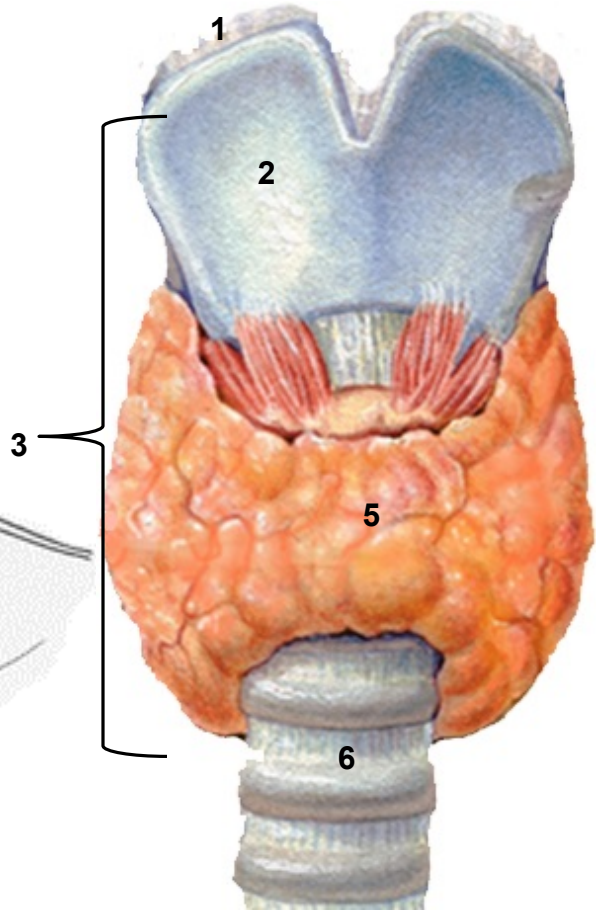
To be added

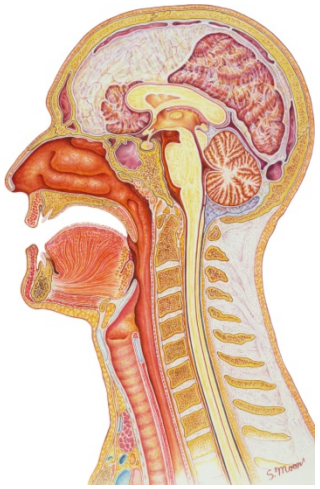
Procurement

Thyroid & Parathyroid

Anatomy



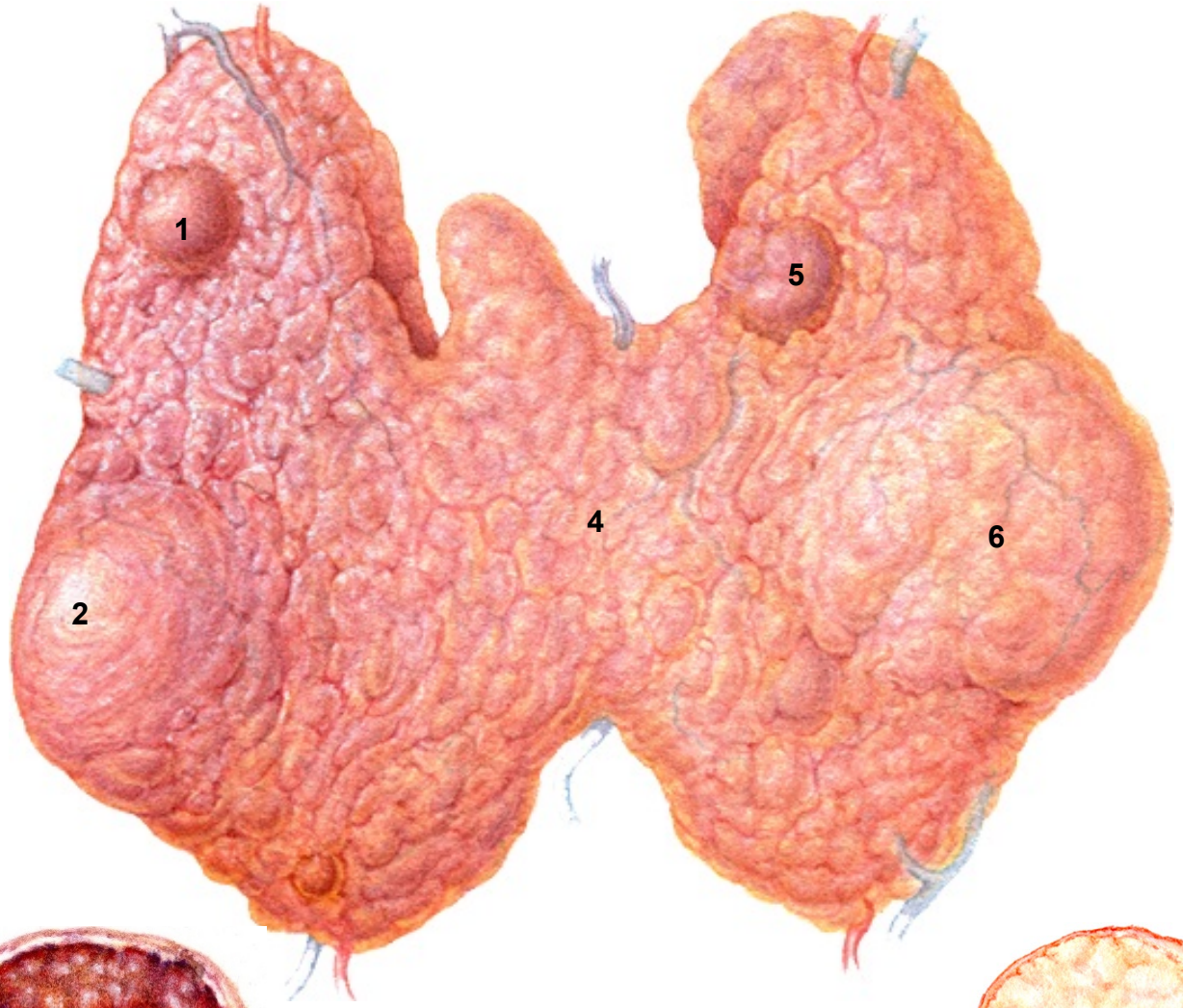


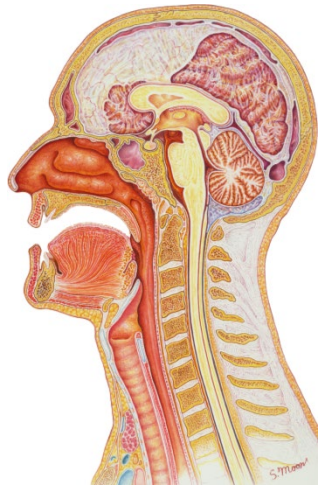


1. thyroid membrane
2. thyroid cartilage
3. larynx
4. parathyroid (on back side)
5. thyroid (front view)
6. trachea

Thyroid & Parathyroid

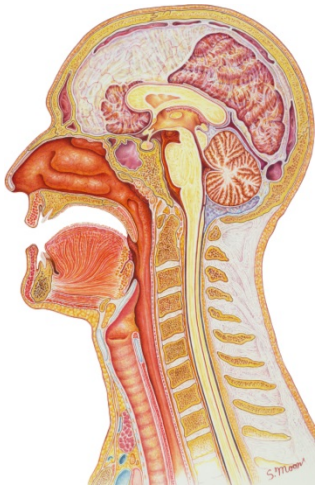
Tumors





1. early papillary carcinoma +/- 80%?
2. late papillary carcinoma +/- 80%?
3. cross section of excised late papillary carcinoma +/- 80%?
4. thyroid (front view)
5. early follicular carcinoma +/- 20%?
6. late follicular carcinoma +/- 20%?
7. cross section of excised late follicular carcinoma +/- 80%?

Thyroid & Parathyroid



More likely to support procurement:

- thyroidectomy – surgery to remove the thyroid gland or thyroid tumors.
- parathyroidectomy - surgery to remove the parathyroid glands or parathyroid tumors.

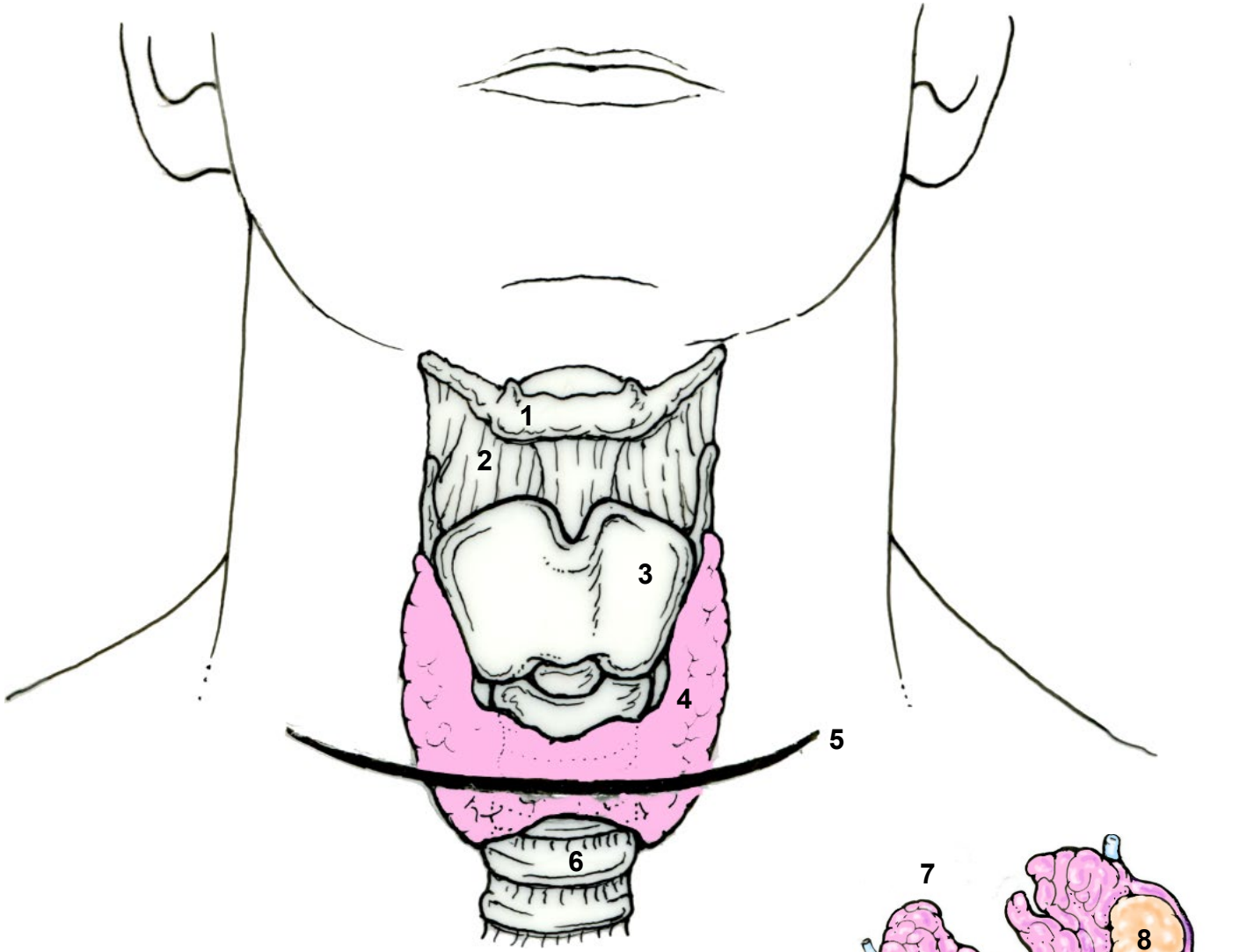
Less likely to support procurement:

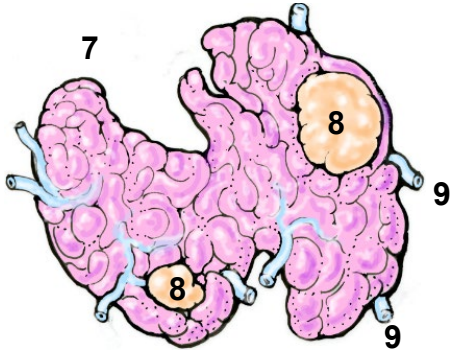
- none

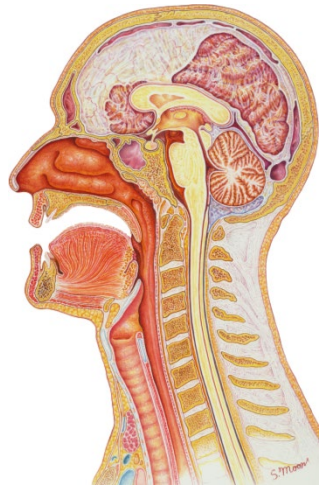
Procedures

Thyroid & Parathyroid

Procedure





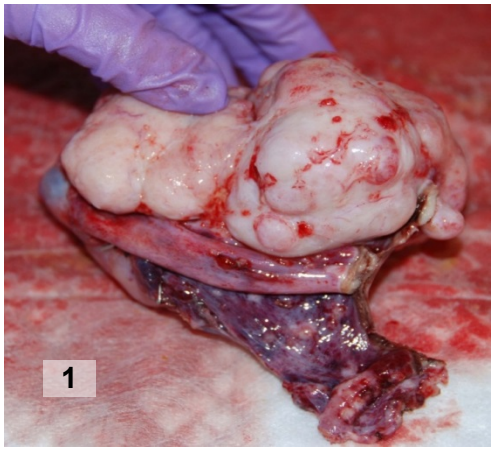


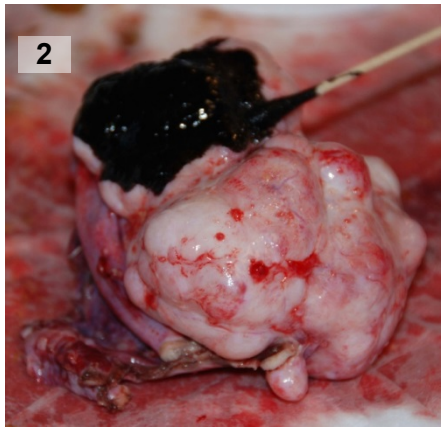
Thyroidectomy

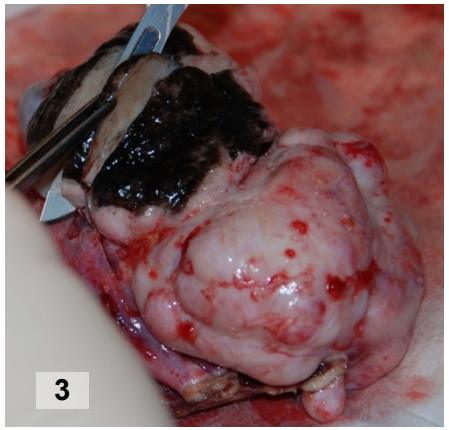
1. hyoid bone
2. thyroid membrane
3. thyroid cartilage
4. thyroid
5. incision
6. trachea
7. extracted thyroid with two tumors
8. tumor
9. venous channel

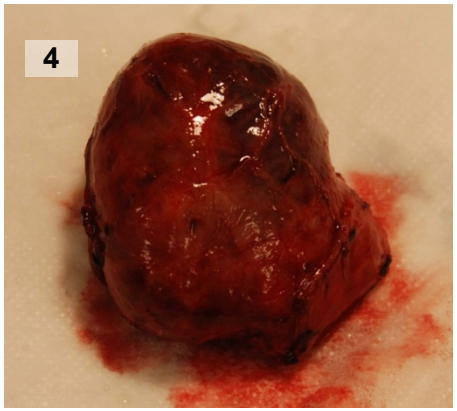
Thyroid & Parathyroid

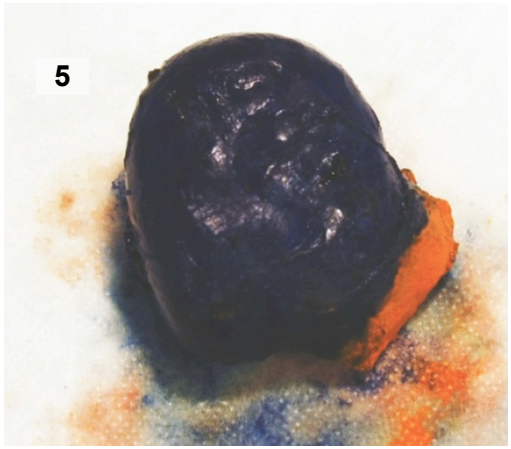
Procurement

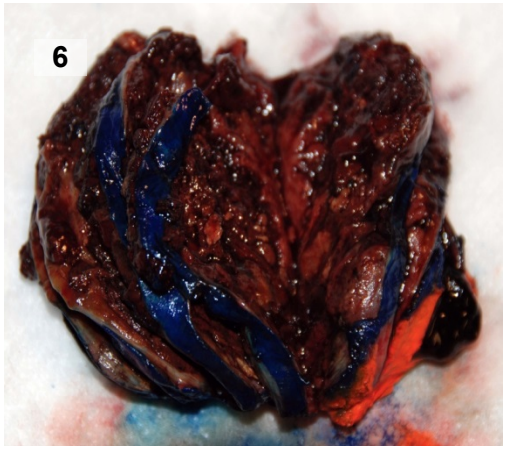


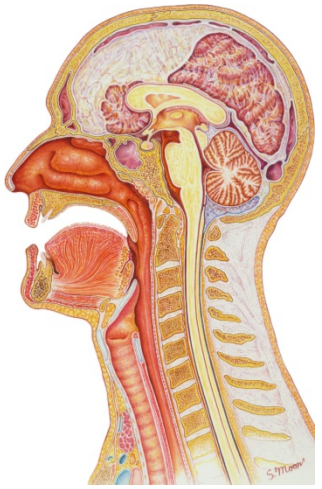












Hemi-thyroid (1-3)

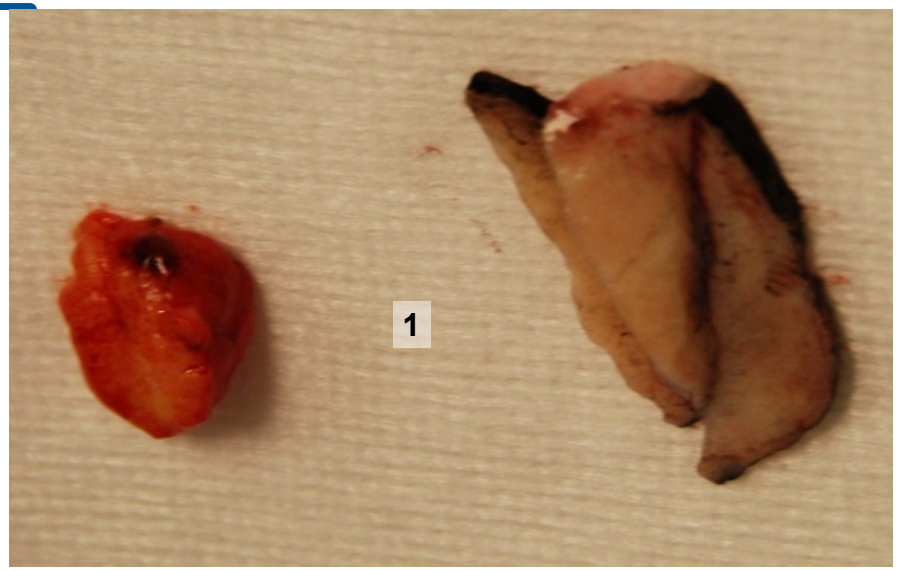
1. extracted half of thyroid before inking
2. during inking
3. during sectioning

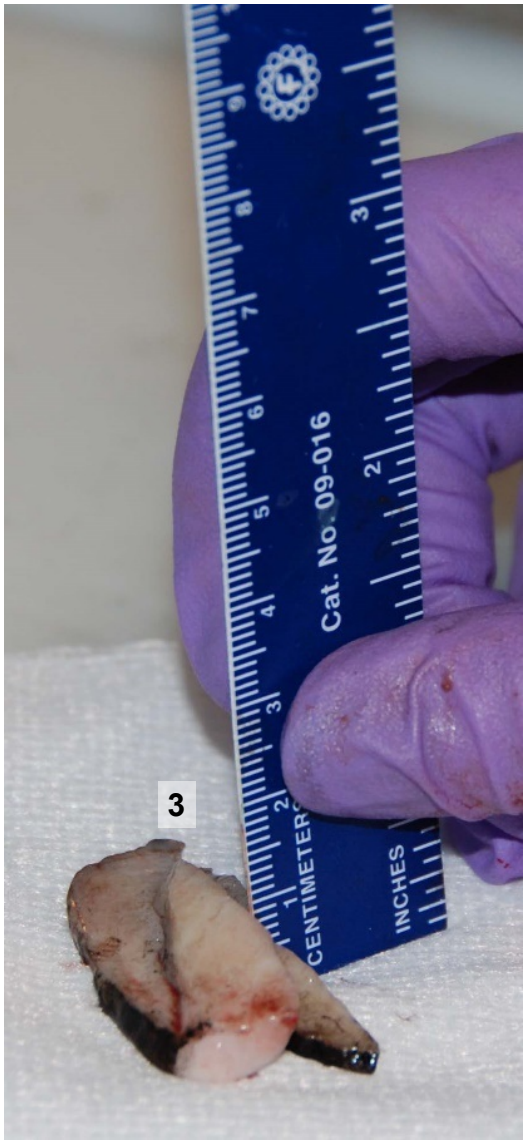
Nodule (4-6)

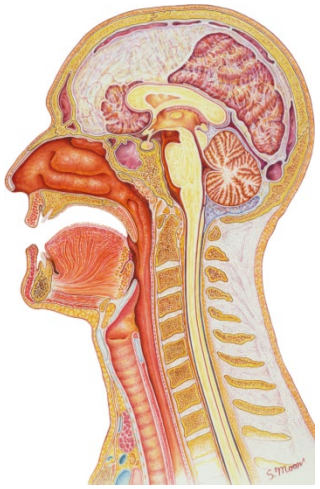
4. extracted thyroid nodule before inking
5. after inking
6. after sectioning

Thyroid & Parathyroid

Procurement

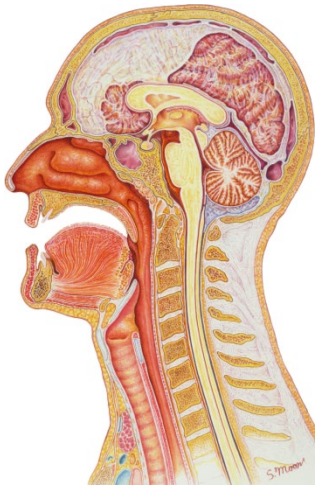






1. thyroid sections
2. measure section width/length
3. measure section thickness

Head & Neck



- To be added

Tips

Heart

To be added

Anatomy

Heart

To be added

Tumors

Heart

- heart transplant - surgery to remove a person's diseased heart and replace it with a healthy heart from a deceased donor.
- autopsy
- valve replacement

Procedures

Heart

To be added

Procurement

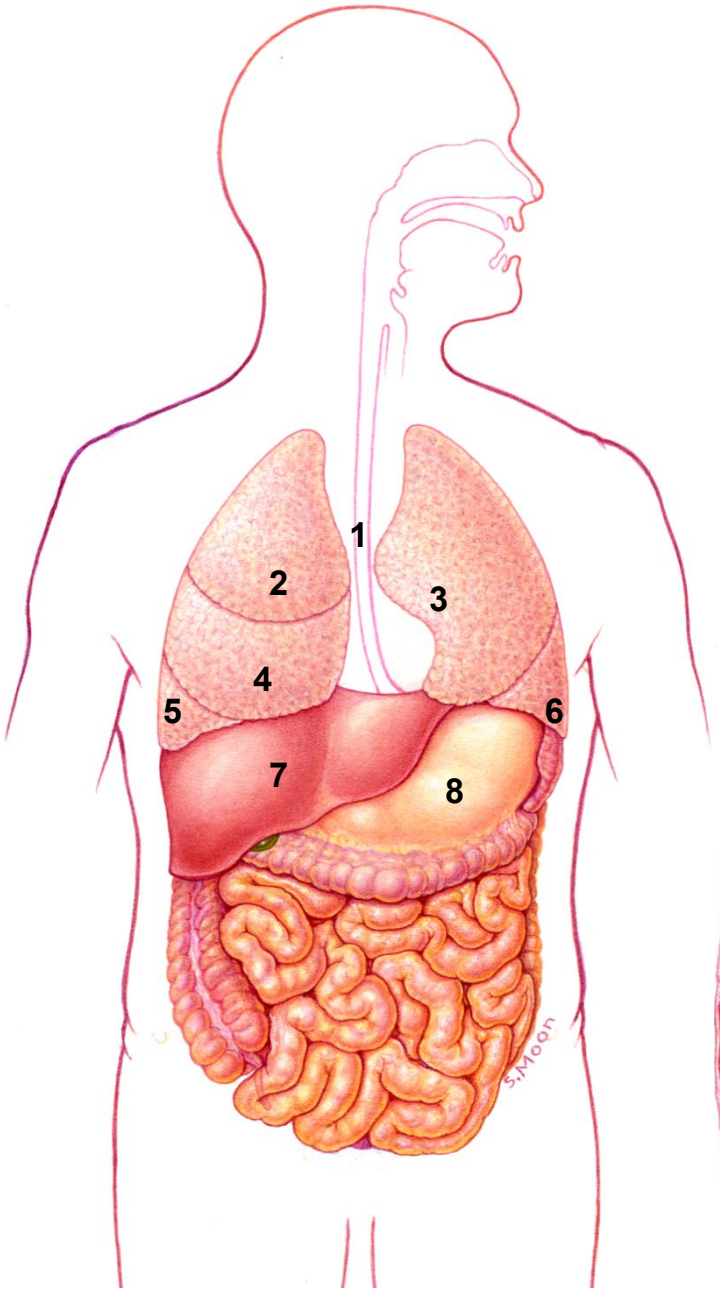
Heart

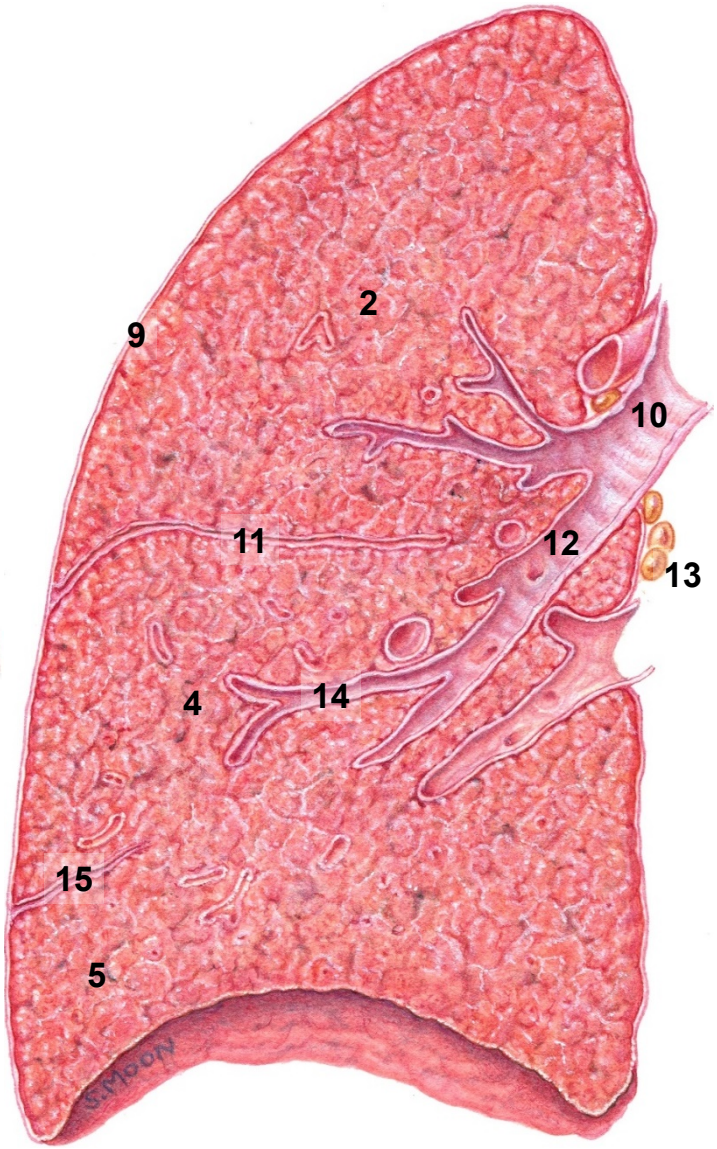
To be added

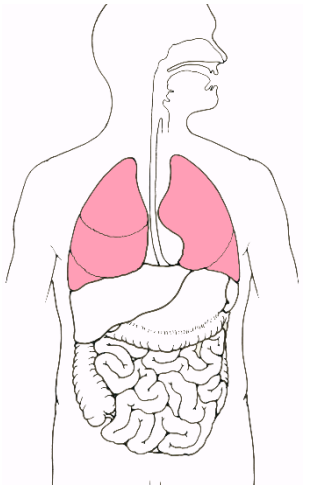
Tips

Lung

Anatomy



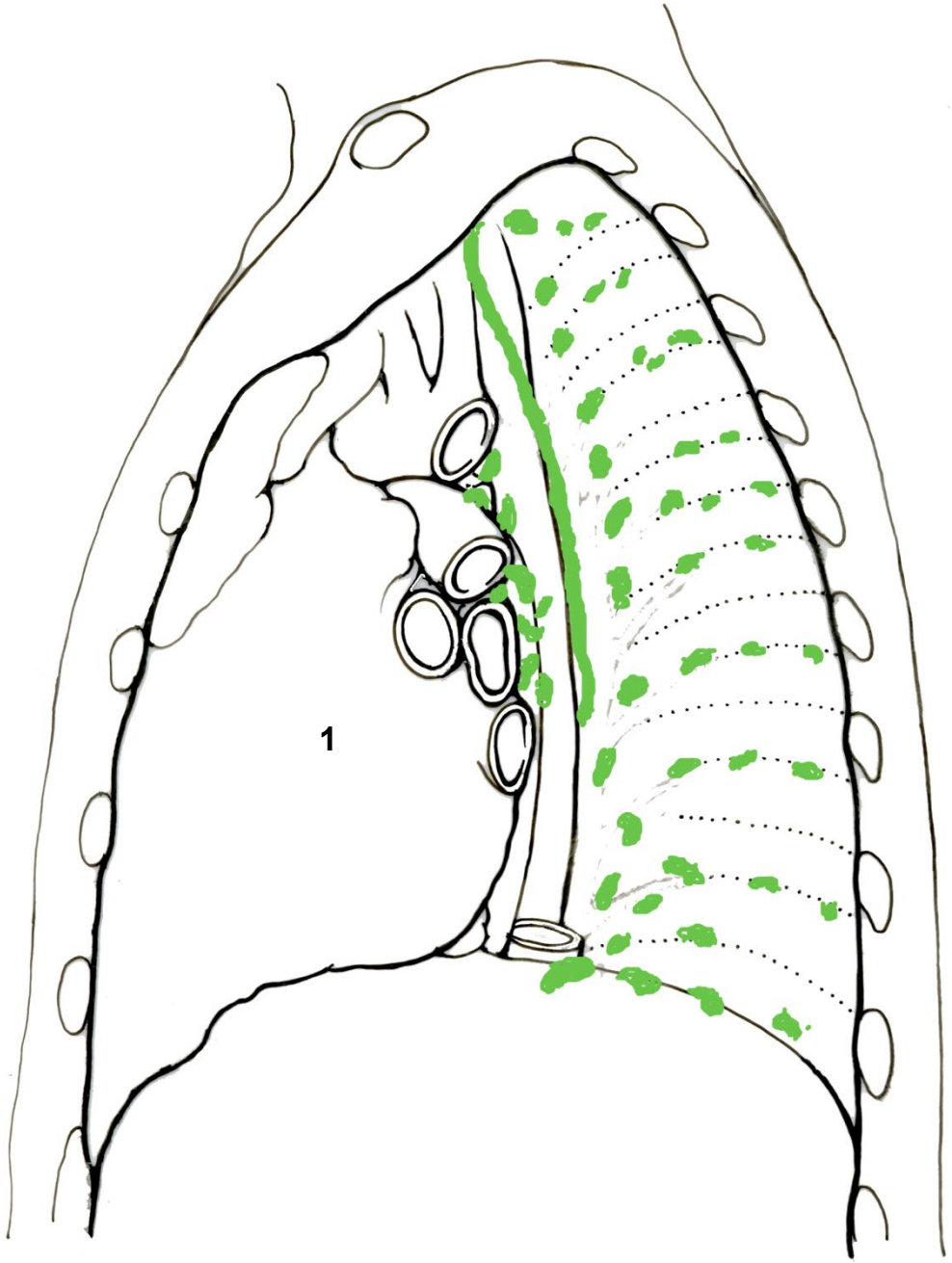


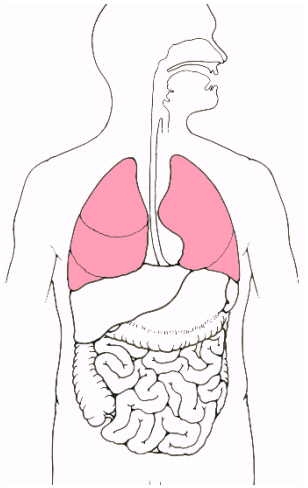


1. trachea
2. right superior lobe (lung)
3. left superior lobe (lung)
4. right middle lobe (lung)
5. right inferior lobe (lung)
6. left inferior lobe (lung)
7. liver
8. stomach
9. visceral pleura
10. main (primary) bronchus
11. horizontal fissure of lung
12. lobar (secondary) bronchus
13. coronal lymph nodes
14. segmental (tertiary) bronchus
15. oblique fissure of right lung

Lung

Anatomy





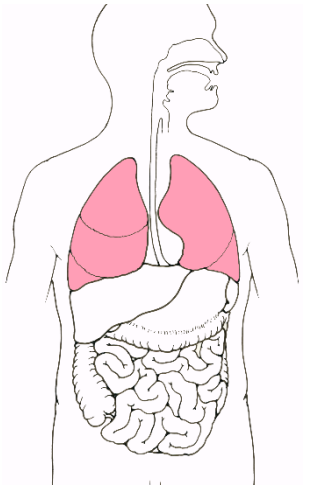
Lymph nodes in left thorax

1. heart

Lymph node anatomy in other sections

- Head & Neck
- Stomach
- Colon & Rectum
- Pancreas
- Spleen
- Female Reproductive
- Lymphatic System

Lung

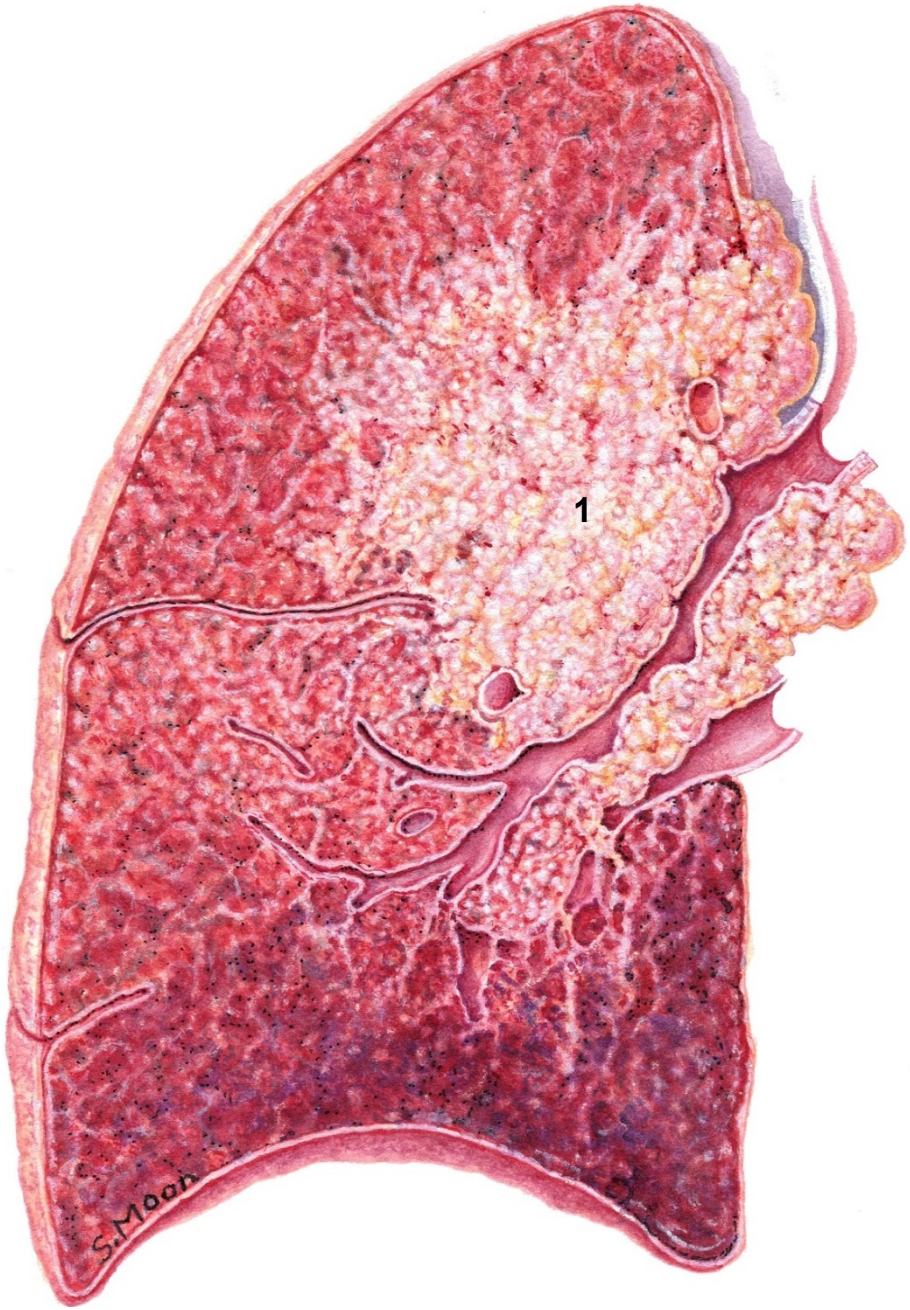


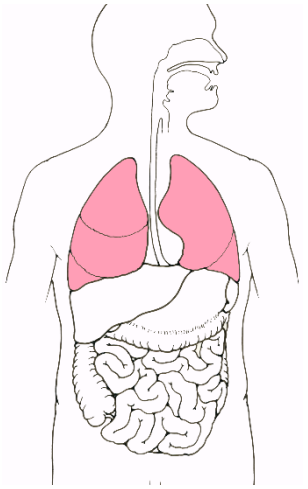
Apically located (at apex of lung)

1. squamous cell carcinoma

Tumors

Lung

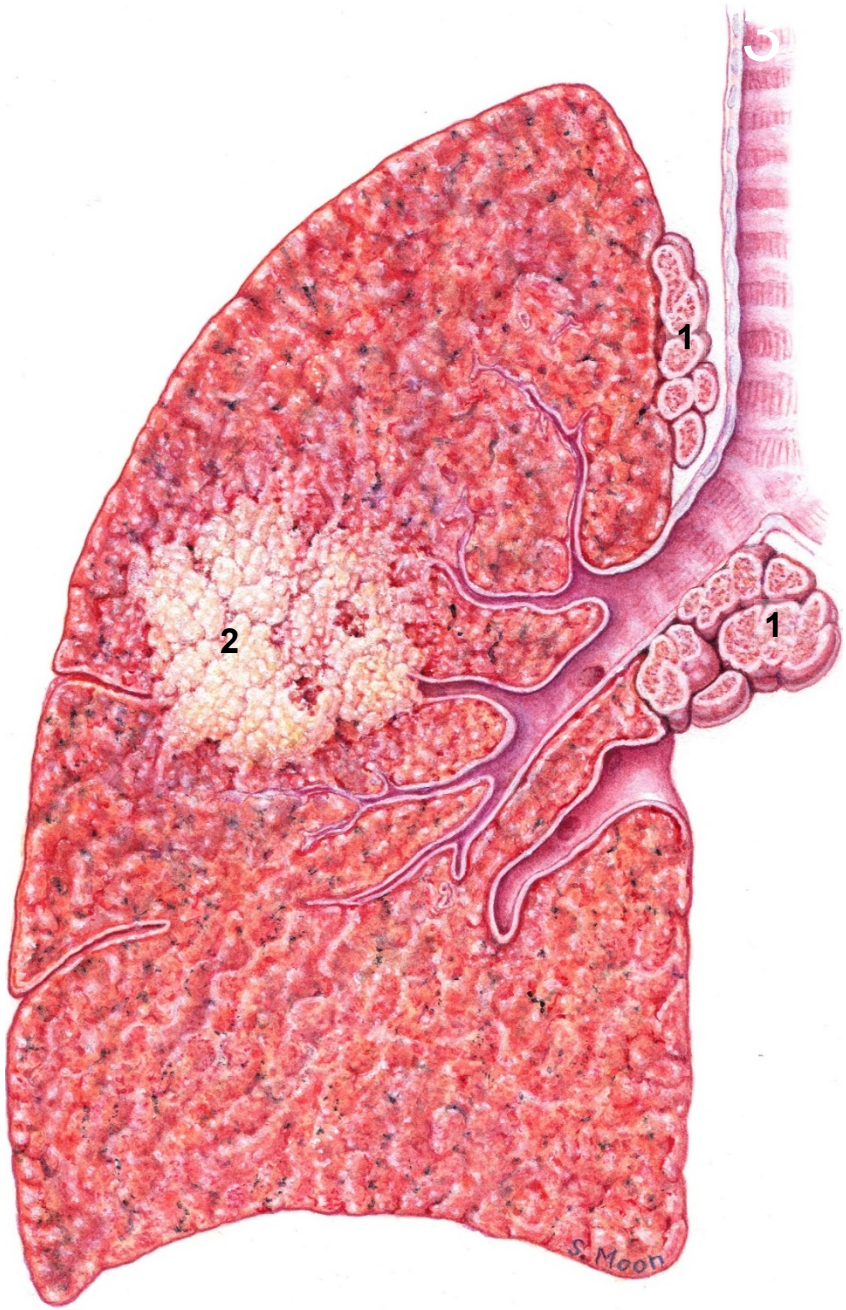


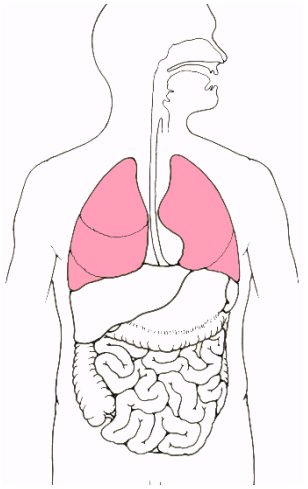


Centrally located in lung

1. small cell carcinoma

Lung



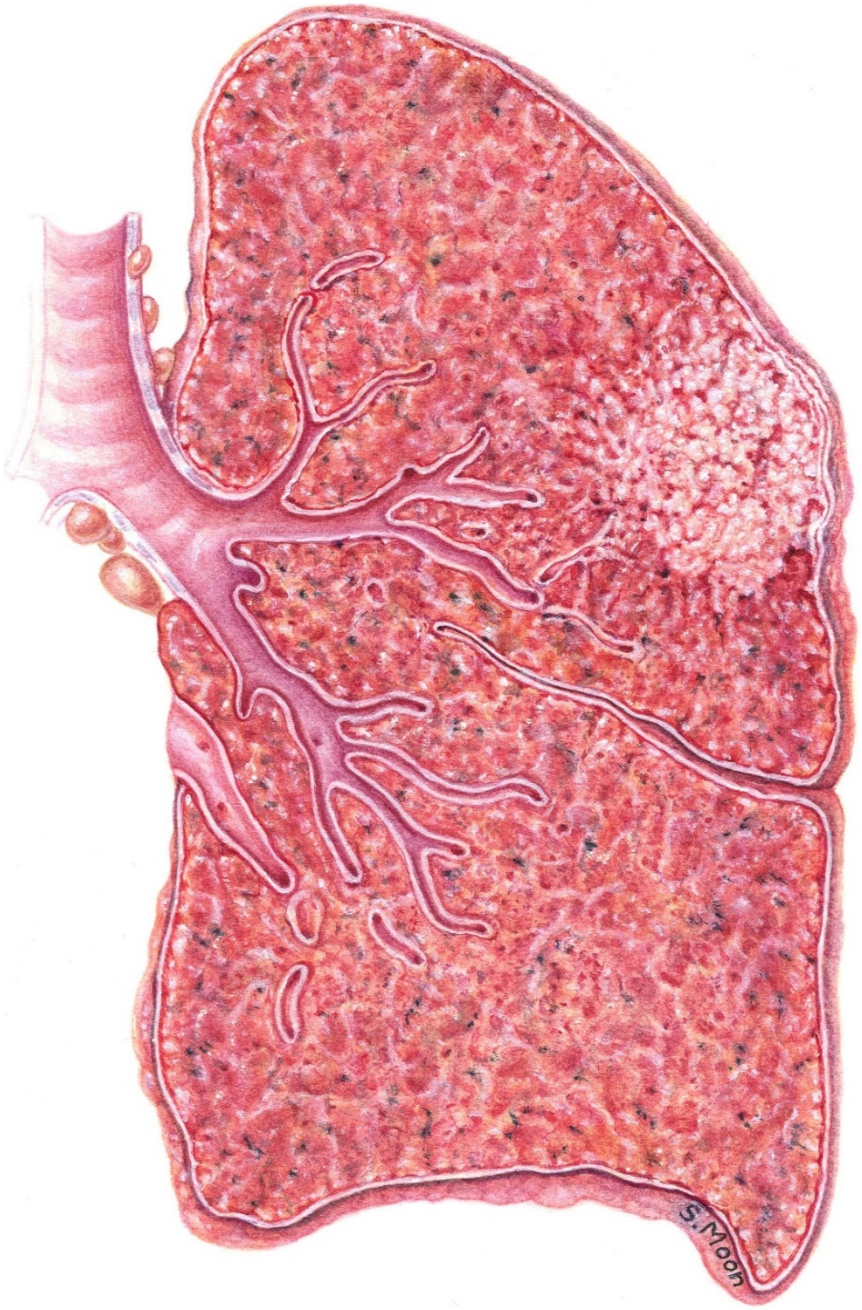


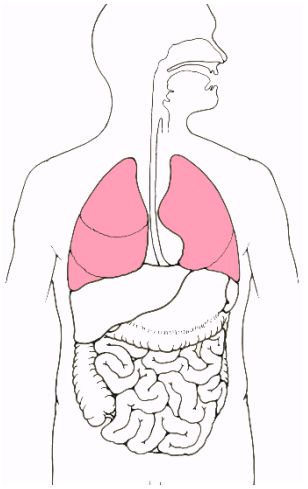
Located in mid-lung

1. hilar lymph nodes
2. large cell carcinoma

Tumors

Lung



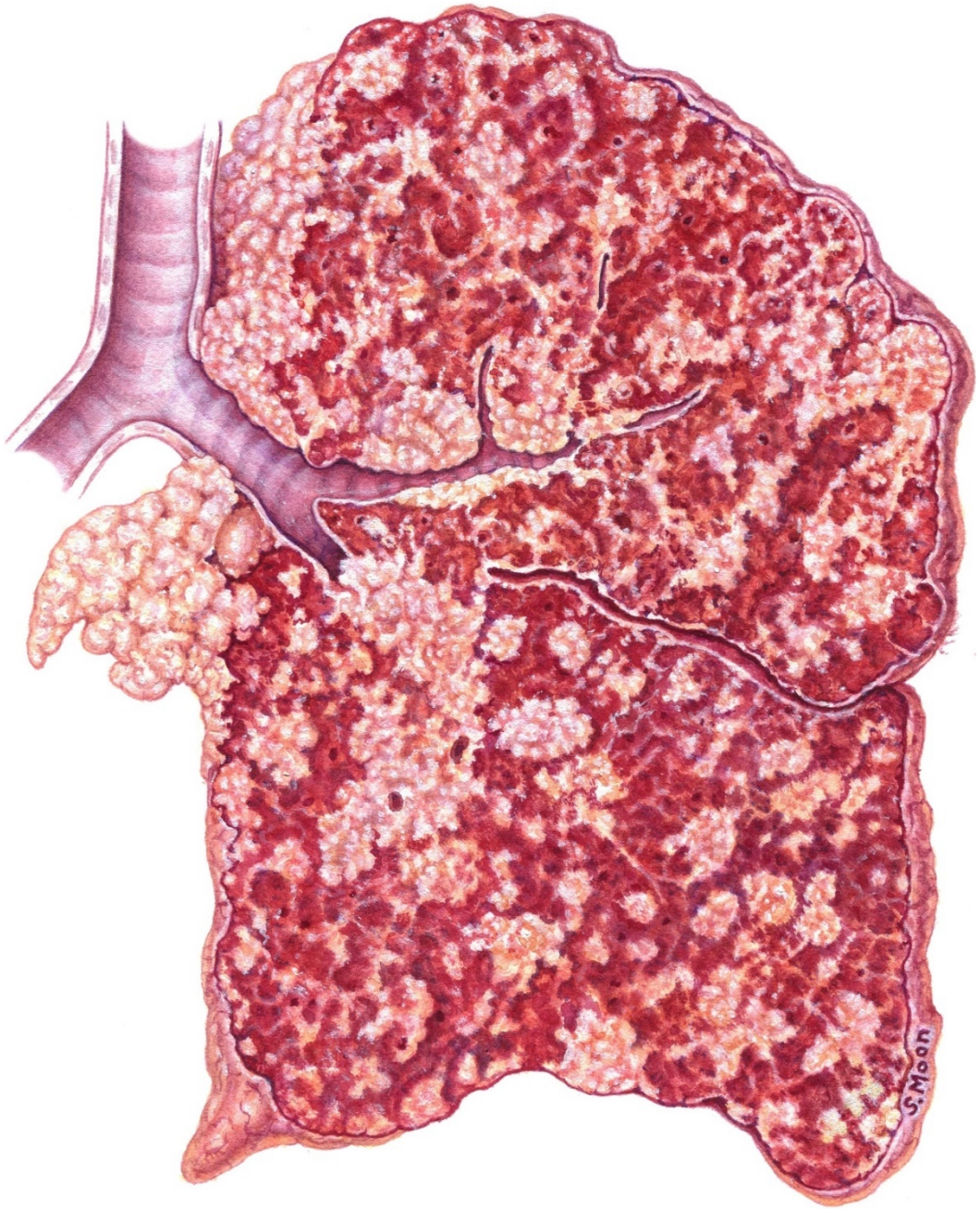


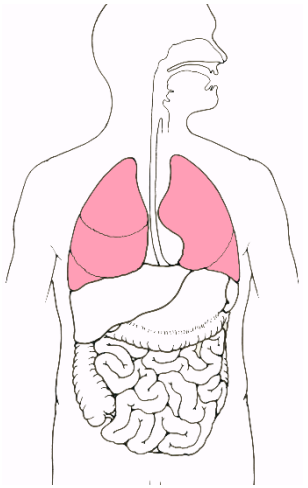
Peripherally located in lung

1. adenocarcinoma

Tumors

Lung



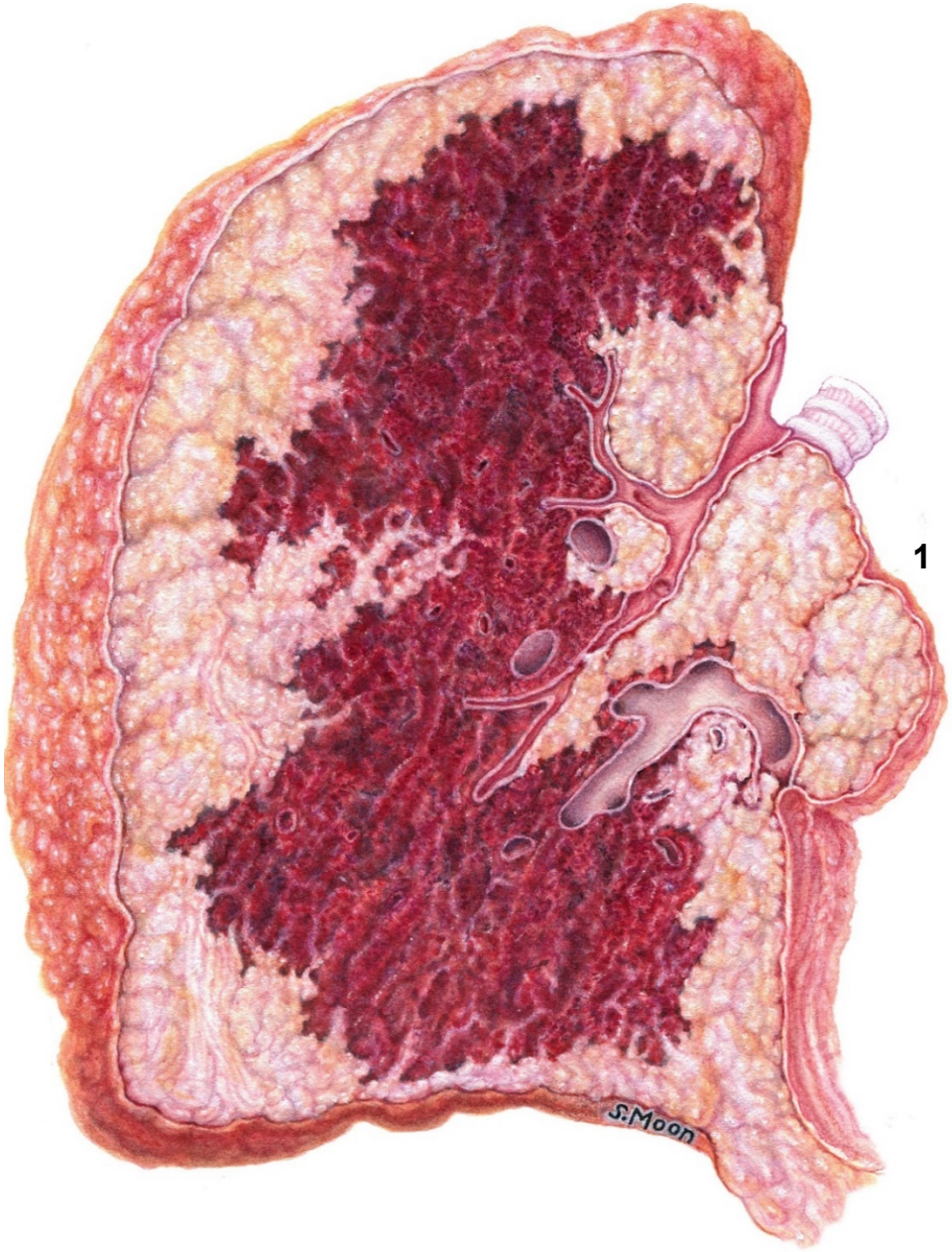


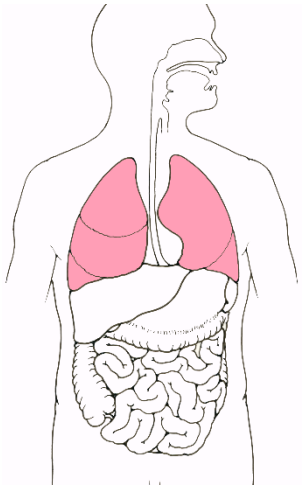
Metastatic pattern in lung possibly from kidney

Tumors

Lung

Tumors

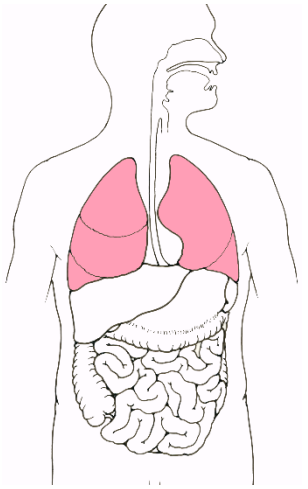




Pleural malignancy (lung)

1. mesothelioma

Lung



Procedures

More likely to support procurement:

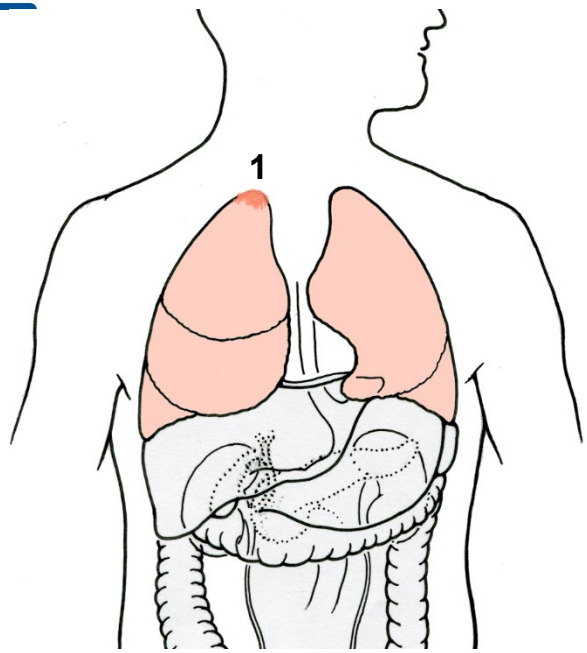
- segmentectomy or segmental resection (lung) - is a surgical procedure to remove part of a lung, as a sub-type of a resection, which might involve removing the whole lung. It may also be used to remove a tumor and normal tissue around it.
- lobectomy (lung) - surgical removal of a lobe of a lung.
- pneumonectomy - surgical removal of a lung or part of a lung.
- lung transplant - is a surgical procedure to replace a diseased or failing lung with a healthy lung, usually from a deceased donor.

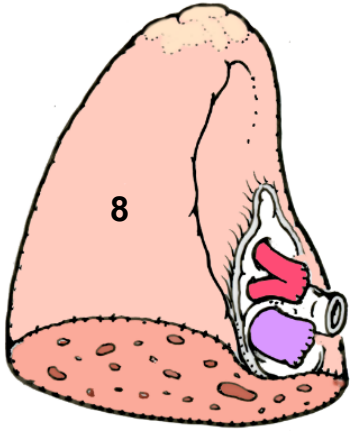
Less likely to support procurement:

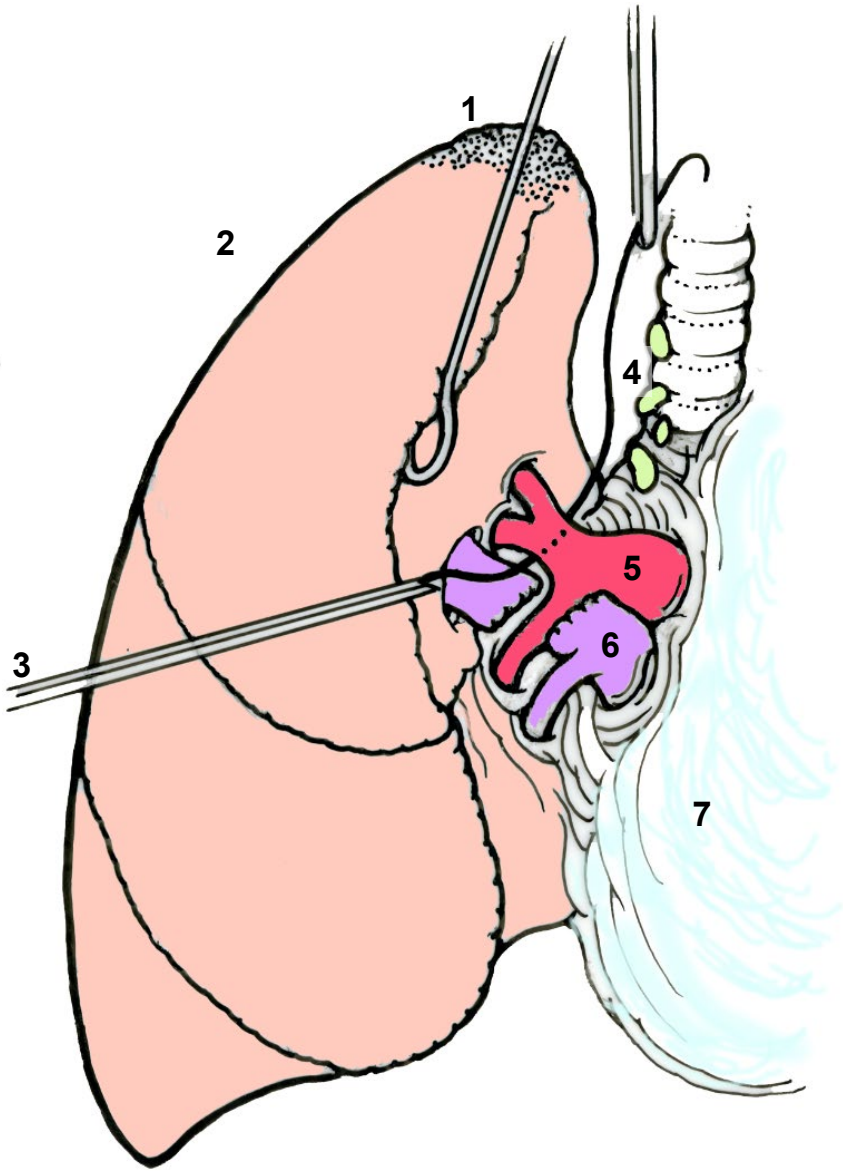
- none

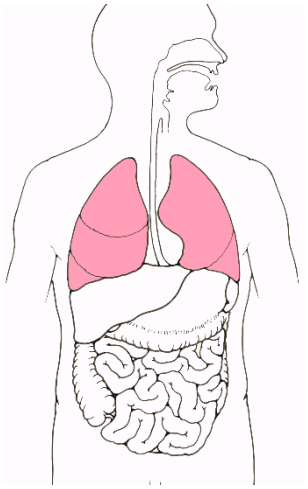
Lung

Procedure





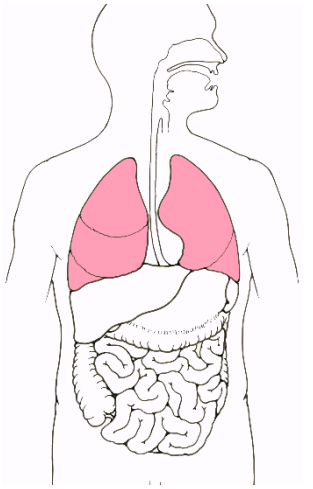


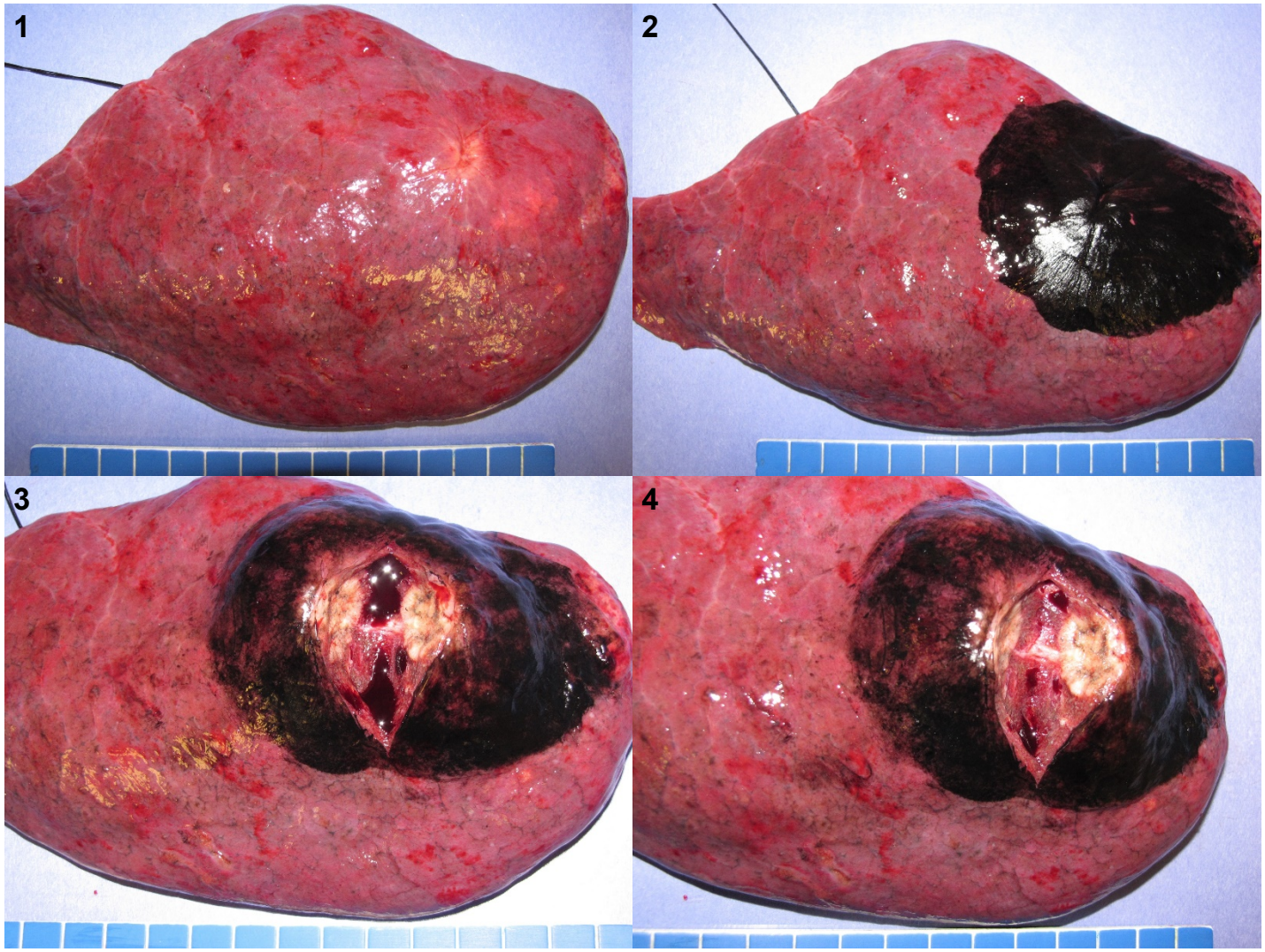


Lung lobectomy

1. apex tumor
2. right upper lobectomy
3. endovascular stapler and endoleader
4. pulmonary lymph nodes
5. pulmonary artery
6. superior pulmonary vein stapled
7. pericardium over right ventricular
8. resected upper right lung specimen

Lung

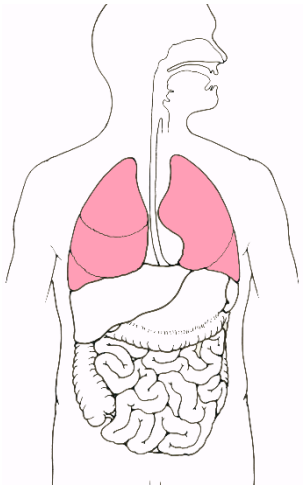




1. uninked lung
2. inked lung
3. lung after incision
4. lung opened at tumor

Procurement

Lung

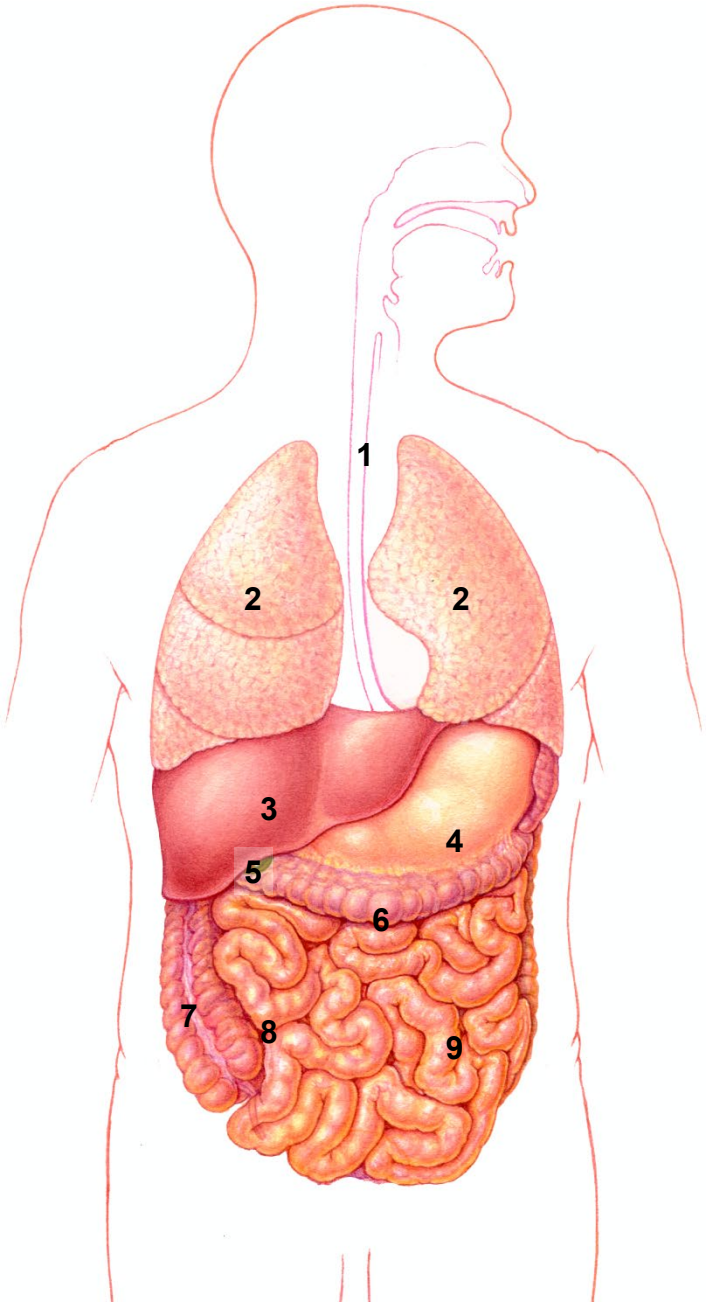


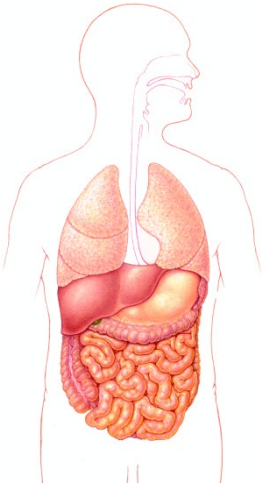
- To be added

Tips

Gastrointestinal (GI) Tract

Anatomy

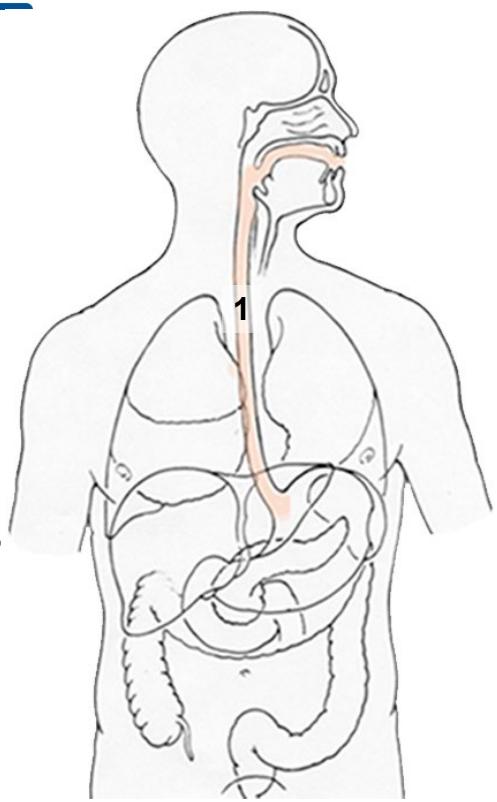


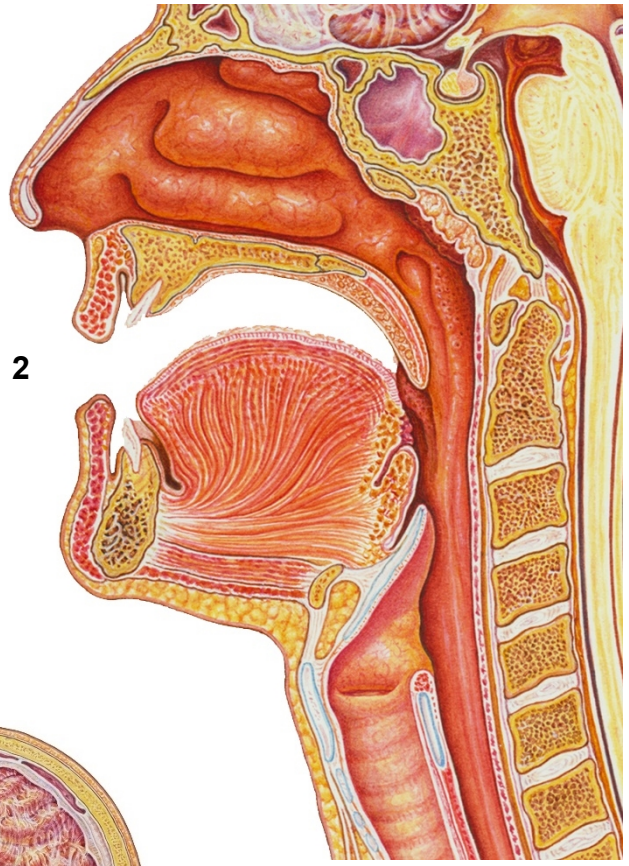


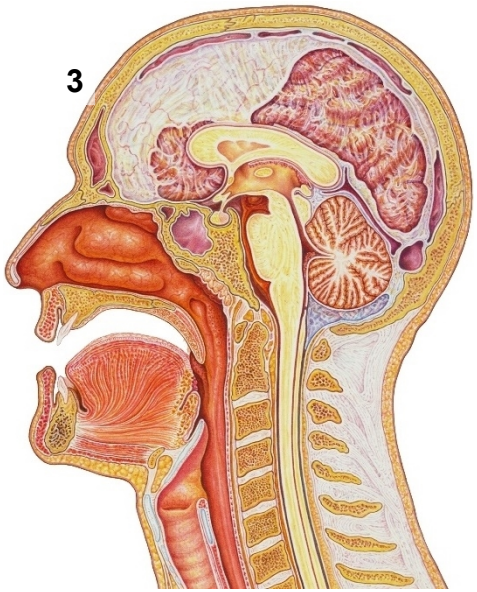
1. esophagus
2. lung
3. liver
4. stomach
5. gallbladder (behind liver)
6. transverse of large intestine/colon
7. descending colon
8. Ileum of colon
9. jejunum

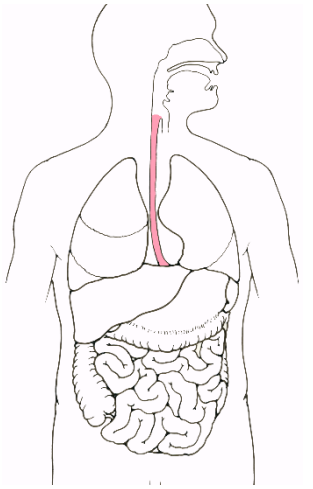
Esophagus

Anatomy





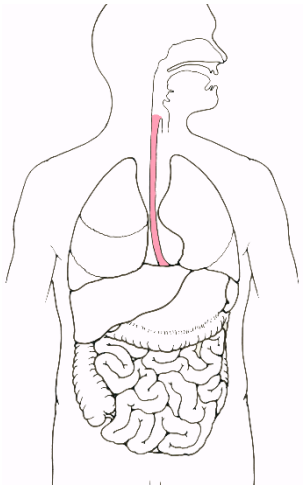




1. location of esophagus
2. to be added
3. to be added

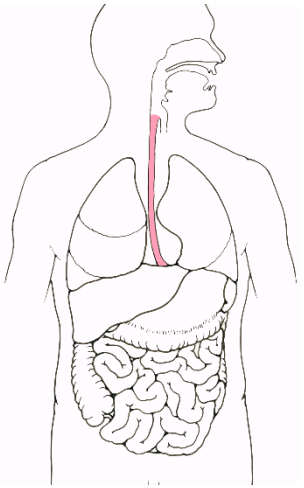
Esophagus

Tumors



1. upper, carcinoma
2. intramural leiomyoma
3. mid, ulcerative infiltrative carcinoma
4. lower, primary ulcerated carcinoma
5. lower, adenocarcinoma

Esophagus



More likely to support procurement:

- esophagectomy - is surgery to remove part or all of the esophagus. This is the tube that moves food from throat to stomach. After it is removed, the esophagus is rebuilt from part of the stomach or part of the large intestine.

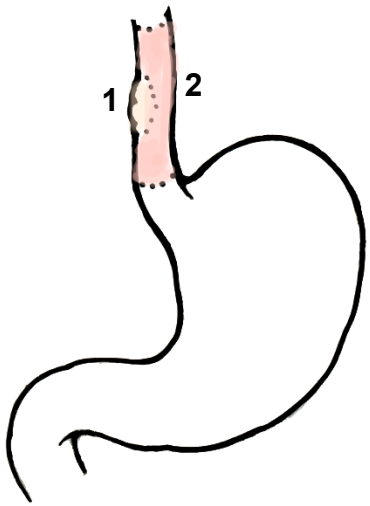
Less likely to support procurement:

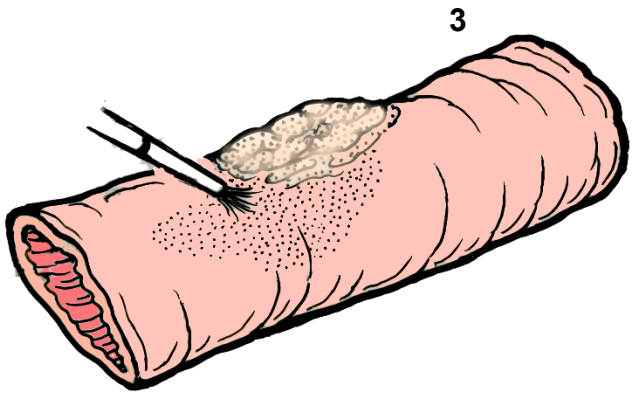
- none

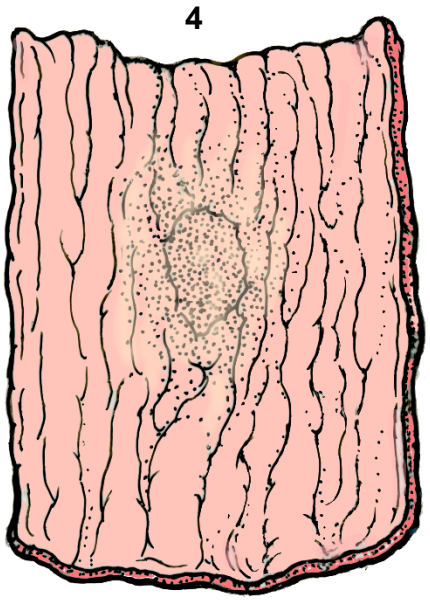
Procedures

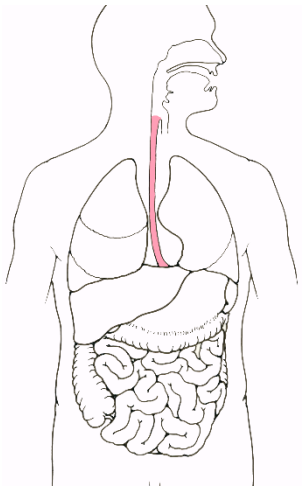
Esophagus

Procurement





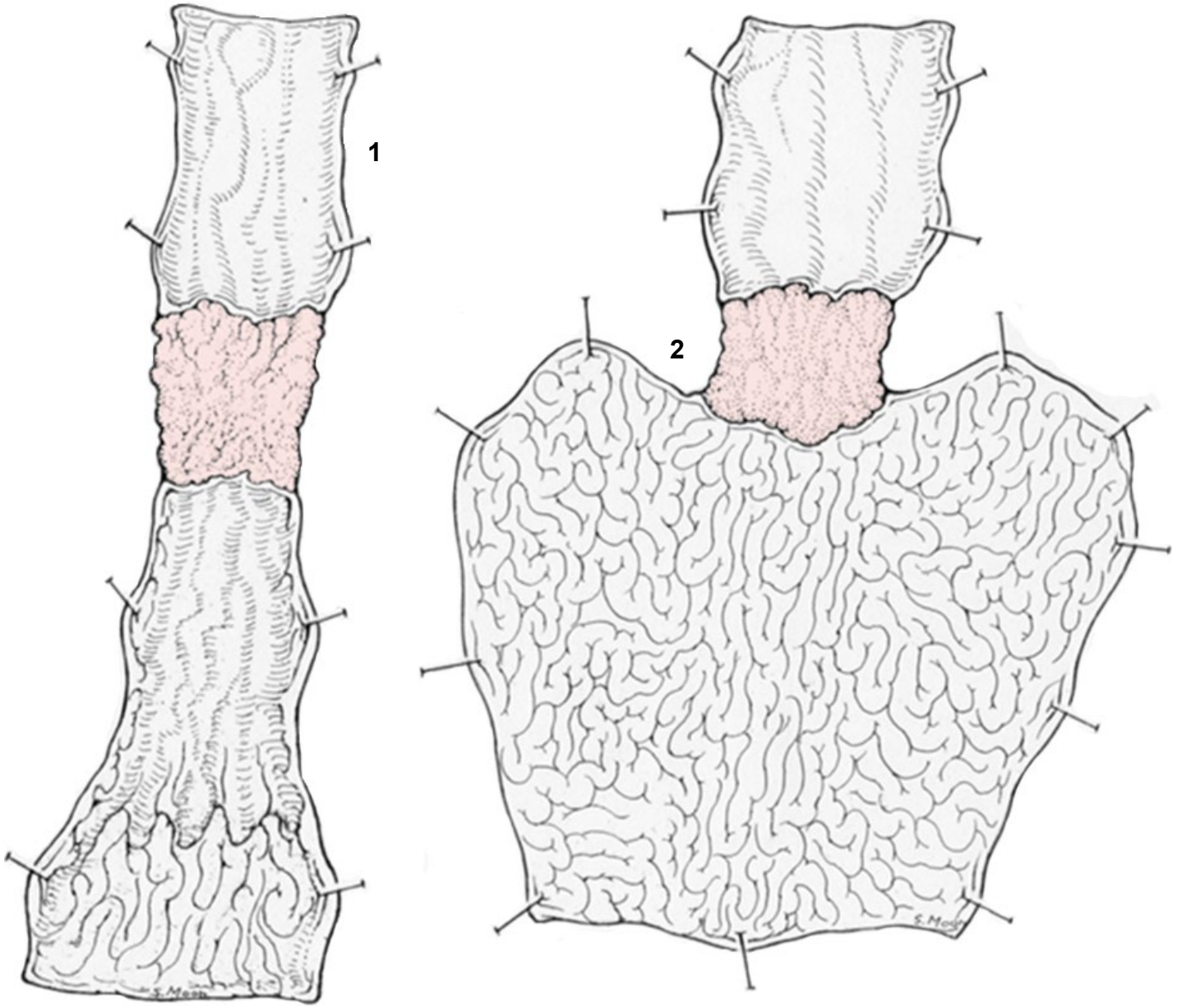


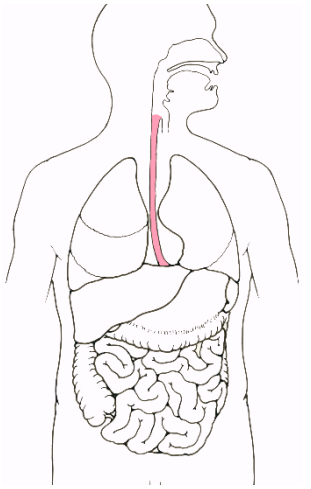


1. tumor
2. area of resected esophagus
3. resected esophagus specimen
4. dissected esophagus with tumor

Esophagus

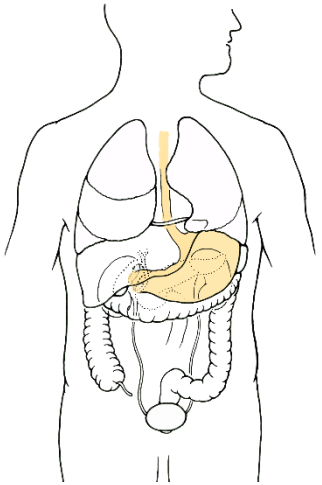
Procurement





1. pin top half
2. pin bottom half

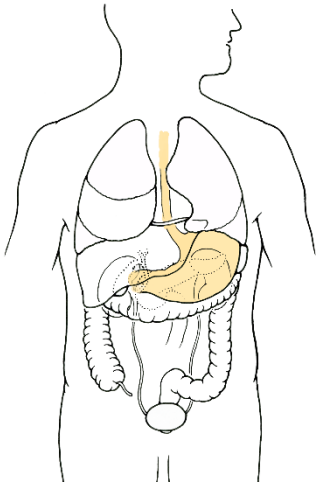
Stomach



1. esophagus
2. stomach
3. duodenum of small intestine

Anatomy

Stomach



Stomach lymph nodes

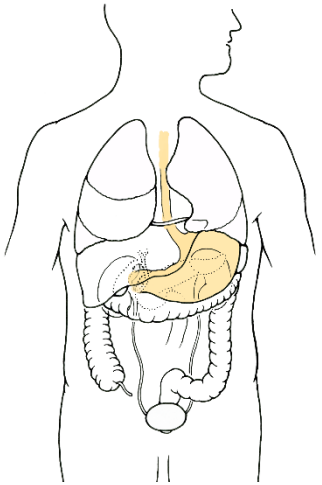
Lymph node anatomy in other sections

- Head & Neck
- Lung
- Colon & Rectum
- Pancreas
- Spleen
- Female Reproductive
- Lymphatic System

Anatomy

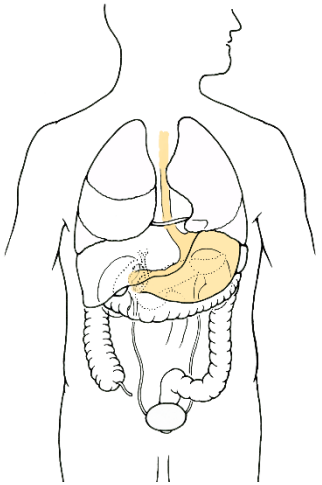
Stomach

Tumors



1. adenocarcinoma of fundus
2. adenocarcinoma of cardiac stomach
3. polypoid adenocarcinoma
4. submucosal lymphoma
5. early carcinoma – thickened rigidity of mucosa-stomach wall
6. colloid adenocarcinoma
7. infiltrating ulcerative adenocarcinoma
8. gastrointestinal stromal tumor (GIST) – sectioned from stomach rugae
9. duodenal adenocarcinoma
10. linitis plastica
11. pyloric adenocarcinoma

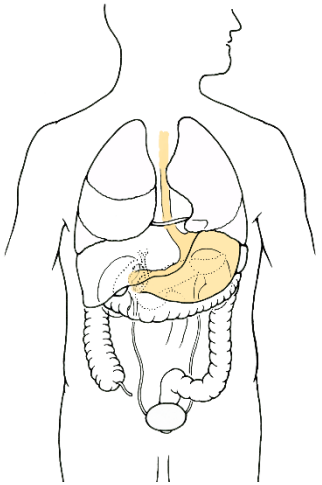
Stomach



Acute and/or chronic gastritis may be seen with neoplasia anywhere on stomach mucosa.

Tumors

Stomach



Procedures

More likely to support procurement:

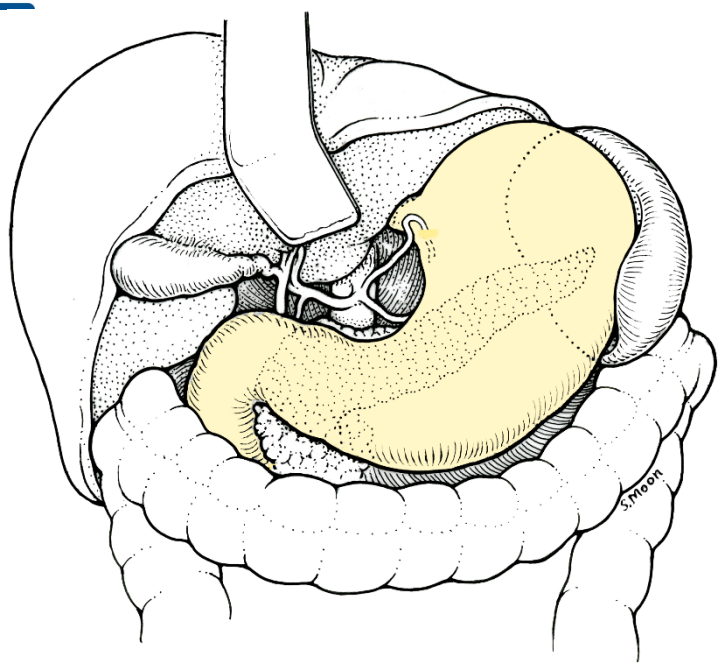
- gastrectomy – surgical removal of all or part of the stomach
- sleeve gastrectomy - a surgical weight-loss procedure in which the stomach is reduced to about 15% of its original size, by surgical removal of a large portion of the stomach along the greater curvature.
- gastric bypass (Roux-en-Y) - a type of weight-loss surgery that involves creating a small pouch from the stomach and connecting the newly created pouch directly to the small intestine. Parts of the stomach and small intestine are removed.
- duodenal switch with biliopancreatic diversion - entails two major steps: 1) sleeve gastrectomy (the pyloric valve that releases food to the small intestine remains, along with a limited portion of the small intestine that normally connects to the stomach) 2) bypass the majority of the intestine by connecting the end portion of the intestine to the duodenum near the stomach. The rest of intestine removed and available.

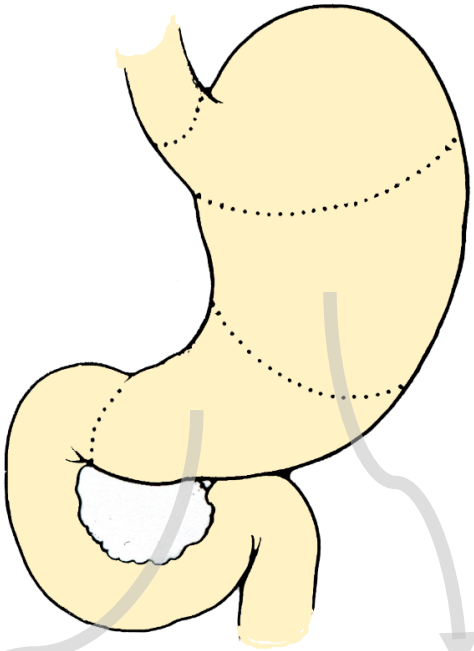
Less likely to support procurement:

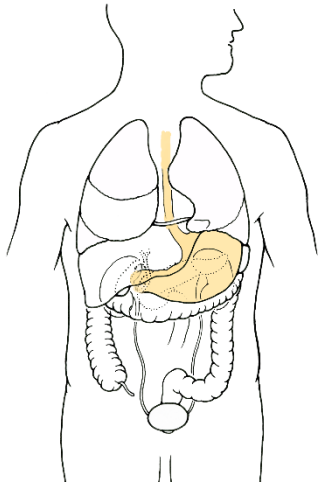
- laparoscopic adjustable gastric banding - is a surgery where an inflatable silicone device is placed around the top portion of the stomach.

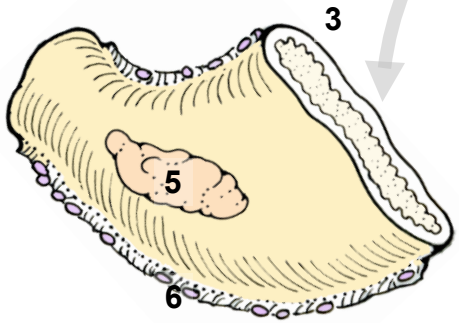
Stomach

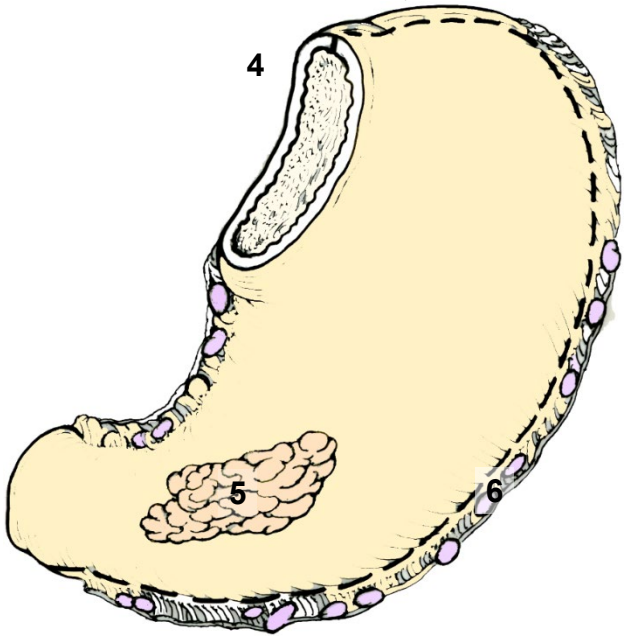
Procedure









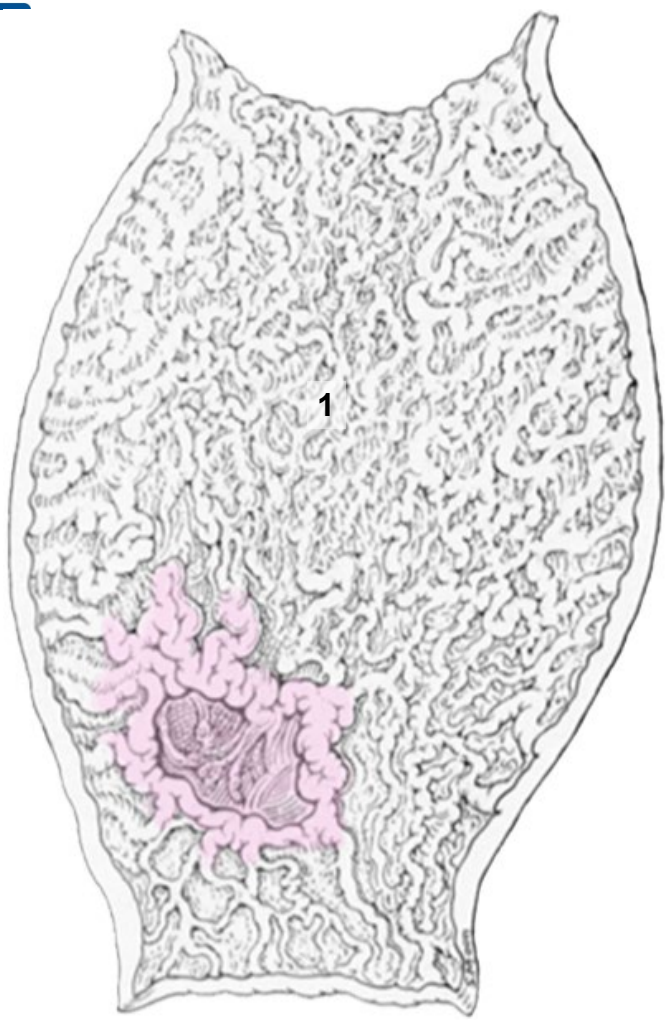


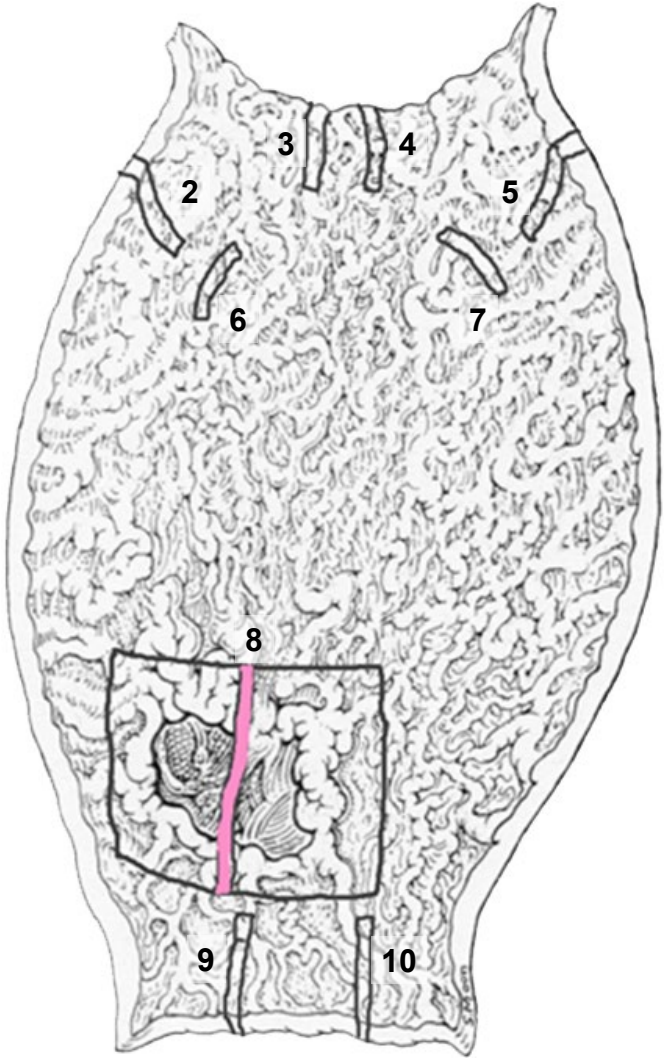
Gastrectomy

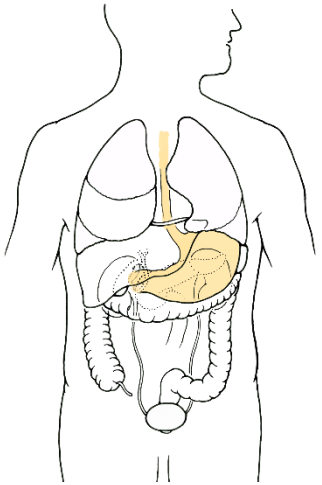
1. anterior organ exposure for stomach resection
2. various possible gastric resections (incision locations for full or partial removal)
3. subtotal gastrectomy specimen (lower 1/3 of stomach)
4. total gastrectomy specimen (entire stomach)
5. tumors
6. gastric lymph nodes

Stomach

Procurement



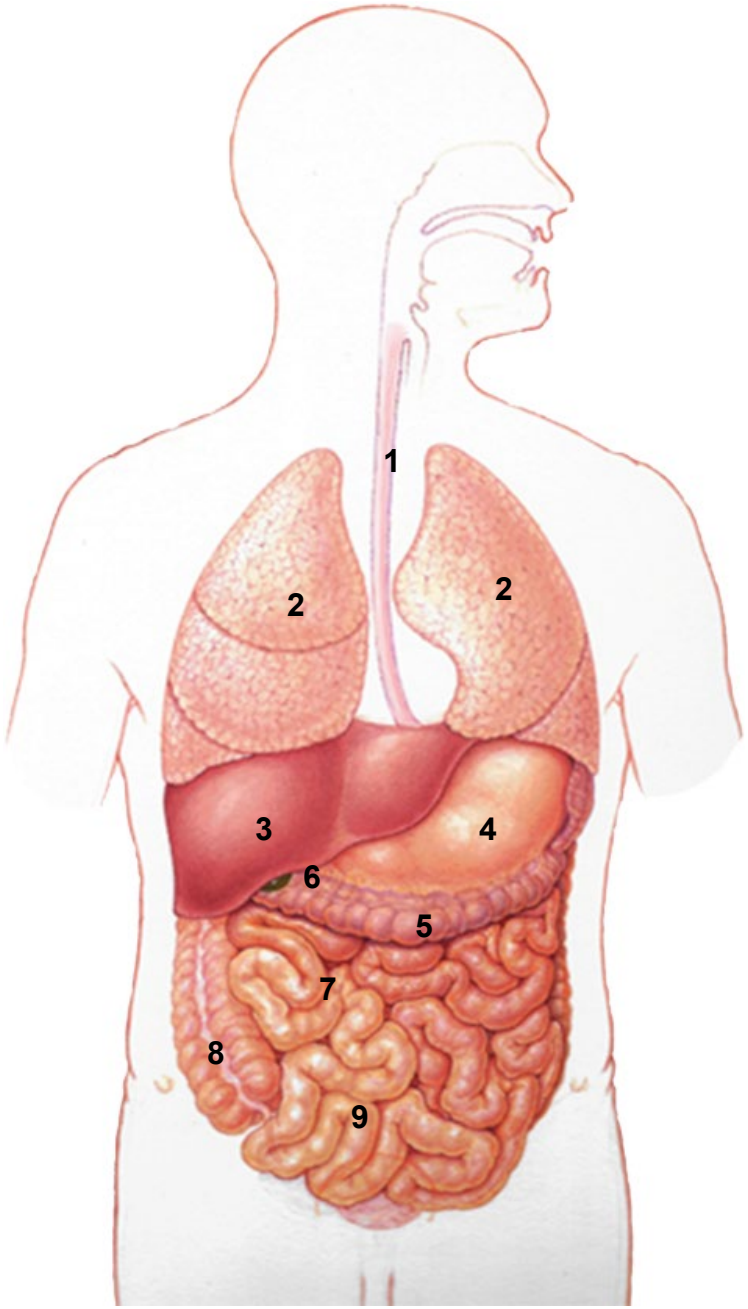


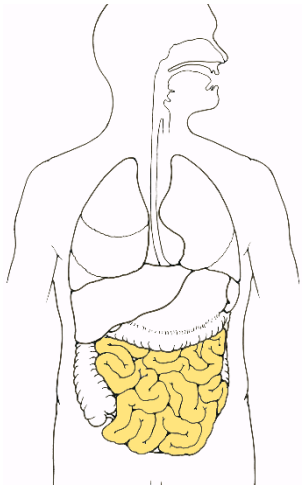


1. stomach spread out
2. section
3. section
4. section
5. section
6. section
7. section
8. tumor section
9. section
10. section

Small Intestine

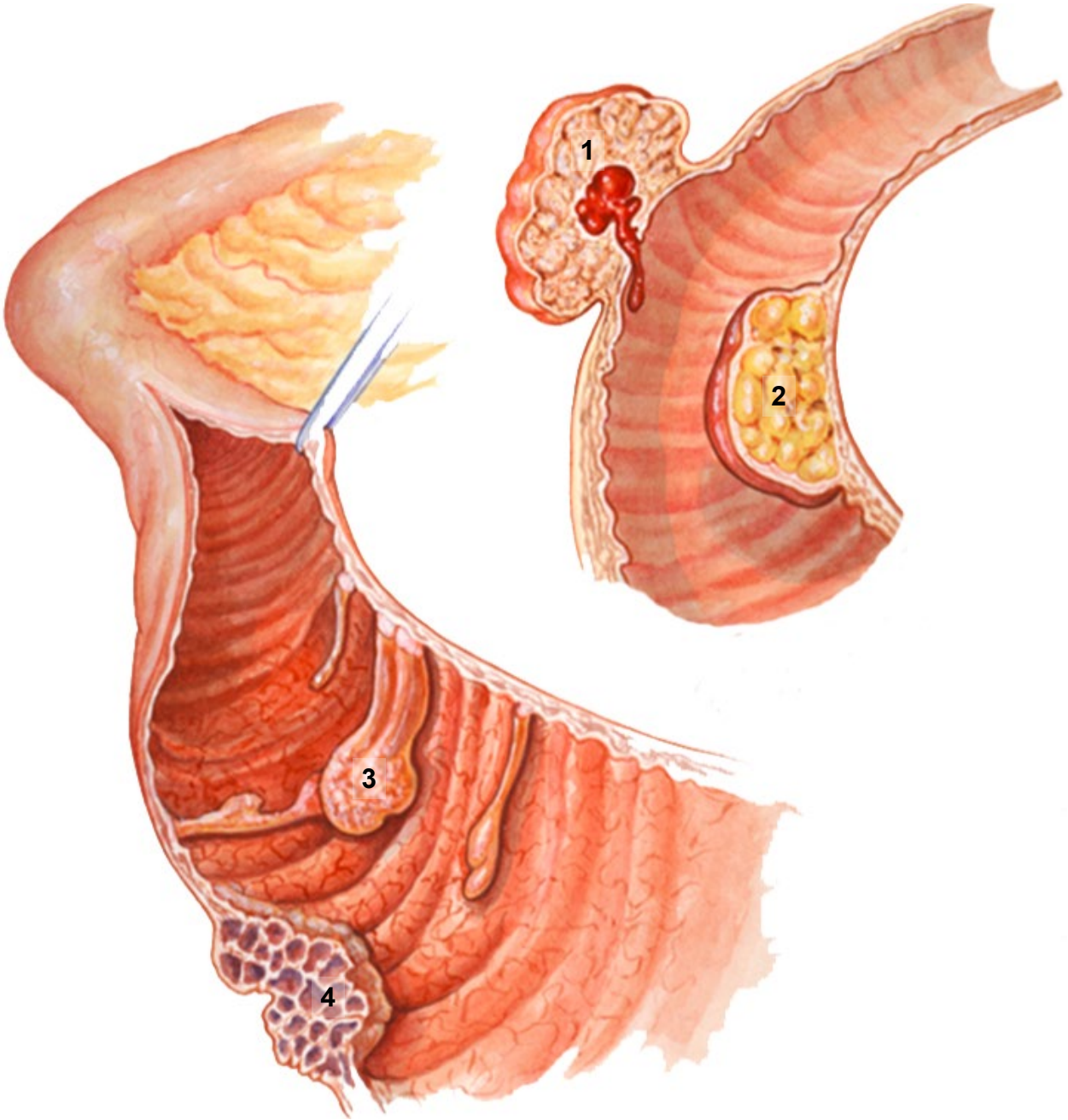
Anatomy

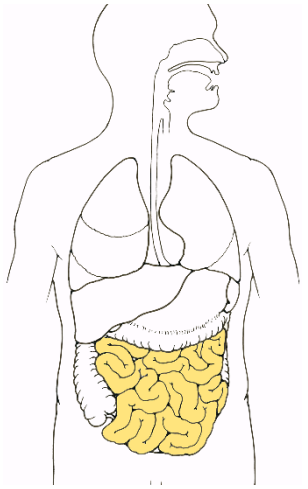




1. esophagus
2. lungs
3. liver
4. stomach
5. large intestine (colon)
6. duodenum of small intestine (hidden by liver)
7. jejunum of small intestine
8. colon
9. ileum of small intestine

Small Intestine





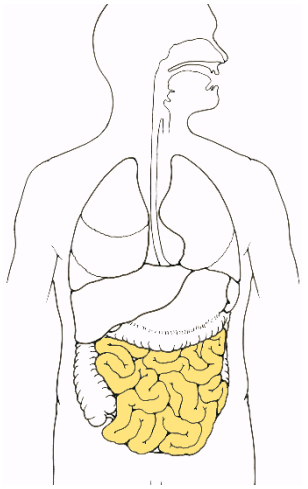
Related conditions

1. leiomyoma
2. lipoma
3. polyps
4. cavernous hemangioma

Tumors

Small Intestine

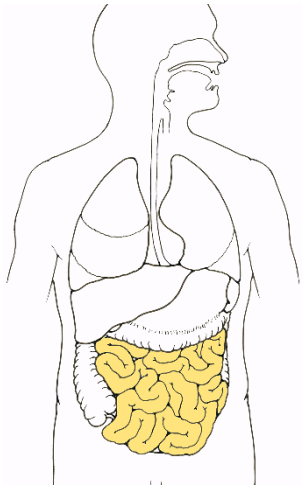
Tumors



Malignancies

1. carcinoid
2. multiple carcinoids
3. leiomyosarcoma
4. melanomas
5. polyps
6. adenosarcoma
7. lymphoma
8. gastrointestinal stroma tissue (GIST)
9. GIST lobular
10. ulcerative carcinoma

Small Intestine



More likely to support procurement:

- small bowel resection

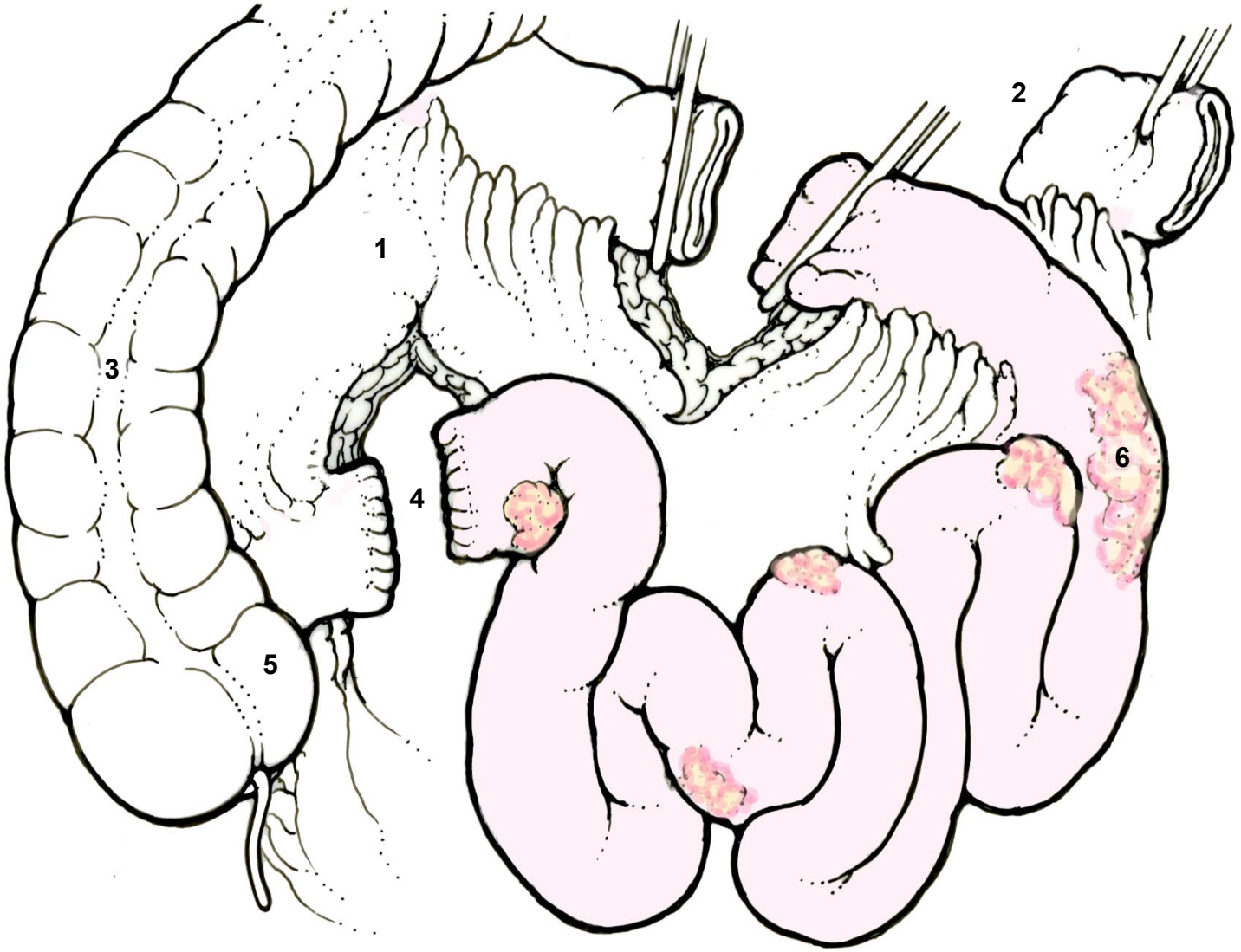
Less likely to support procurement:

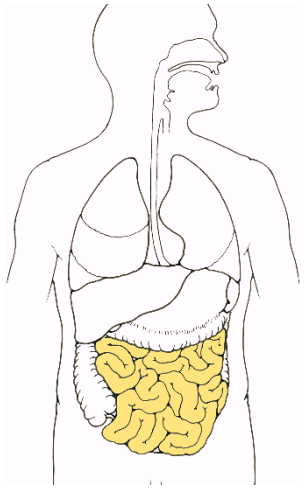
- none

Procedures

Small Intestine

Procedure

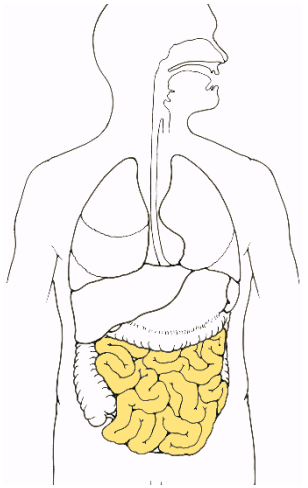




Small bowel resection

1. omentum
2. extracting section to check margin
3. ascending colon
4. gap made by removing length (partial resection) of small intestine
5. cecum
6. tumor

Small Intestine

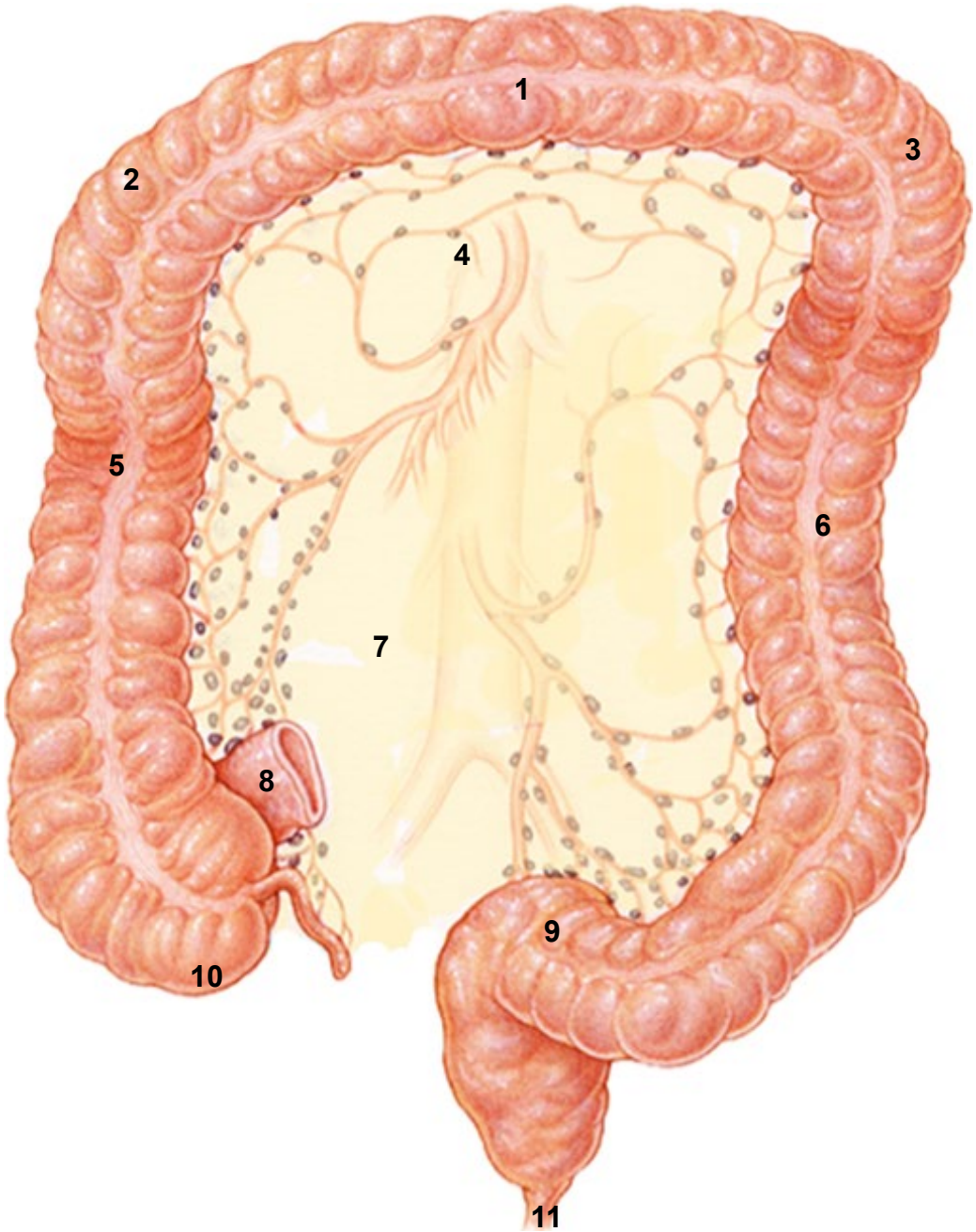


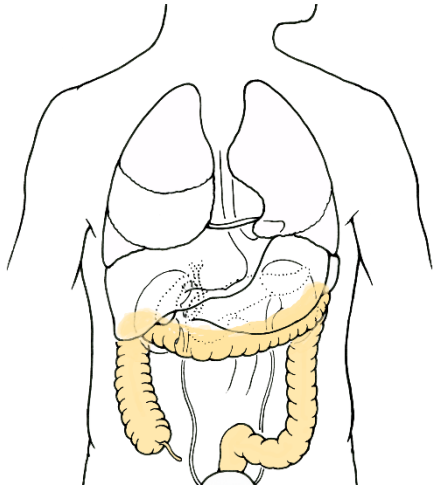
To be added

Procurement

Colon & Rectum

Anatomy

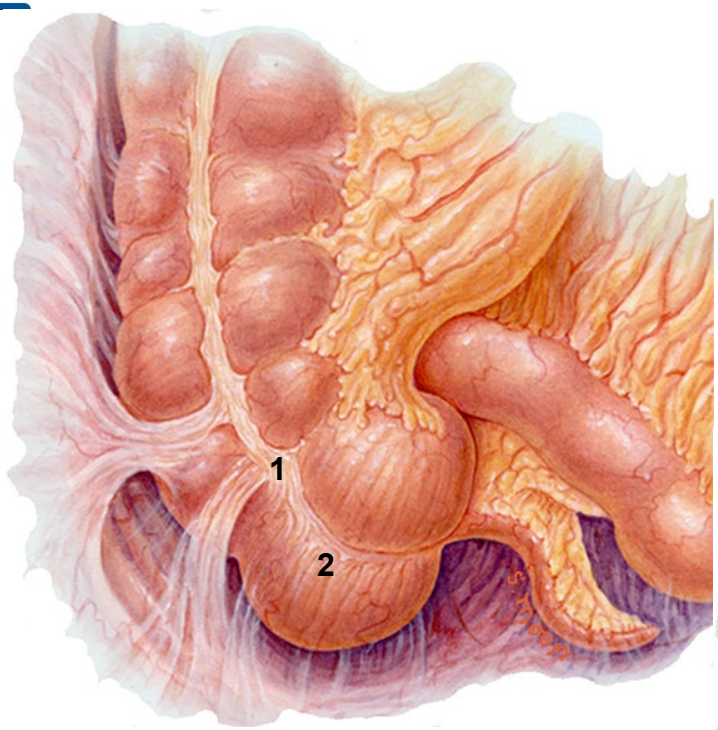


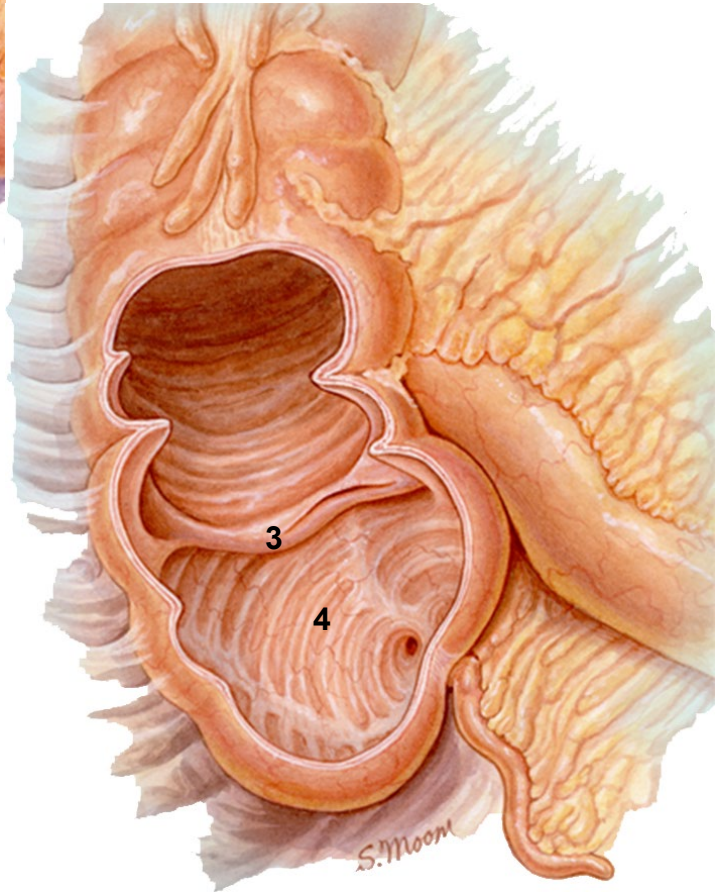


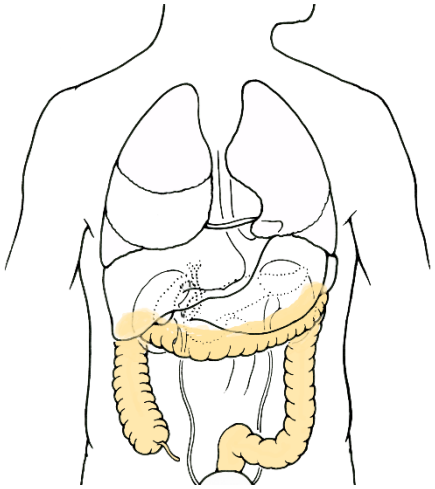
1. transverse colon
2. hepatic flexure
3. splenic flexure
4. lymph nodes
5. ascending colon
6. descending colon
7. mesentery
8. ileum of small intestine
9. sigmoid colon
10. cecum
11. rectum

Colon & Rectum

Anatomy



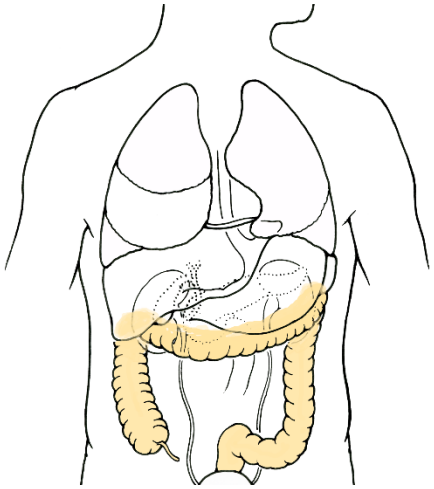




1. exterior ileocecal junction
2. exterior cecum
3. interior ileocecal junction
4. interior cecum

Colon & Rectum

Anatomy



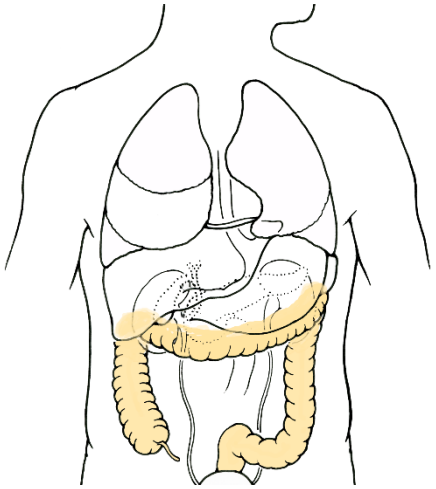
Ileocecal junction lymph nodes

Lymph node anatomy in other sections

- Head & Neck
- Lung
- Stomach
- Pancreas
- Spleen
- Female Reproductive
- Lymphatic System

Colon & Rectum

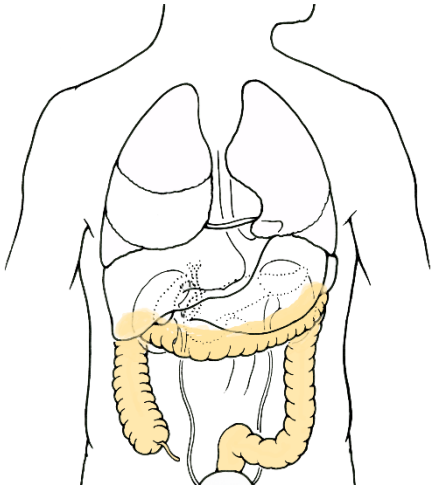
Tumors



Important tumors in situ

1. ulcerative infiltrating adenocarcinoma of hepatic flexure
2. constricting adenocarcinoma of transverse colon
3. infiltrating fungative adenocarcinoma of splenic flexure
4. polyps of descending colon
5. polypoid adenocarcinoma of ascending colon
6. cecal adenocarcinoma
7. infiltrating adenocarcinoma of sigmoid
8. ulcerating adenocarcinoma of rectum
9. carcinoid of appendix
10. melanoma of rectum
11. carcinoma of rectum
12. tumor of rectum

Colon & Rectum



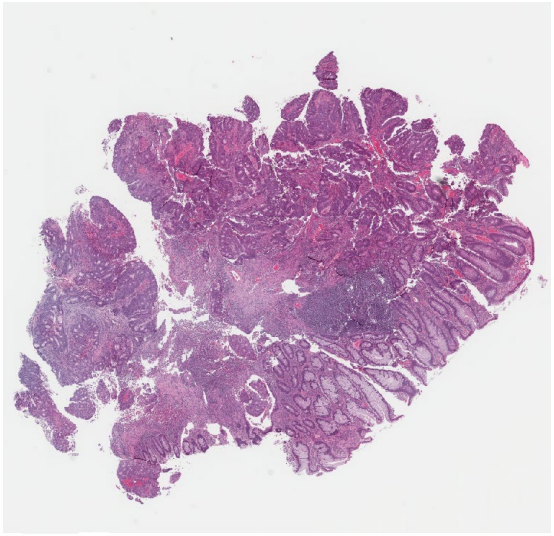
Neoplasia extension and secondary metastasis to colon from other organs, primarily the stomach

Tumors

Colon & Rectum

Tumors

1



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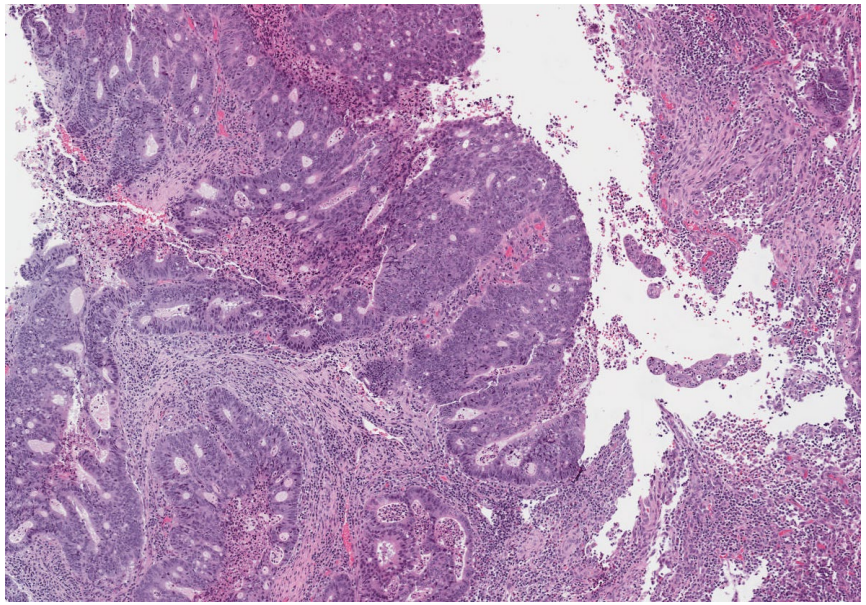
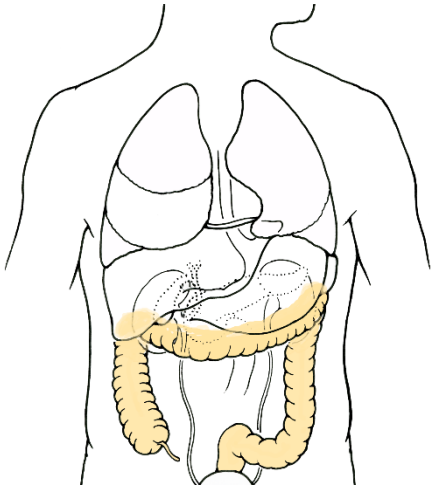
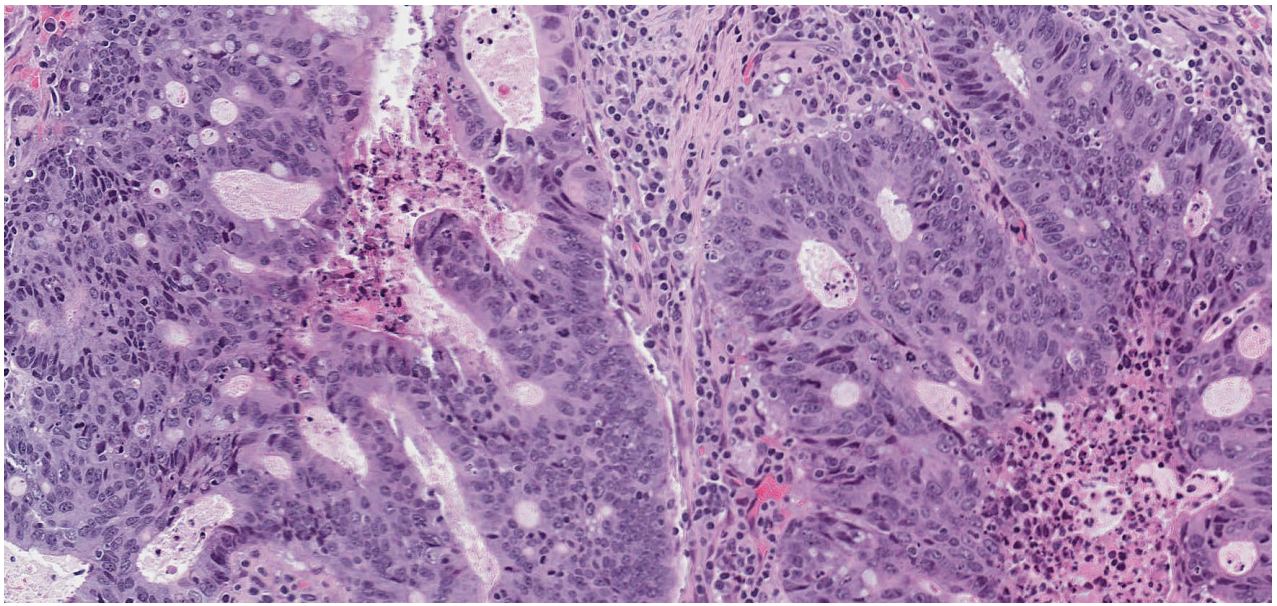




Adenocarcinoma (colon).

1. 1X
2. 5X
3. 20X
4. 40X

3



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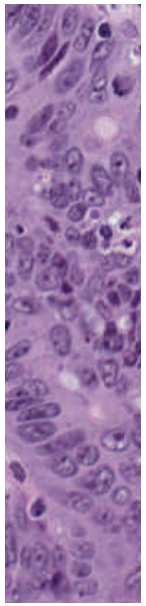
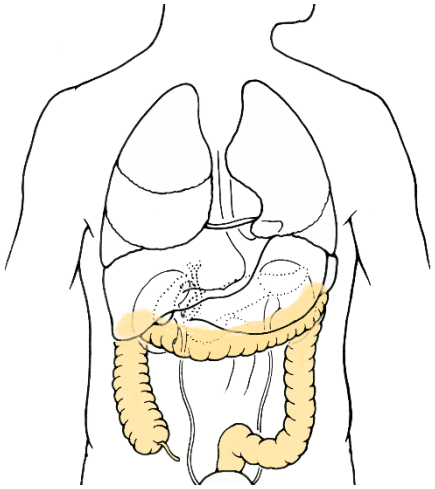


Colon & Rectum



Procedures

More likely to support procurement:

- polypectomy - a procedure used to remove polyps from the inside of the colon, usually during a colonoscopy. A polyp is an abnormal collection of tissue.
- surgical colon resection, hemicolectomy, partial colectomy or bowel resection - removal of a various parts of the colon (see summary of colon neoplasm resections or segmental colectomies)

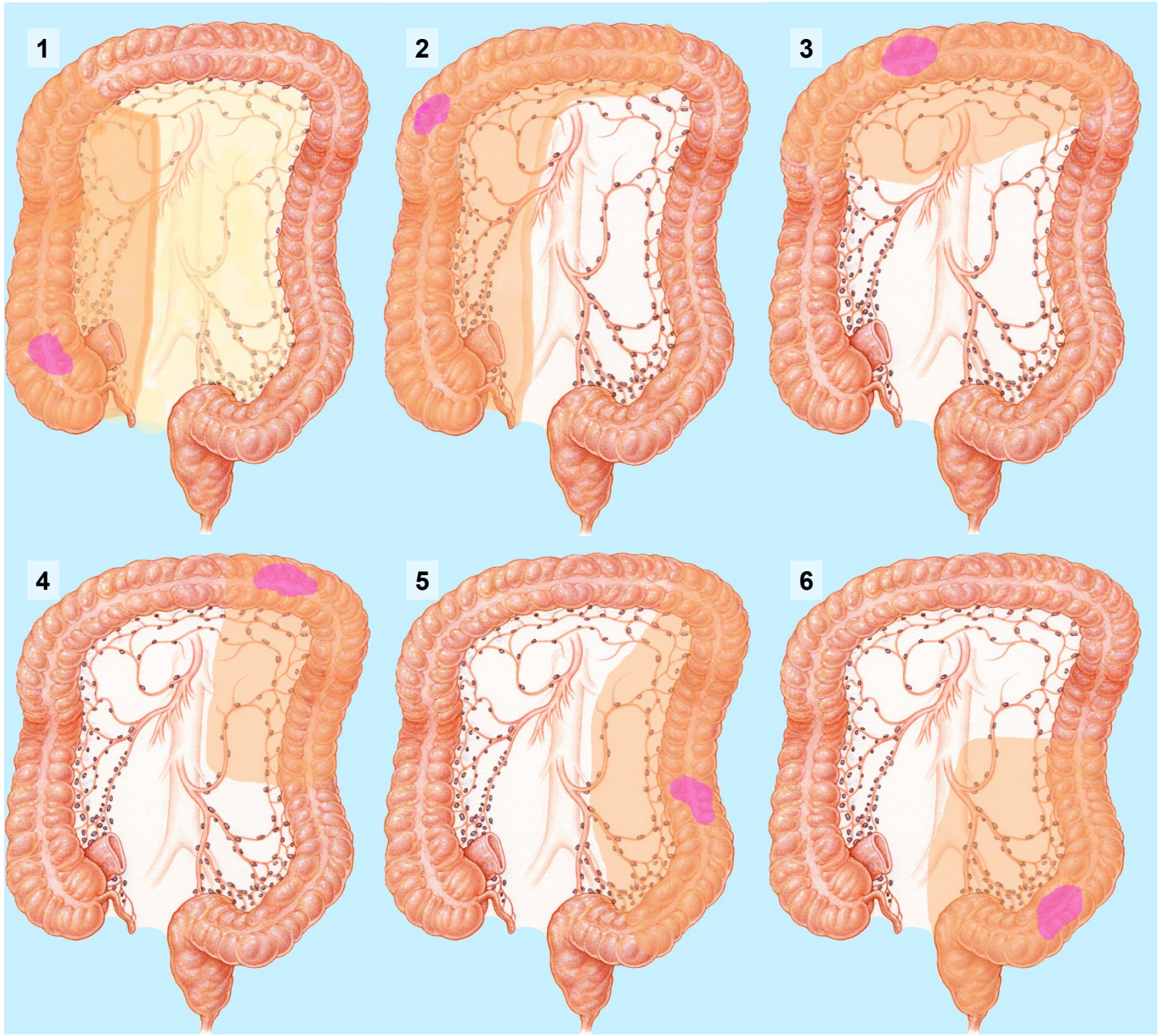
- total colectomy - removal of the large intestine from the lowest part of the small intestine (ileum) to the rectum.
- total proctocolectomy - removal of the entire colon with anastomosis of the end of the small bowel to the rectum (and creation of a pouch).

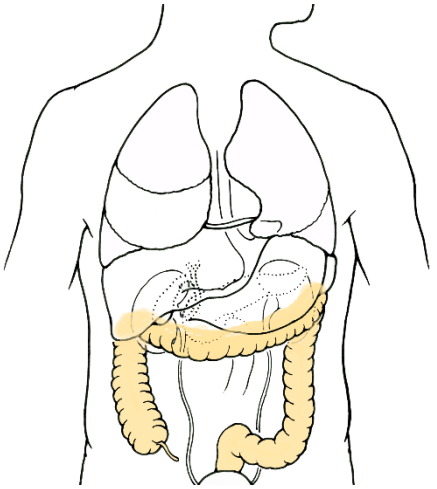
Less likely to support procurement:

- none

Colon & Rectum

Procedure



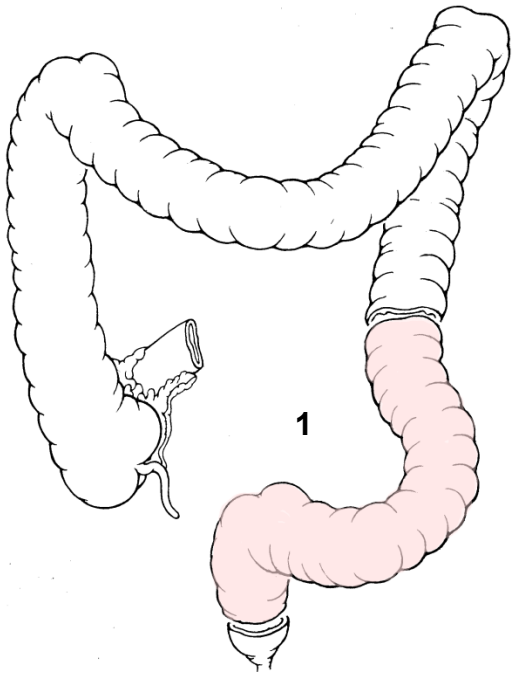


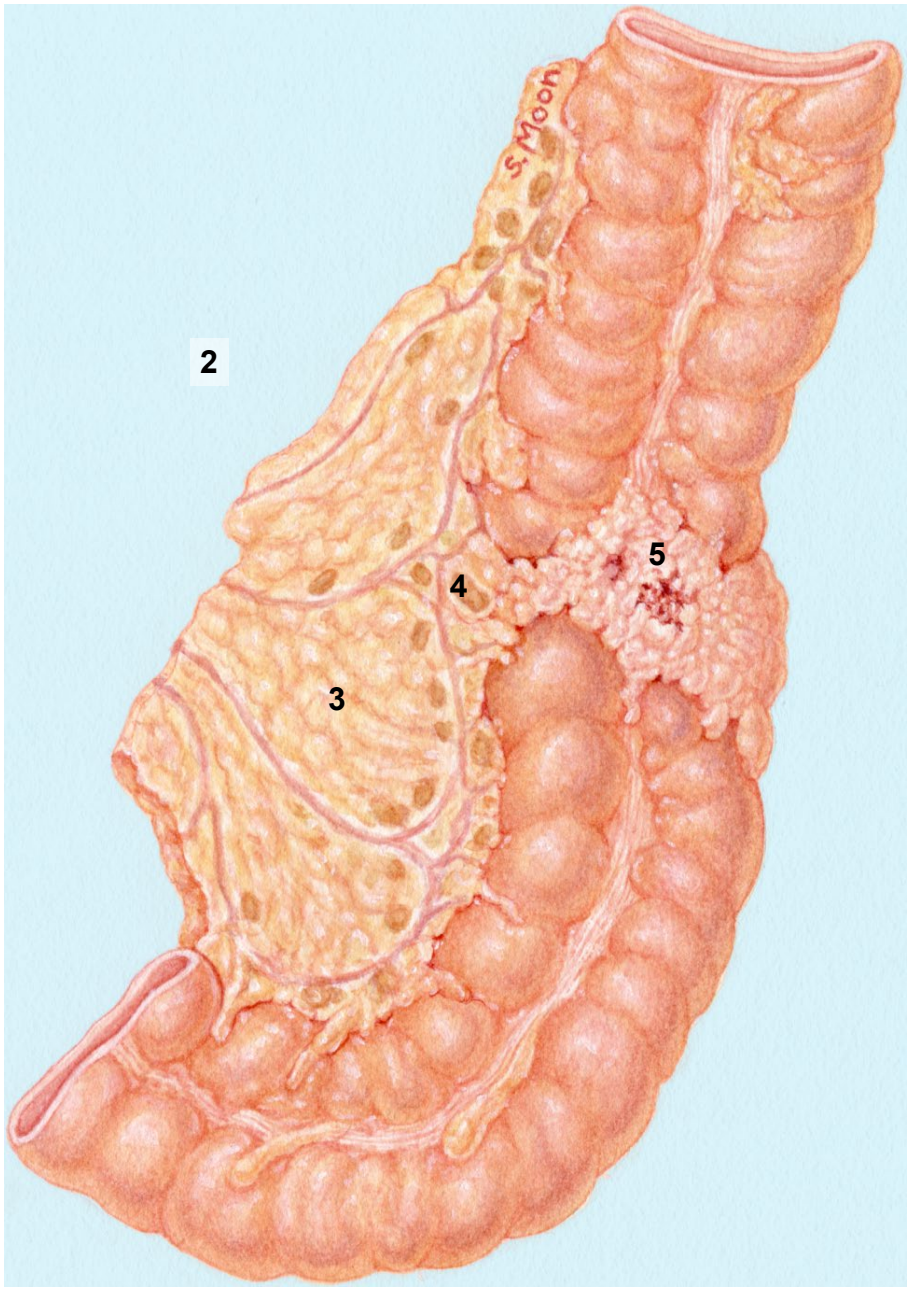
Colon neoplasm resections (segmental colectomies)

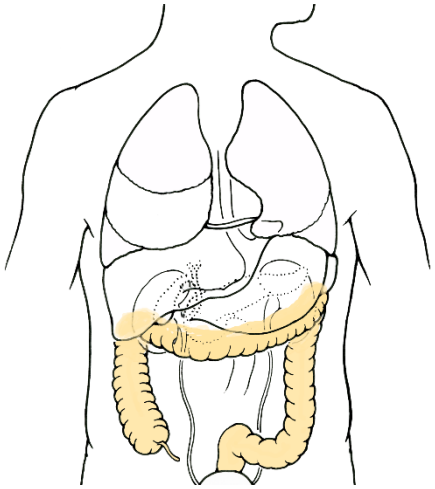
1. cecum and ascending to hepatic flexure
2. cecum, ascending and transverse to splenic flexure
3. transverse from hepatic to splenic flexures
4. part of transverse including splenic flexure and descending
5. splenic flexure, descending and sigmoid
6. part of descending, sigmoid and rectum

Colon & Rectum

Procedure





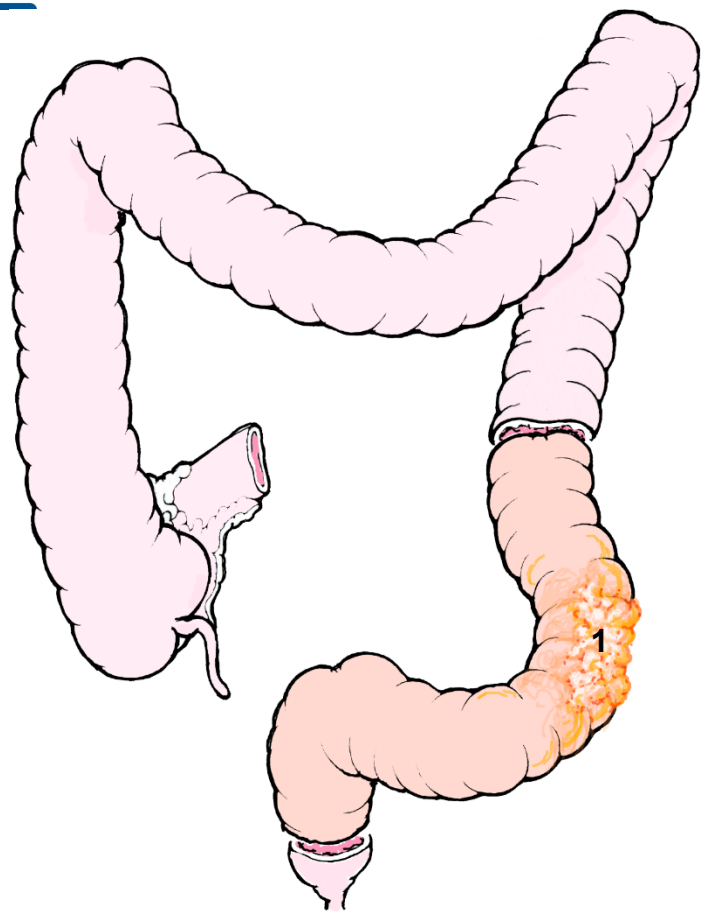


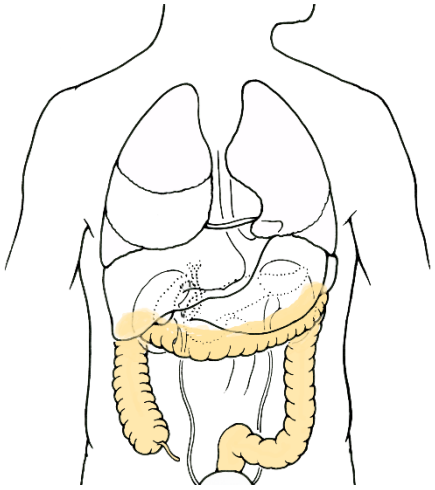
Surgical resection of sigmoid colon

1. location of resection
2. resected portion with tumor and adjacent mesentery and lymph nodes
3. adjacent mesentery
4. adjacent lymph nodes
5. tumor (adenocarcinoma of sigmoid)

Colon & Rectum

Procedure

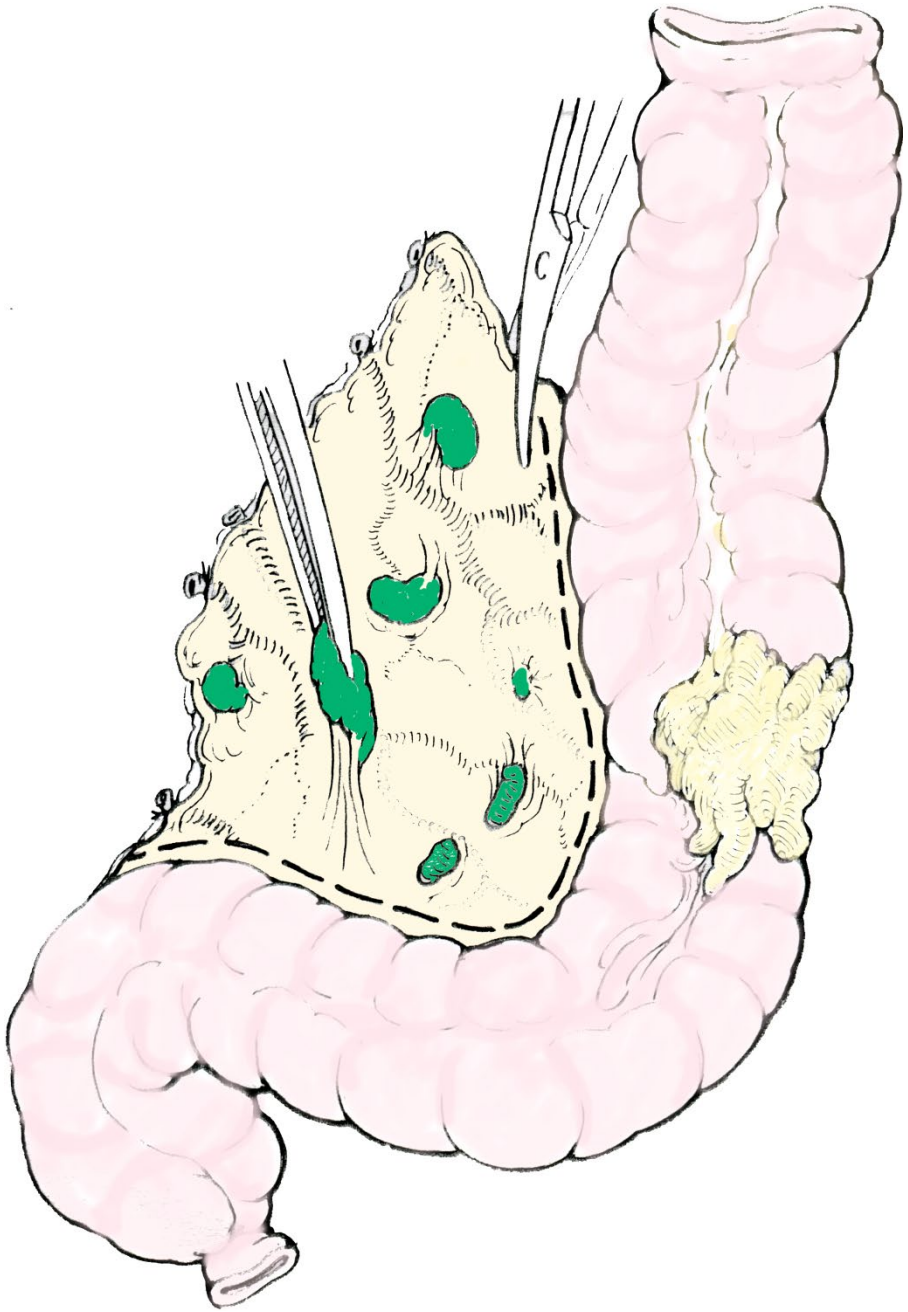


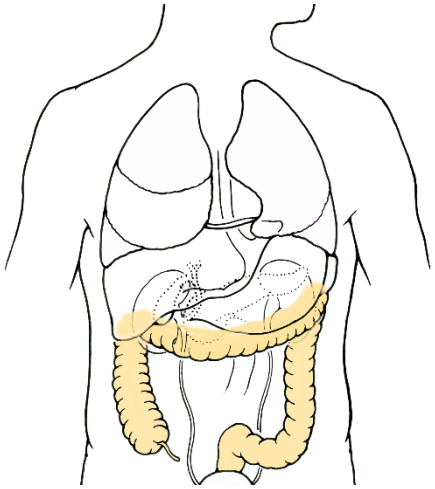


Resection of descending/sigmoid colon (left hemicolectomy) and rectum

1. tumor
2. extracting mesenteric lymph nodes

Colon & Rectum





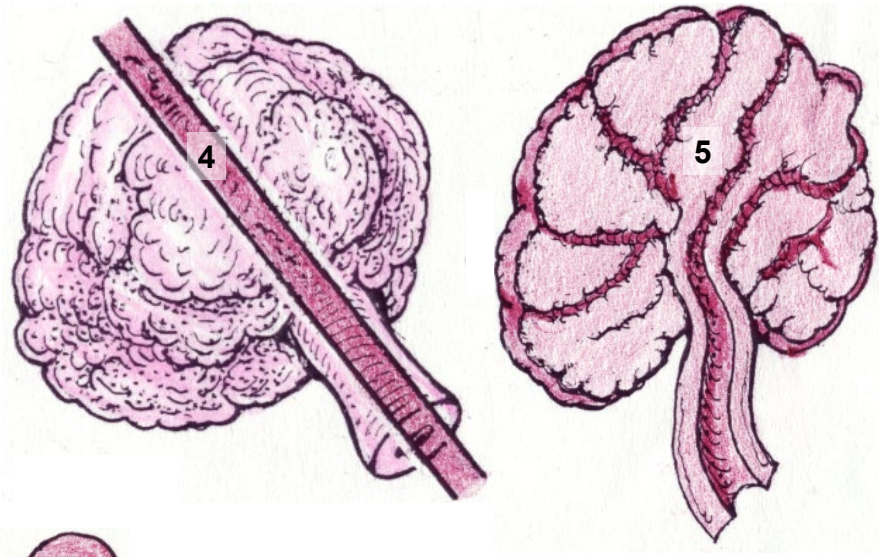
Dissection of mesenteric lymph nodes

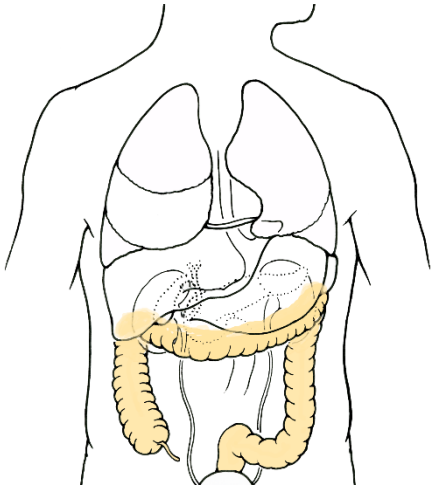
Lymph node anatomy in other sections

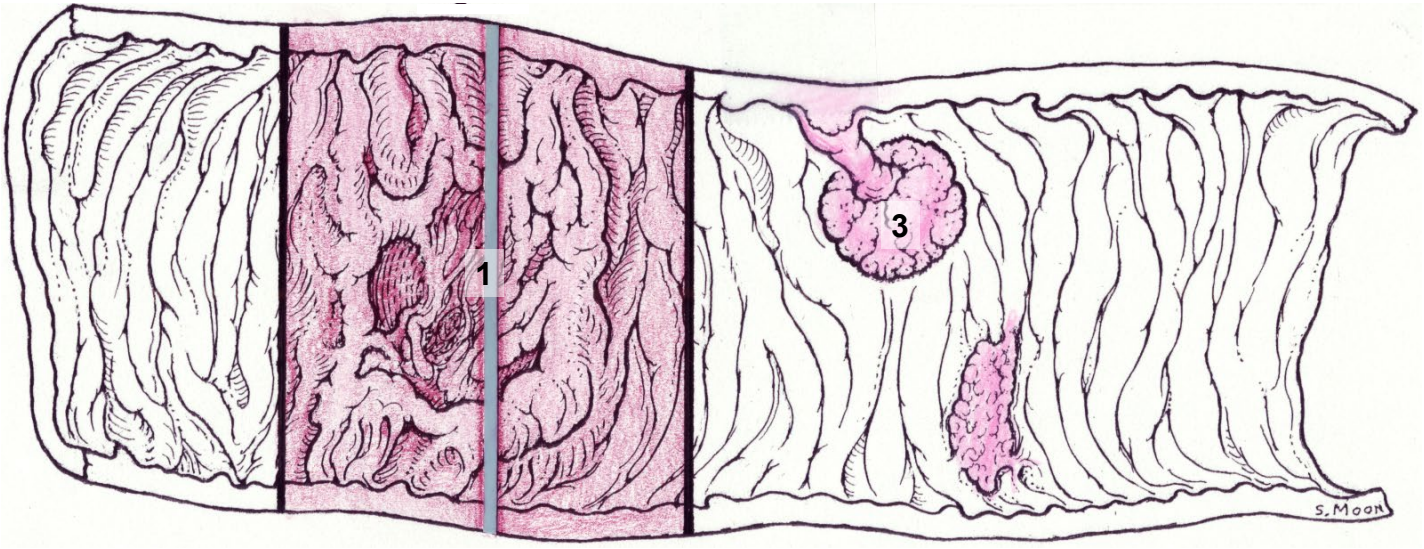
- Head & Neck
- Lung
- Stomach
- Pancreas
- Spleen
- Female Reproductive
- Lymphatic System

Procurement

Colon & Rectum







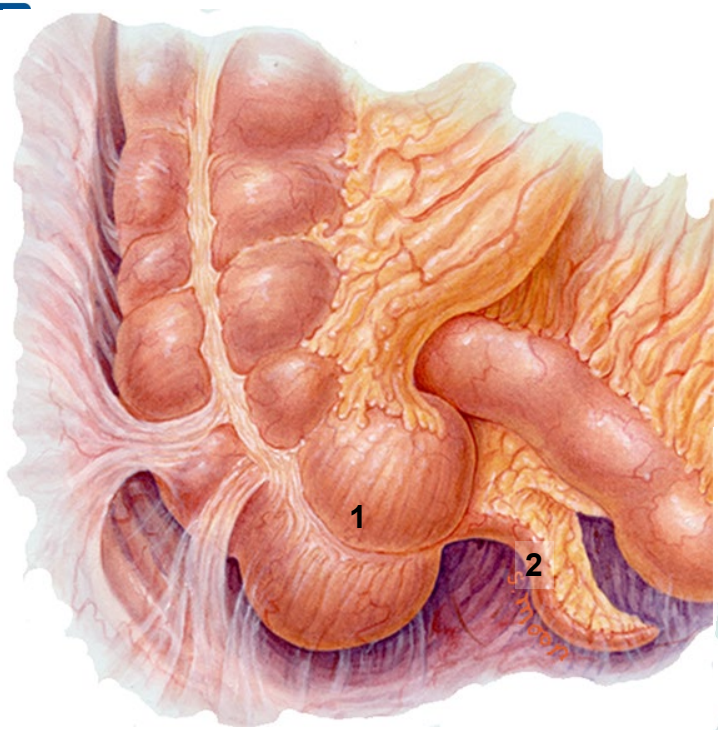
Procurement

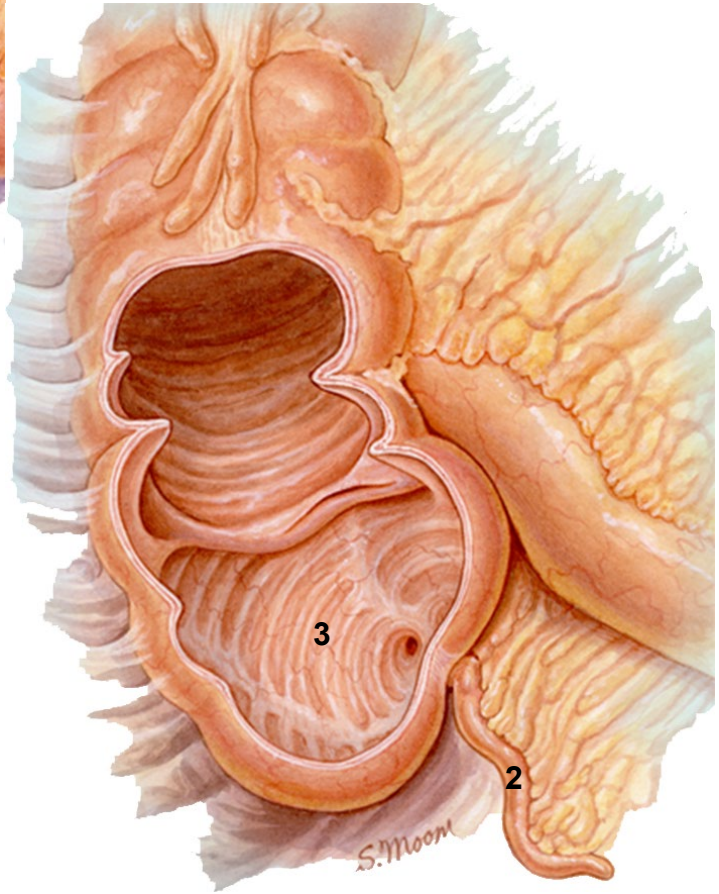
Specimen tissue sectioning procedure

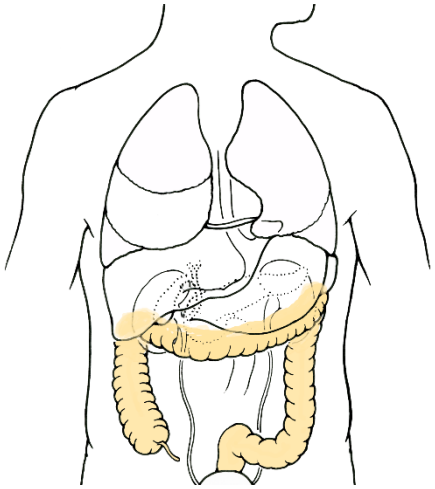
1. neoplasm dissection
2. resulting neoplasm section
3. polyp in situ
4. extracted polyp with lines indicating where to get section
5. resulting section of polyp

Appendix

Anatomy



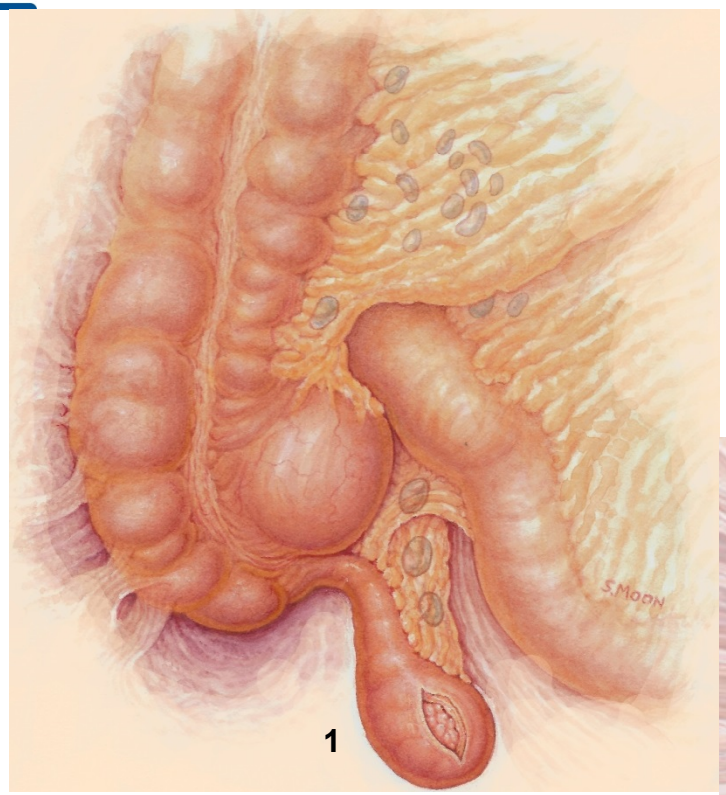


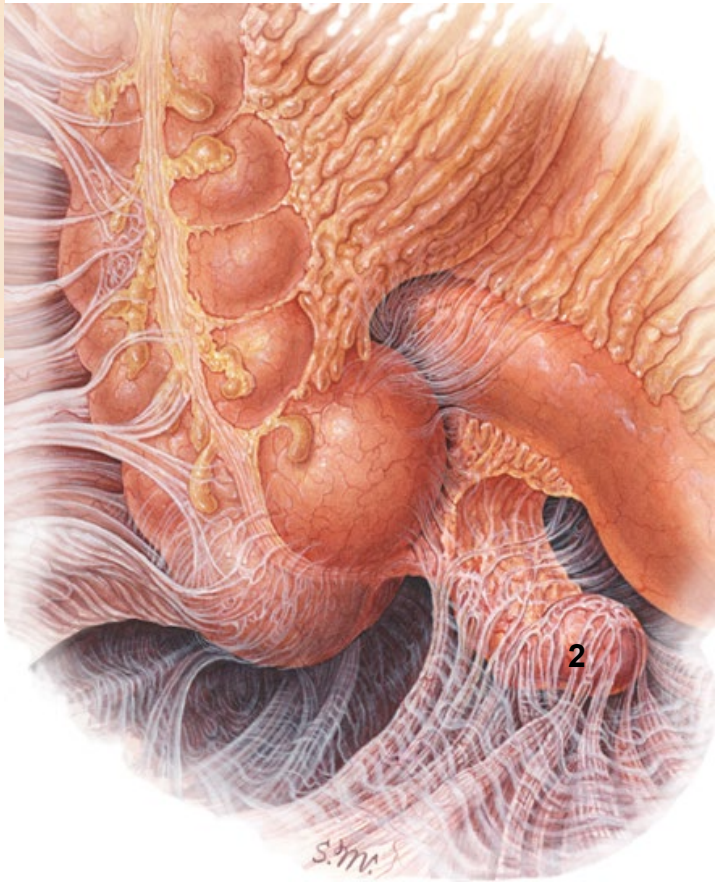


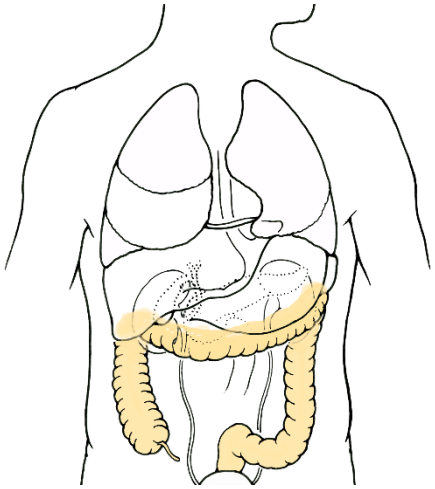
1. exterior of cecum
2. appendix
3. interior of cecum

Appendix

Tumors







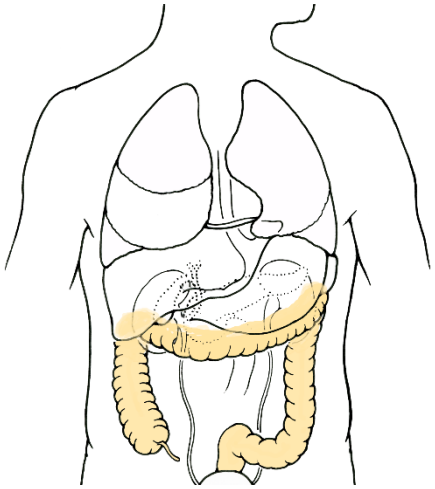
Cutaway view of tumor

1. tumor

Adhesions

2. scarring, appendicitis, neoplasia

Appendix



More likely to support procurement:

- appendectomy - a surgical operation to remove the appendix.
- hemicolectomy - a surgical procedure that involves removing a segment of the colon sometimes with cecum and/or appendix.

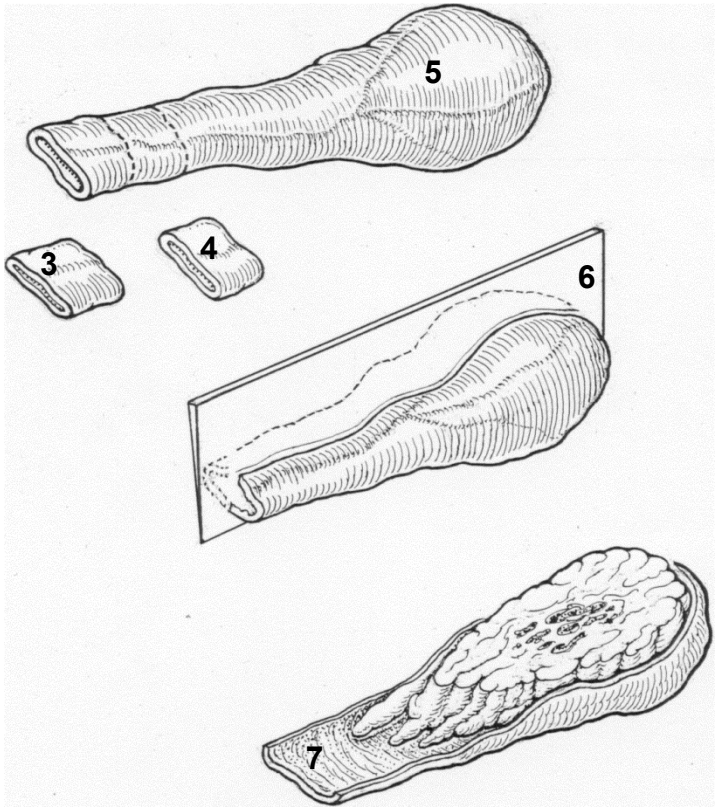
Less likely to support procurement:

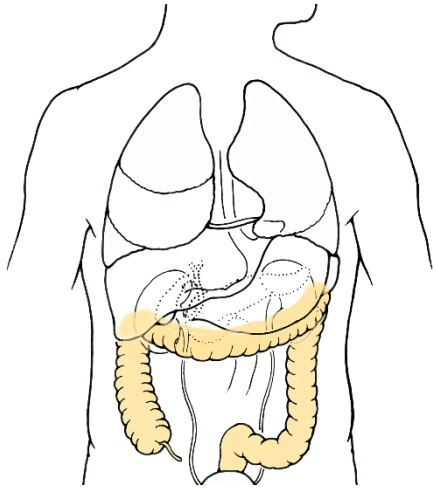
- none

Procedures

Appendix

Procedure



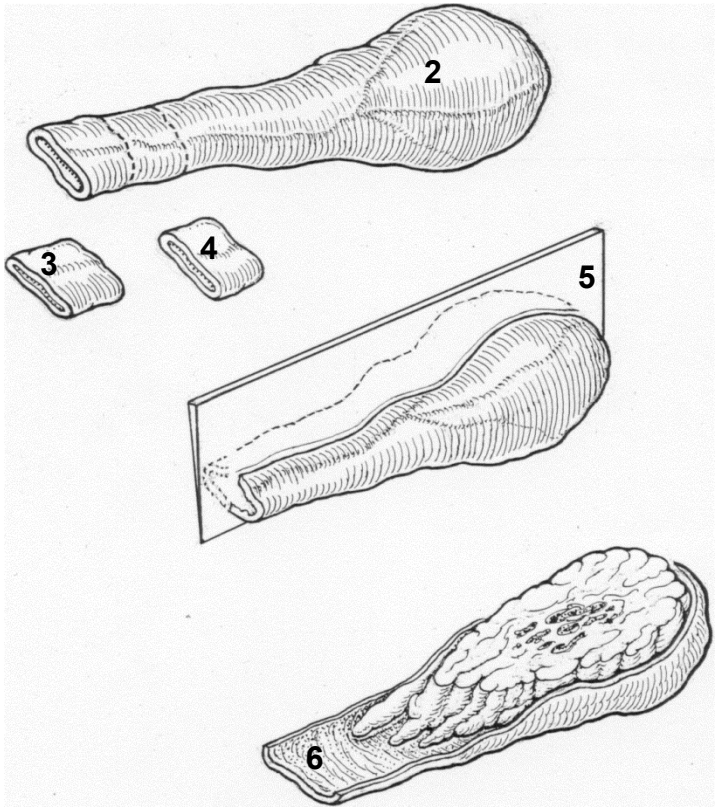


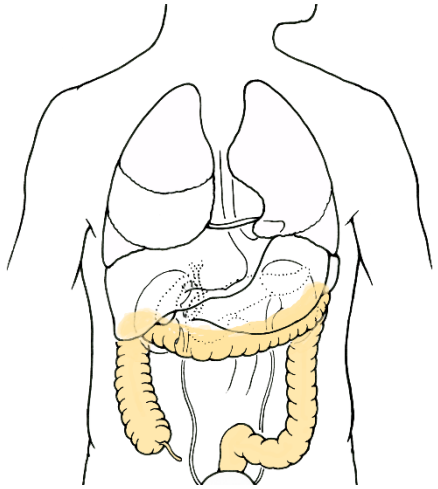
Left hemicolectomy with appendix and cecal tumor

1. tumor on cecum
2. enlarged appendix with tumor in situ before removal (nearby lymph nodes shown)
3. margin tissue
4. normal adjacent tissue
5. submitted tissue
6. bi-section
7. bisected tissue

Appendix

Procurement

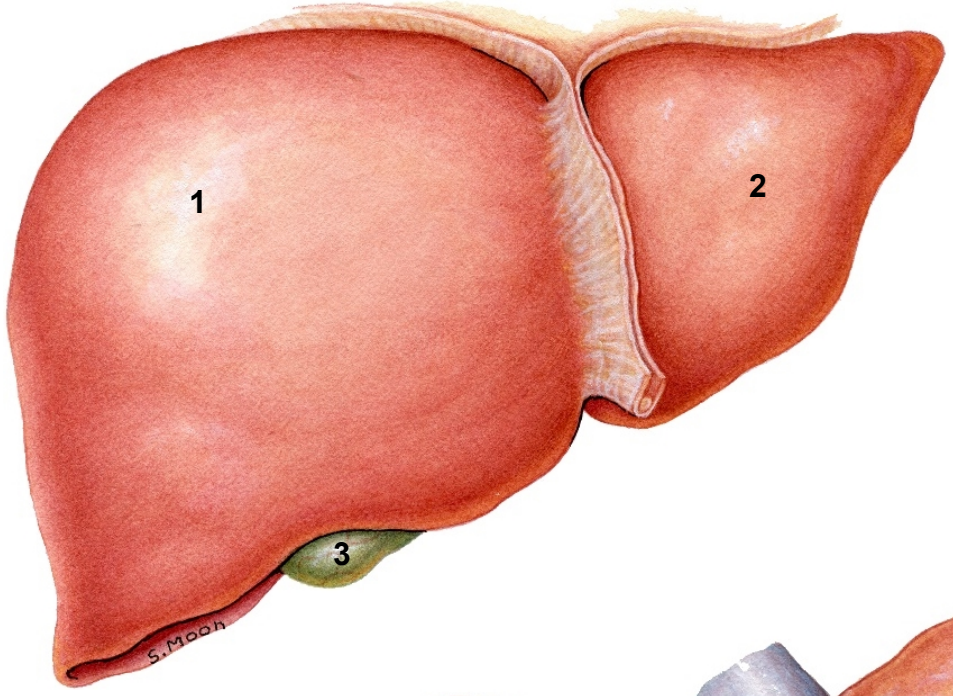


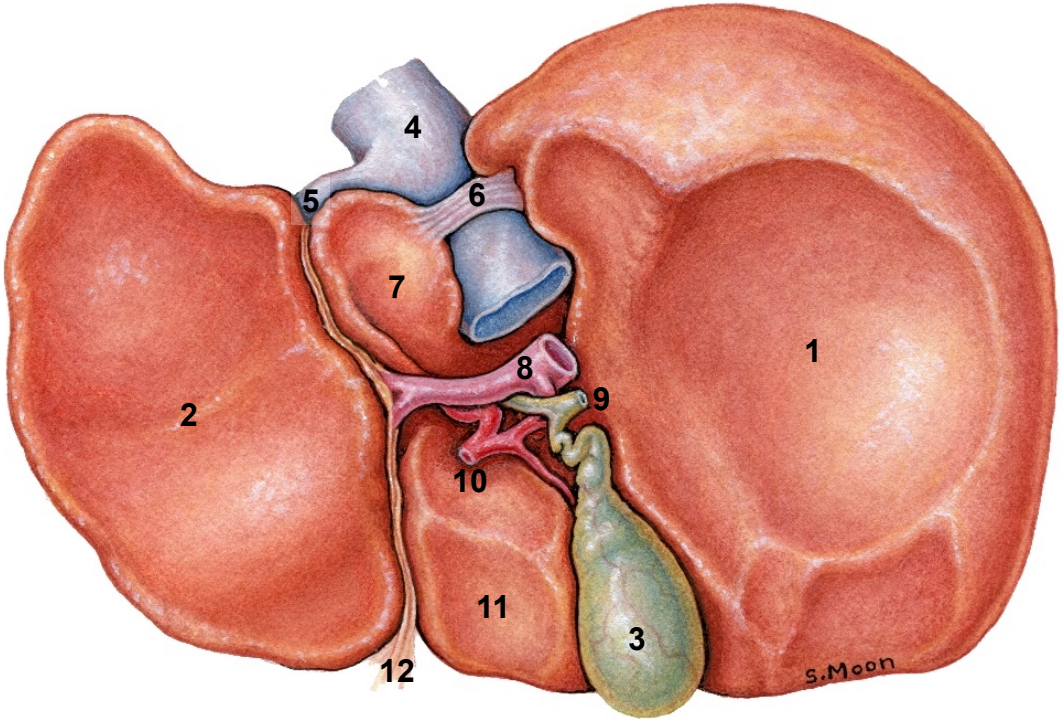


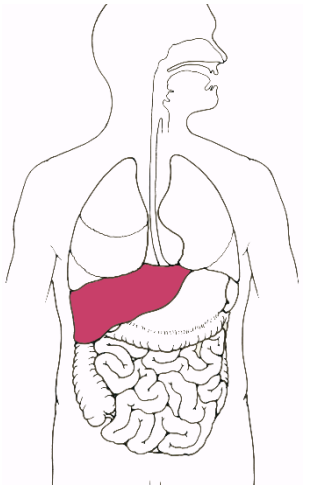
1. enlarged in situ before removal (nearby lymph nodes highlighted)
2. submitted tissue
3. margin tissue
4. normal adjacent tissue
5. bi-section
6. bisected tissue

Liver

Anatomy



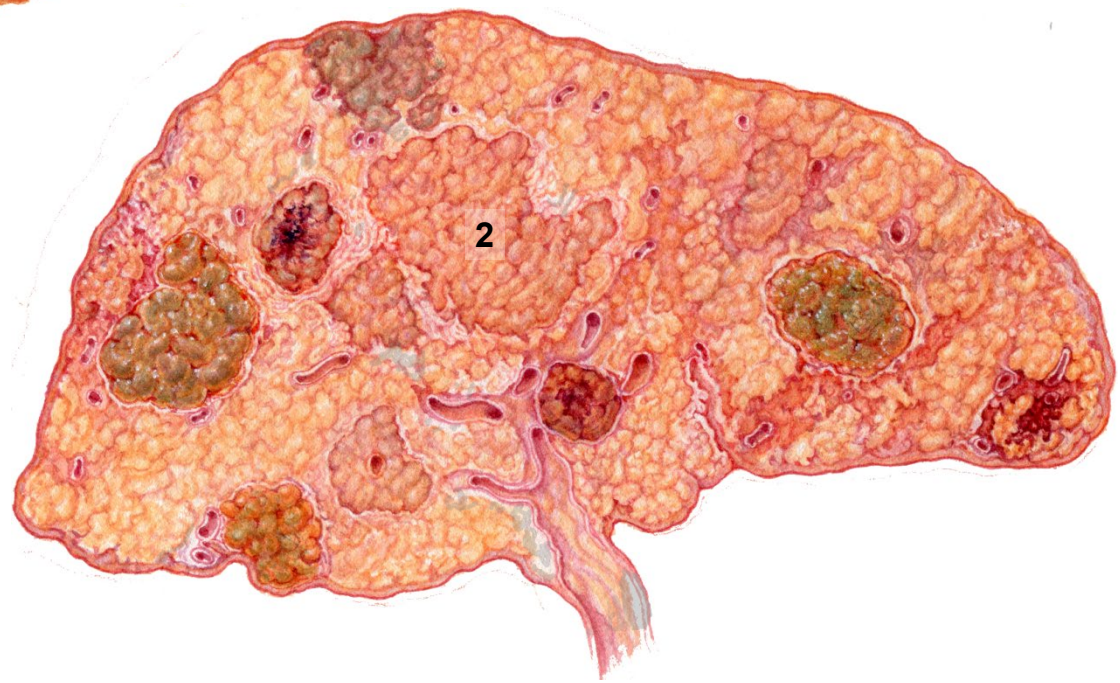


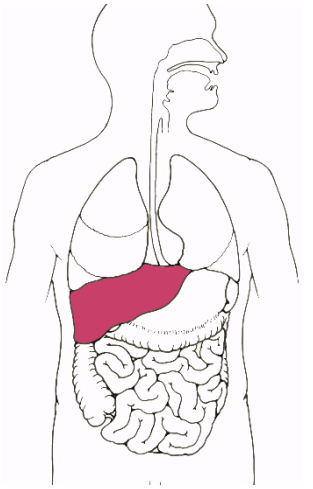


1. right lobe
2. left lobe
3. gallbladder
4. inferior vena cava
5. hepatic vein
6. ligament of vena cava
7. caudate lobe
8. hepatic vein
9. hepatic duct
10. hepatic artery
11. quadrate lobe
12. round ligament

Liver

Tumors

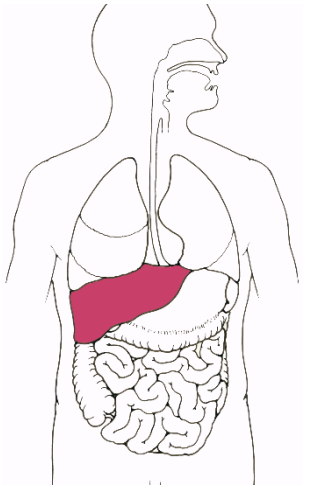


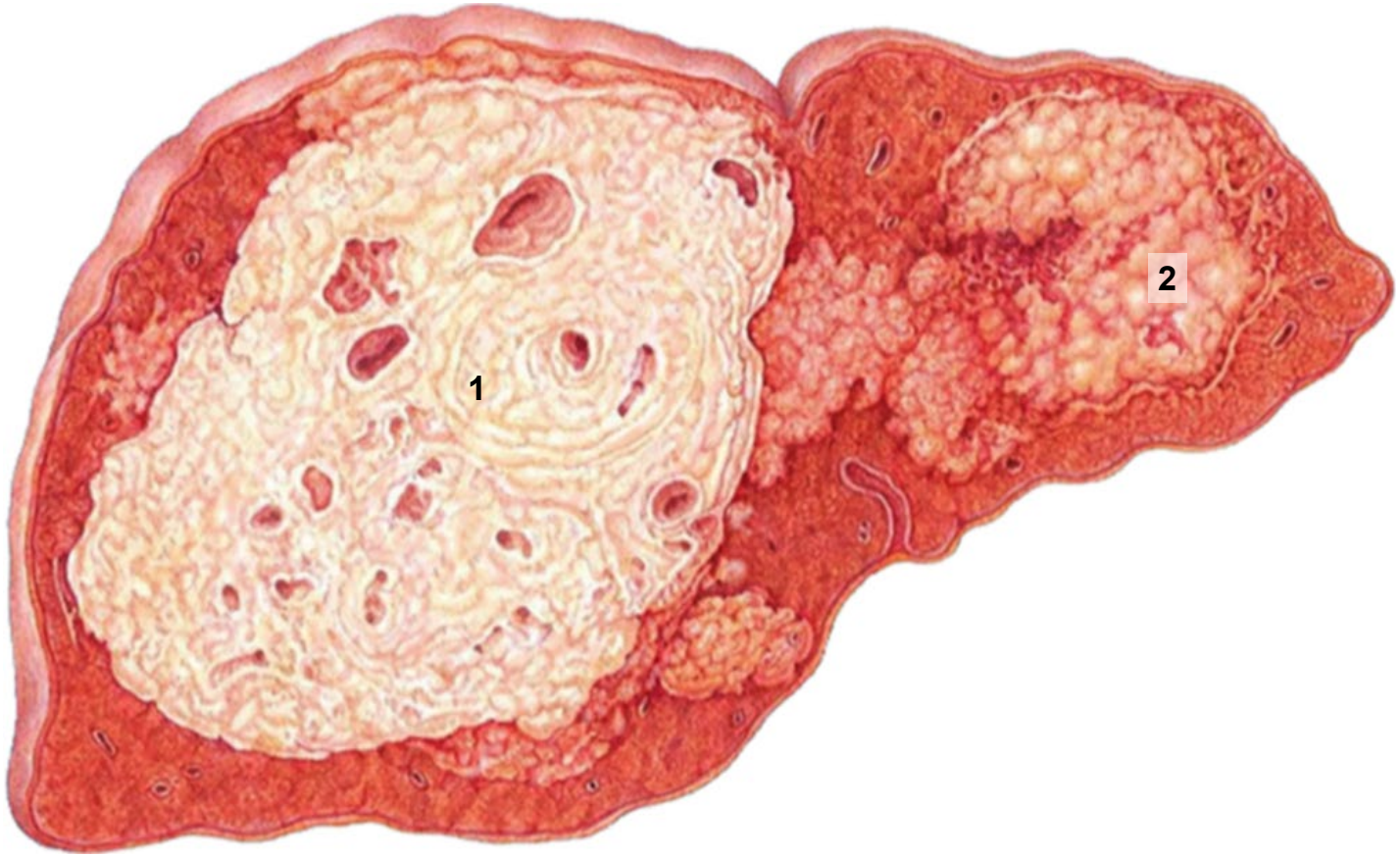


Macronodular cirrhosis

1. surface appearance
2. Primary liver, hepatocellular carcinoma with cirrhosis, infiltrative diffuse malignancy

Liver



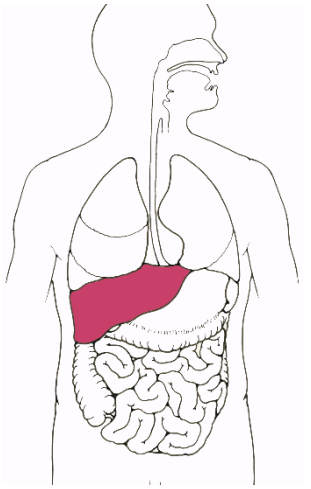


1. hepatoblastoma (primary)
2. hepatocellular carcinoma

Tumors

Liver

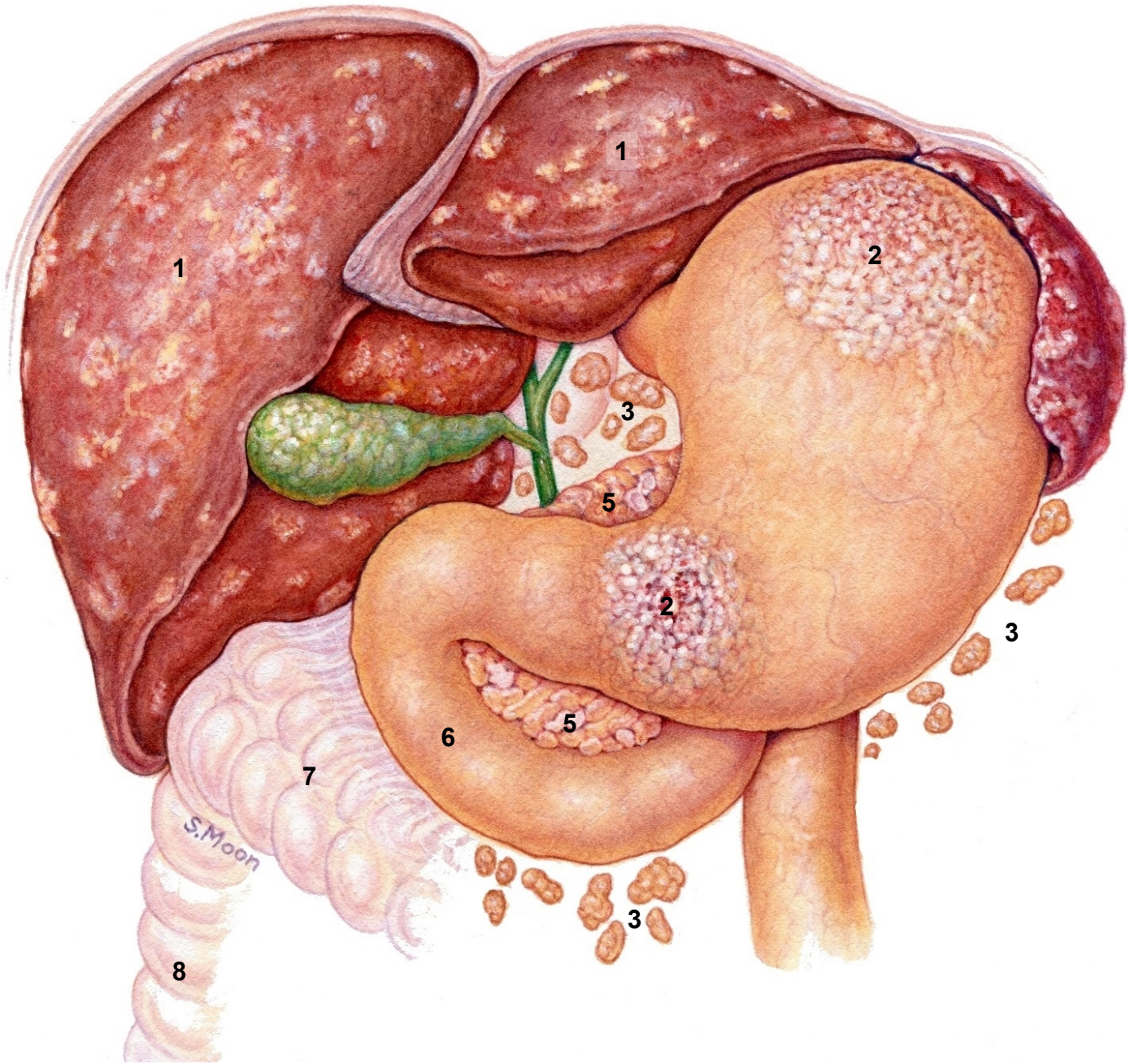
Tumors

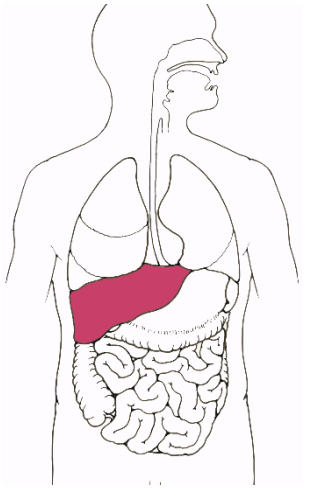


1. multifocal-massive hepatocellular carcinoma (primary)

Liver

Tumors

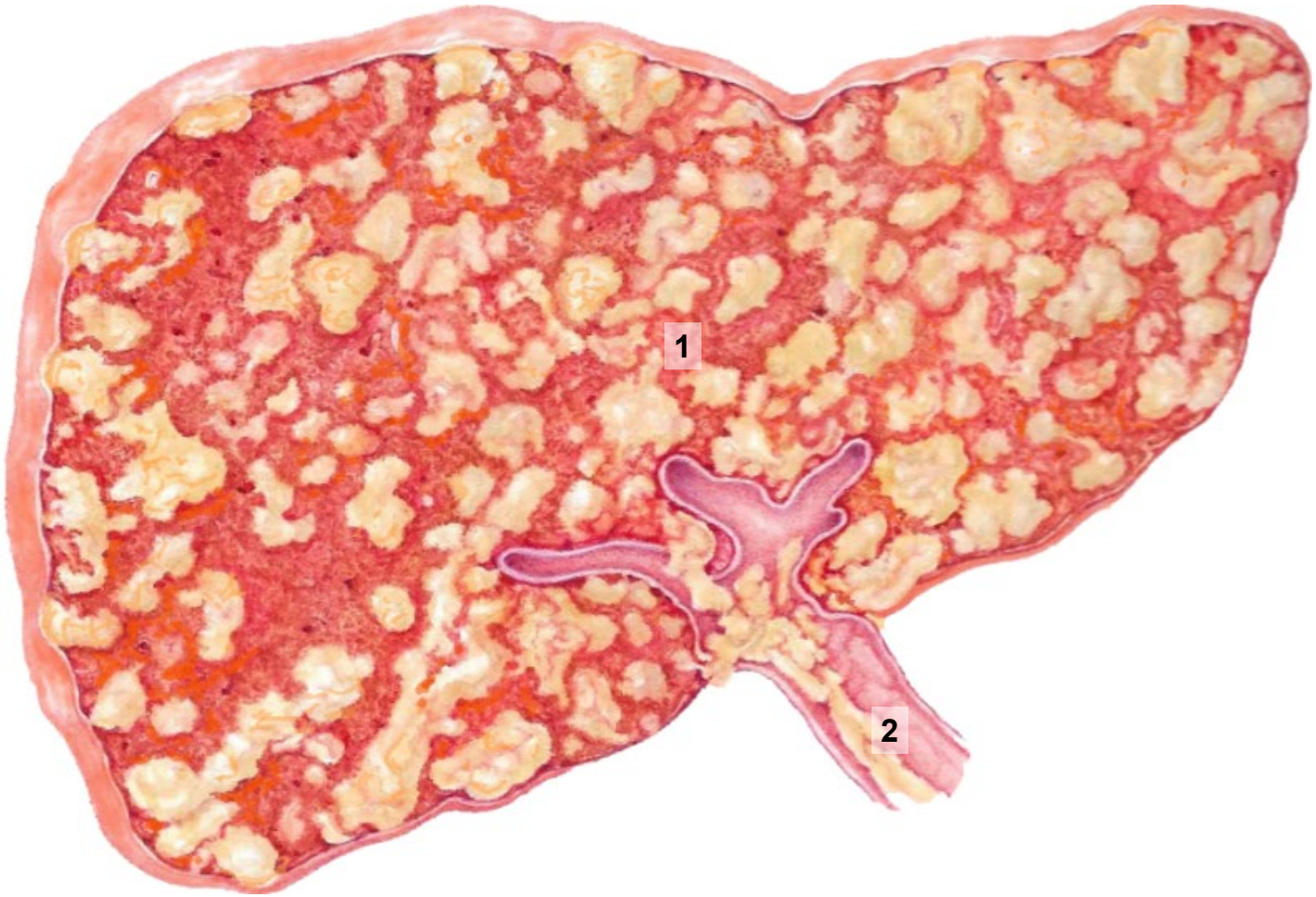


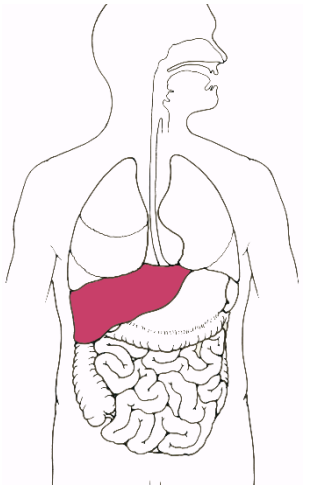


1. metastasis to liver
2. metastasis to stomach
3. metastasis to lymph nodes
4. diseased gallbladder
5. metastasis to or from pancreas
6. duodenum
7. transverse colon
8. ascending colon

Liver

Tumors

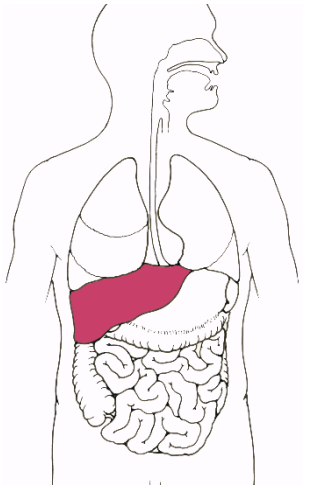




Metastatic disease

1. cross section of metastasis to liver from other organs
2. portal vein

Liver



More likely to support procurement:

- partial hepatectomy (liver resection) - is a type of surgery designed to remove cancerous tumors from the liver.

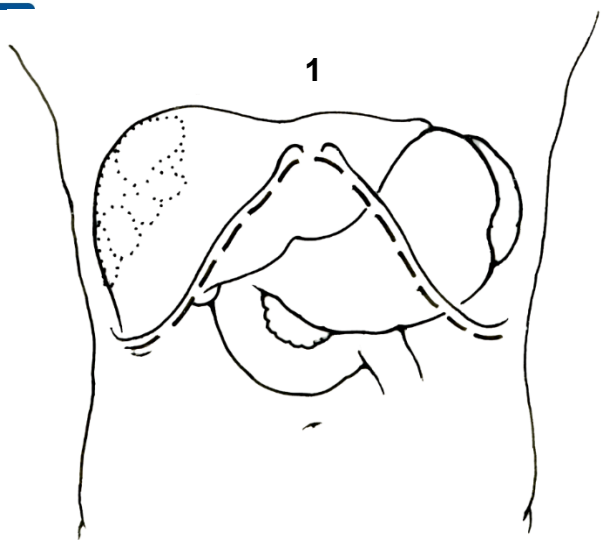
Less likely to support procurement:

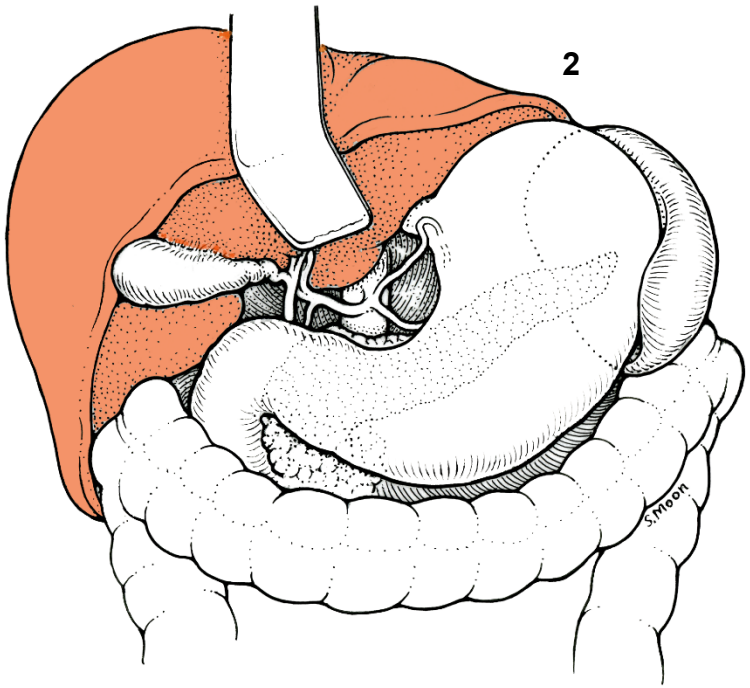
- none

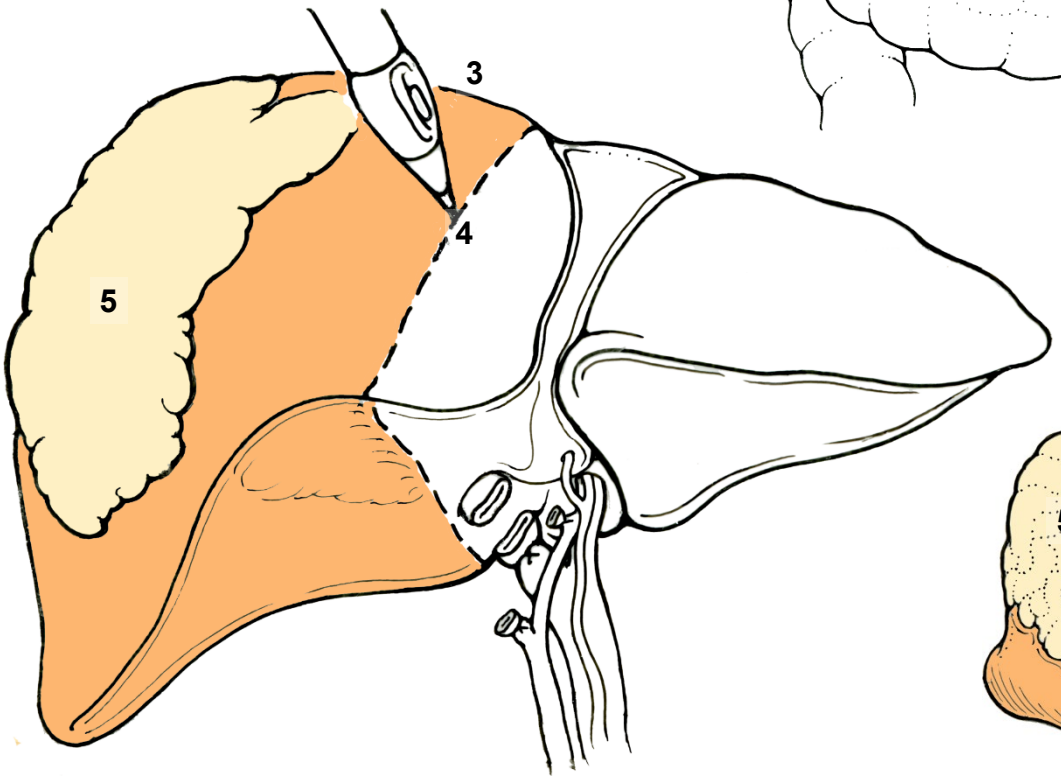
Procedures

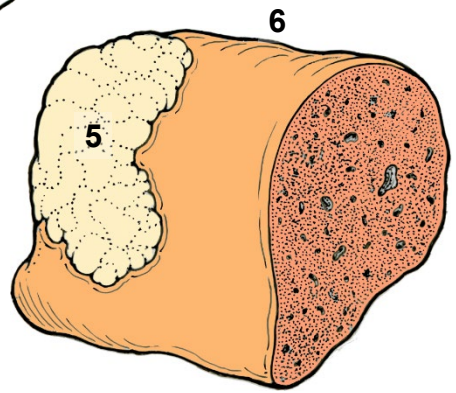
Liver

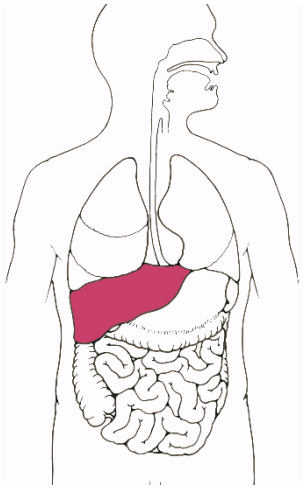
Procedure







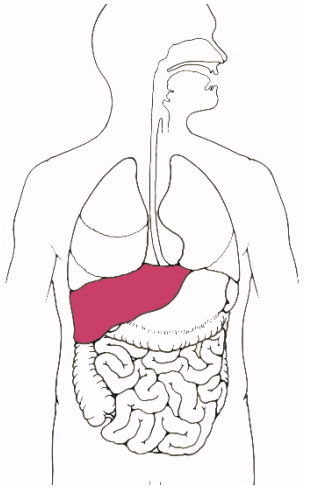


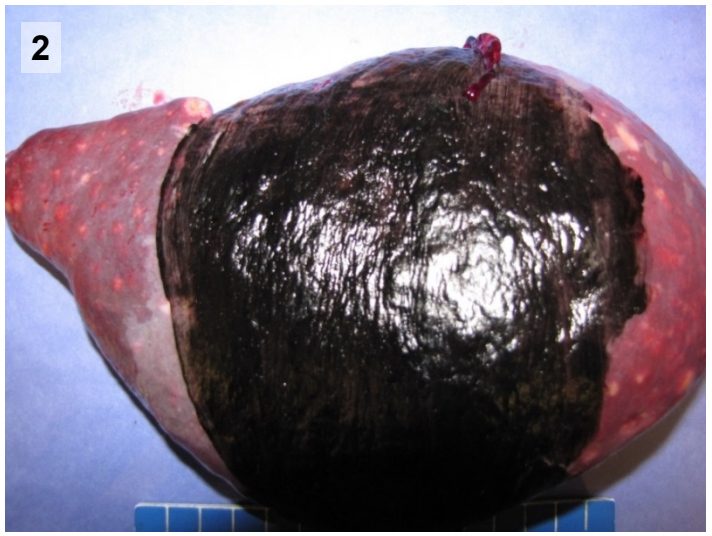


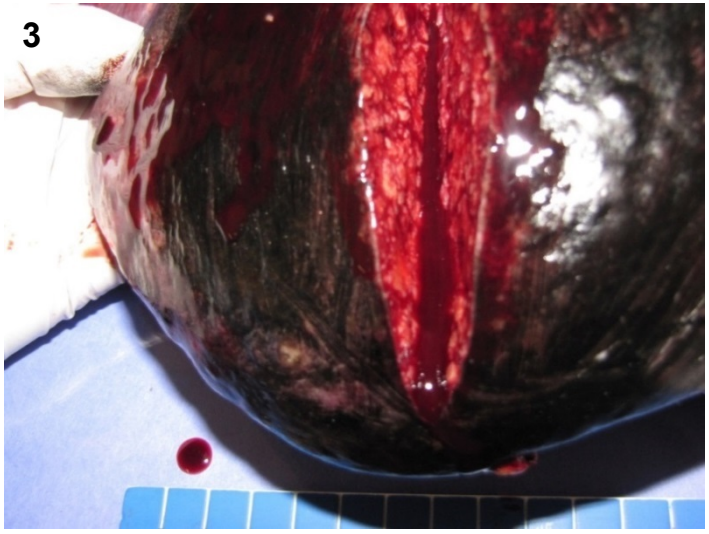
Partial hepatectomy

1. anterior liver position and hepatectomy incision
2. mobilized/exposed liver position
3. resection incision for right hepatectomy
4. incision
5. tumor
6. resected hepatic specimen

Liver



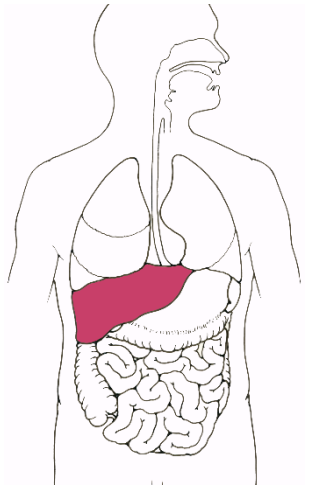




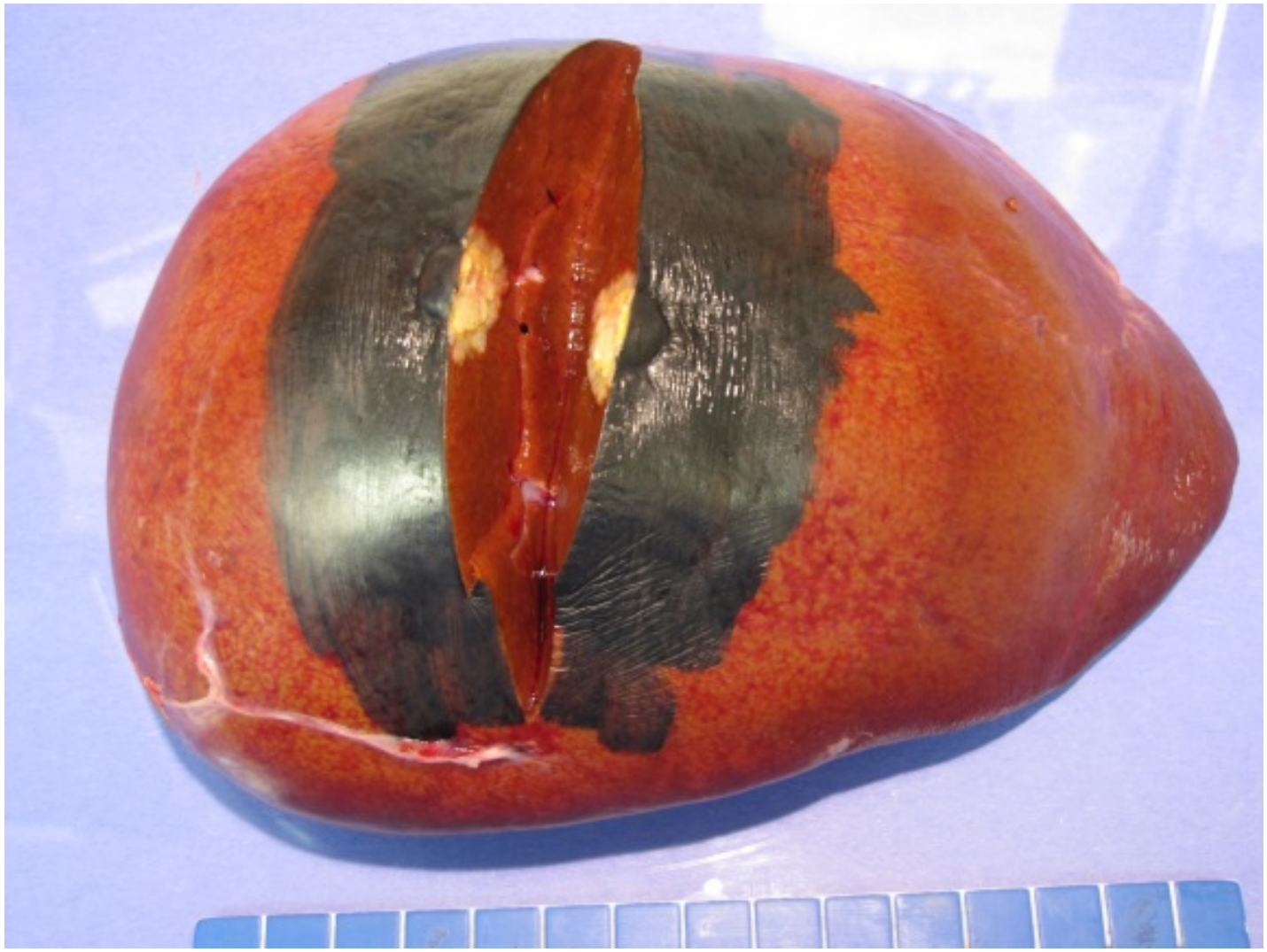
1. extracted
2. inked
3. initial cut

Procurement

Liver



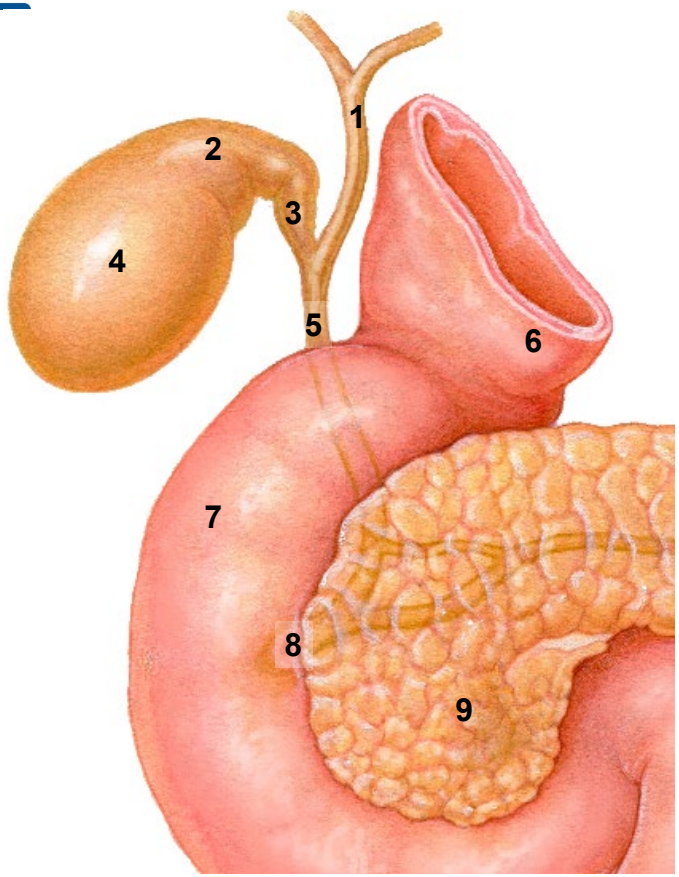
Solitary lesion

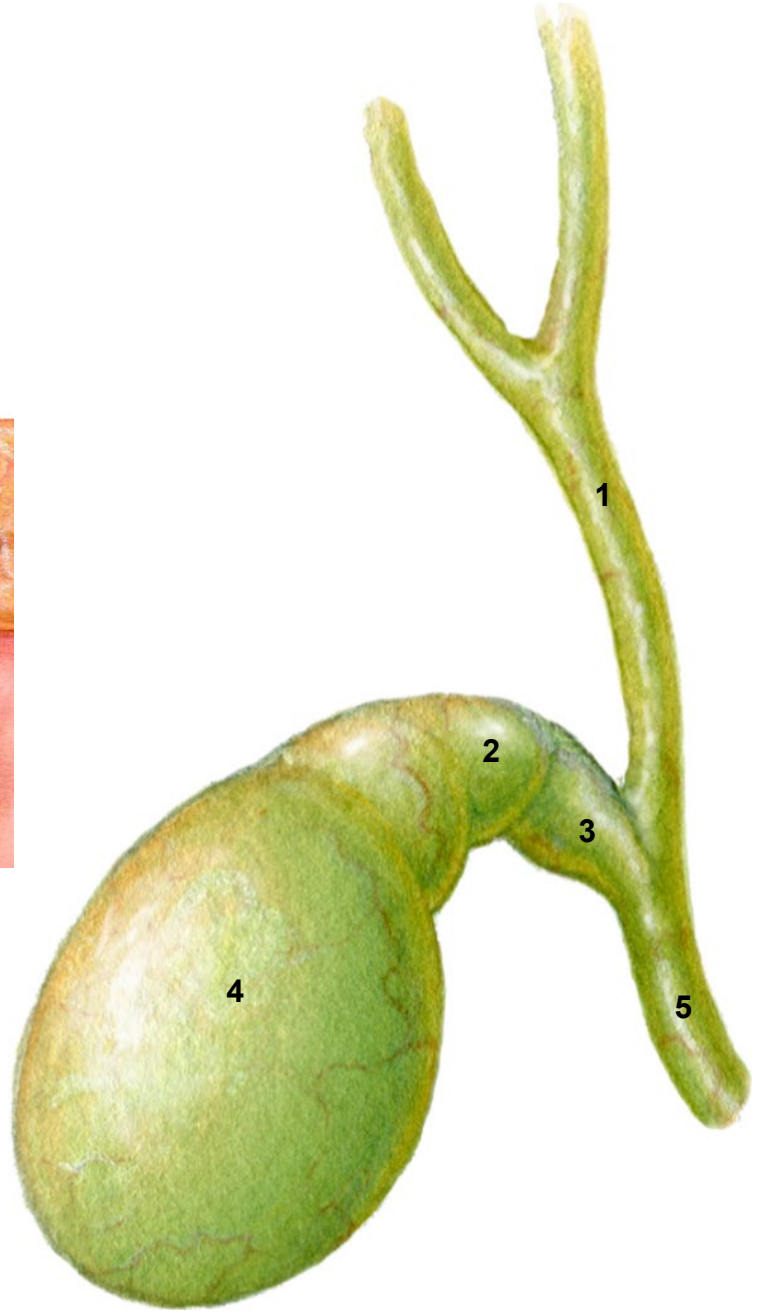


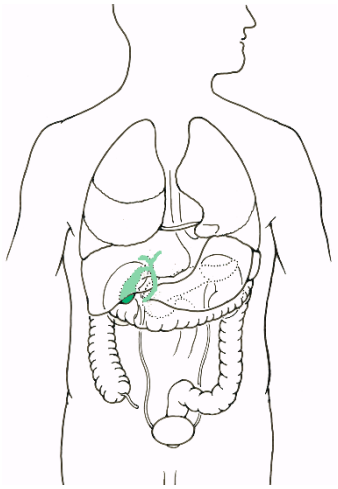
Procurement

Gallbladder

Anatomy

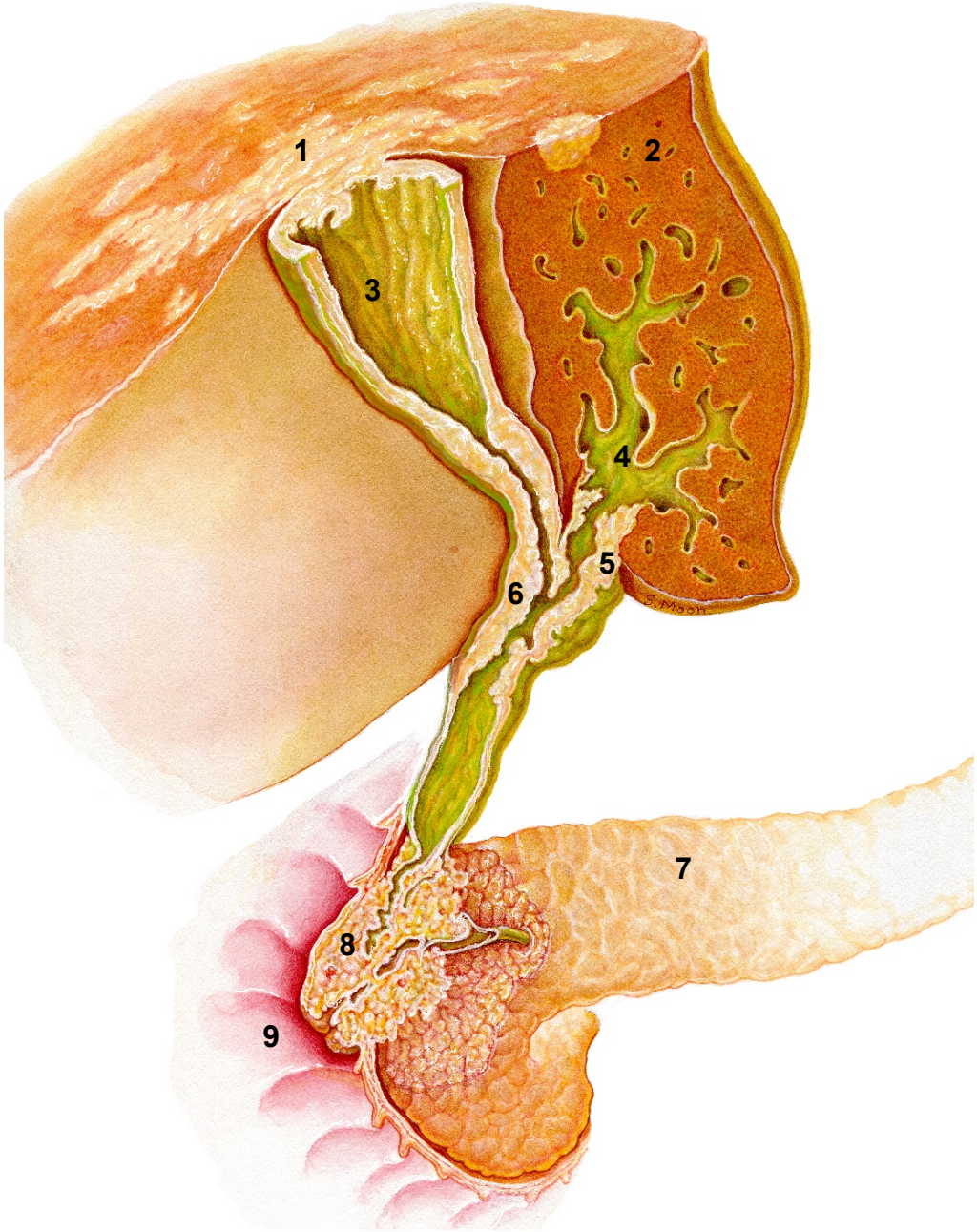


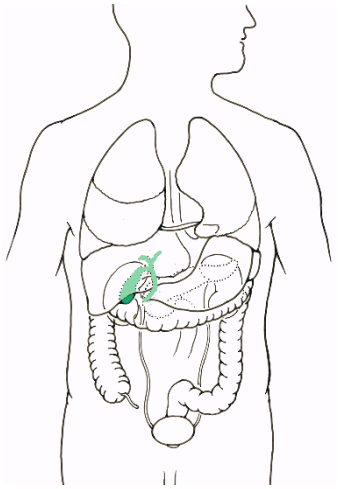




1. common hepatic duct
2. neck of gallbladder
3. cystic duct
4. body of gallbladder
5. common bile duct
6. to jejunum (distal)
7. duodenum
8. ampulla of Vater
9. head of pancreas

Gallbladder

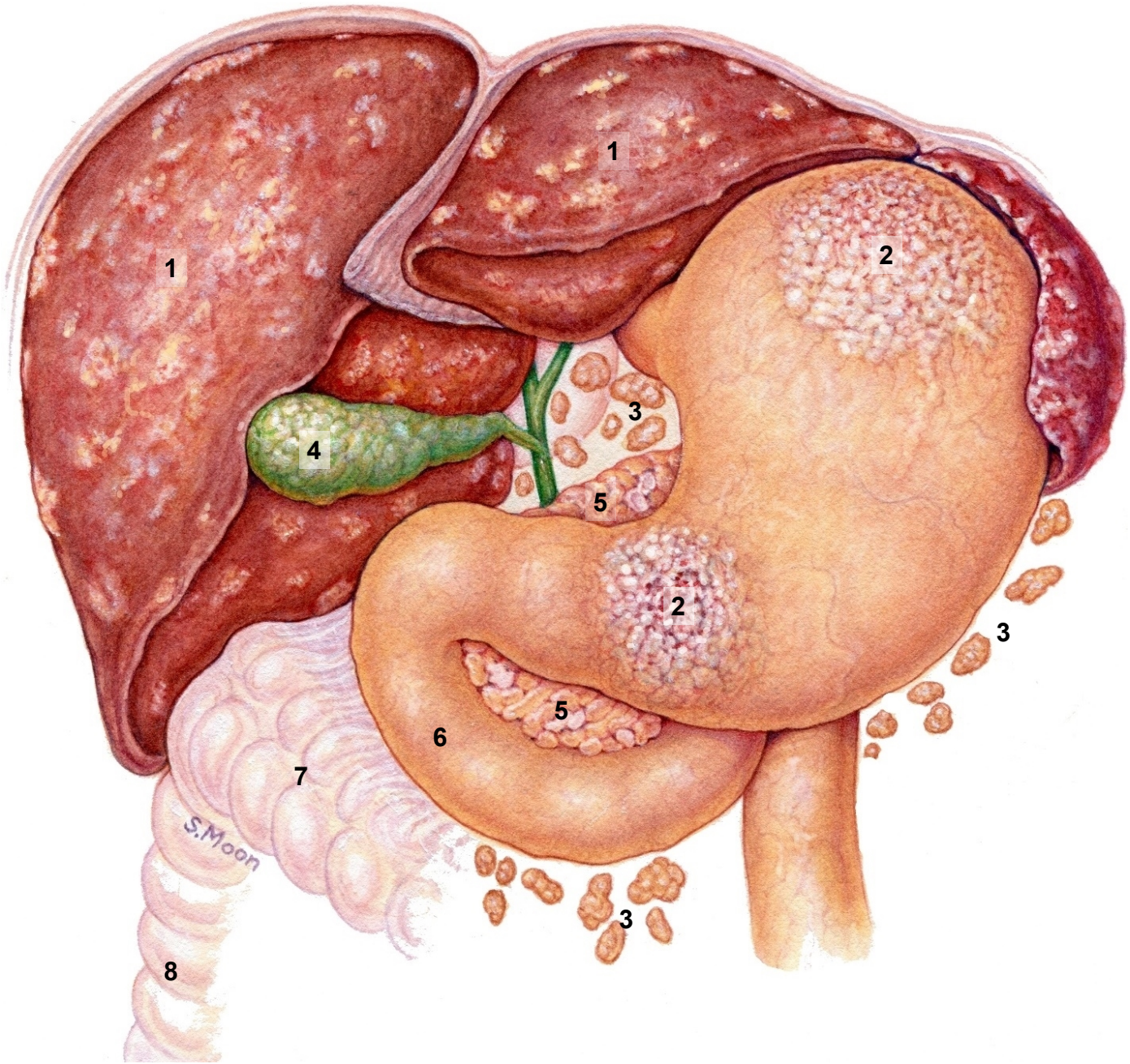


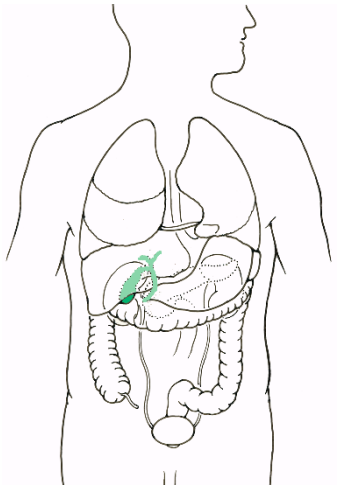


1. invasion of liver from gallbladder
2. normal liver
3. gallbladder
4. common hepatic duct
5. constriction or tumor
6. chronic obstruction
7. pancreas
8. tumor or chronic obstruction at ampulla of Vater
9. duodenum of small intestine

Gallbladder

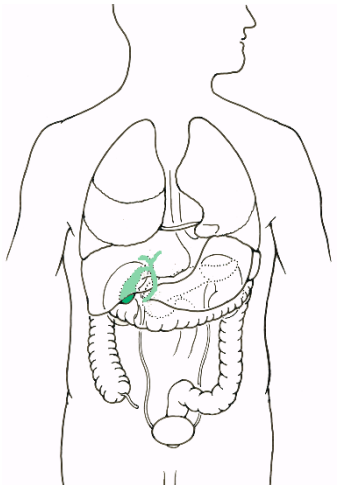
Tumors





1. metastasis to liver
2. metastasis to stomach
3. metastasis to lymph nodes
4. diseased gallbladder
5. metastasis to or from pancreas
6. duodenum
7. transverse colon
8. ascending colon

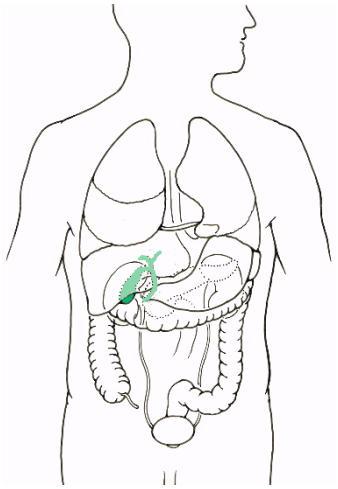
Gallbladder



1. enlarged gallbladder
2. pancreatitis
3. cystic dilation of ducts
4. stones in collecting ducts

The gallbladder may be enlarged as a result of conditions of the liver, biliary tract, and/or pancreas. It can also enlarge because of infections, neoplastic developments, and/or obstructions of the biliary tract, stones or neoplastic development. The gallbladder can become greatly enlarged.

Gallbladder



More likely to support procurement:

- (open) cholecystectomy - surgical removal of the gallbladder via one large cut.
- laparoscopic cholecystectomy via several small cuts instead of one large one.

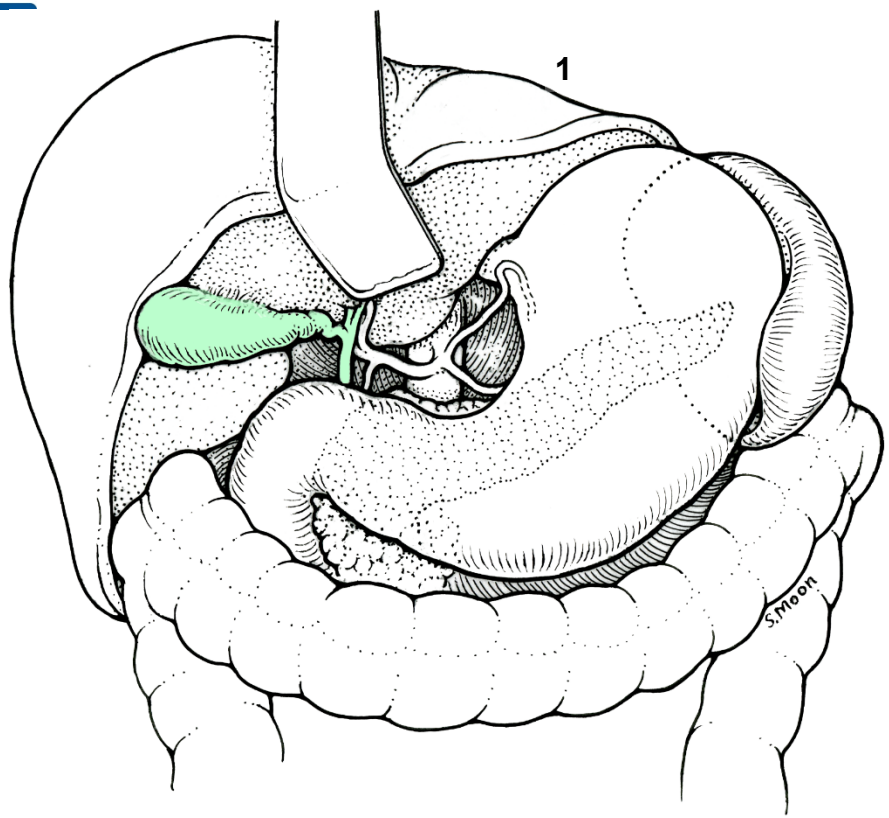
Less likely to support procurement:

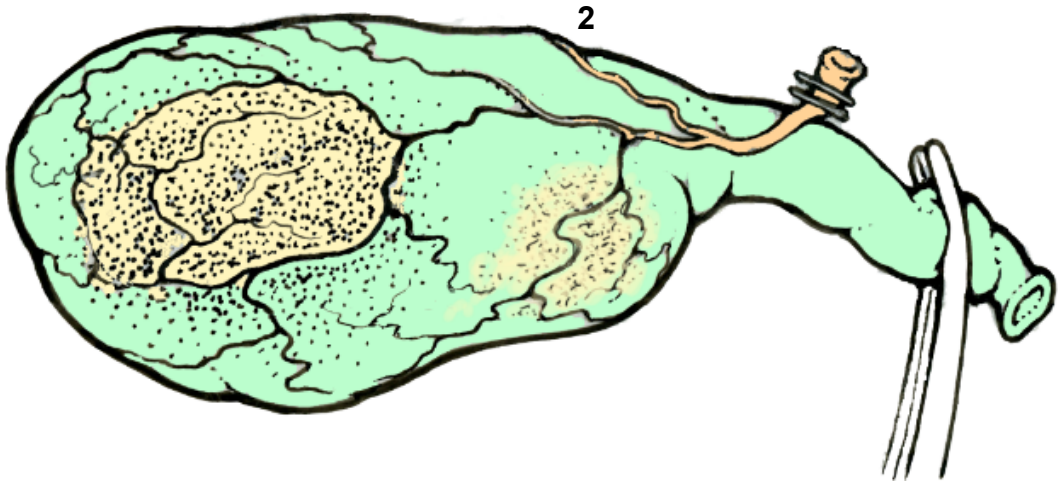
- none

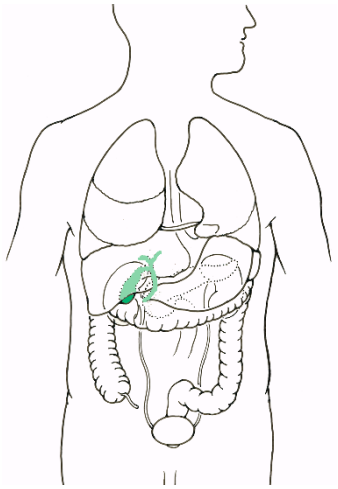
Procedures

Gallbladder

Procedure





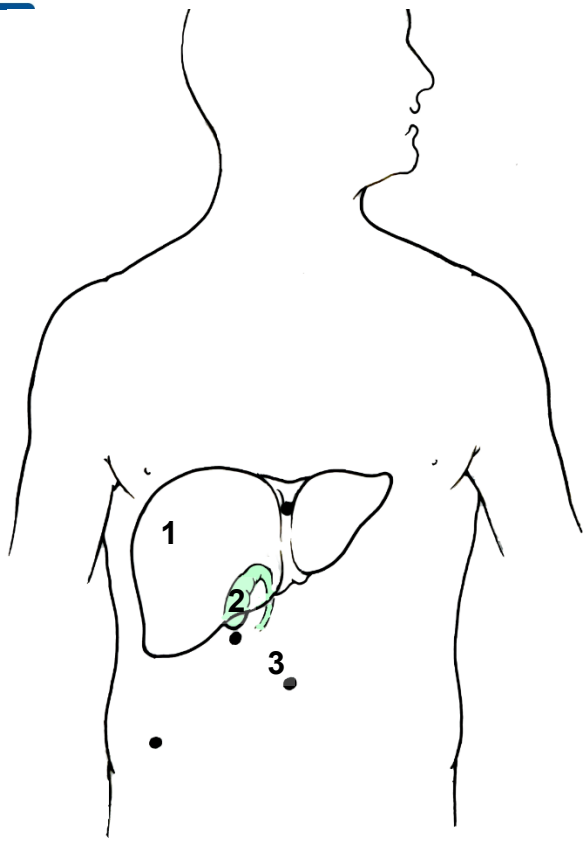


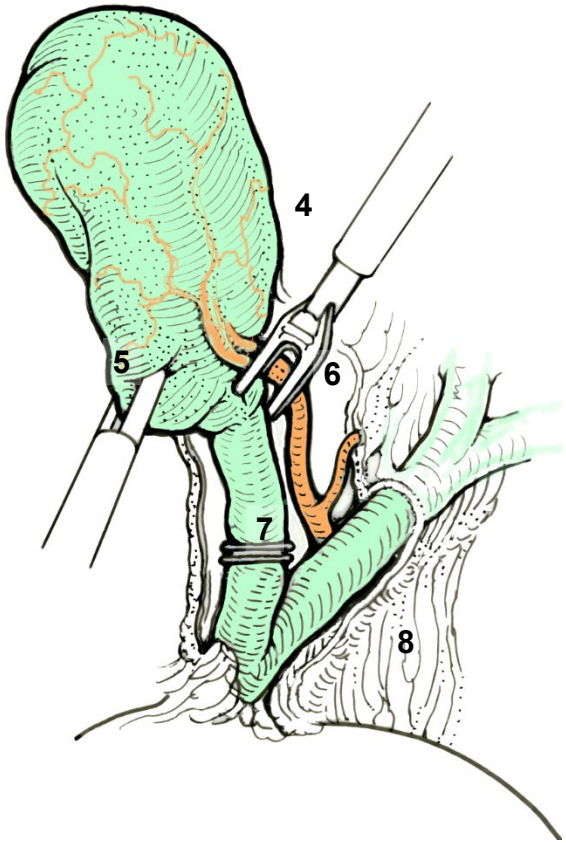
(Open) cholecystectomy

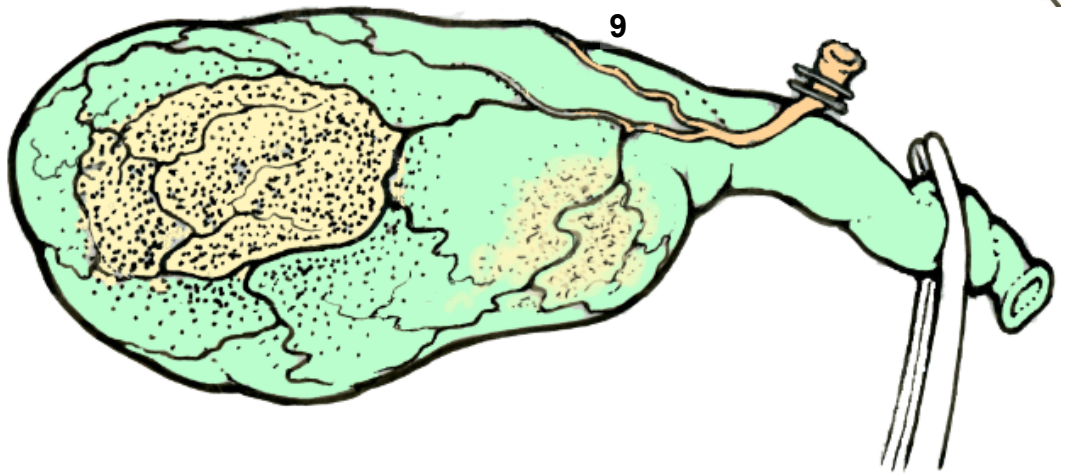
1. surgical anatomy with retractor (anterior location of gallbladder and abdominal organs)
2. resected specimen with tumor

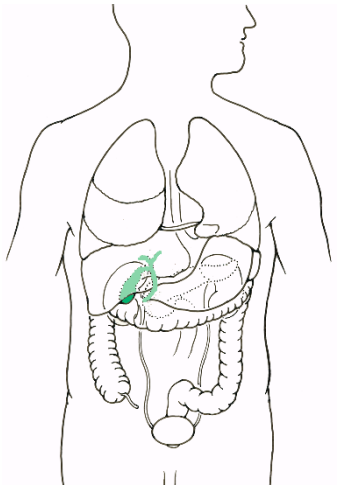
Gallbladder

Procedure





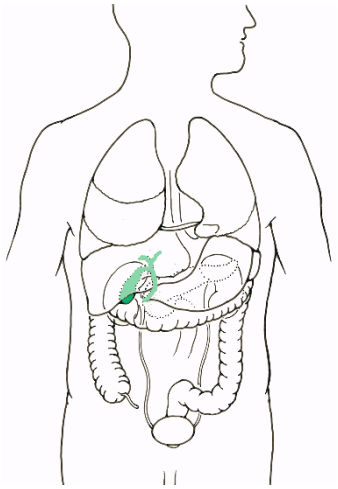




Laparoscopic cholecystectomy

1. liver
2. gallbladder
3. surgical entry port locations
4. elevation of gallbladder infundibulum and exposure of porta hepatis
5. retracting infundibulum
6. clip off cystic artery
7. hemoclip on cyst duct
8. porta hepatis
9. specimen

Gallbladder

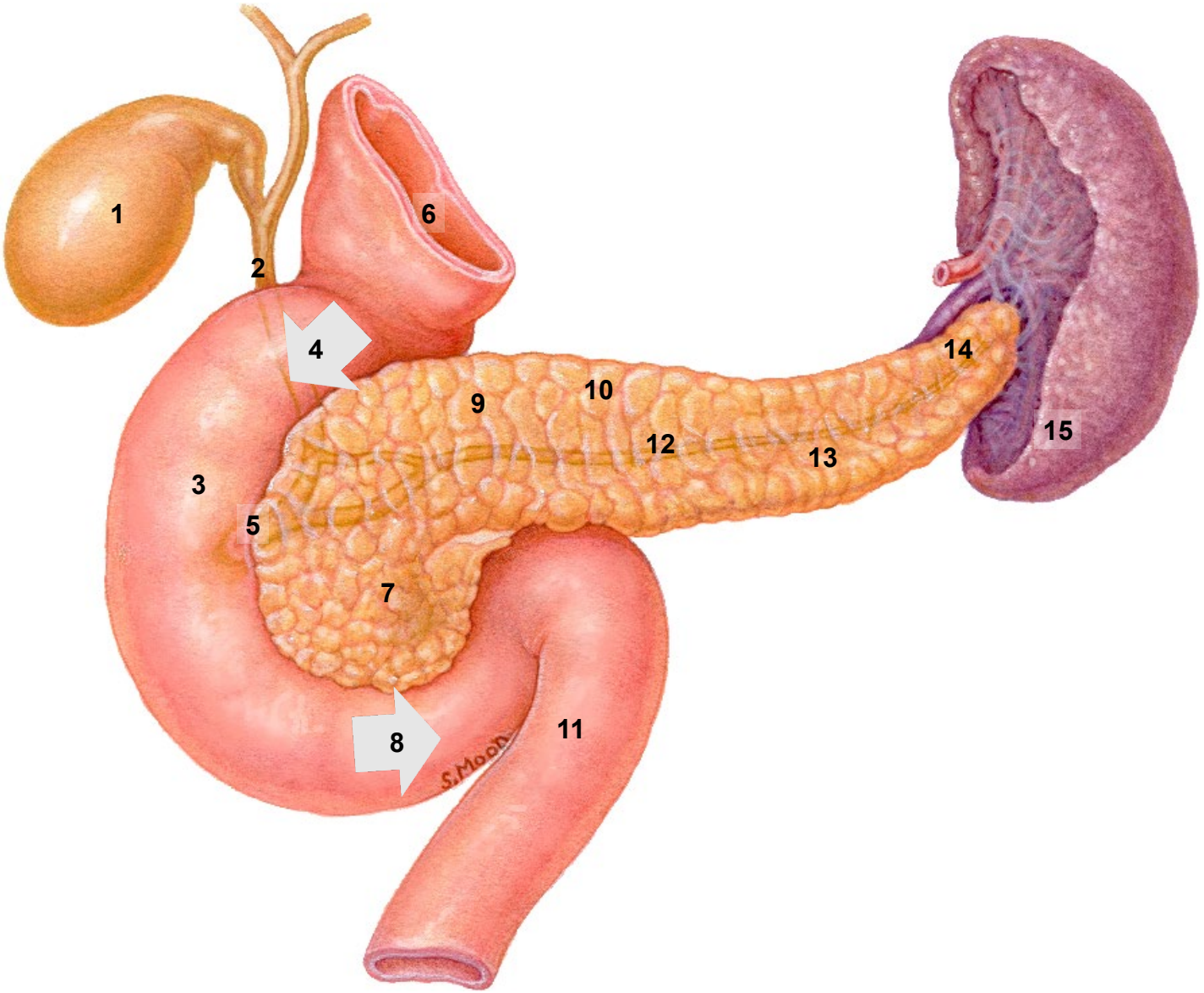


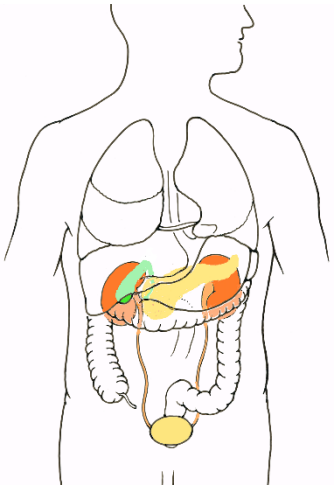
To be added

Procurement

Pancreas

Anatomy

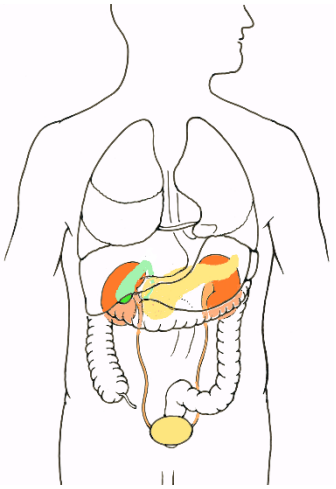




1. gallbladder
2. common bile duct
3. duodenum
4. from stomach (proximal)
5. ampulla of Vater
6. stomach
7. head (proximal)
8. to jejunum (distal)
9. neck
10. body
11. jejunum
12. pancreatic duct
13. pancreas
14. tail (distal)
15. spleen

Pancreas

Anatomy



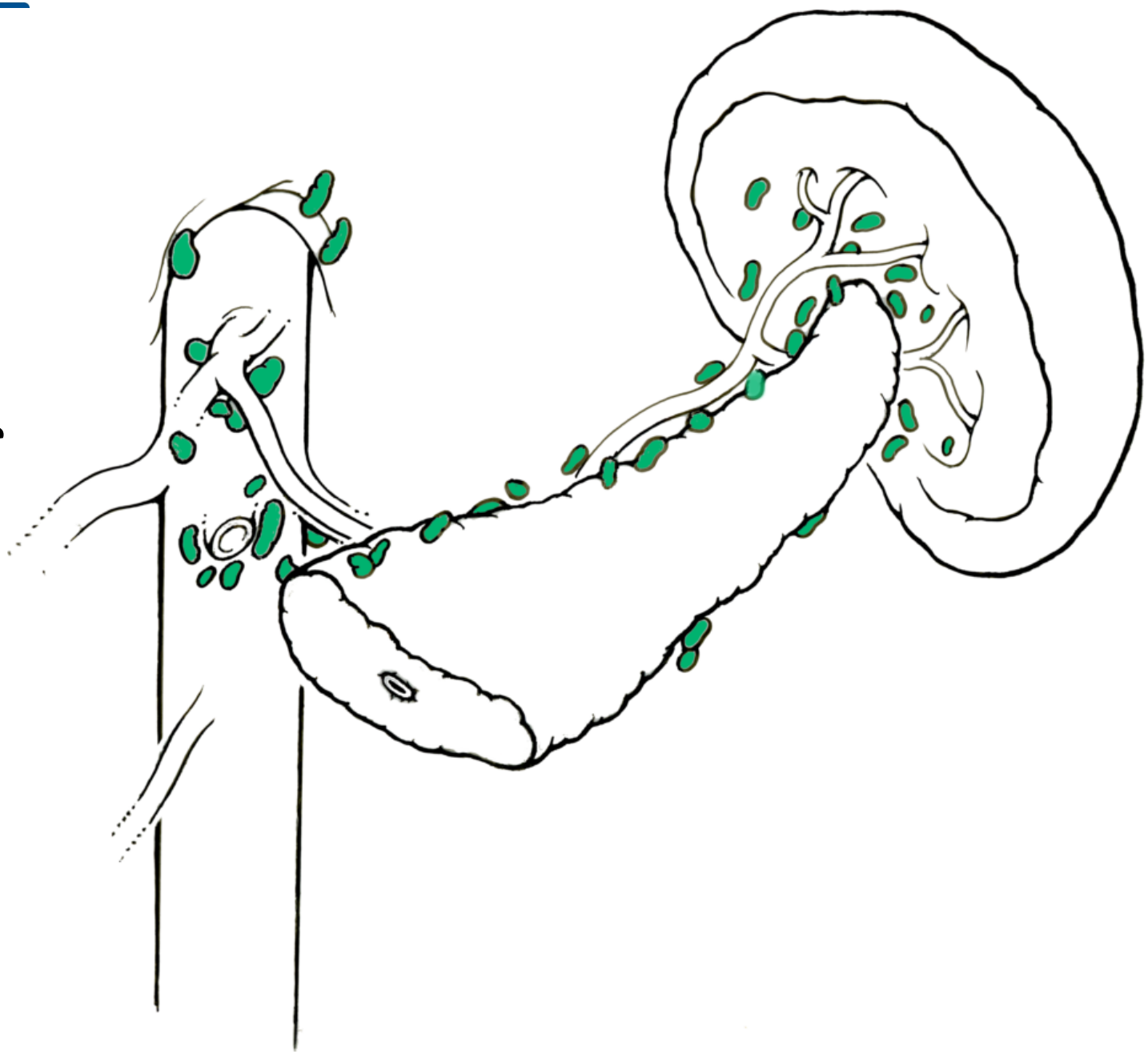
Pancreatic lymph nodes

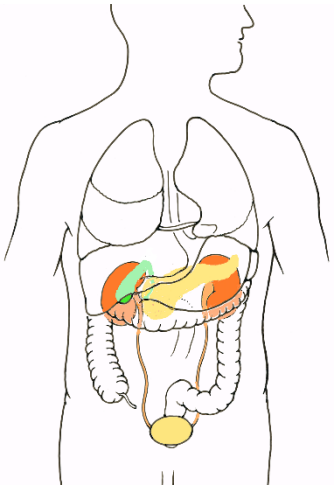
Lymph node anatomy in other sections

- Head & Neck
- Lung
- Stomach
- Colon & Rectum
- Spleen
- Female Reproductive
- Lymphatic System

Pancreas

Anatomy





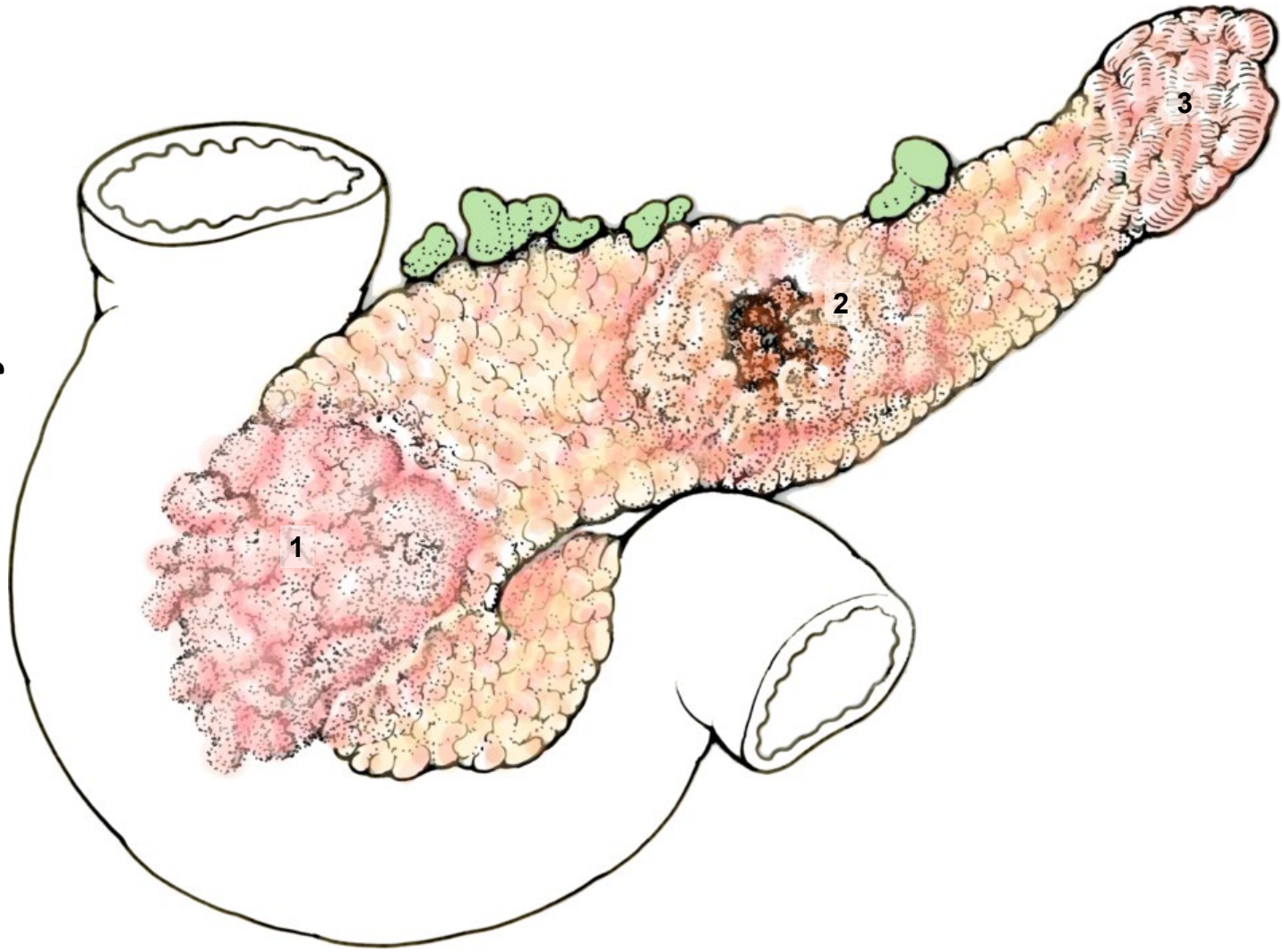
Axis lymph nodes

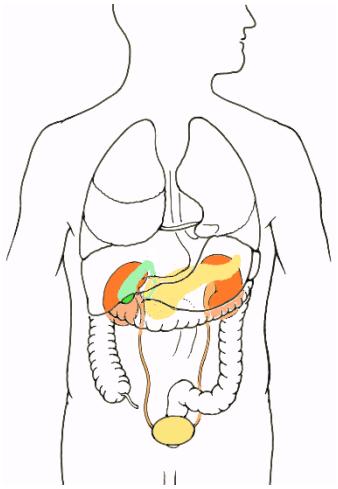
Lymph node anatomy in other sections

- Head & Neck
- Lung
- Stomach
- Colon & Rectum
- Spleen
- Female Reproductive
- Lymphatic System

Pancreas

Anatomy



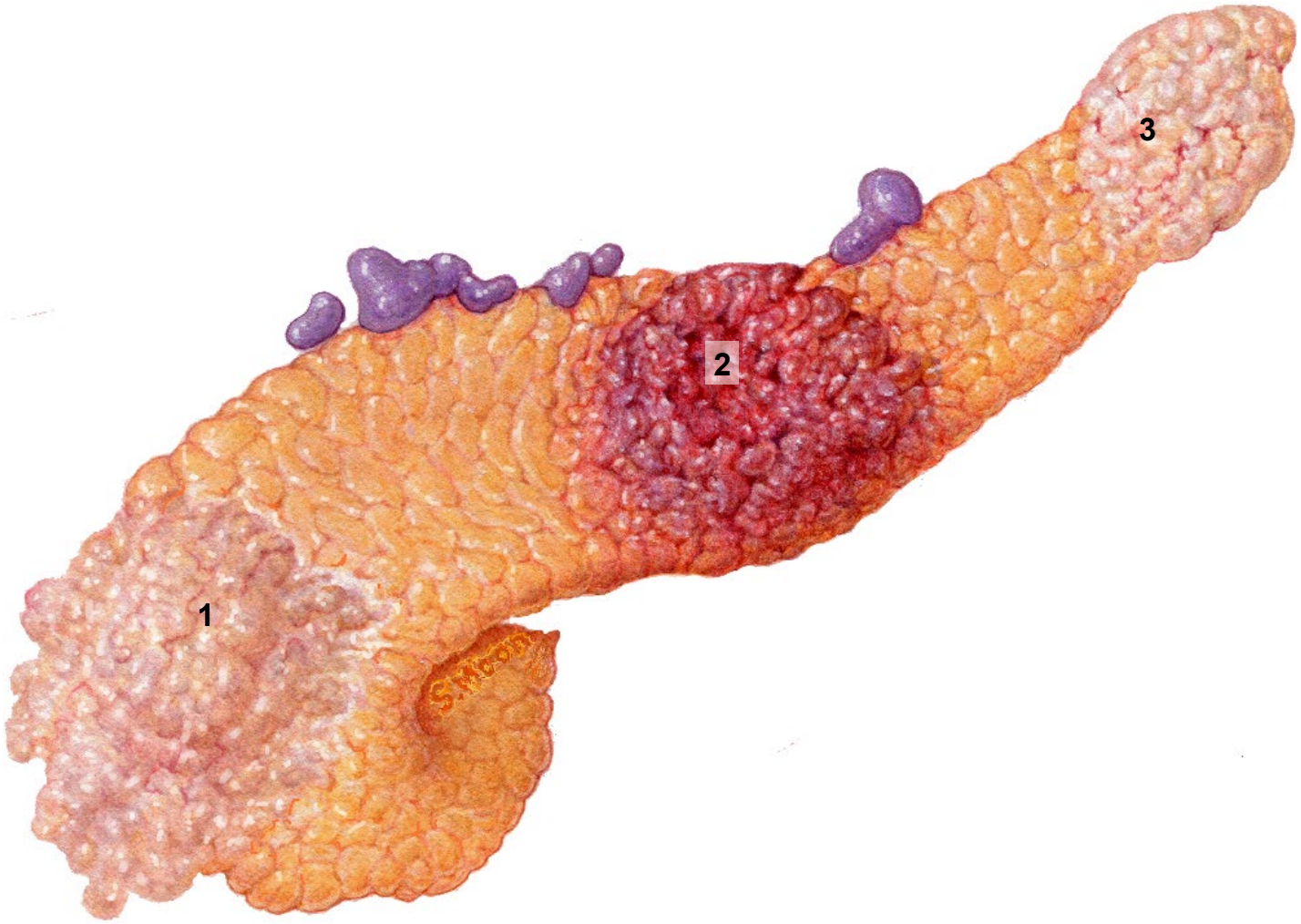


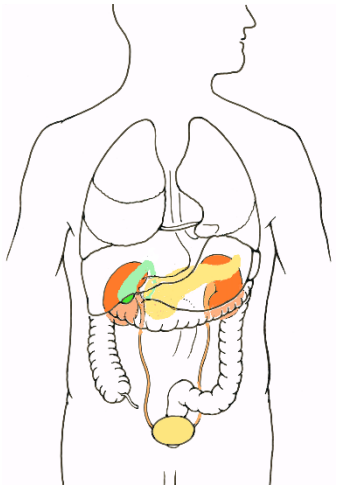
Tumors with lymph nodes

1. head
2. body
3. tail

Pancreas

Tumors

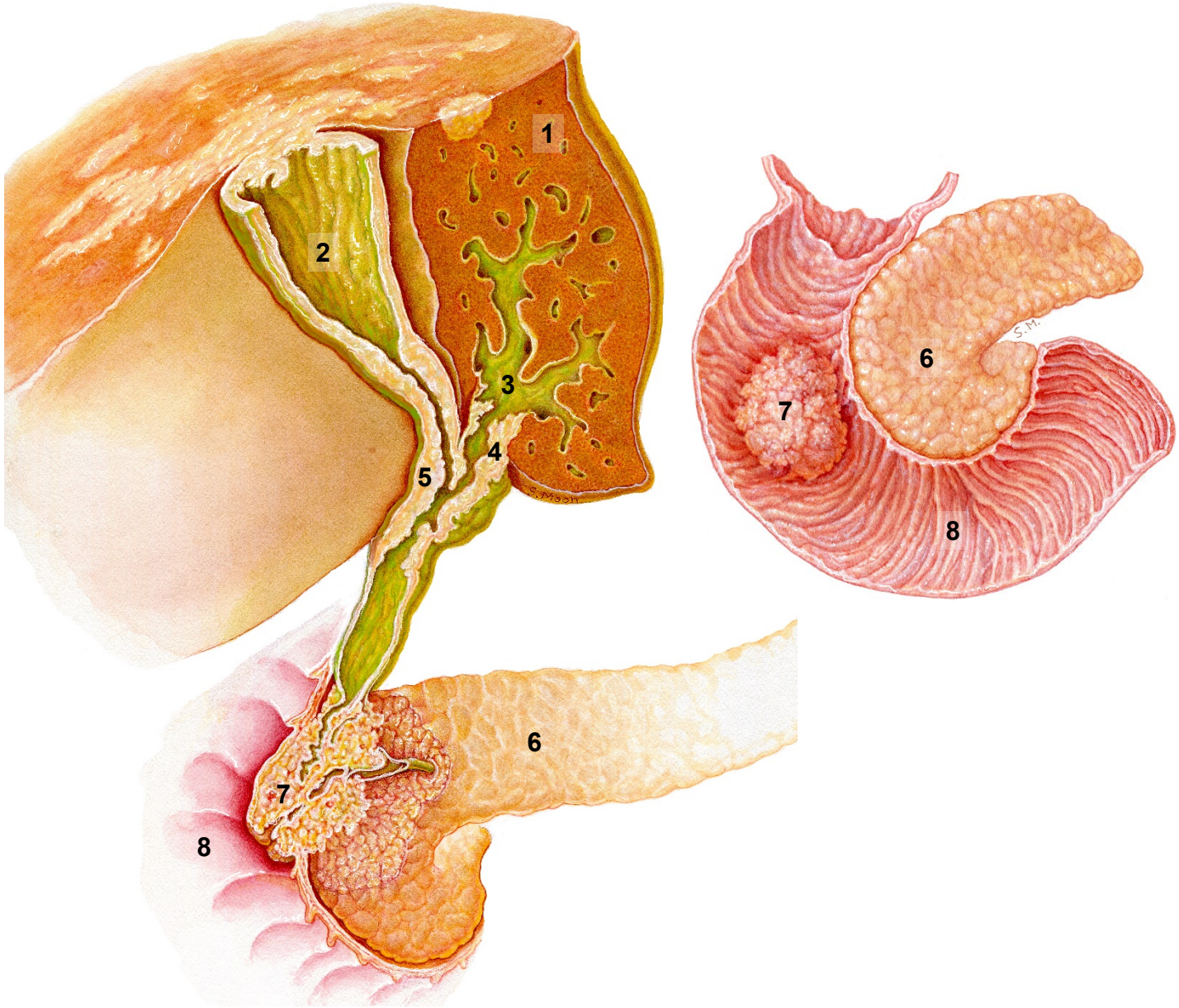


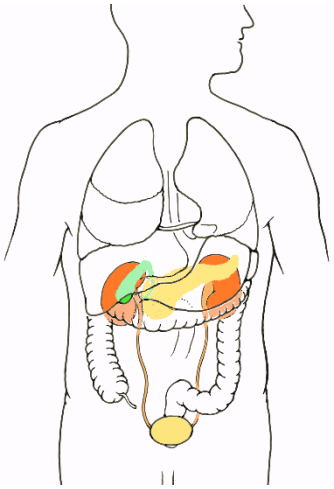


1. tumor in head
2. tumor in body
3. tumor in tail

Pancreas

Tumors

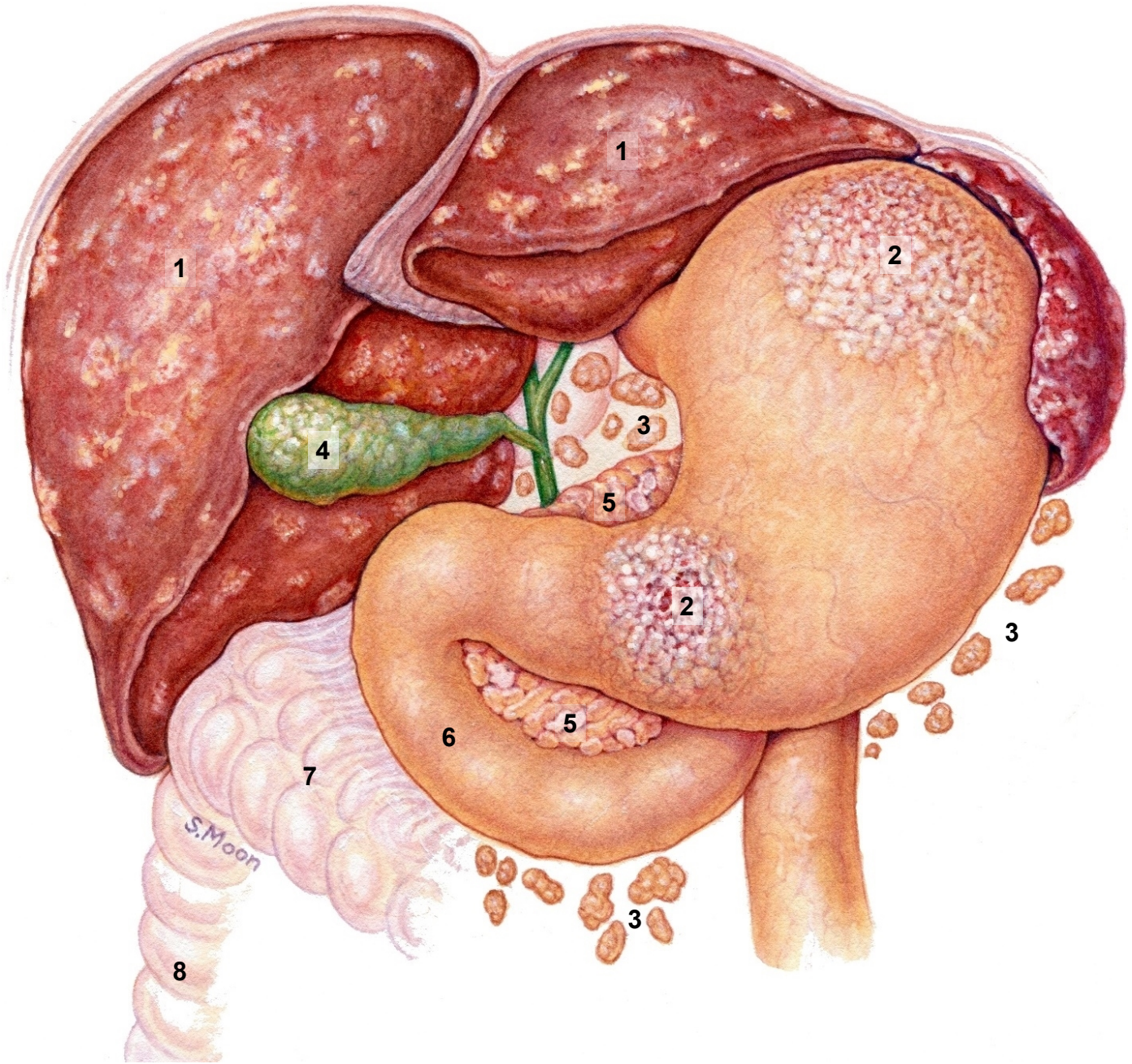


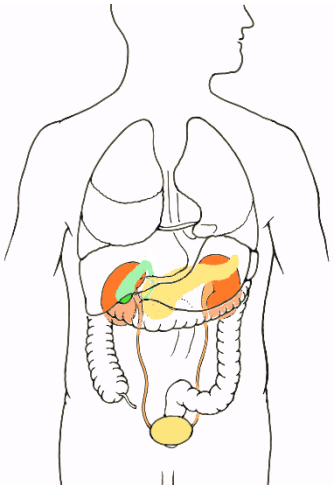


1. normal liver
2. gallbladder
3. common hepatic duct
4. constriction or tumor?
5. chronic obstruction?
6. pancreas
7. tumor or chronic obstruction at ampulla of Vater
8. duodenum of small intestine

Pancreas

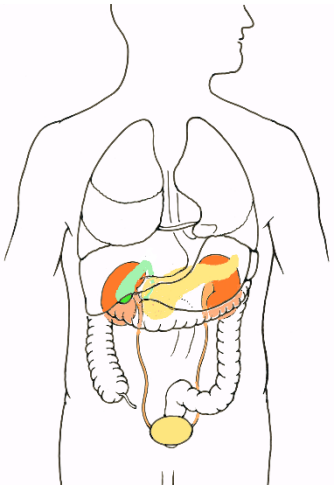
Tumors





1. metastasis to liver
2. metastasis to stomach
3. metastasis to lymph nodes
4. diseased gallbladder
5. metastasis to or from pancreas
6. duodenum
7. transverse colon
8. ascending colon

Pancreas



Procedures

More likely to support procurement:

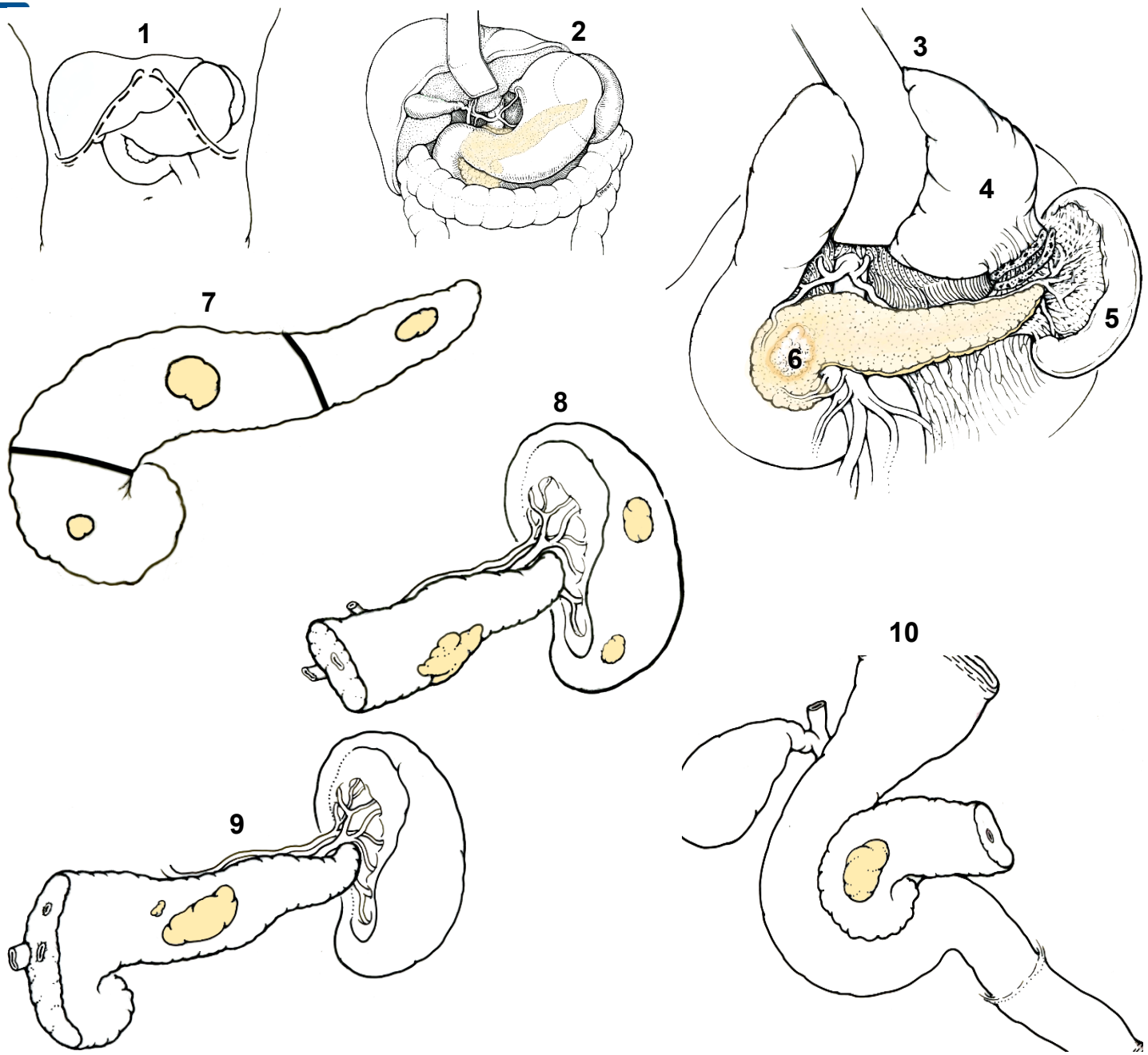
- ampullectomy - endoscopic ampullectomy is a minimally invasive method of treating superficial lesions of the ampulla of Vater.
- tumor surgery summary
- pancreaticoduodectomy (Whipple)
- distal pancreatectomy - surgery to remove the body and the tail of the pancreas. The spleen may also be removed.

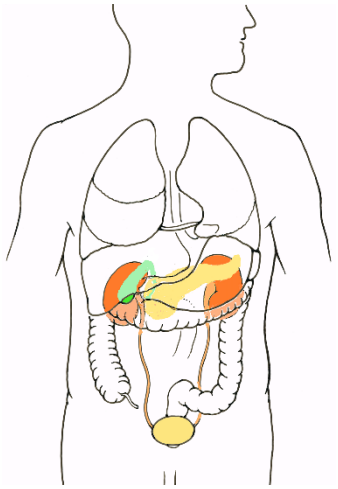
Less likely to support procurement:

- none

Pancreas

Procedure



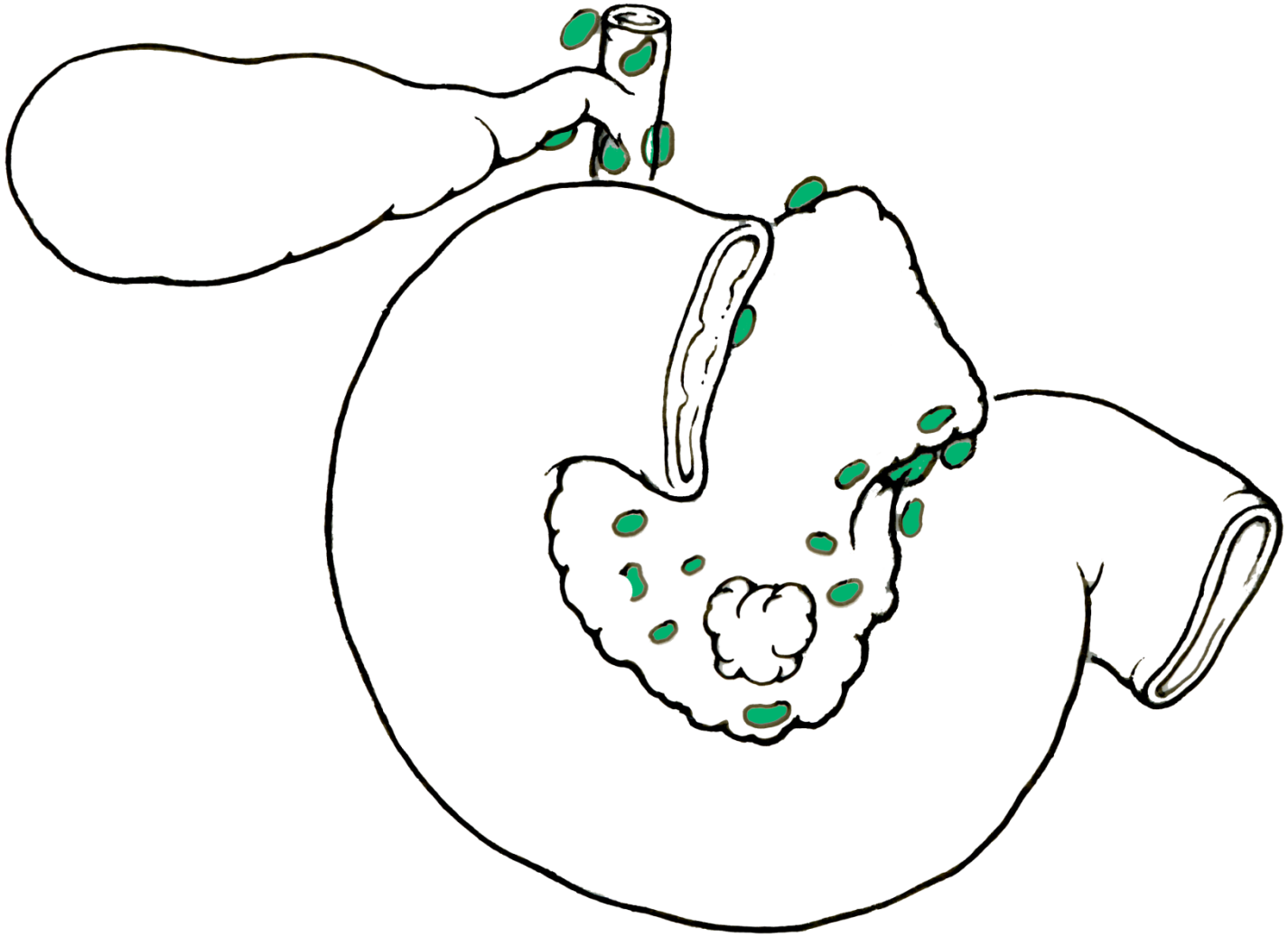


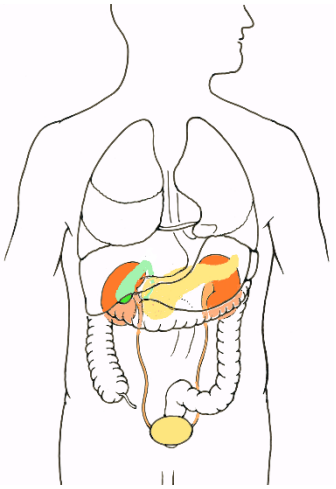
Tumor surgery summary

1. initial incision
2. anterior deep location of pancreas, posterior to stomach
3. mobilized stomach, spleen and duodenum to reveal pancreas
4. stomach
5. spleen
6. tumor
7. possible pancreas tumor locations in head (60% of tumors), mid/body (10%) and tail (5%). 25% of pancreatic tumors are diffuse.
8. subtotal pancreatectomy and spleen (extracted tail and body of pancreas and spleen from distal pancreatectomy)
9. subtotal pancreatectomy and spleen (extracted pancreas and spleen where stomach not removed)
10. extracted material from total pancreatectomy (Whipple procedure)

Pancreas

Procedure



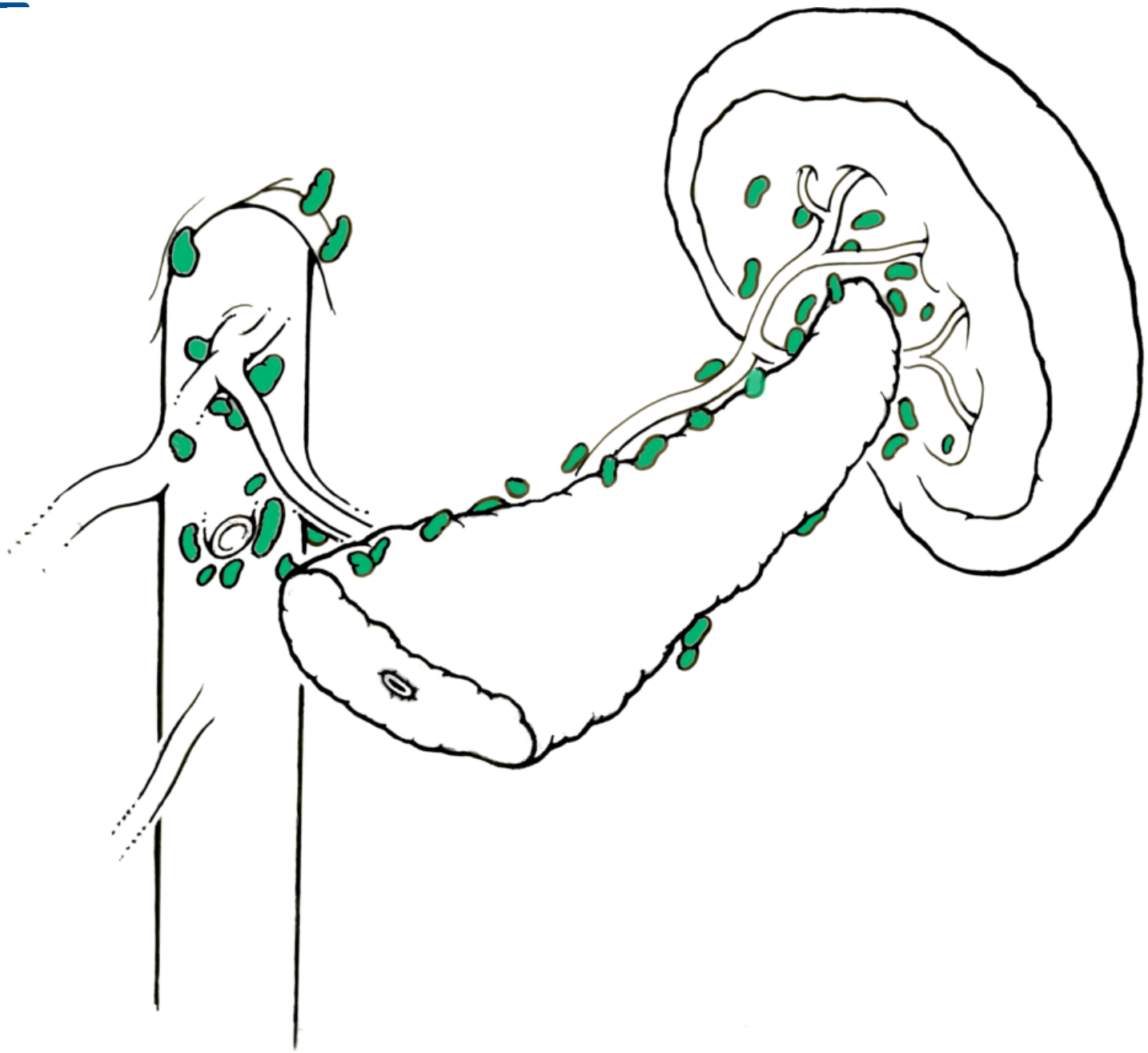


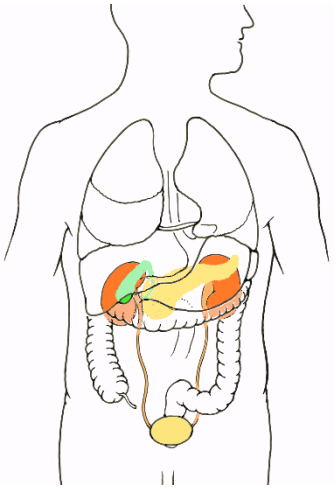
Pancreaticoduodectomy (Whipple)

This procedure consists of the duodenum with ampulla of Vater, the pancreas, and the distal common bile duct. Usually a small portion of distal stomach is attached to the proximal end of the duodenum.

Pancreas

Procedure



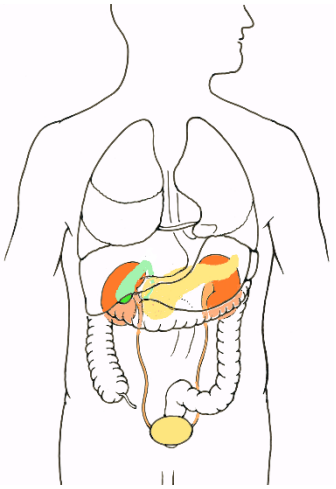


Distal pancreatectomy

This procedure consists of the surgery to remove the body and the tail of the pancreas. The spleen may also be removed.

Pancreas

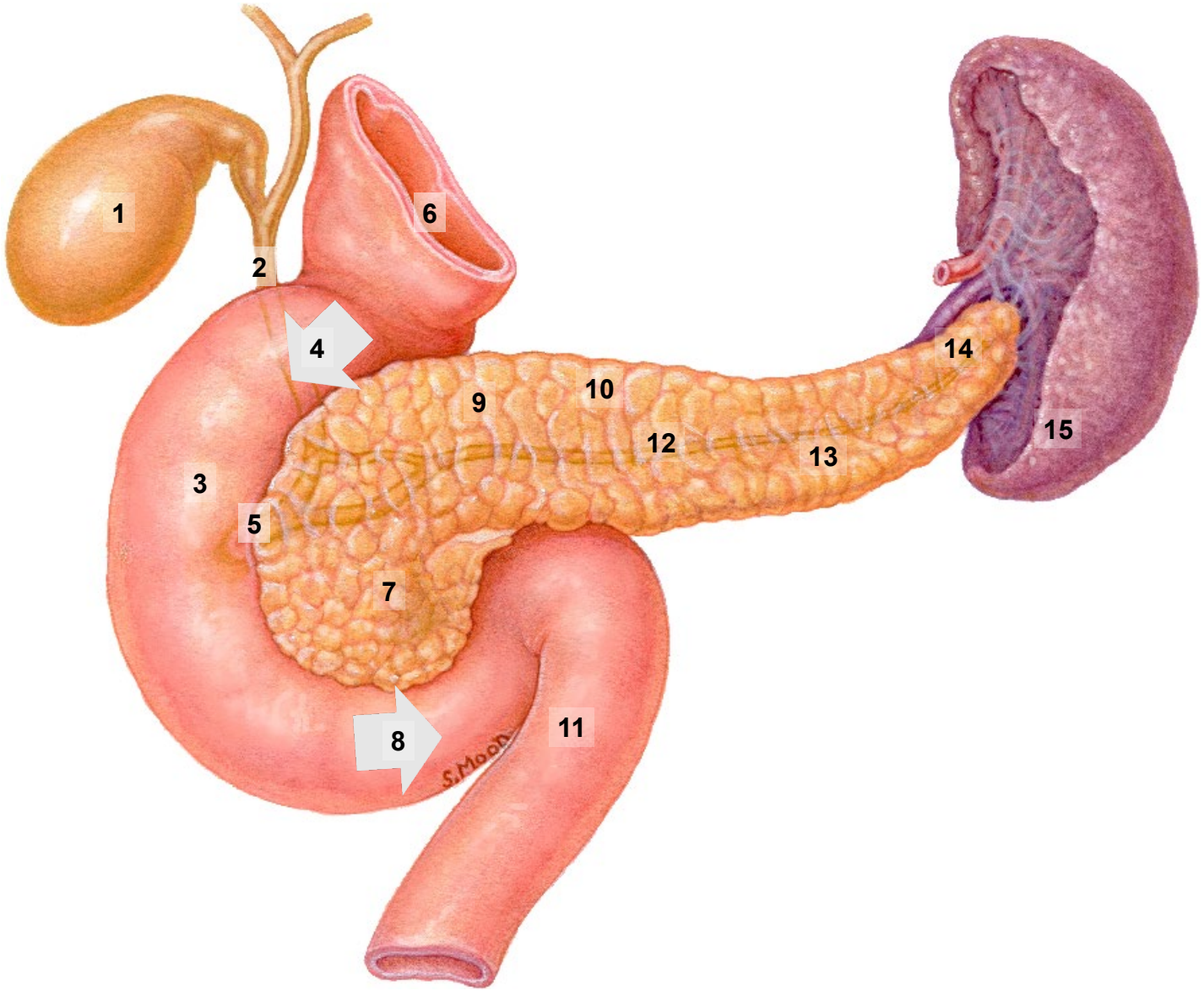
Procurement

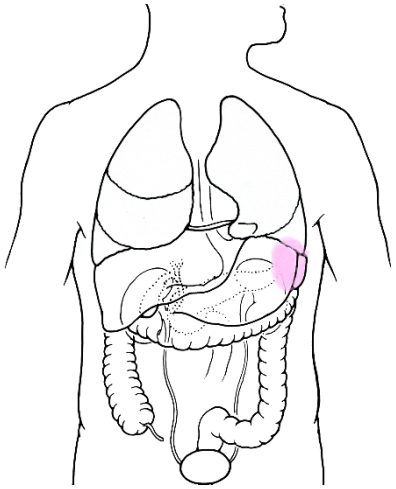


1. head
2. body
3. spleen

Spleen

Anatomy

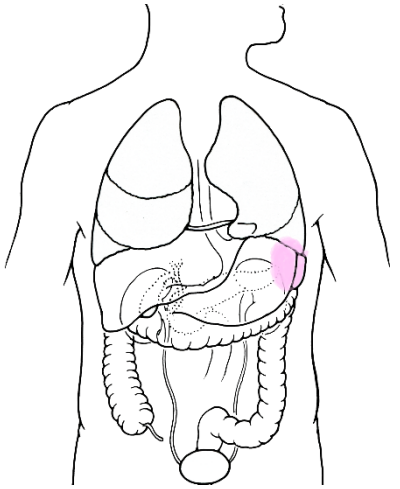




1. gallbladder
2. common bile duct
3. duodenum
4. from stomach (proximal)
5. ampulla of Vater
6. stomach
7. head (proximal)
8. to jejunum (distal)
9. neck
10. body
11. jejunum
12. pancreatic duct
13. pancreas
14. tail (distal)
15. spleen

Spleen

Anatomy

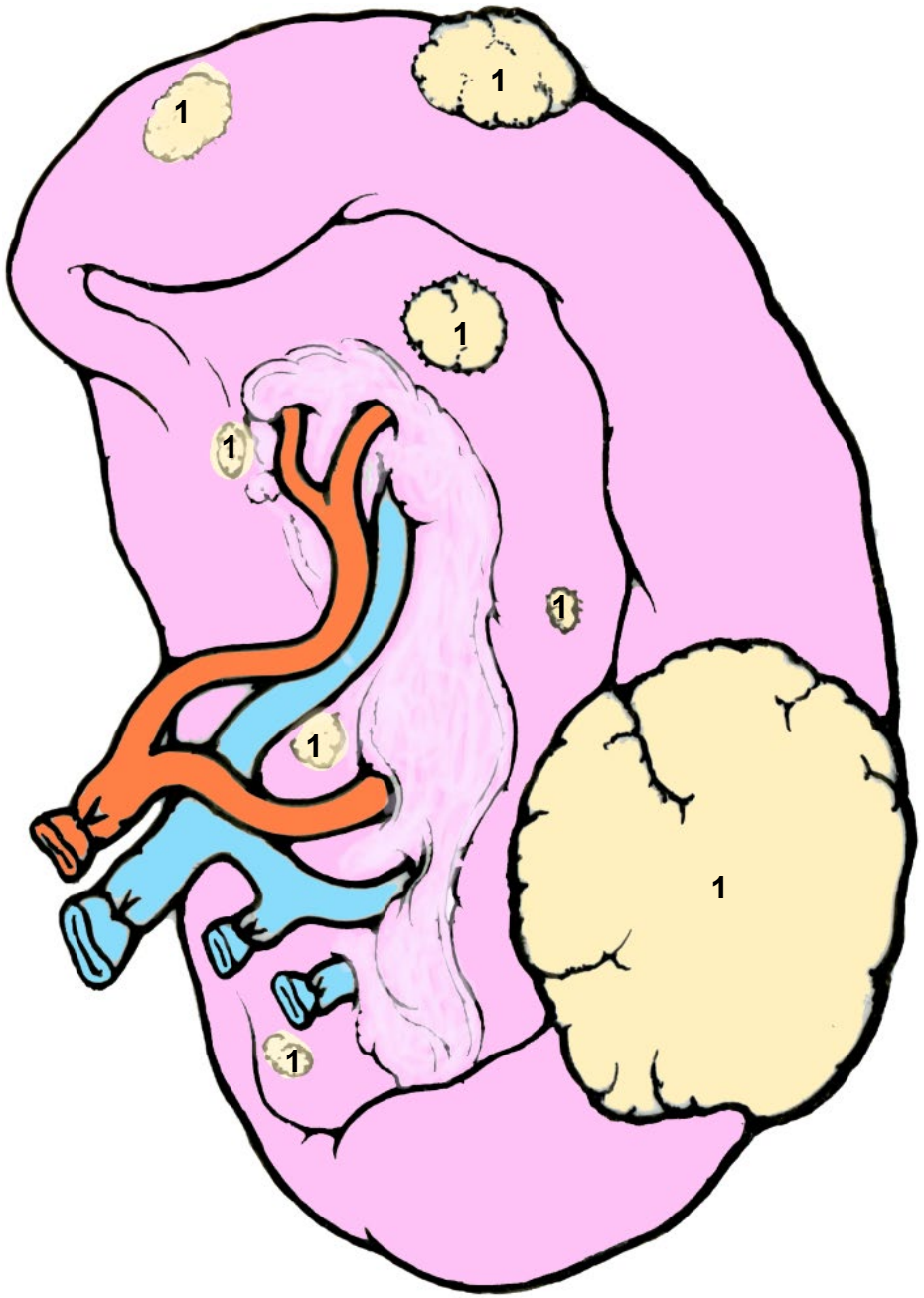


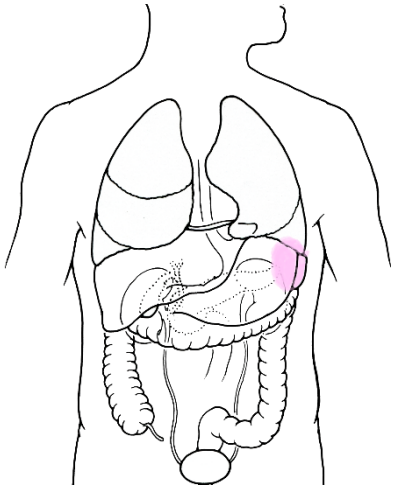
Spleen lymph nodes

Lymph node anatomy in other sections

- Head & Neck
- Lung
- Stomach
- Colon & Rectum
- Pancreas
- Female Reproductive
- Lymphatic System

Spleen

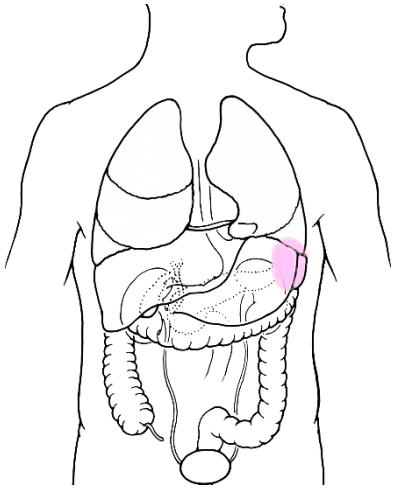




1. tumor

Tumors

Spleen



More likely to support procurement:

- splenectomy – surgery to remove the spleen.
- distal pancreatectomy - surgery to remove the body and the tail of the pancreas. The spleen may also be removed.

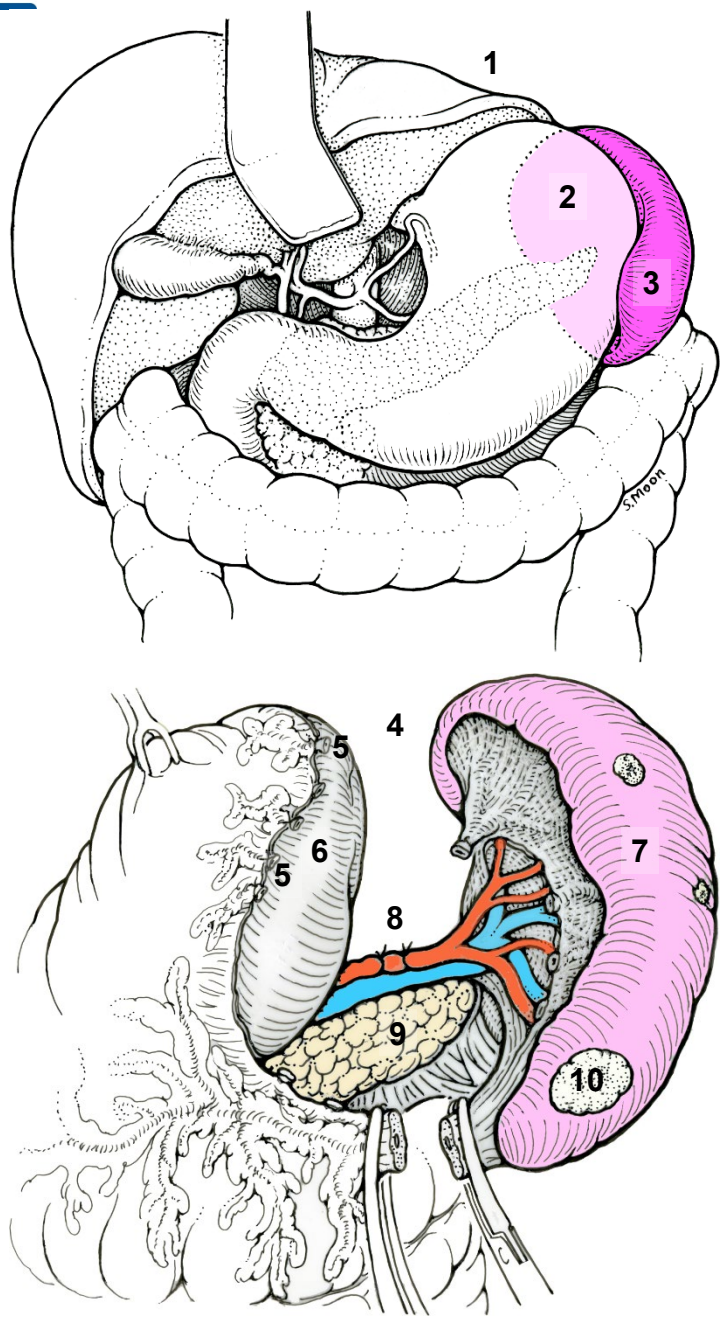
Less likely to support procurement:

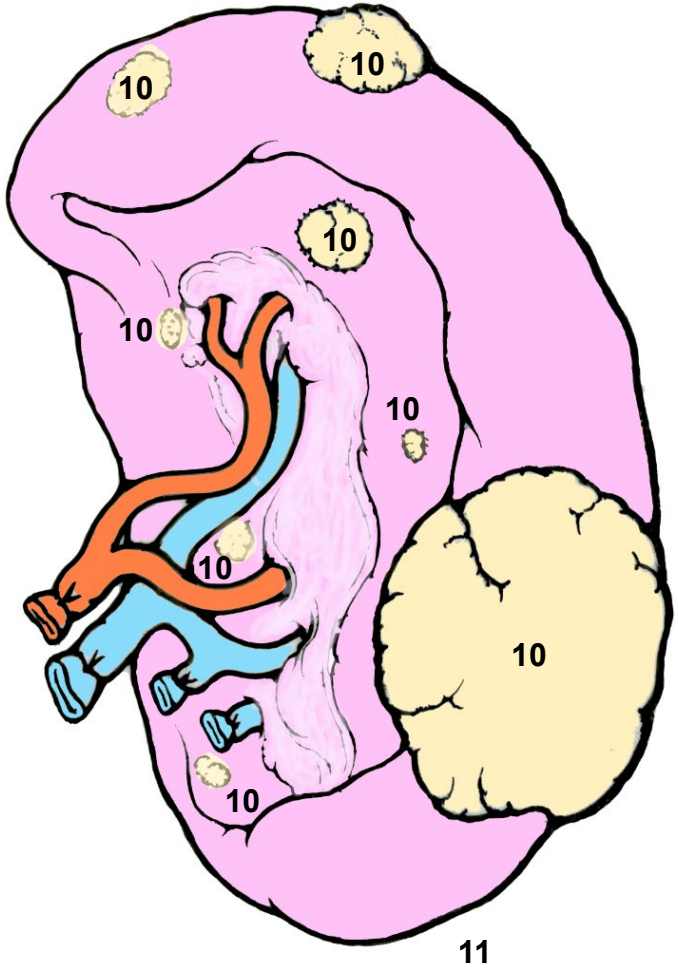
- none

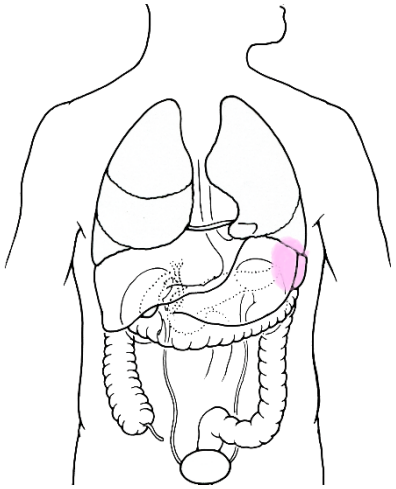
Procedures

Spleen

Procedure



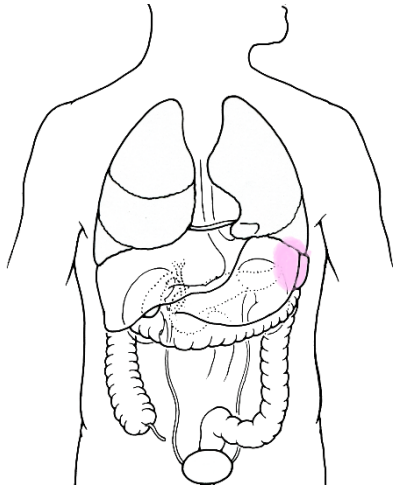




Splenectomy

1. surgical anatomy with retractor and mobilized organs
2. posterior spleen position
3. anterior spleen
4. spleen resection (mobilized spleen)
5. ligated short gastric vessels
6. greater gastric curvature
7. spleen
8. splenic vessels
9. tail of pancreas
10. tumor
11. resected spleen specimen with ligated vessels and tumors

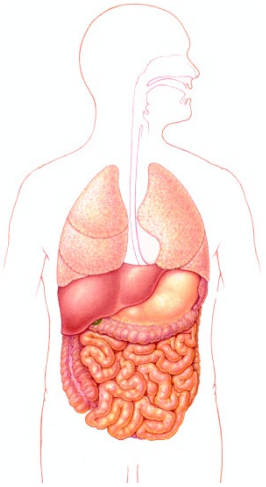
Spleen



1. spleen attached near tail of pancreas

Procurement

Gastrointestinal (GI) System

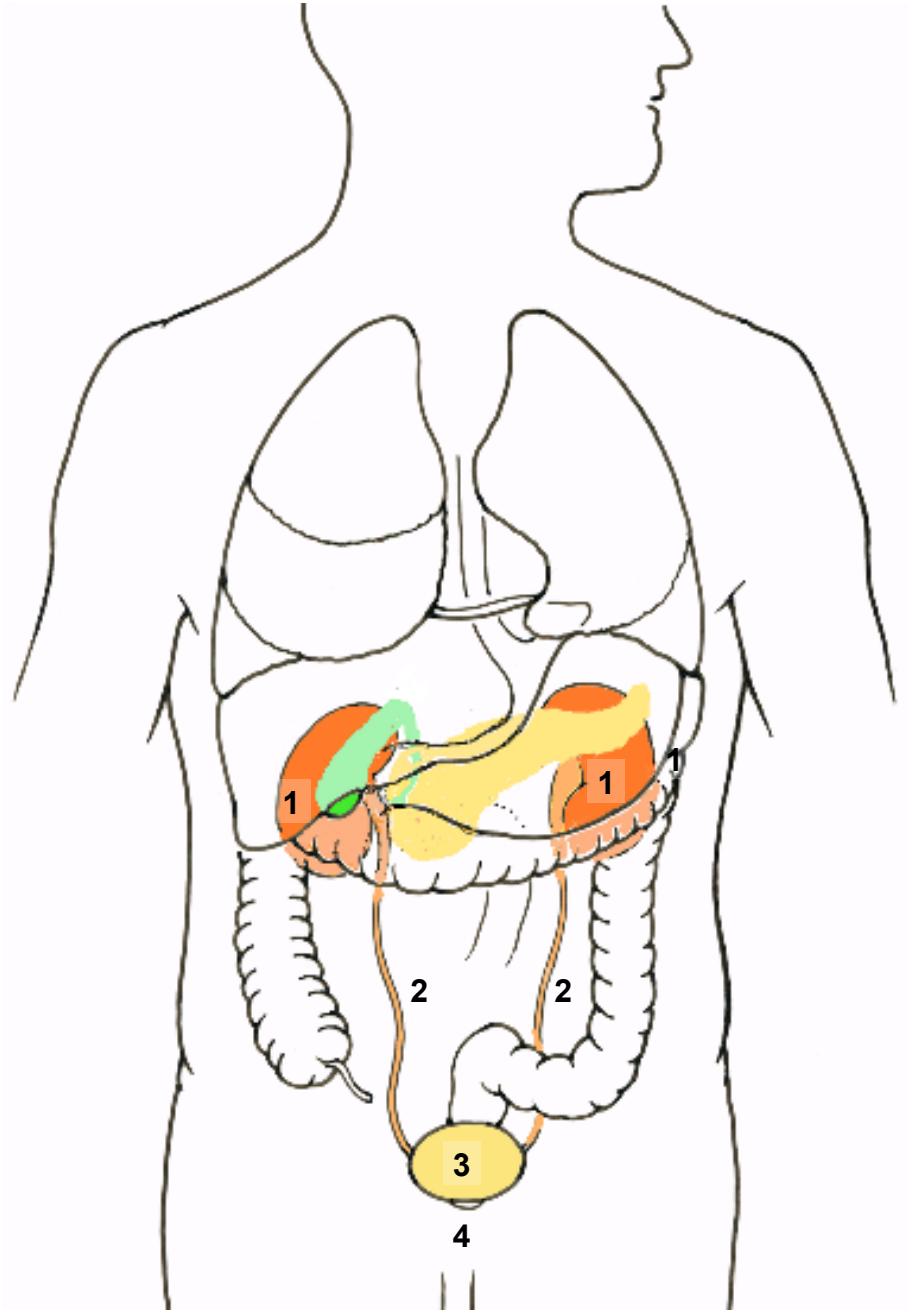


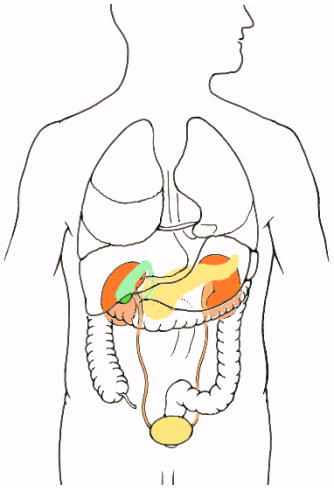
- To be added

Tips

Urinary System

Anatomy

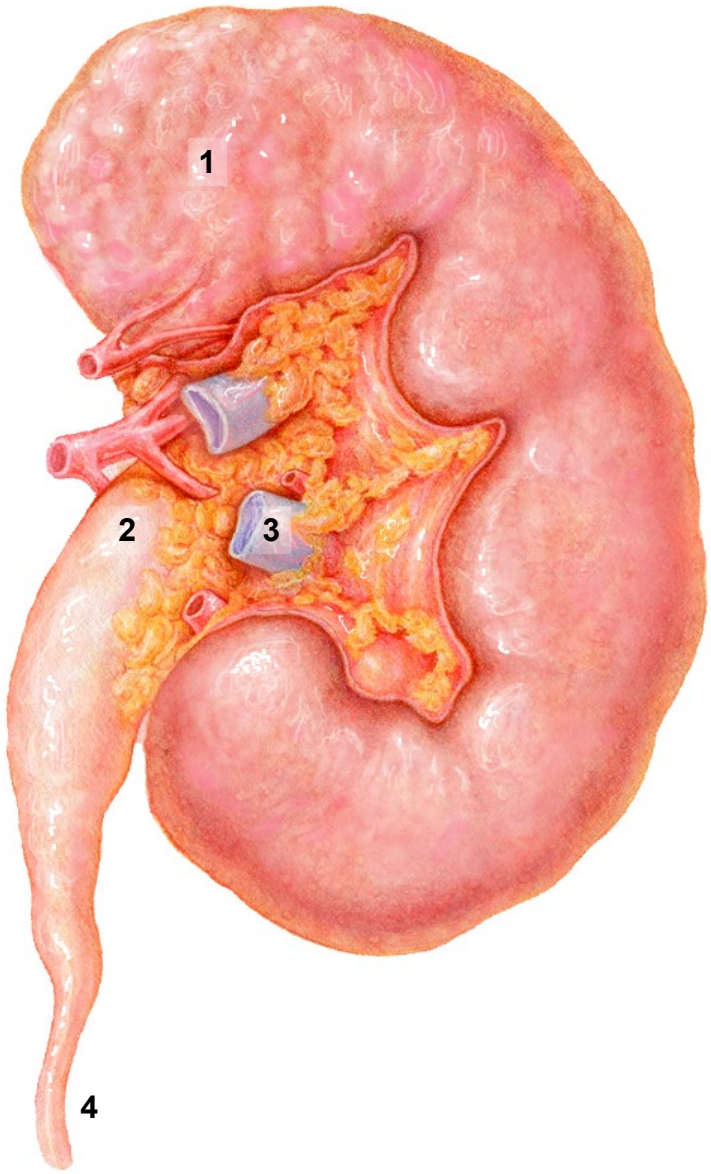


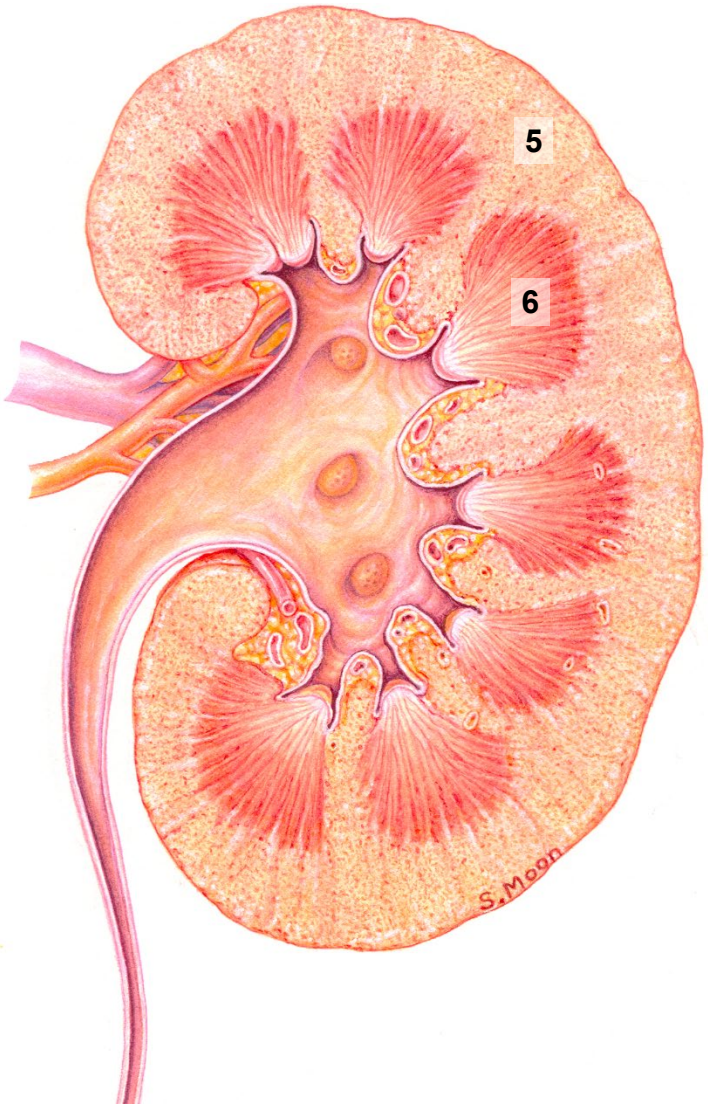


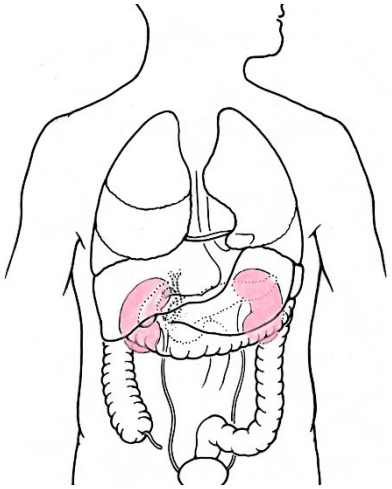
1. kidney
2. ureter
3. bladder
4. location of urethra (not shown)

Kidney

Anatomy





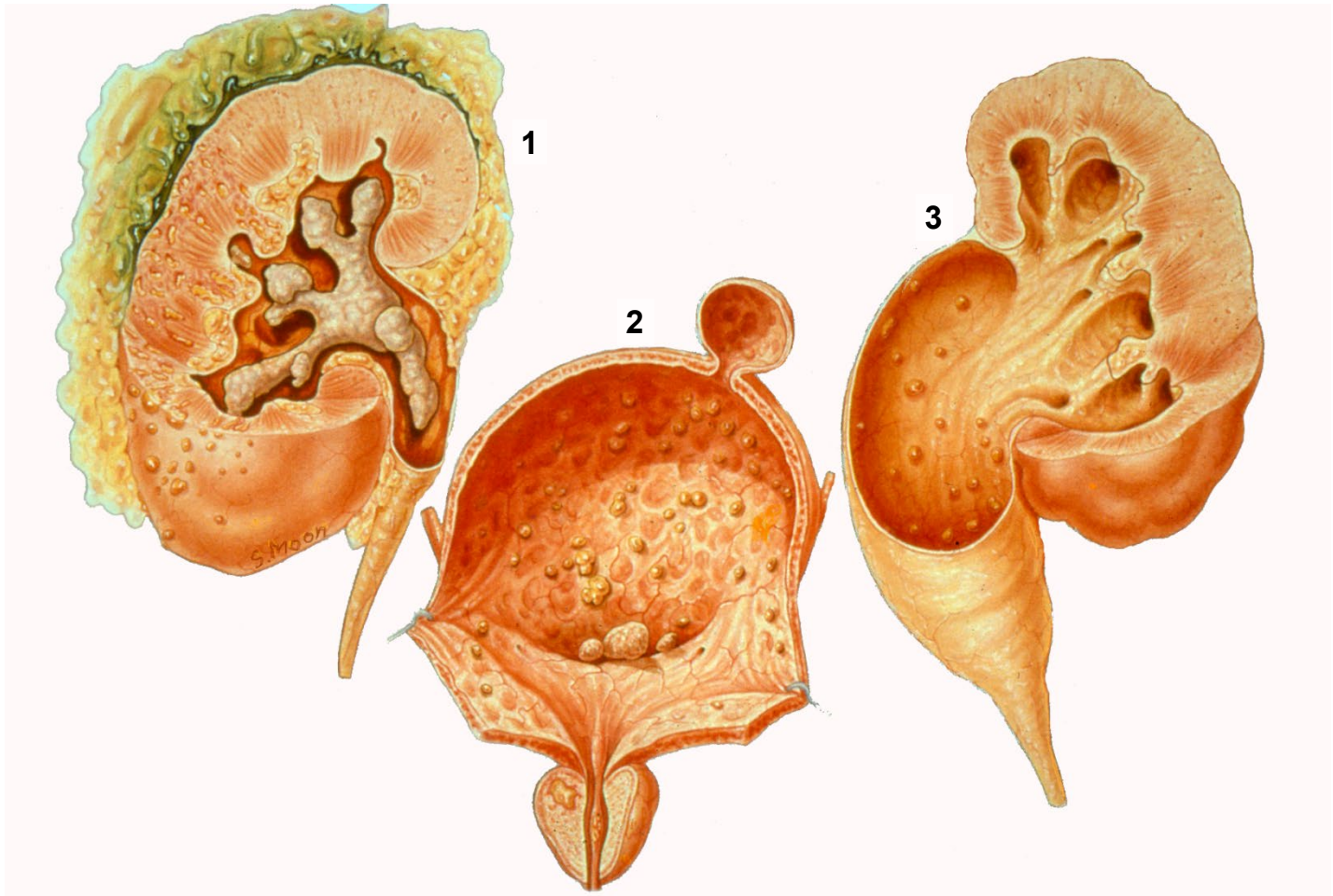


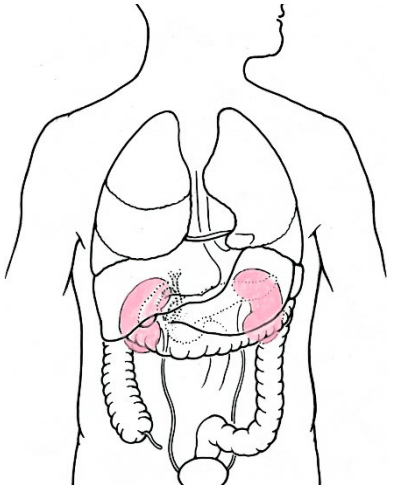
1. disease process
2. renal pelvis
3. renal vein
4. ureter
5. cordex
6. medulla

Kidney

organ conditions

Tumors

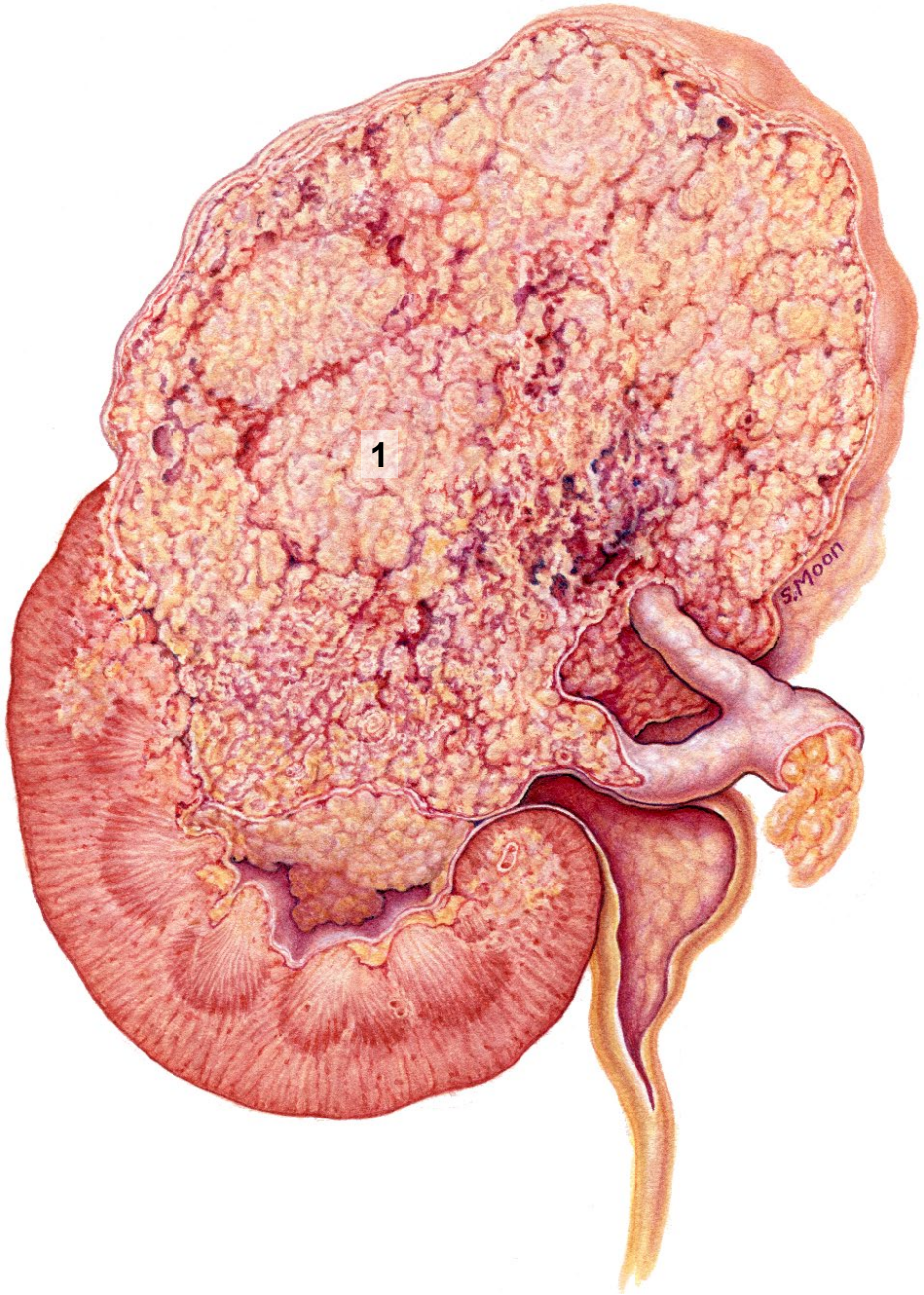


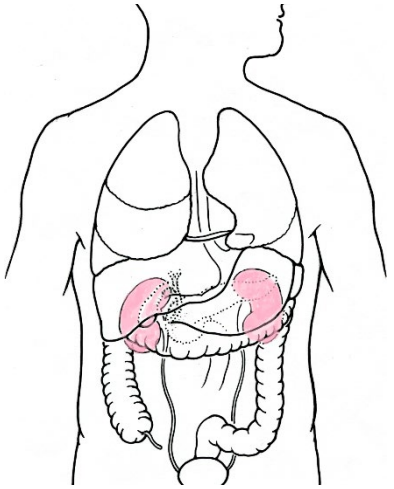


1. stone calyx
2. dilated bladder with diverticulae and stones
3. hydronephrosis

Kidney

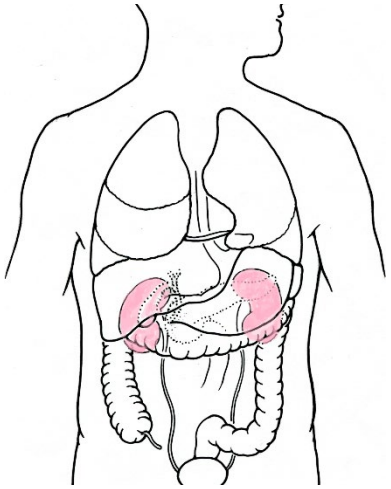
Tumors





1. renal cell carcinoma

Kidney

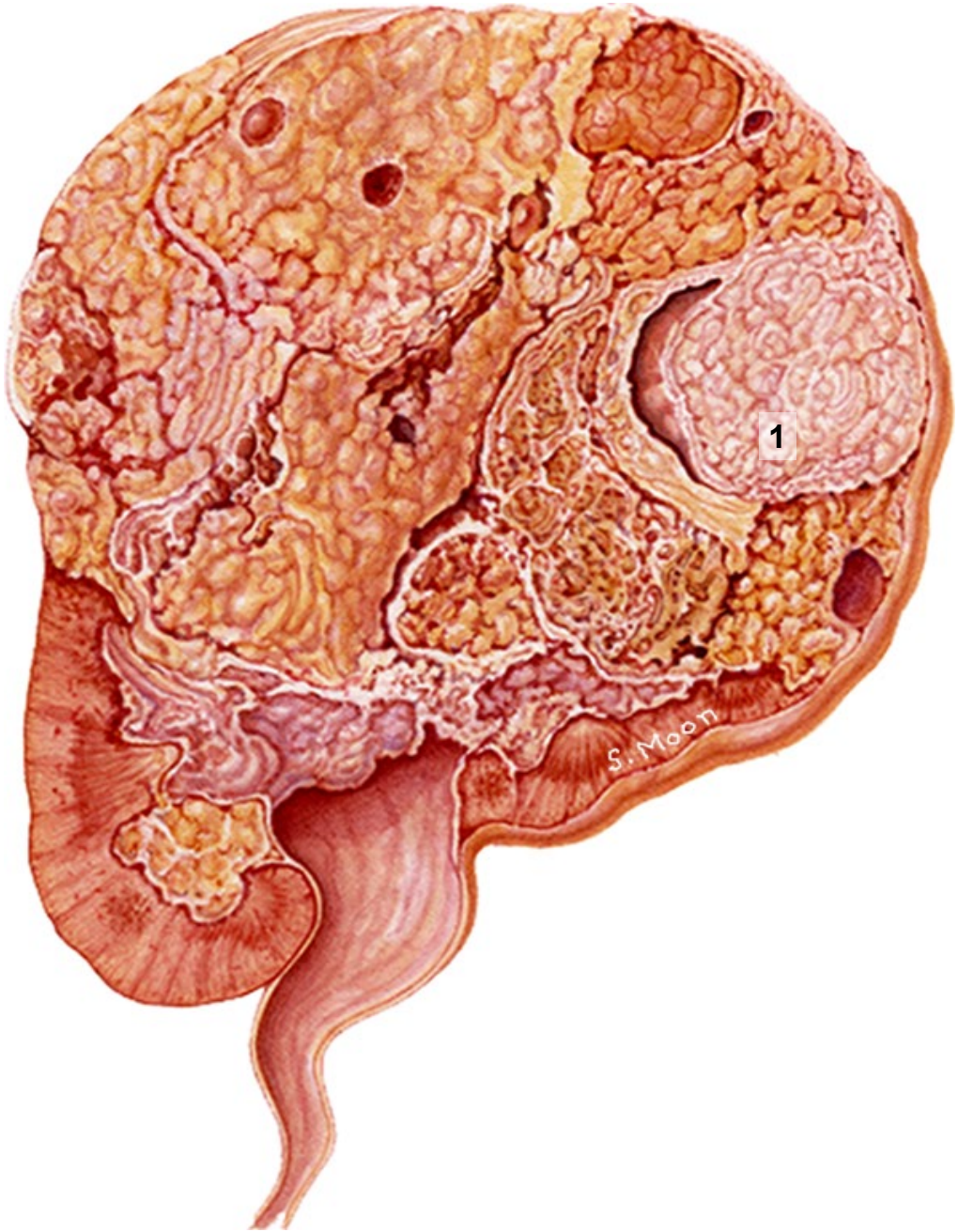


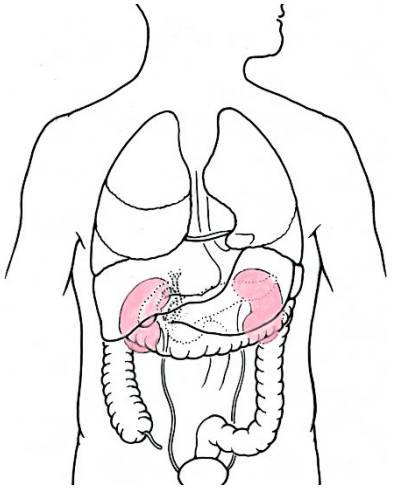
Rare renal tumors

1. clear cell sarcoma (CCSK)
2. congenital mesoblastic nephroma (CMNK)

Tumors

Kidney





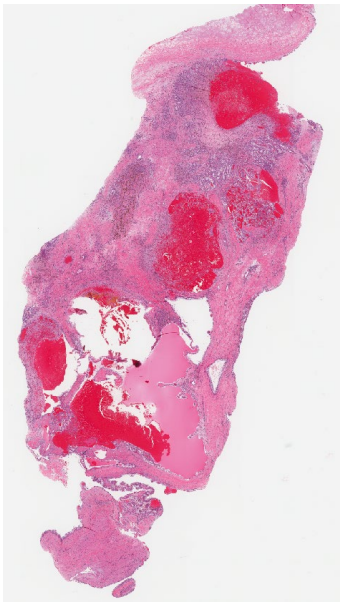
1. Wilms tumors

Tumors

Kidney

Tumors

1



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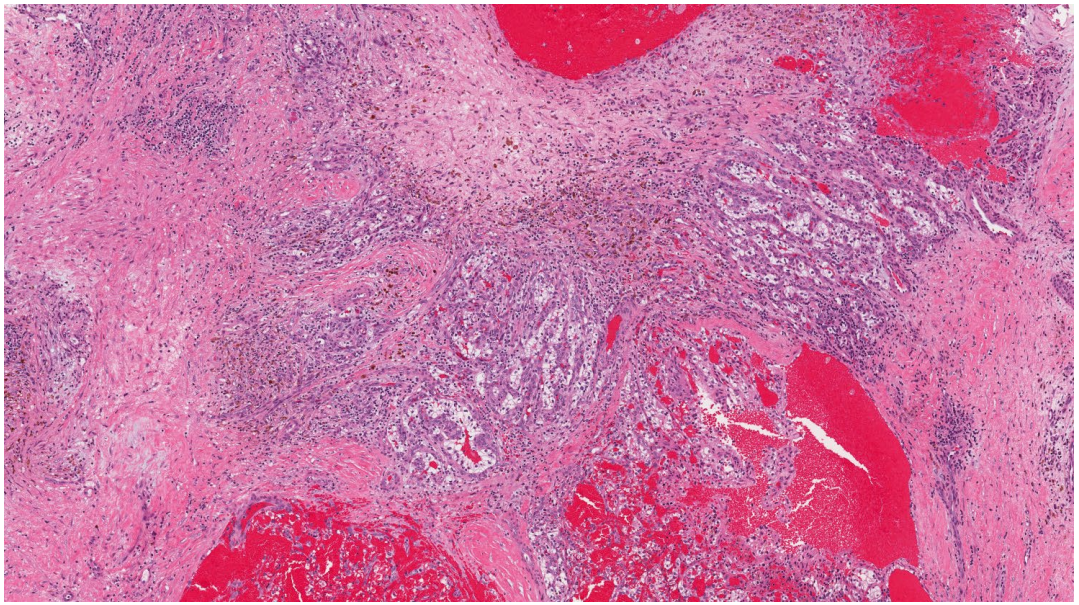
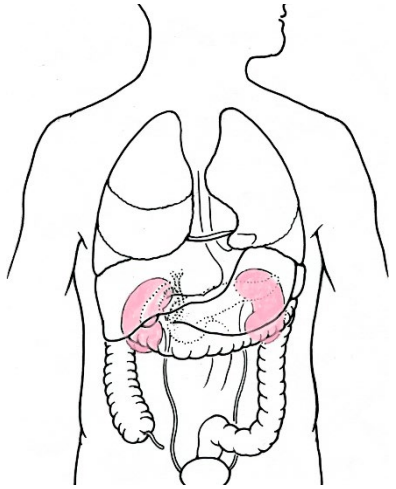
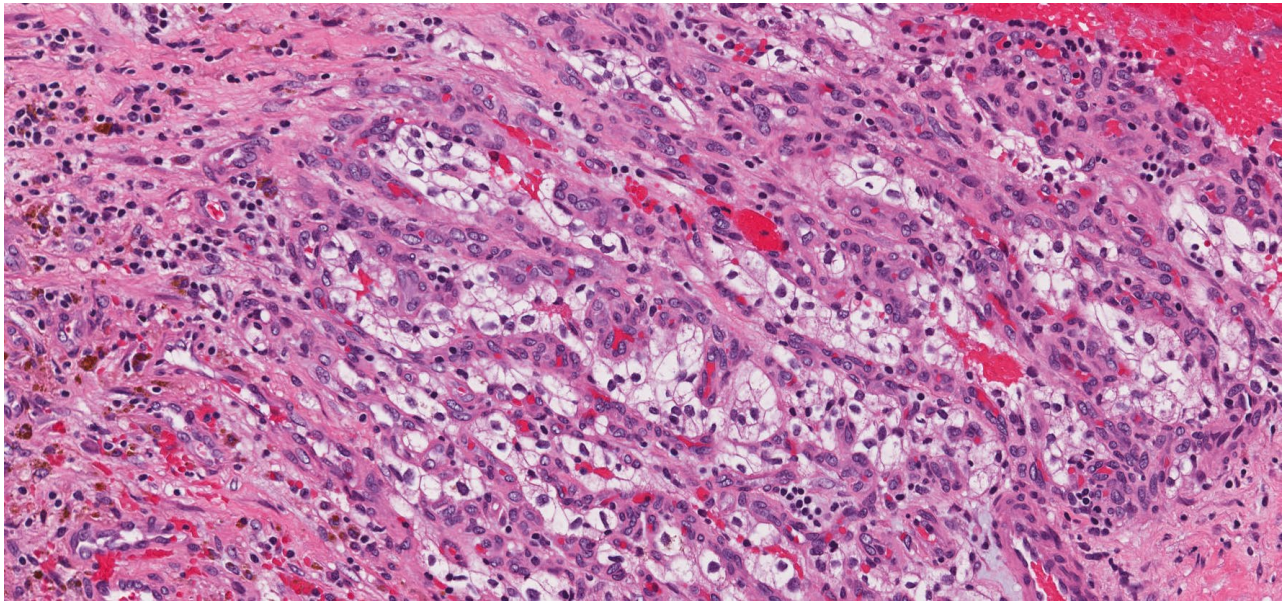




Renal cell carcinoma, clear cell type. Note that morphology is clear at various magnifications.

1. 0.8X
2. 5X
3. 20X
4. 40X

3



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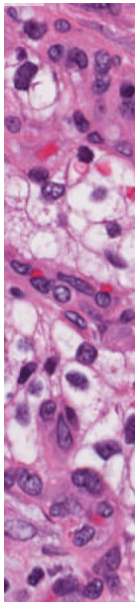
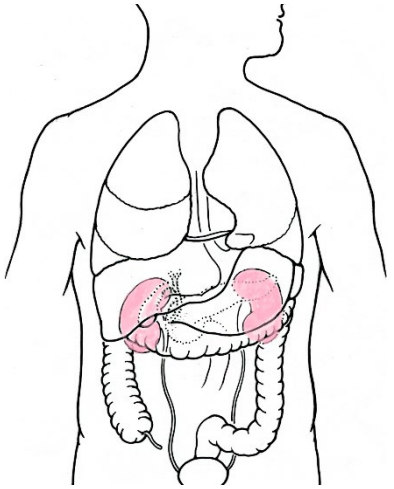


Kidney



More likely to support procurement:

- nephrectomy - surgical removal of one or both (bilateral) of the kidneys.

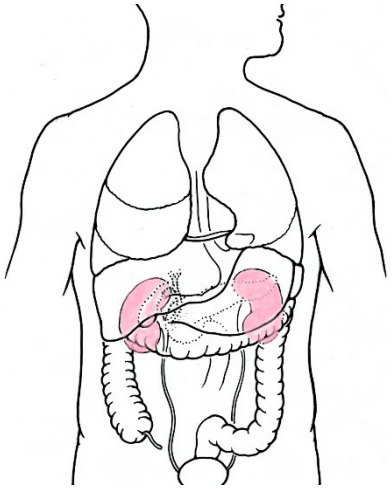
Less likely to support procurement:

- none

Procedures

Kidney

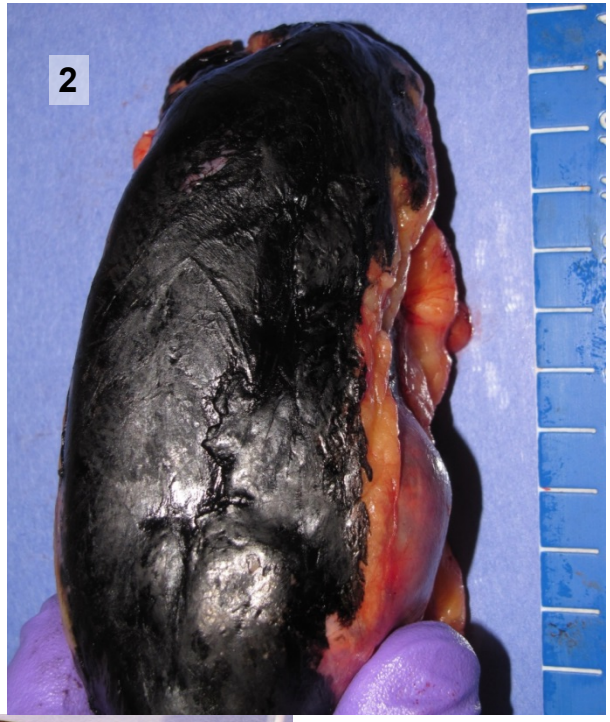
Procedure

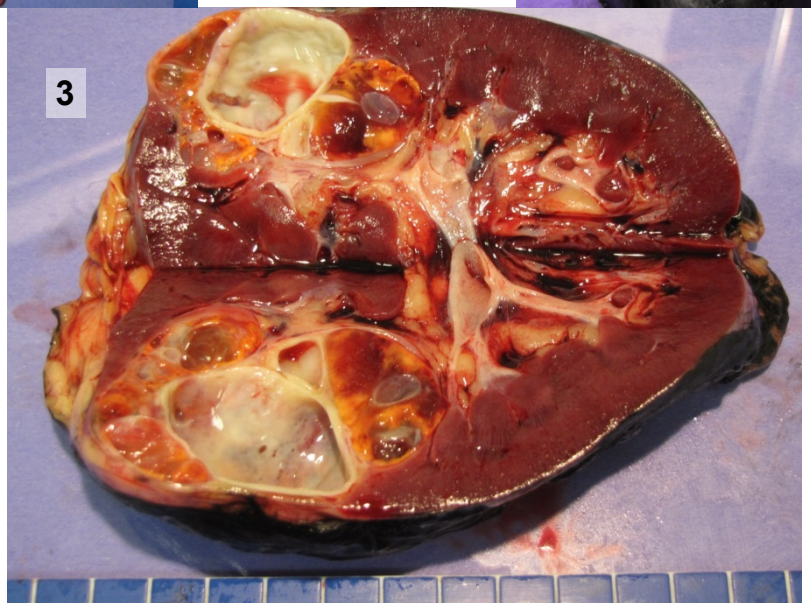


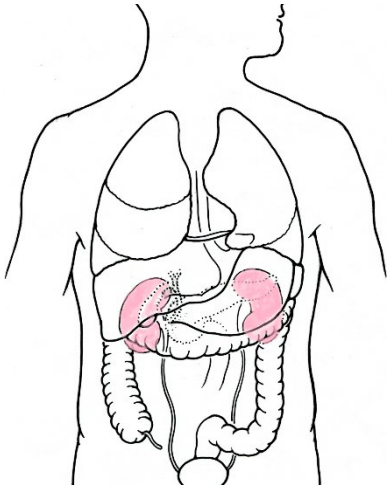
Nephrectomy

1. renal cell carcinoma tumor at top of right kidney (superior renal pole)
2. initial incision line for radical nephrectomy
3. right kidney
4. tumor
5. ascending colon
6. tumor (upper pole)
7. tied off renal vessels
8. tied off ureter
9. resected renal specimen
10. tumor (superior pole)
11. renal pelvis
12. mid pole
13. inferior pole
14. tied off ureter

Kidney



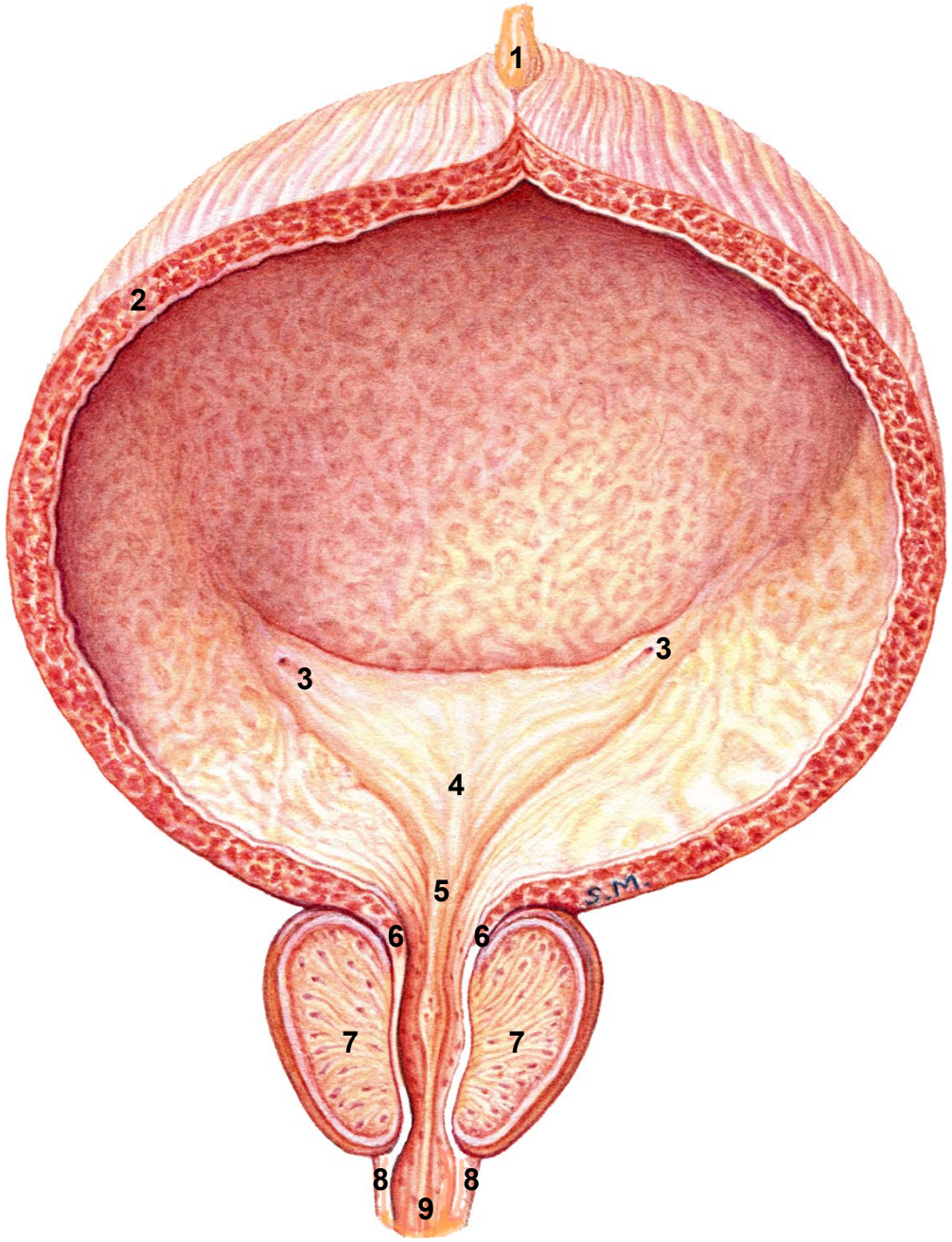


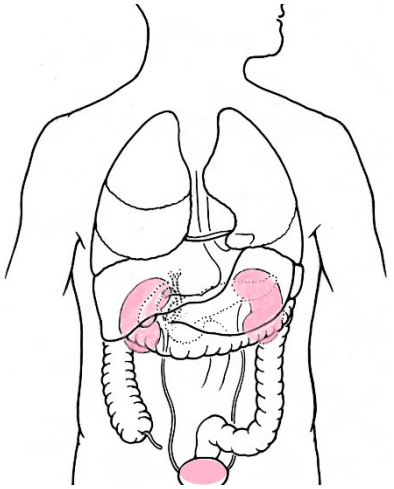


1. excised kidney
2. inked kidney
3. bisected kidney

Bladder

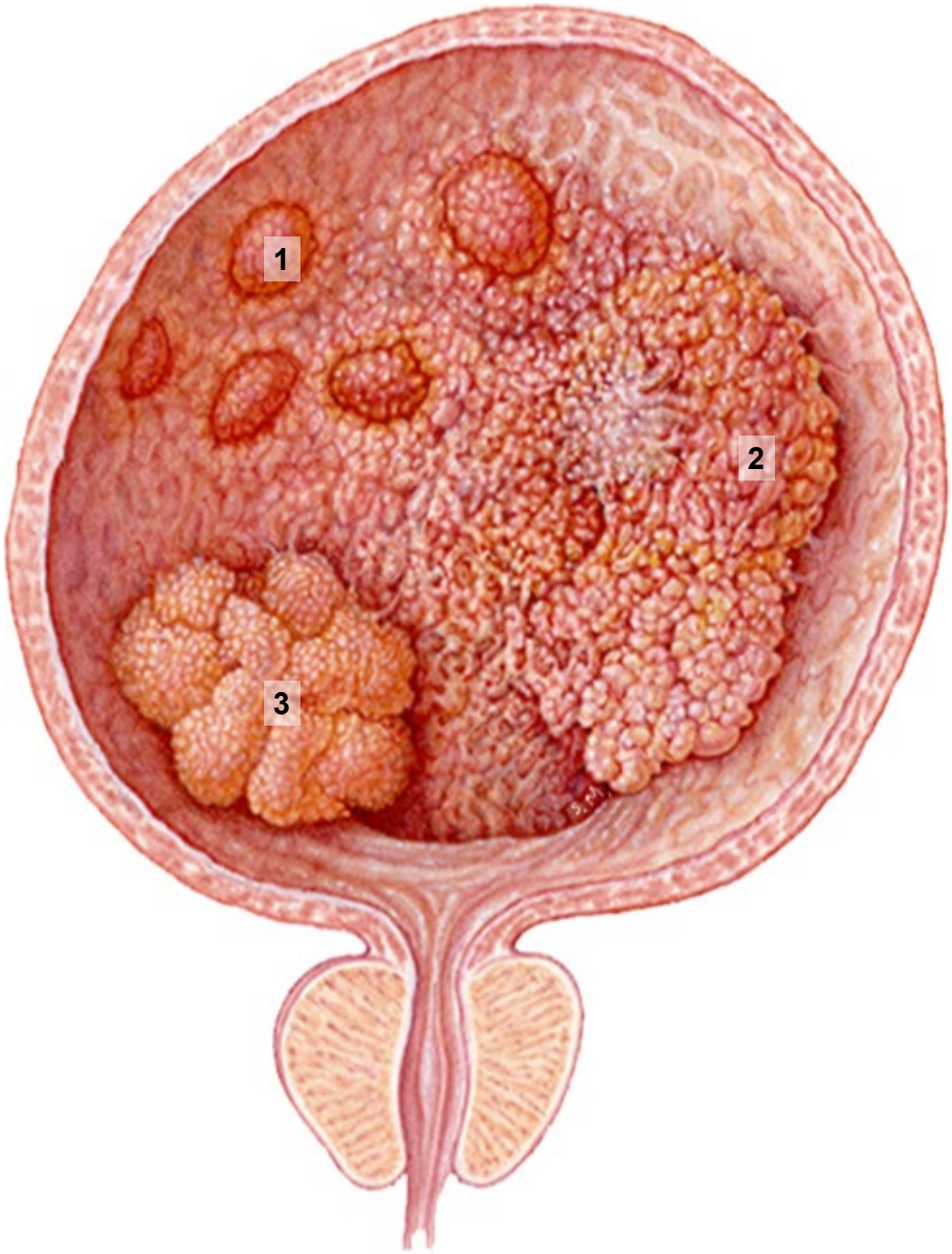
Anatomy

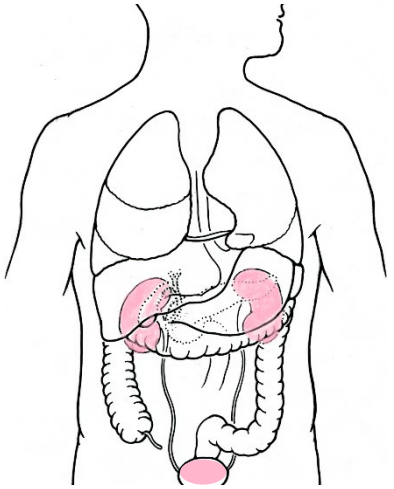




1. middle umbilical ligament
2. detrusor muscle
3. ureteral openings
4. center of trigone
5. neck
6. internal urethral sphincter
7. prostate (present only in males)
8. external urethral sphincter
9. urethra

Bladder



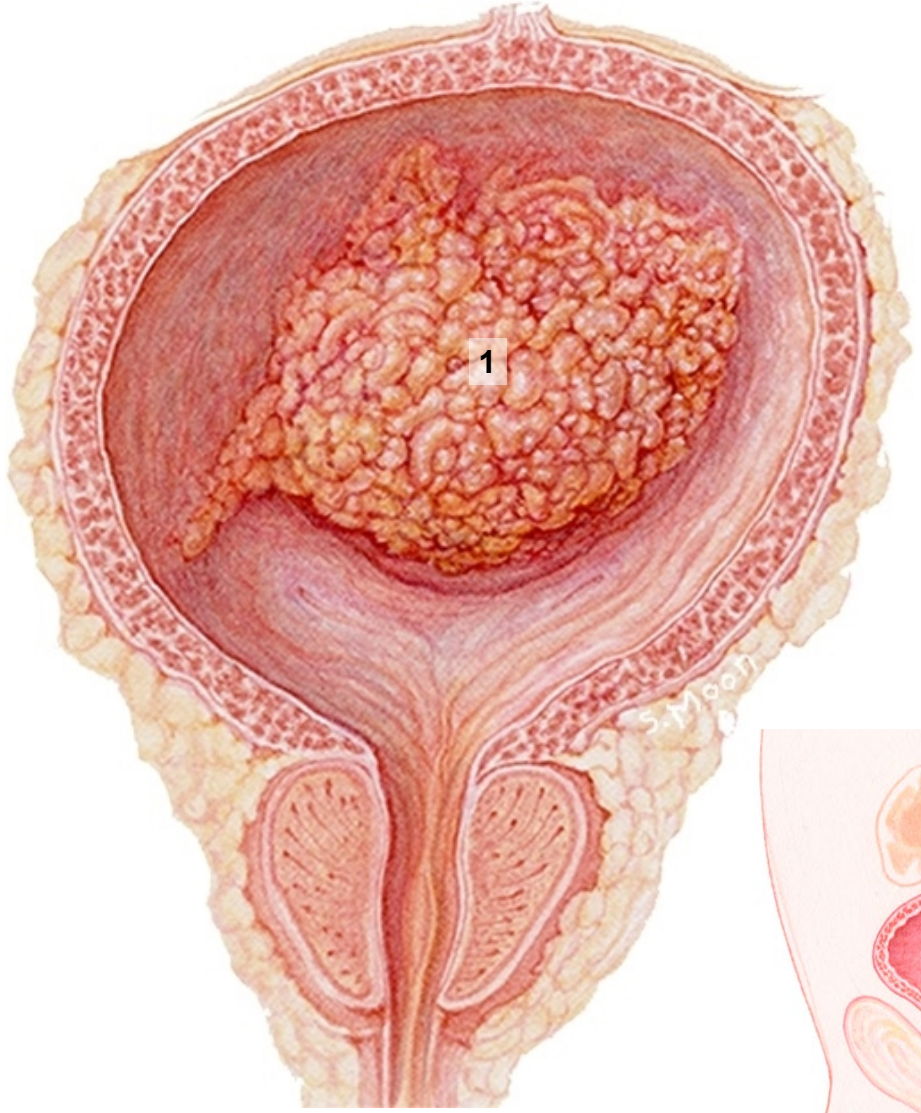


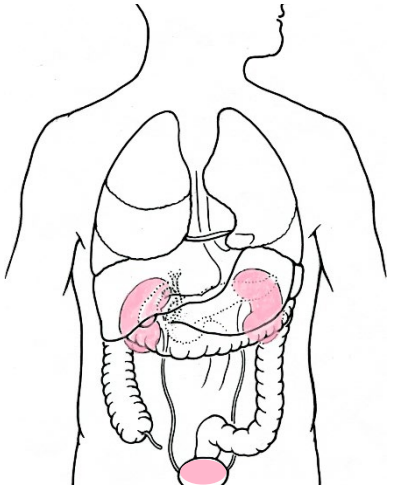
1. transitional cell infiltrating papillomas
2. infiltrating transitional cell carcinoma
3. large villous tumor

Tumors

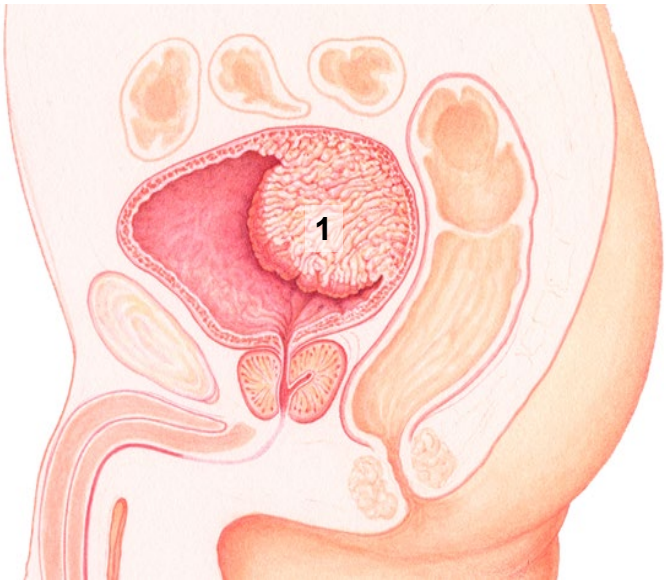
Bladder

Tumors

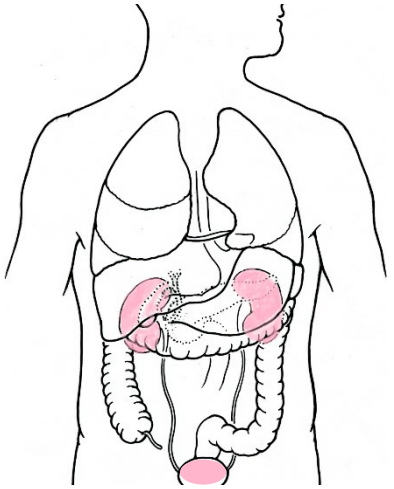




1. large malignant infiltrating tumor



Bladder



More likely to support procurement:

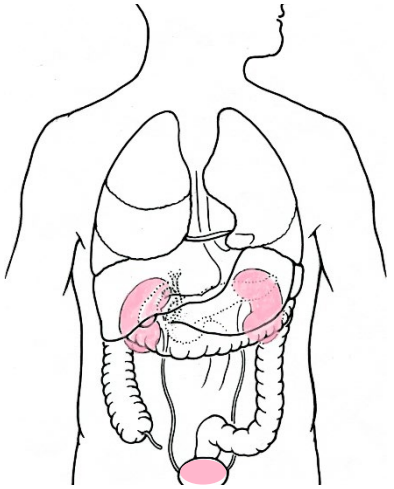
- cystectomy - a surgical operation to remove the urinary bladder.

Less likely to support procurement:

- none

Procedures

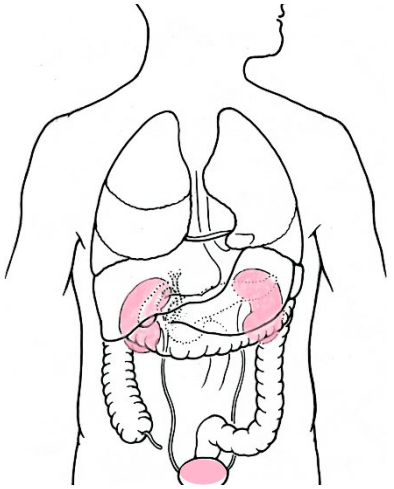
Bladder



To be added

Procurement

Urinary

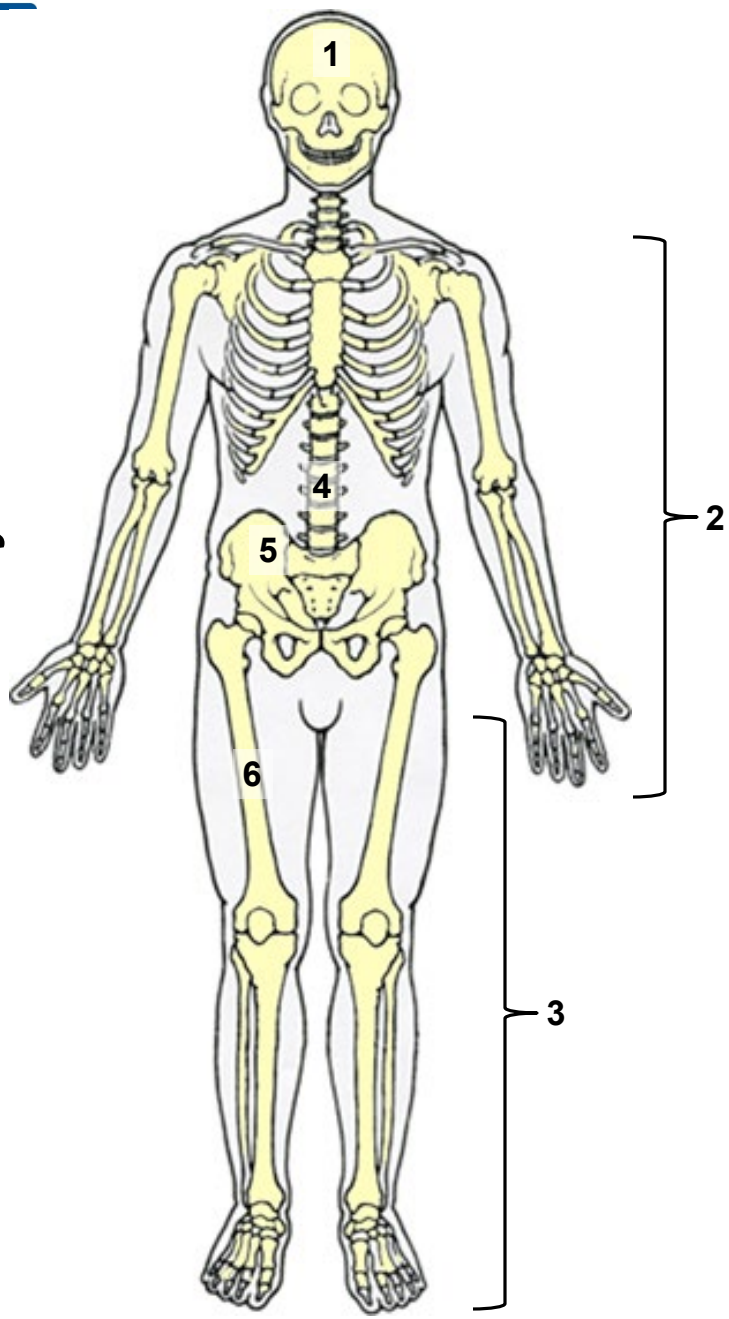


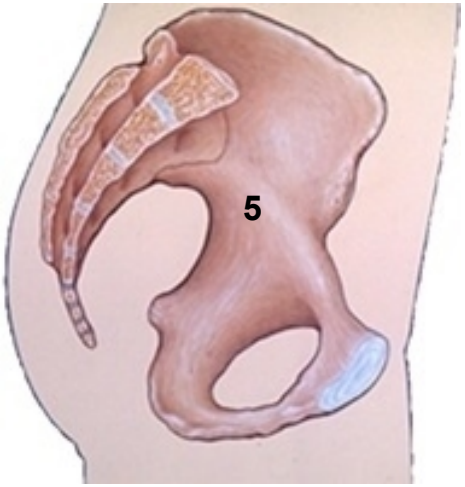
- To be added

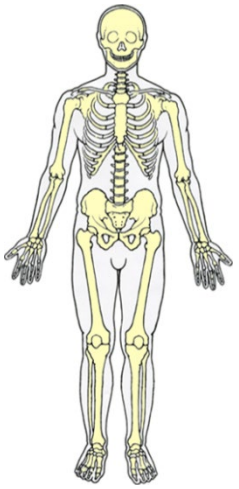
Tips

Bone

Anatomy

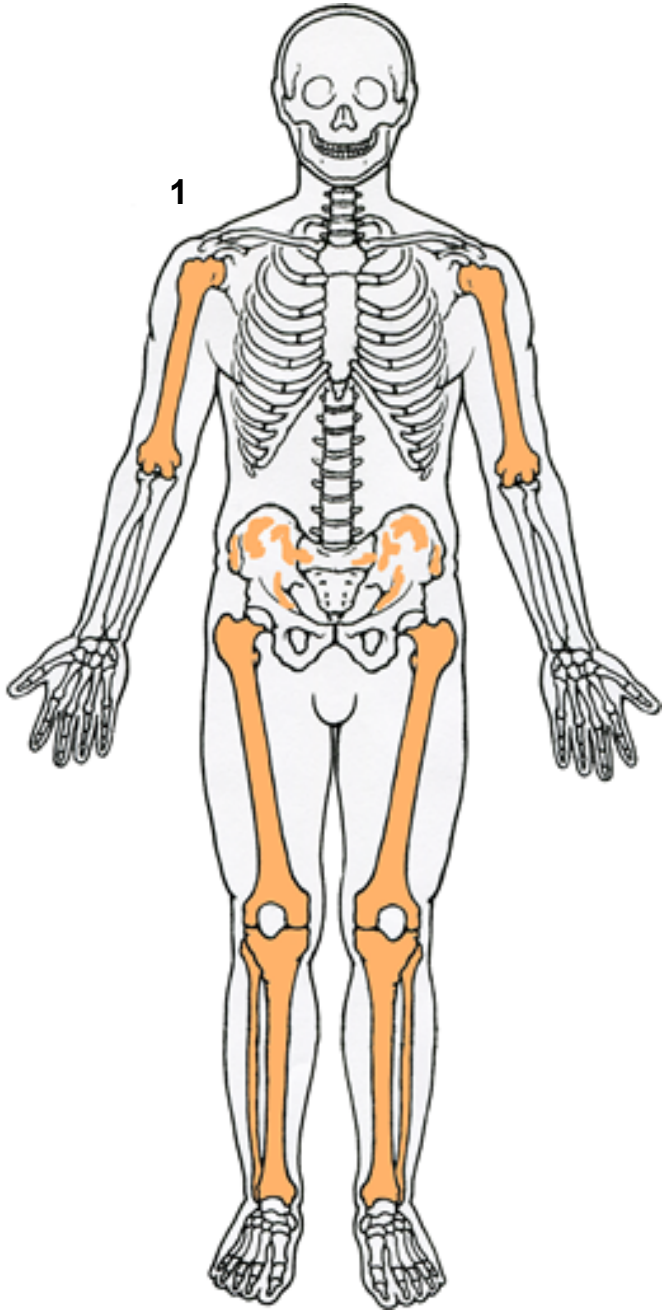


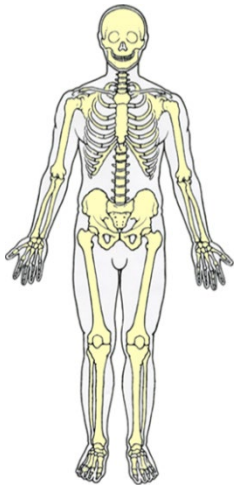




1. skull
2. upper extremity
3. lower extremity
4. spine
5. pelvis
6. femur

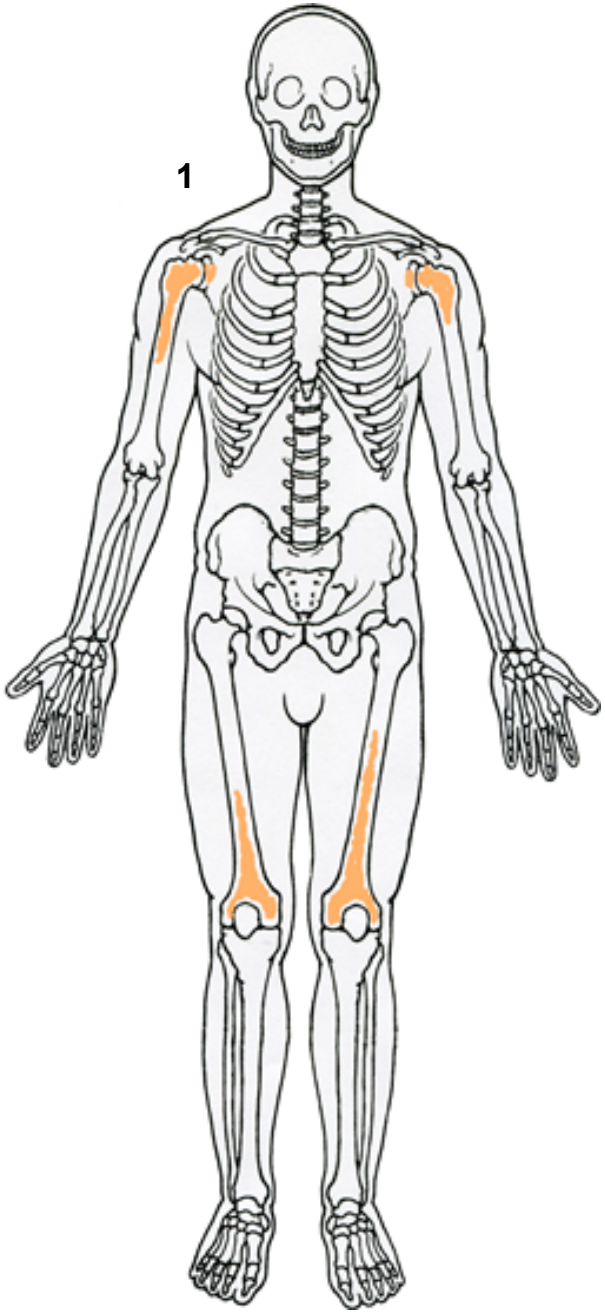
Bone

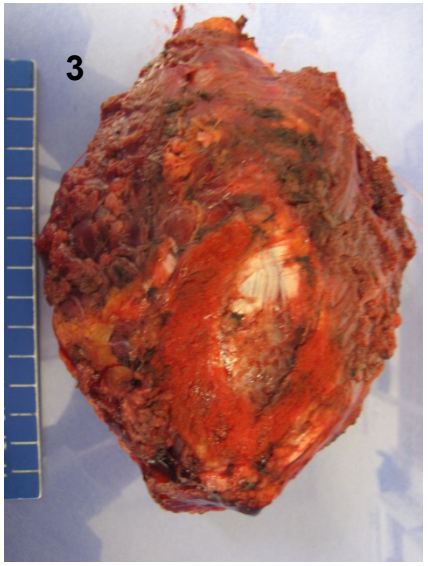


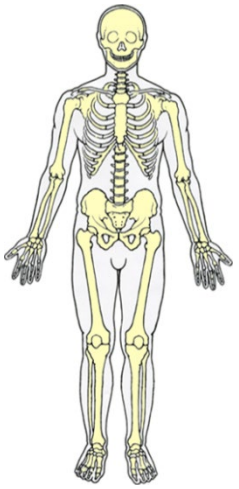


1. locations of Ewing's sarcoma development
2. Ewing's sarcoma

Bone



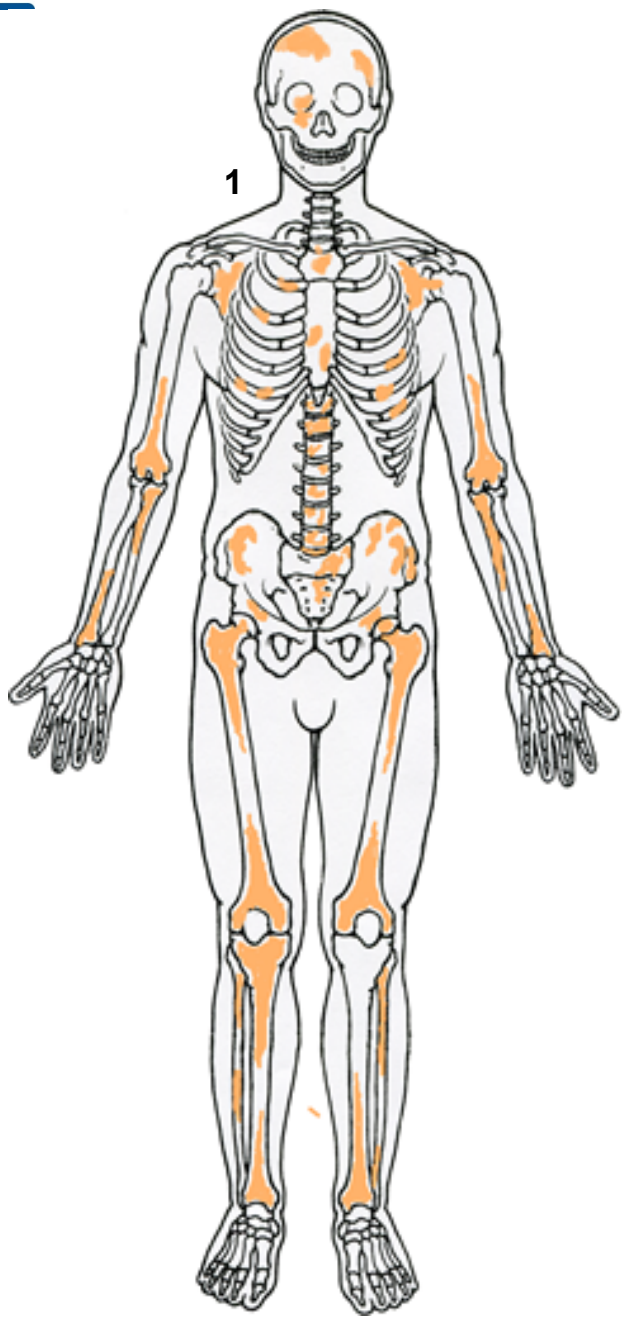


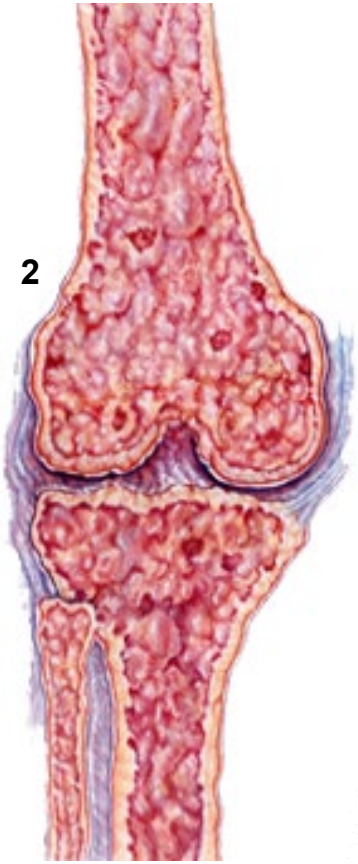


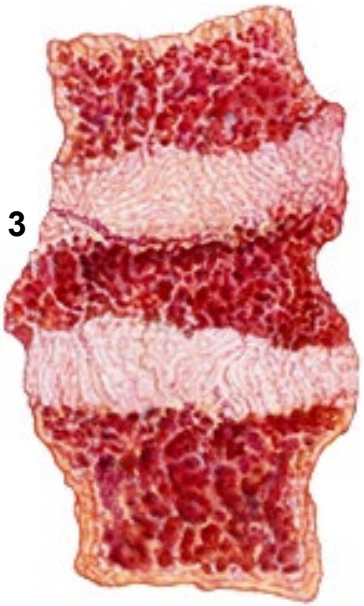
1. locations of osteosarcoma development
2. osteosarcoma (in situ)
3. extracted osteosarcoma tumor

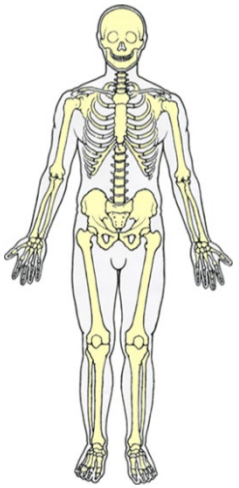
Bone

Tumors

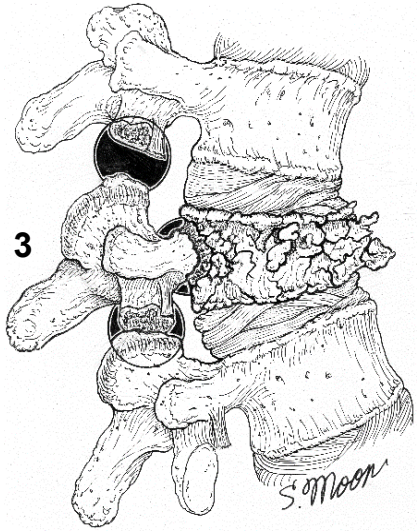




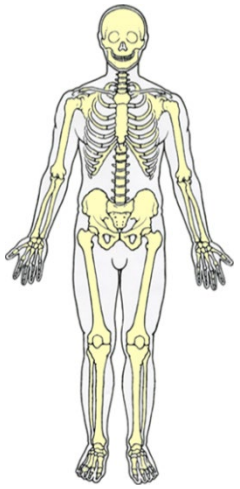




1. locations of multiple myeloma development
2. multiple myeloma (knee)
3. multiple myeloma (spine)



Bone



Procedures

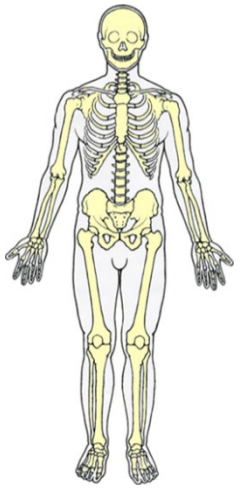
More likely to support procurement:

- amputation
- BKA (below knee amputation)
- AKA (above knee amputation)
- autopsy
- bone marrow aspiration/biopsy

Less likely to support procurement:

- none

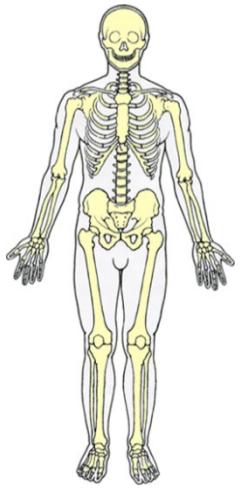
Bone



To be added

Procurement

Bone

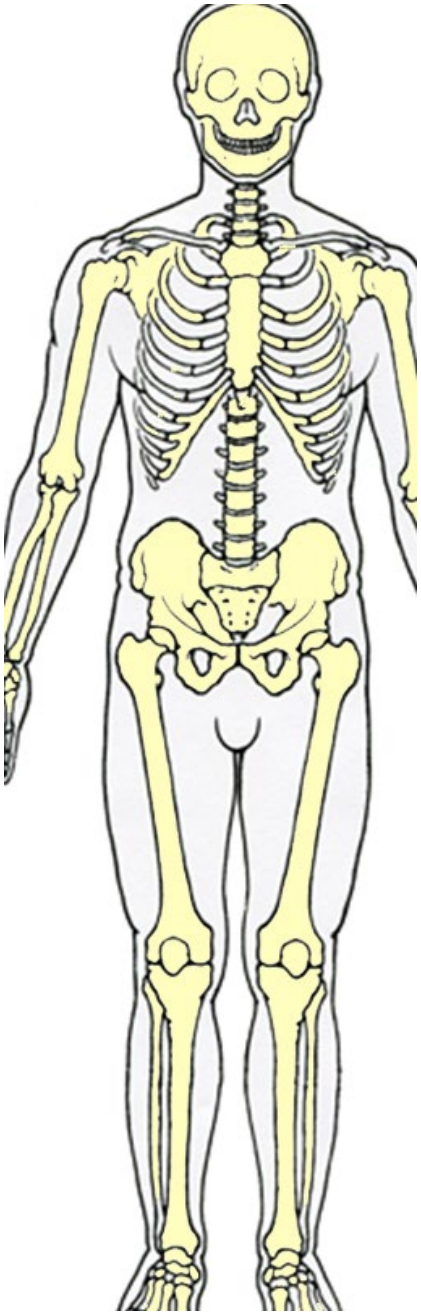


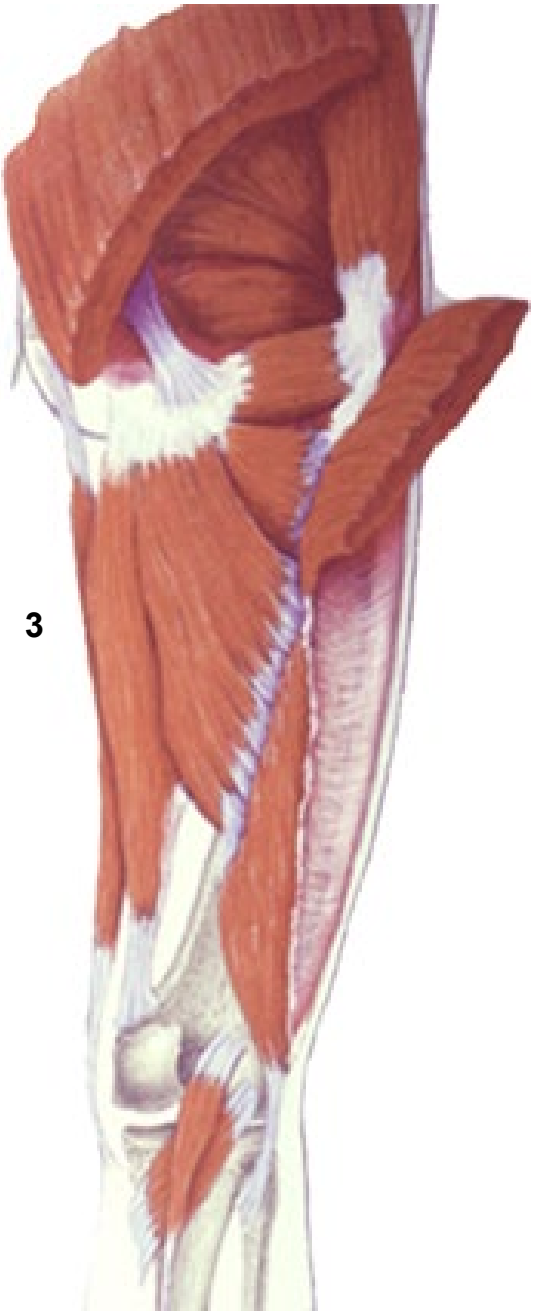
- To be added

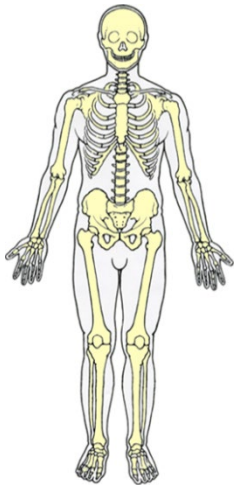
Tips

Muscle

Anatomy

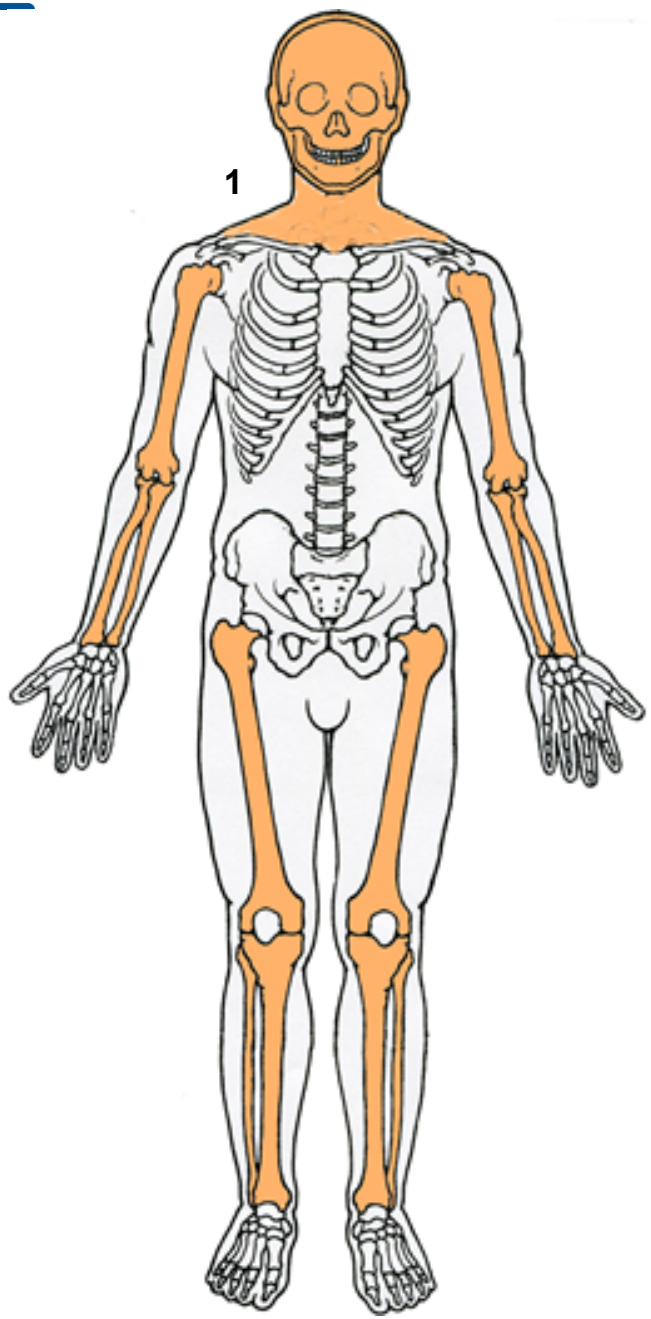


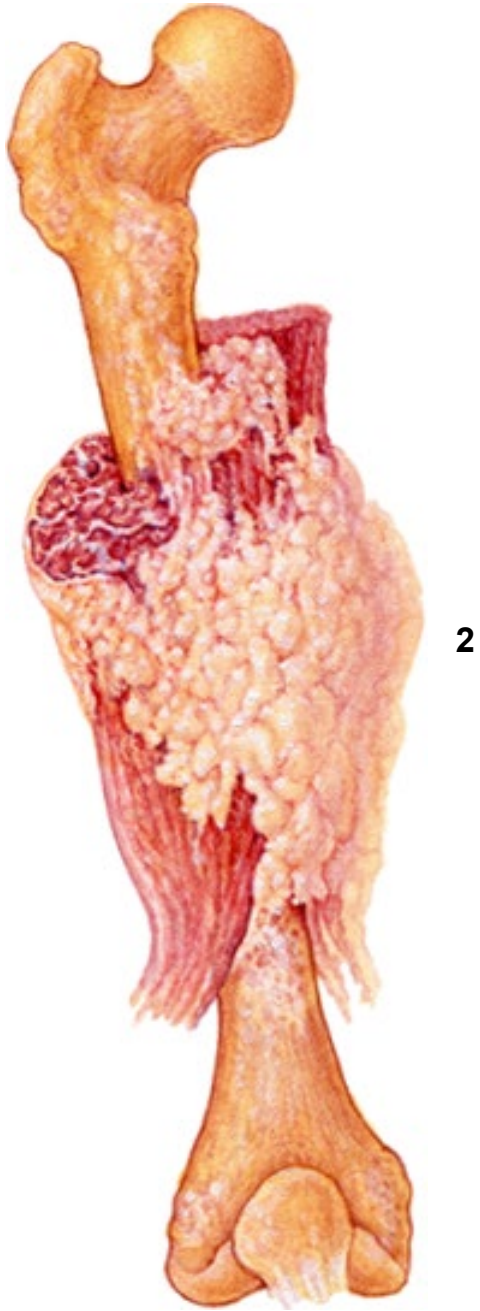


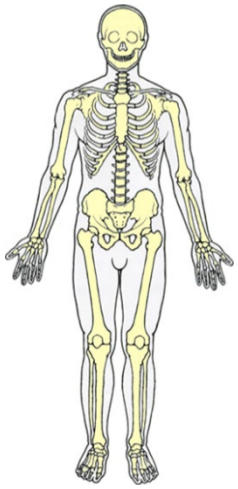


1. upper extremity
2. lower extremity
3. upper leg musculature

Muscle

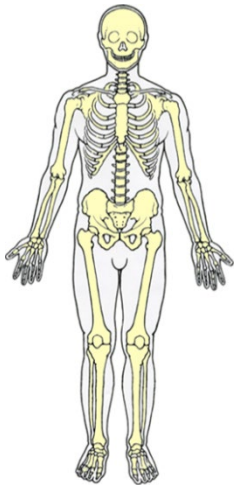






1. locations of rhabdomyosarcoma development
2. rhabdomyosarcoma (in situ)

Muscle



More likely to support procurement:

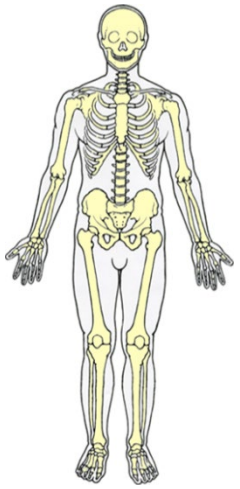
- amputation - surgically cutting off a limb.

Less likely to support procurement:

- none

Procedures

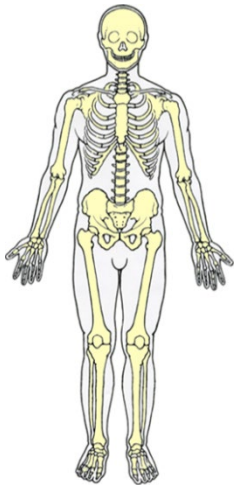
Muscle



To be added

Procurement

Muscle

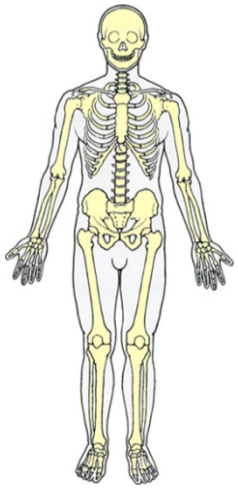


- To be added

Tips

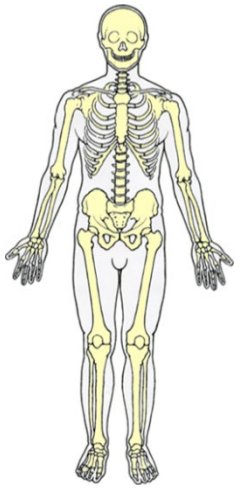
Skin

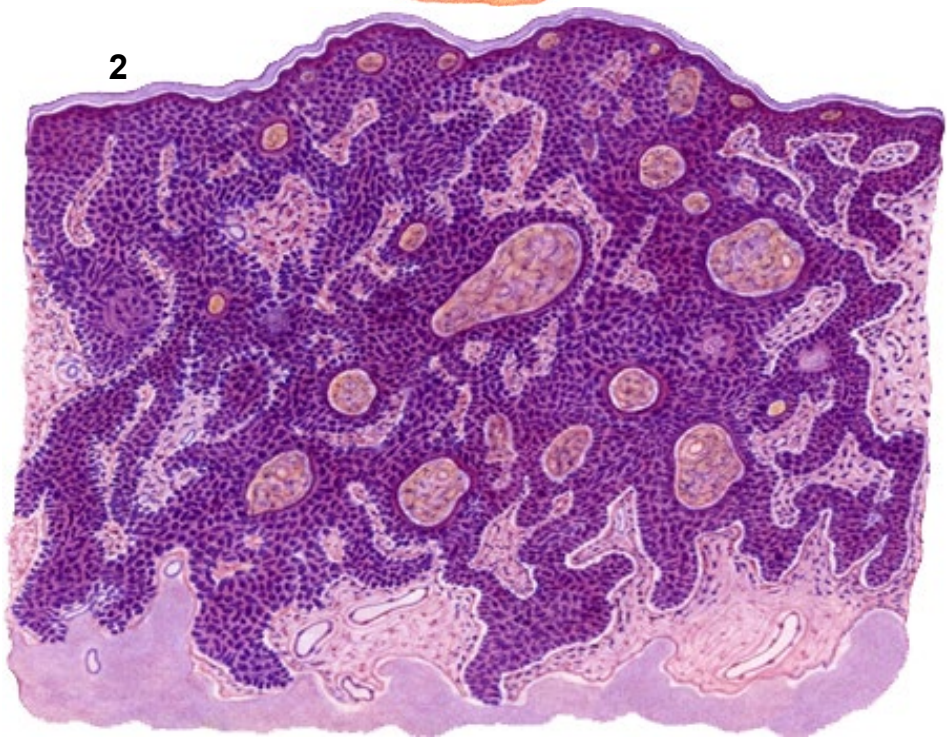
Anatomy



1. keratin layer
2. keratinocytes in epidermis
3. basal cell layer
4. dermis

Skin

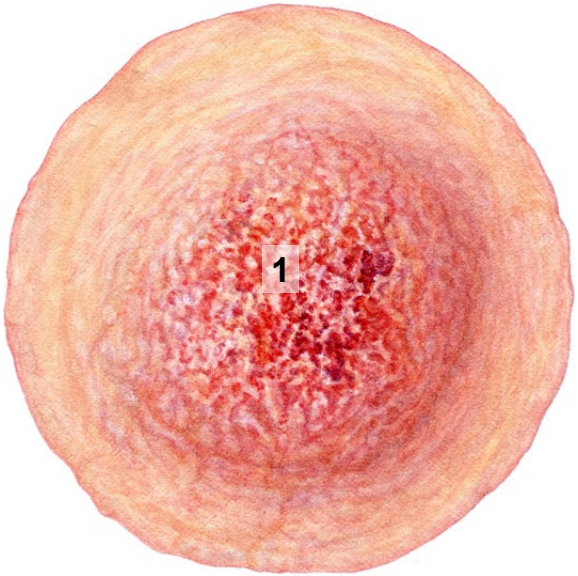


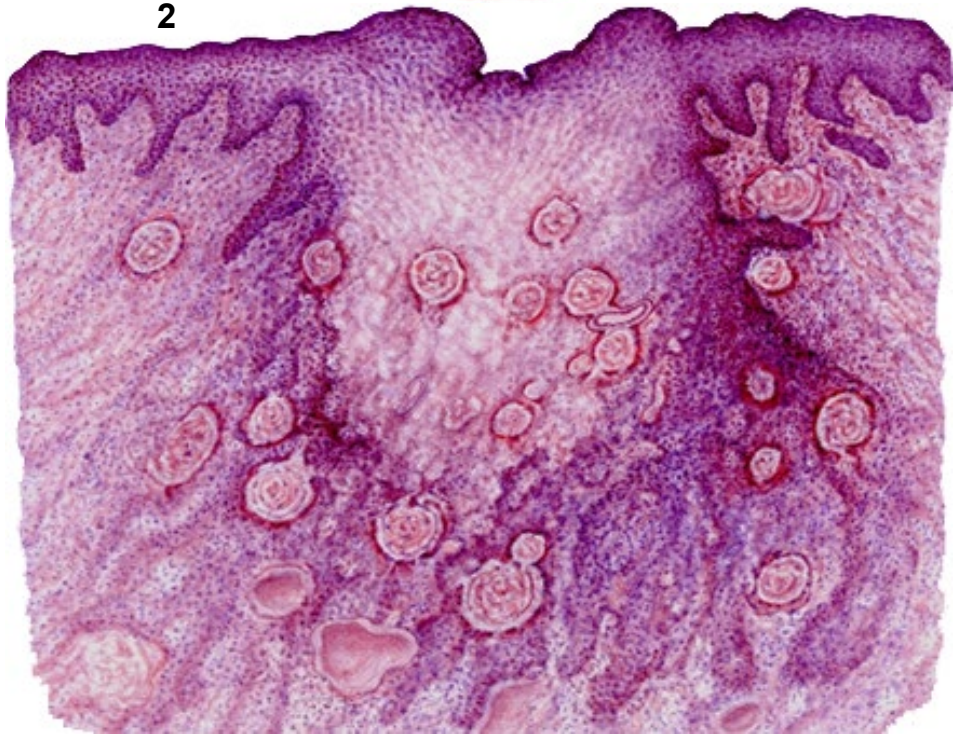


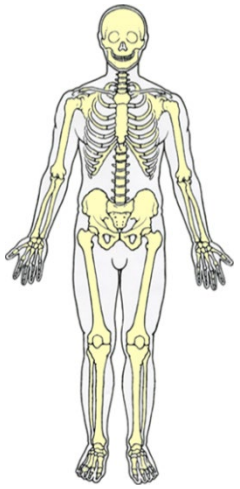
1. basal cell carcinoma
2. cross section tumor in upper dermis

Tumors

Skin



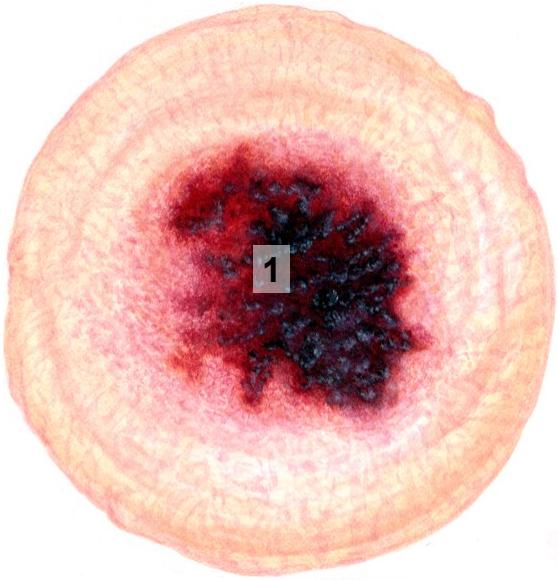


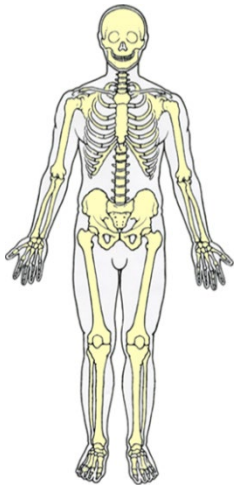


1. squamous cell carcinoma
2. cross section of invasion upper dermis

Skin

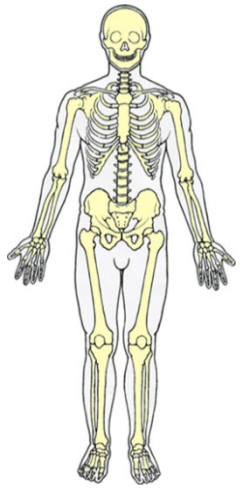
Tumors





1. malignant melanoma
2. cross section of upward and downward invasion of upper dermis

Skin



Procedures

More likely to support procurement:

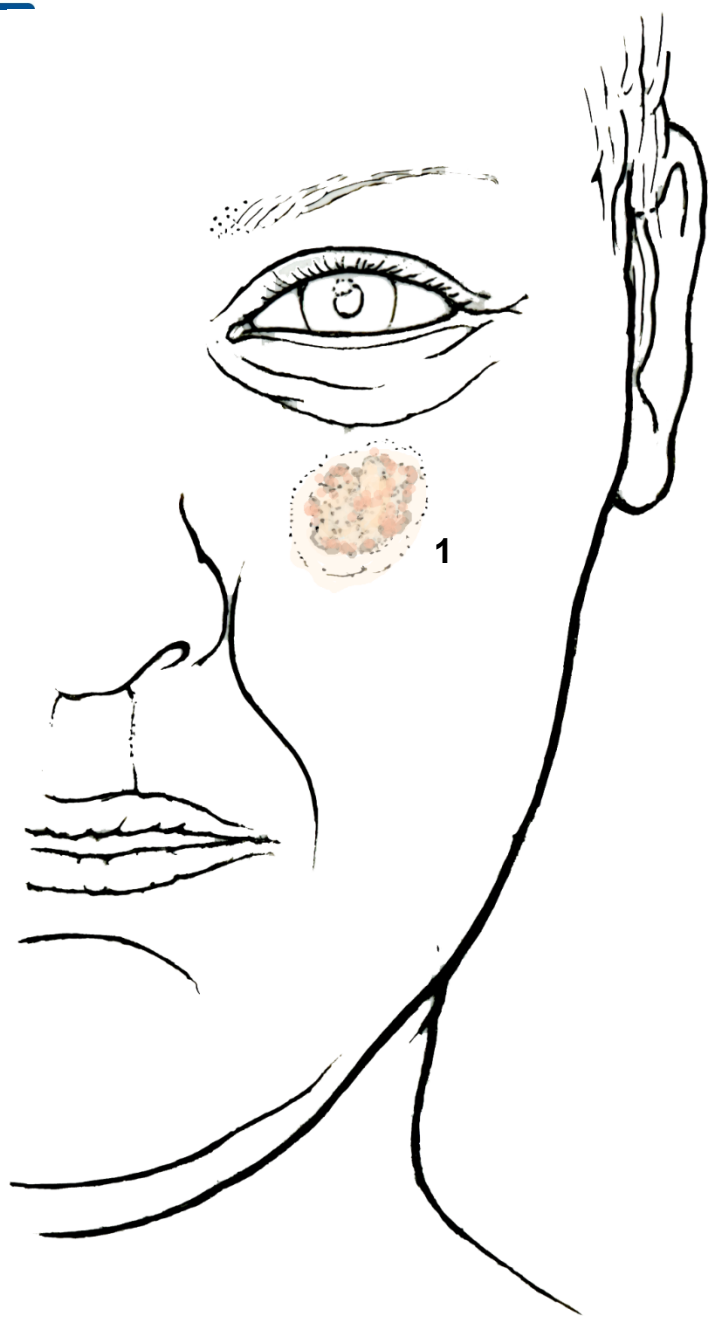
- brachioplasty (arm lift) - surgery that removes excess skin and fat from the undersurface of the upper arm.
- basal cell carcinoma excision – surgery that removes the tumor with a margin that is examined.

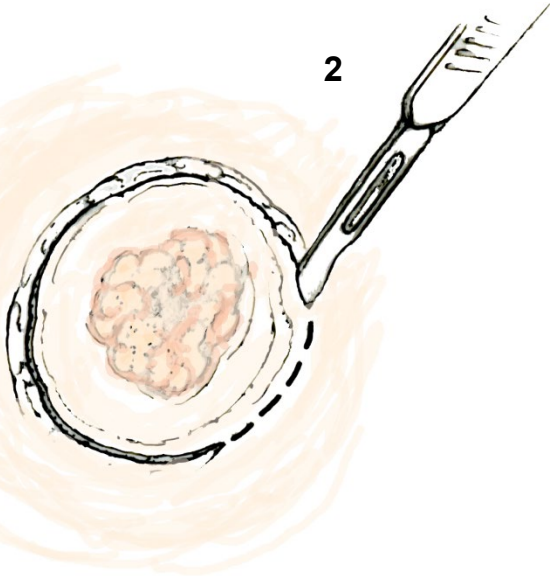
Less likely to support procurement:

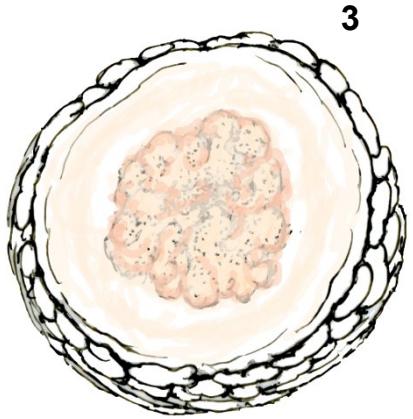
- none

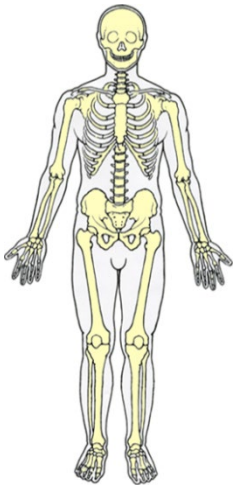
Skin

Procedure





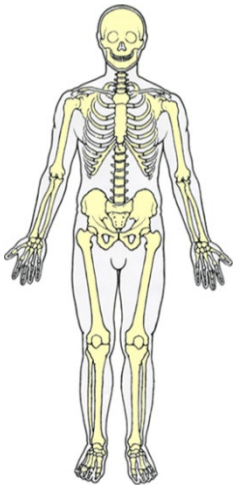


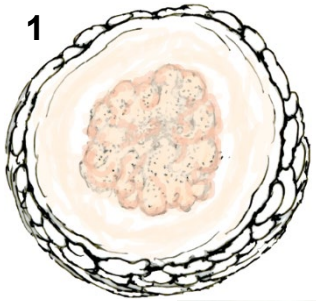


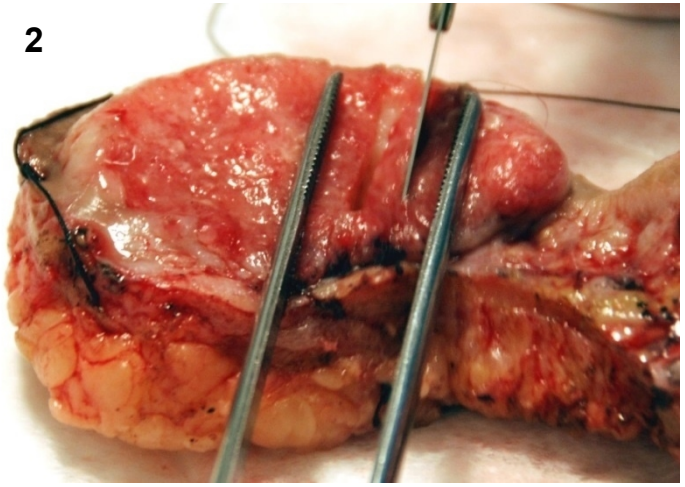
Basal cell carcinoma excision

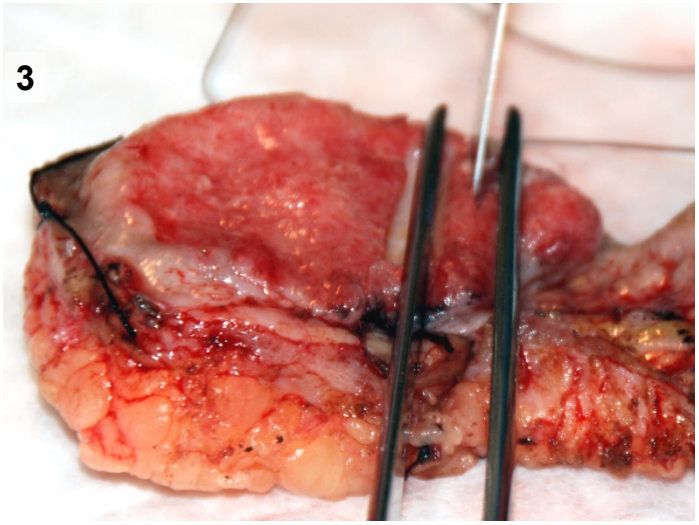
1. tumor in situ
2. resection leaving margins
3. skin basal cell carcinoma specimen

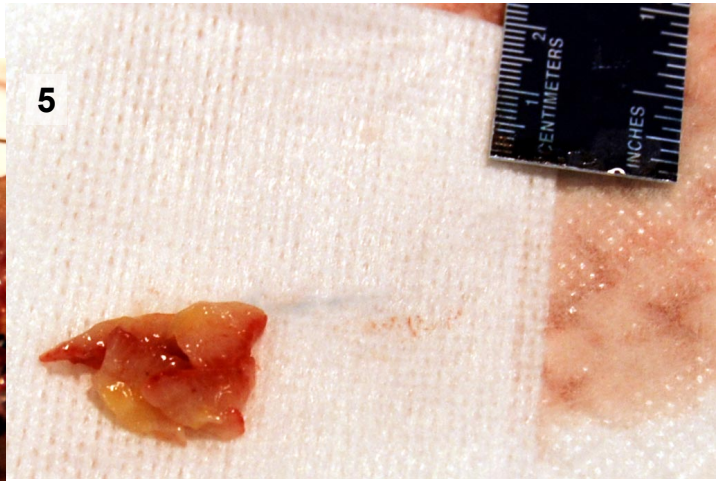
Skin







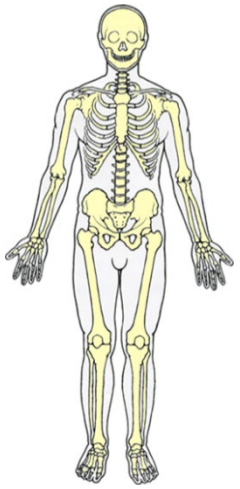




1. extracted squamous cell carcinoma lesion
2. extracted squamous cell carcinoma lesion with first cut made and starting second cut
3. starting third cut
4. after removing section
5. section being measured

Procurement

Skin

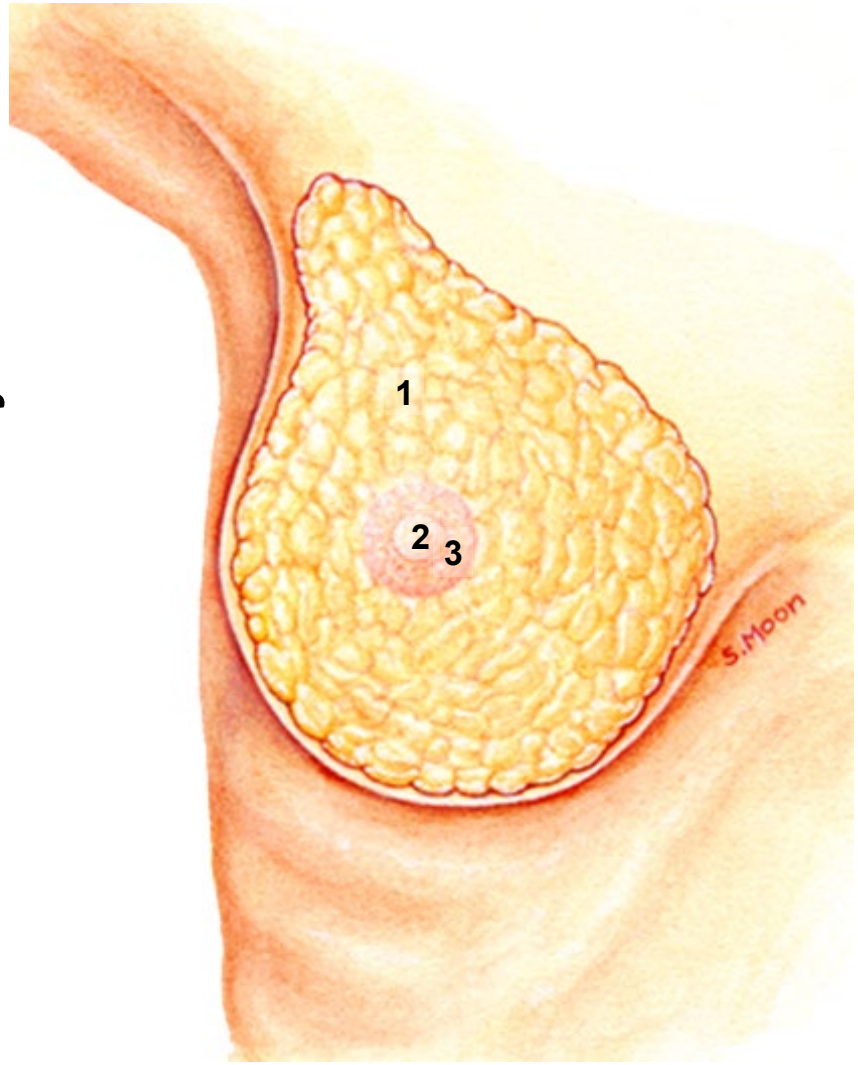


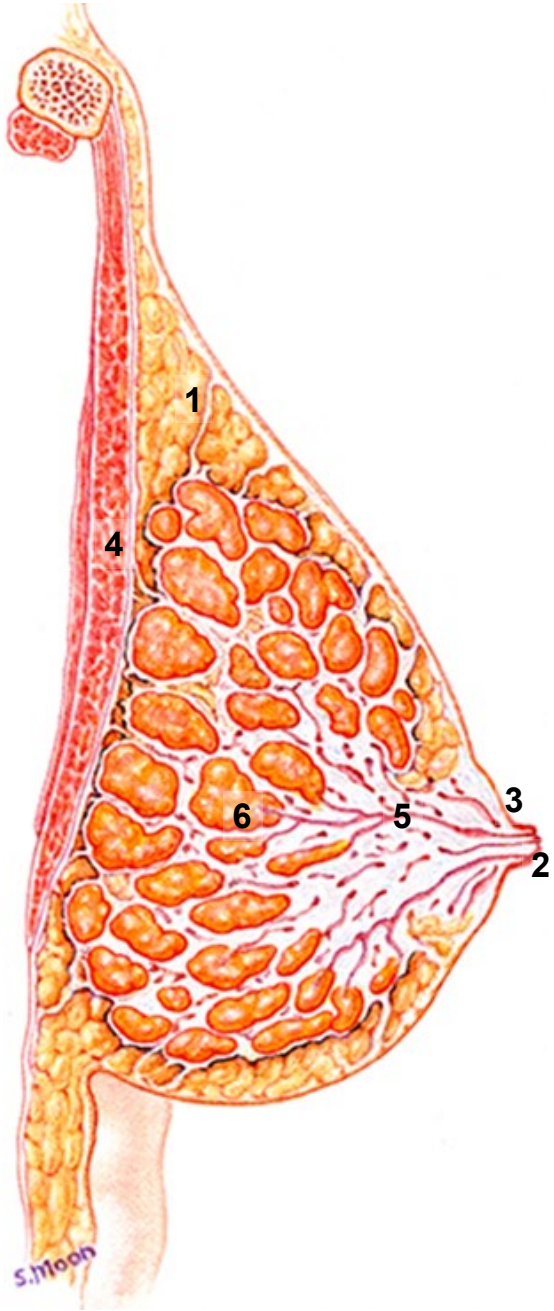
- To be added

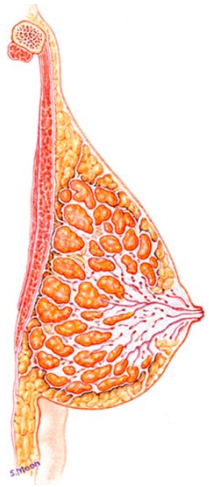
Tips

Breast

Anatomy

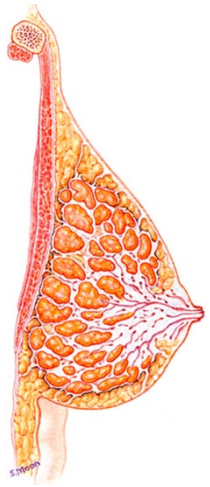






1. fat
2. nipple
3. areola
4. muscle
5. ducts
6. lobules

Breast



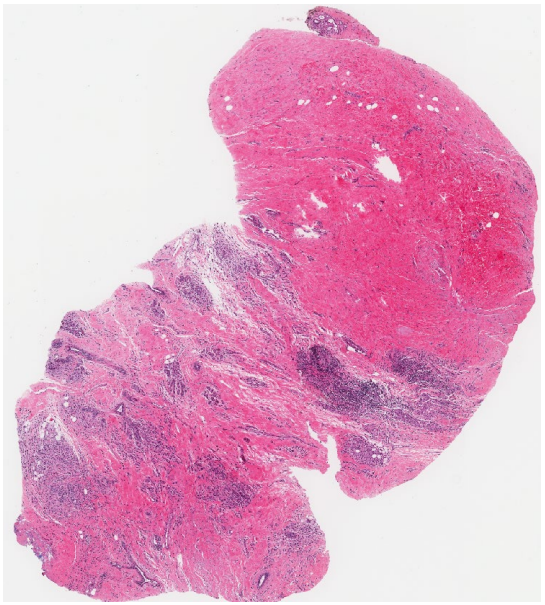
1. advanced carcinoma of breast, lobular type

Tumors

Breast

Tumors

1



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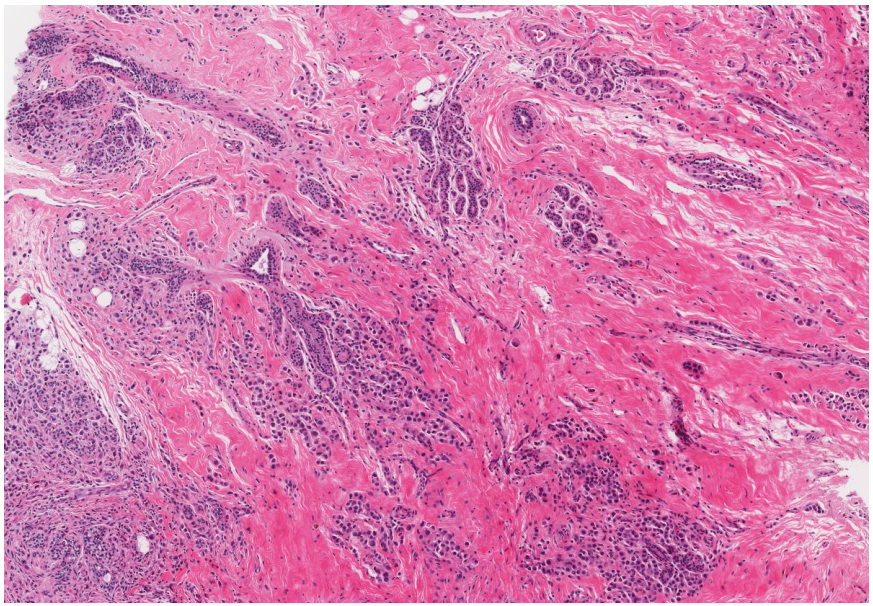
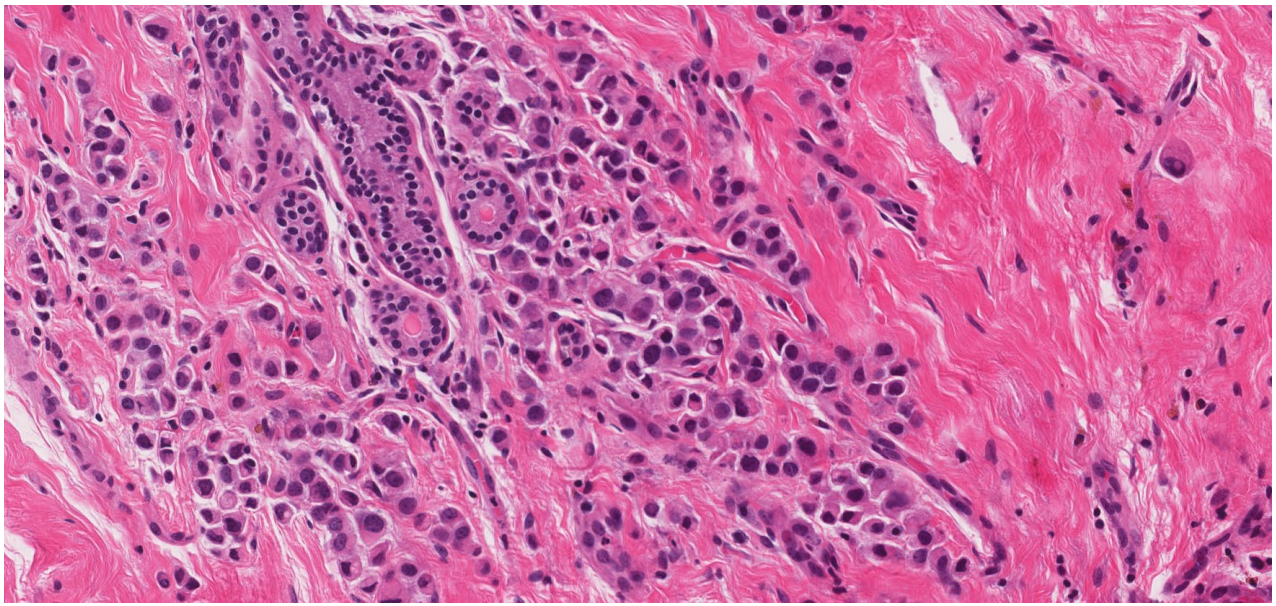


Advanced carcinoma of breast, lobular type

1. 1.5X
2. 5X
3. 20X
4. 40X

3



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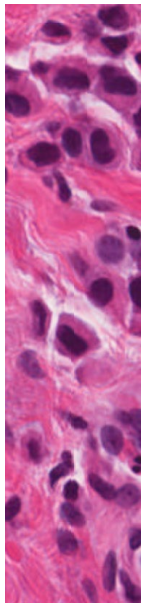
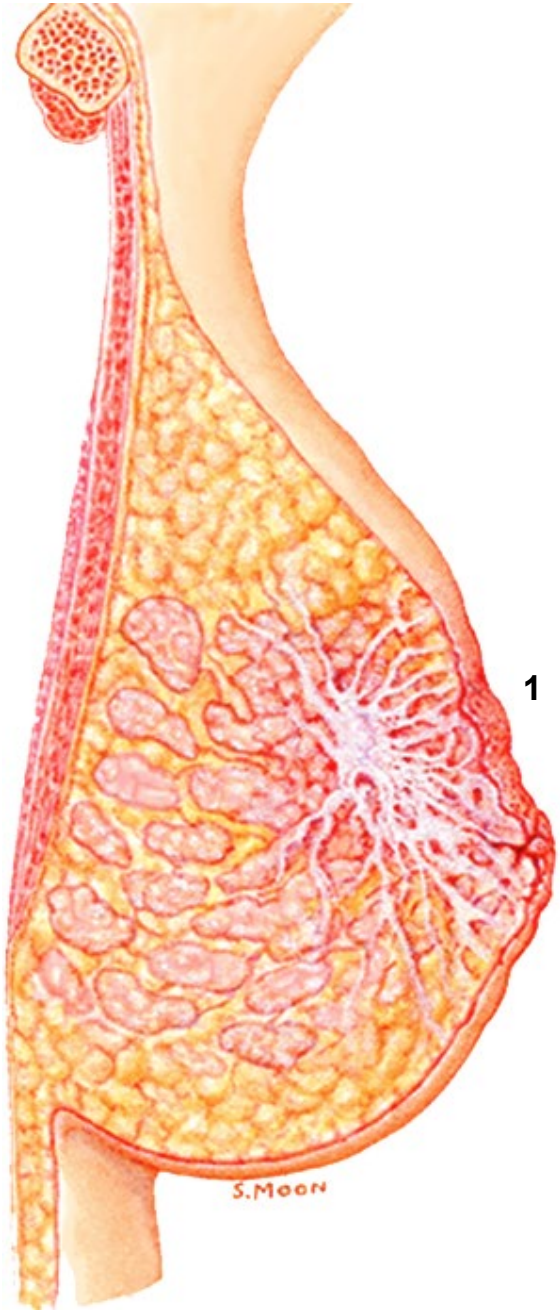
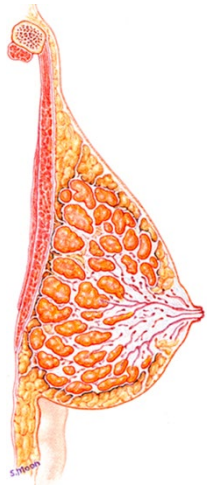


Breast

Tumors



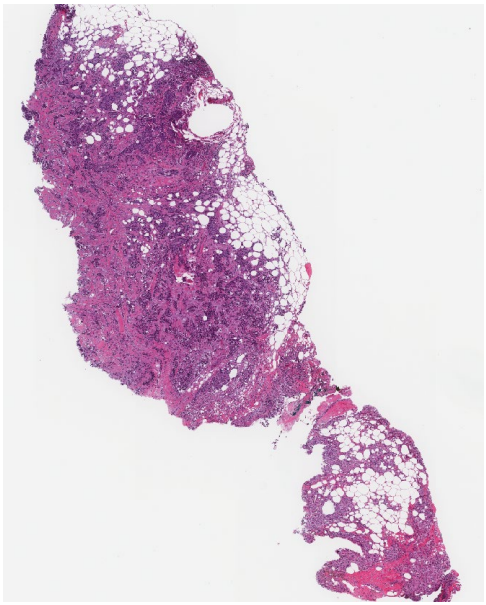


1. ductal carcinoma

Breast

Tumors

1



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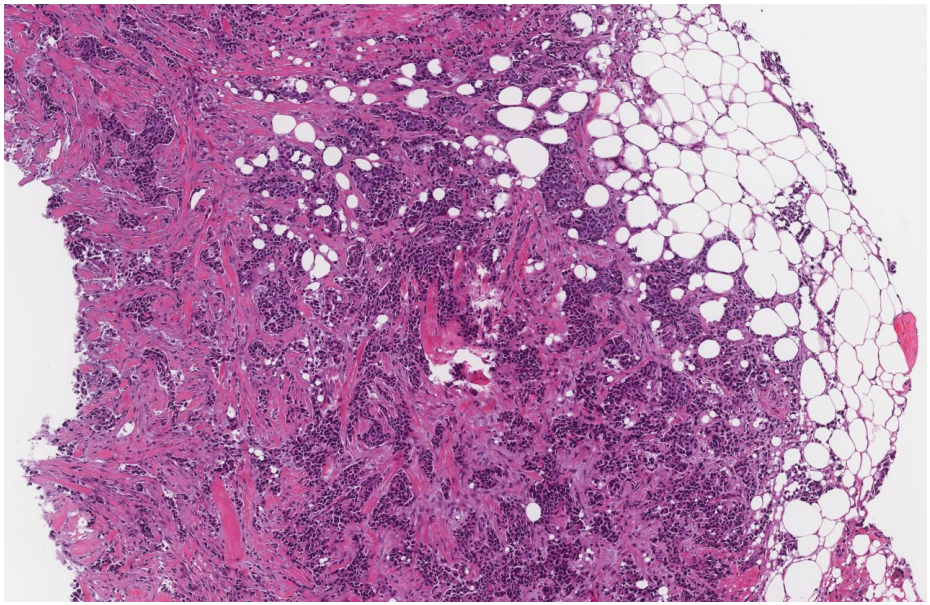
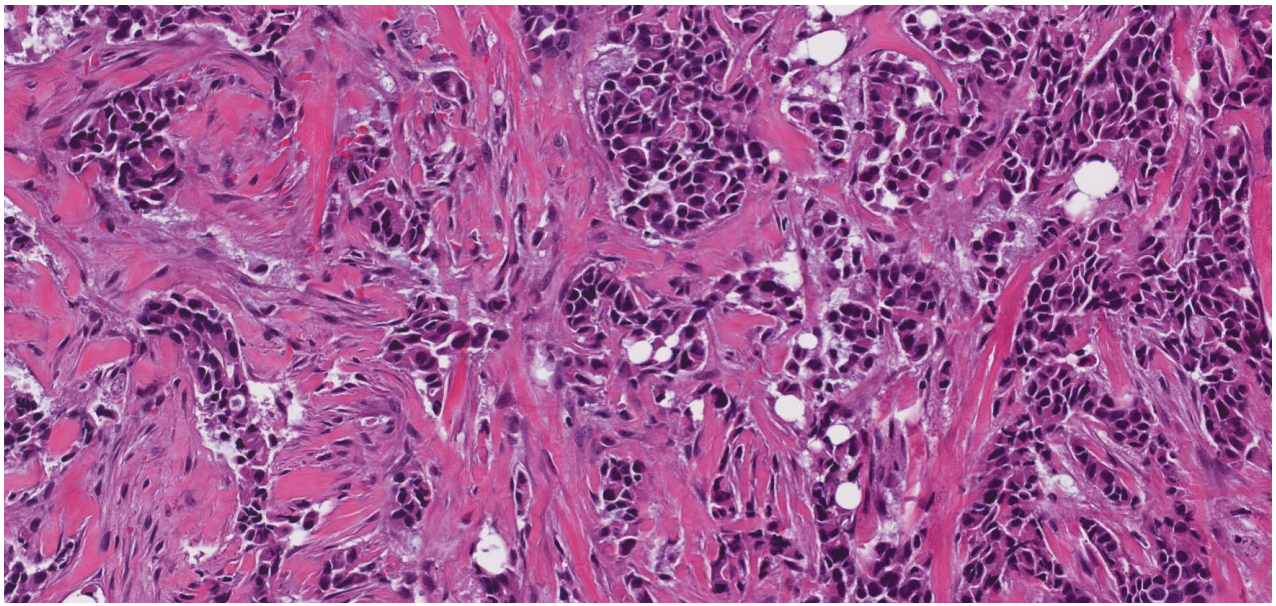


Ductal carcinoma

1. 1.4X
2. 5X
3. 20X
4. 40X

3



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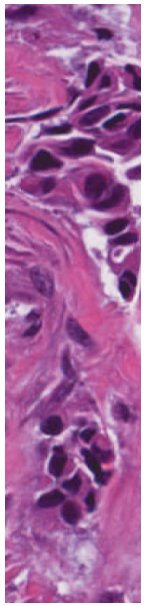
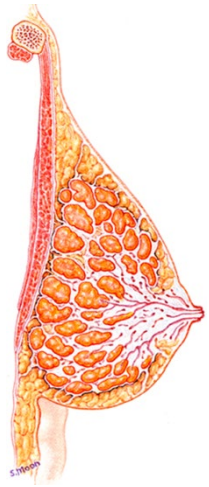


Breast



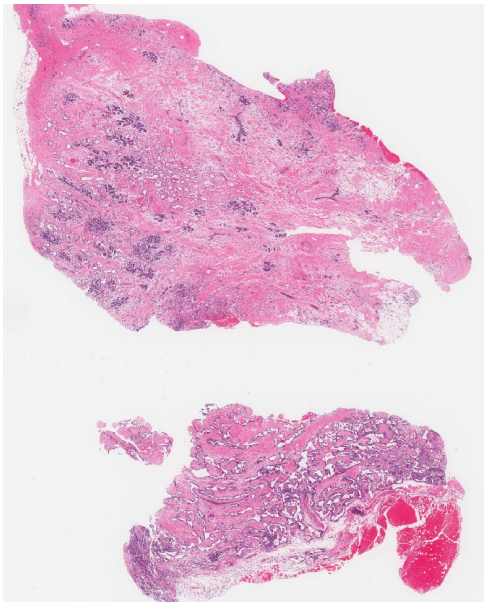
1. Leiomyosarcoma

Tumors

Breast

Tumors

1



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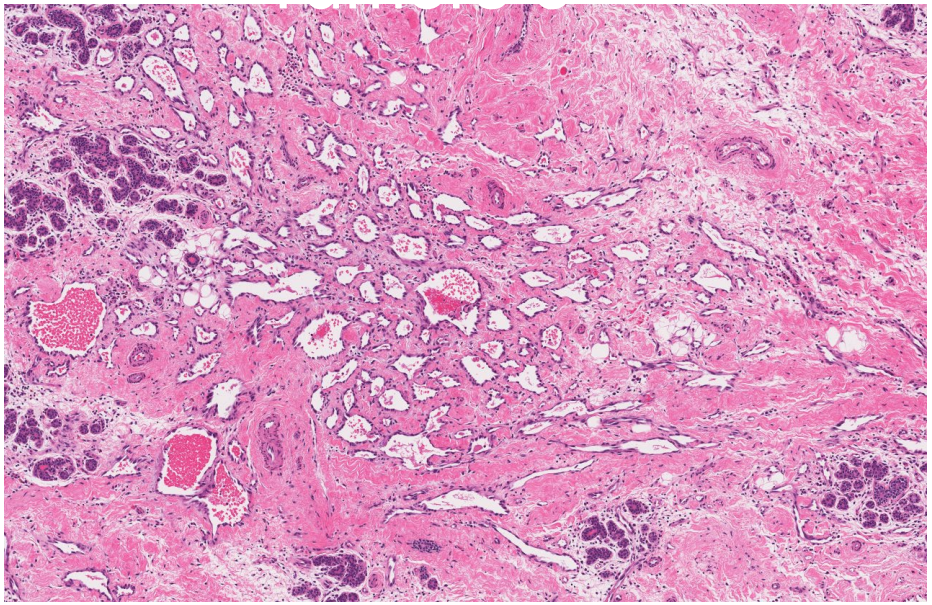
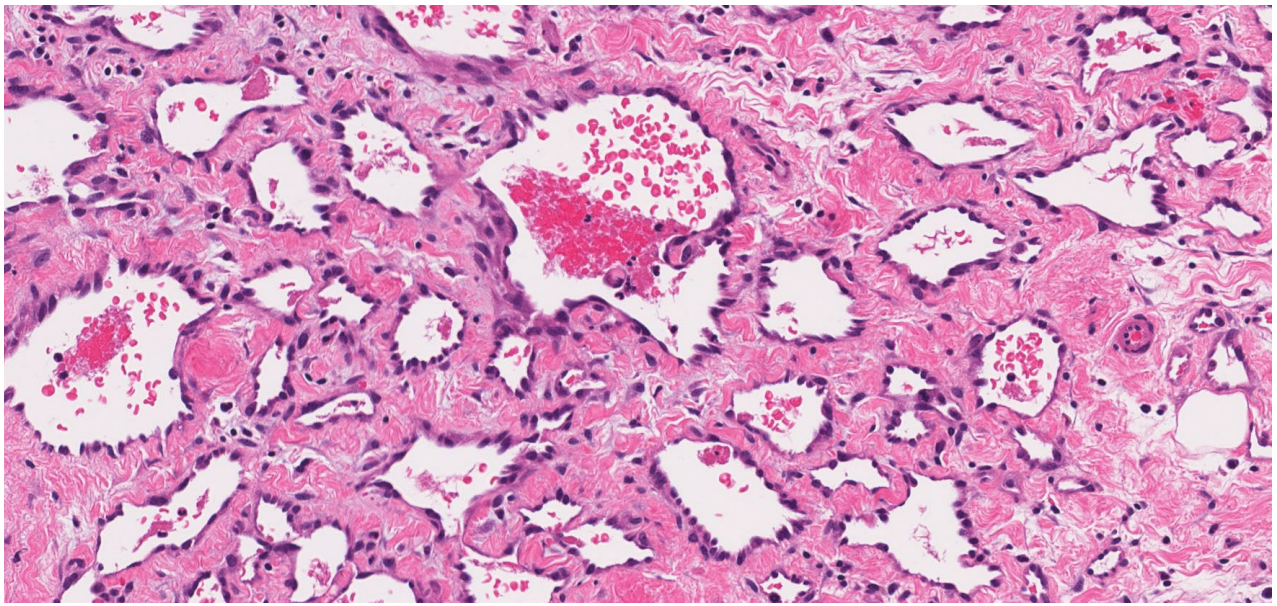


Angiosarcoma

1. 0.7X
2. 5X
3. 20X
4. 40X

3



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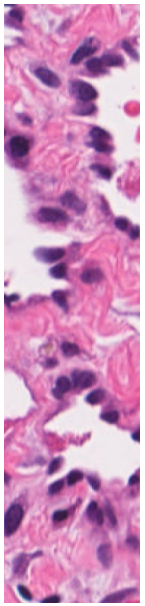
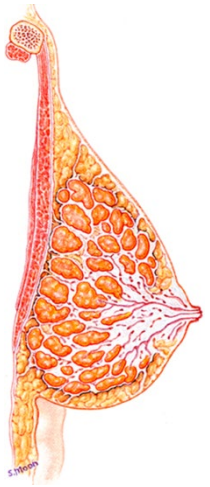


Breast



Procedures

More likely to support procurement:

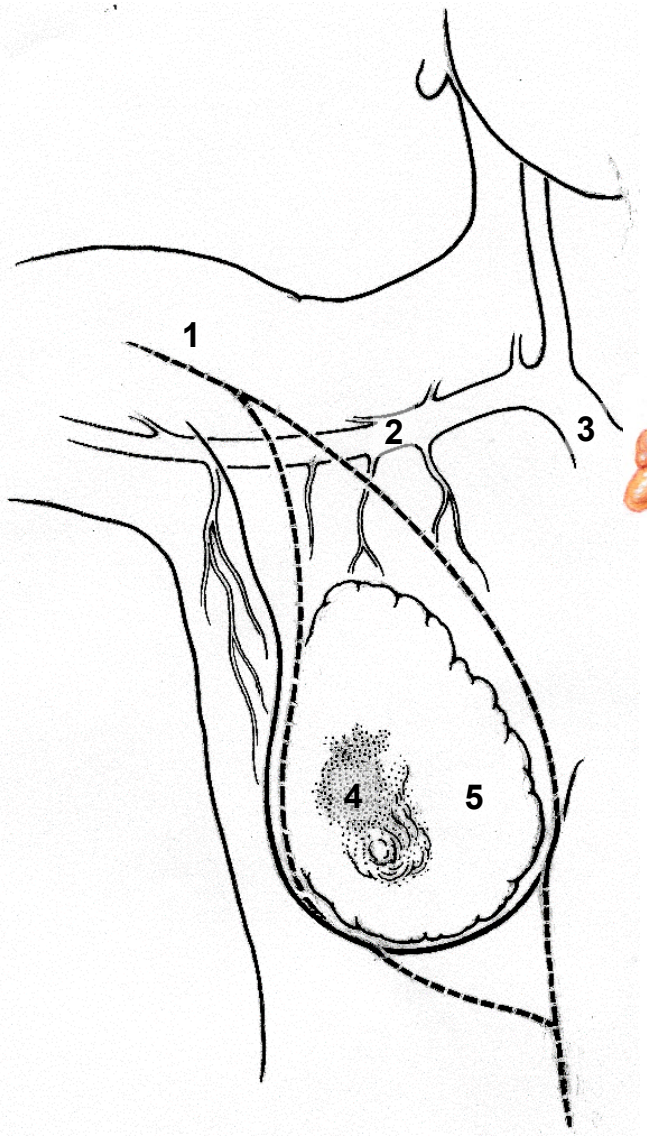
- breast excision
- breast reduction
- resection (with lymph node)
- mastectomy - a surgical operation to remove a breast.
- mastectomy – DCIS (ductal carcinoma in situ)

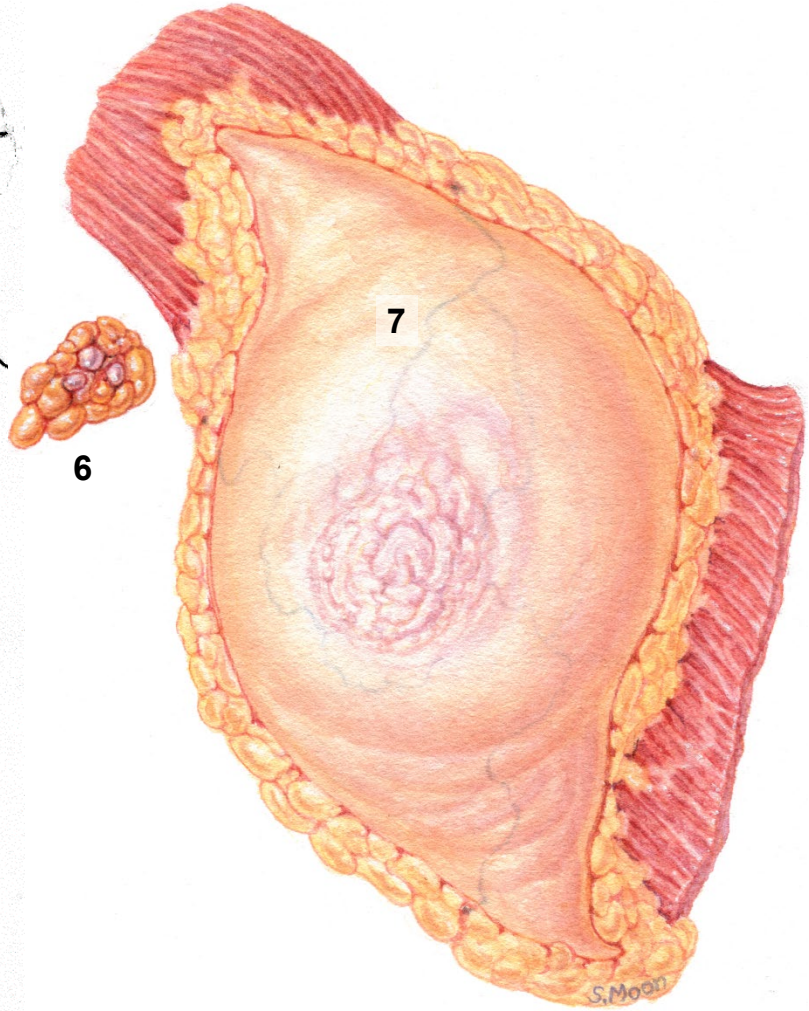
Less likely to support procurement:

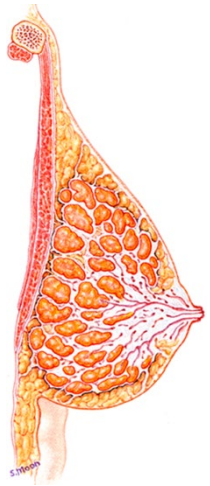
- none

Breast

Procedure





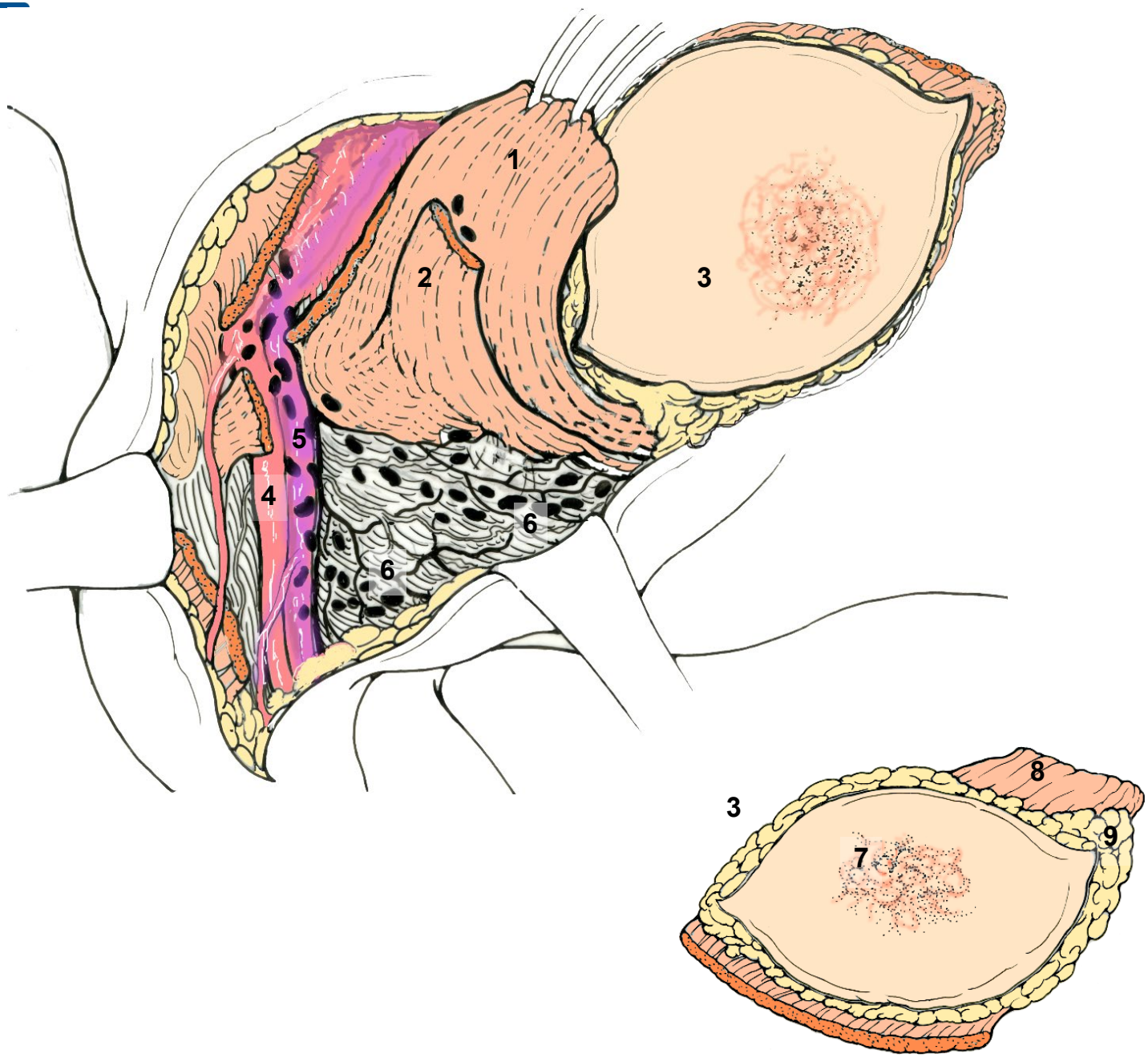


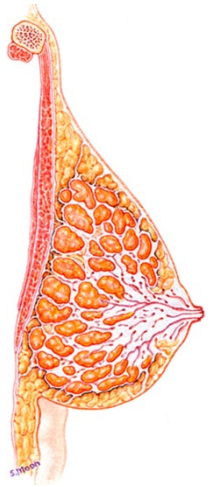
Resection (with lymph node)

1. total mastectomy incision plan
2. axillary vein
3. right brachiocephalic vein
4. breast tumor
5. breast tissue
6. lymph node to be sectioned
7. resected breast to be sectioned

Breast

Procedure



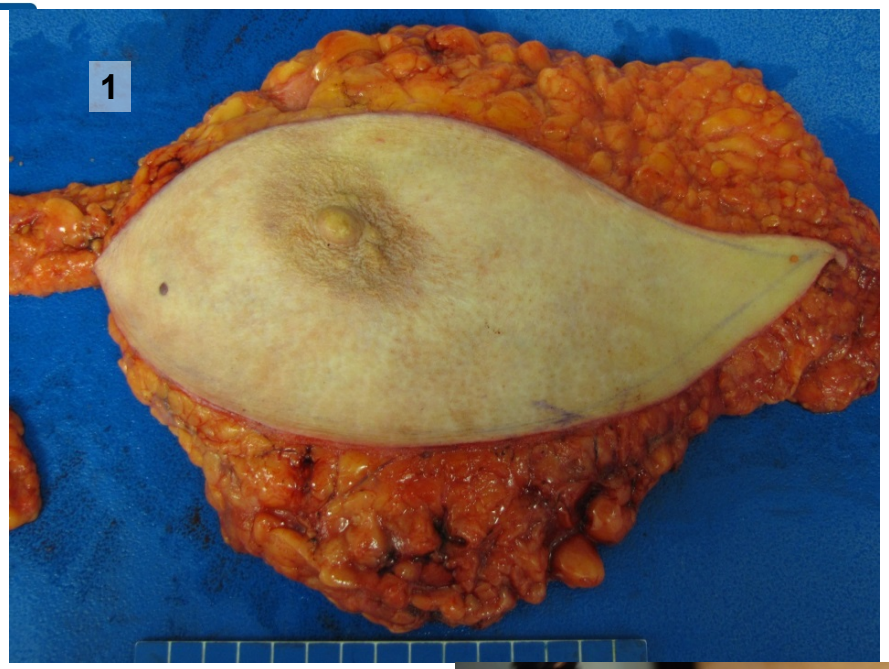


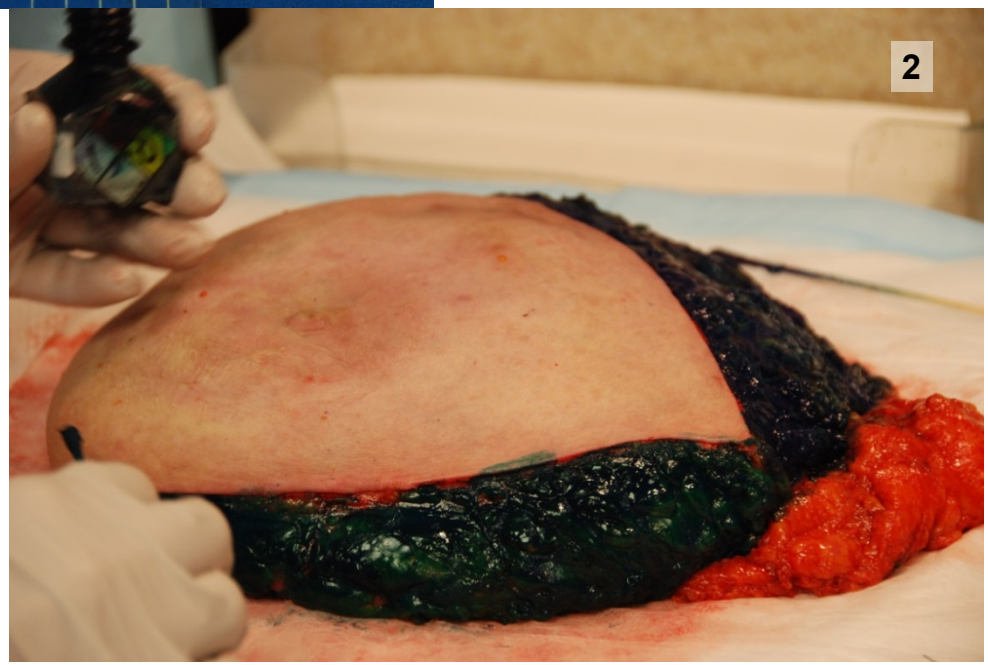
Mastectomy

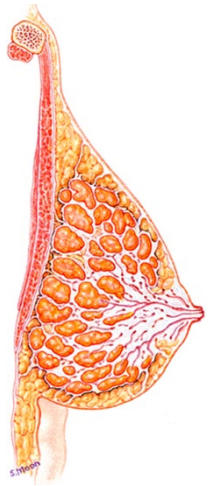
1. reflexed pectoral major
2. reflexed pectoral minor
3. resected breast
4. axillary artery
5. axillary vein
6. important lymph nodes
7. breast tumor
8. pector
9. breast fat

Breast

Procurement



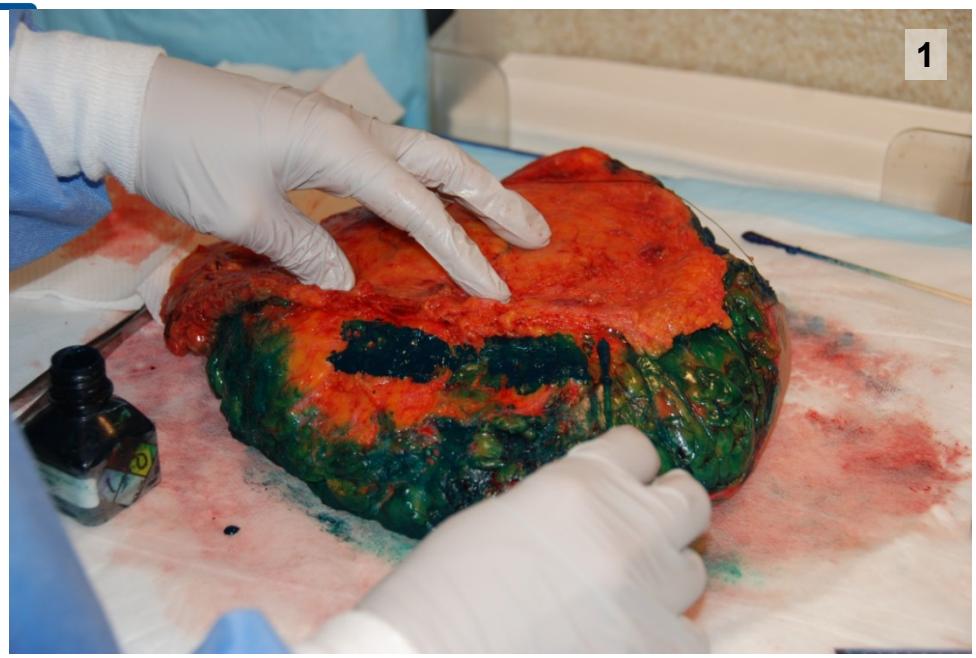


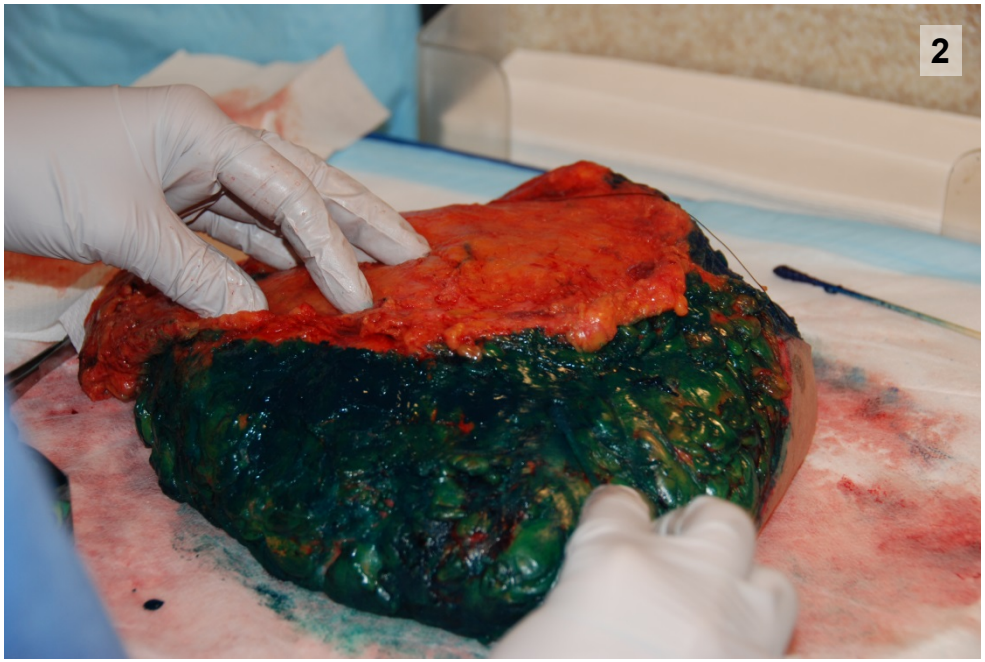


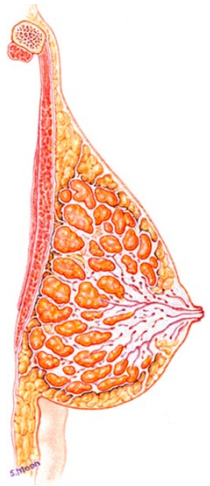
1. Weigh specimen and use the axillary tail and skin to orient the specimen.
2. Ink…
3. Measure and record the dimensions of the breast.

Breast

Procurement



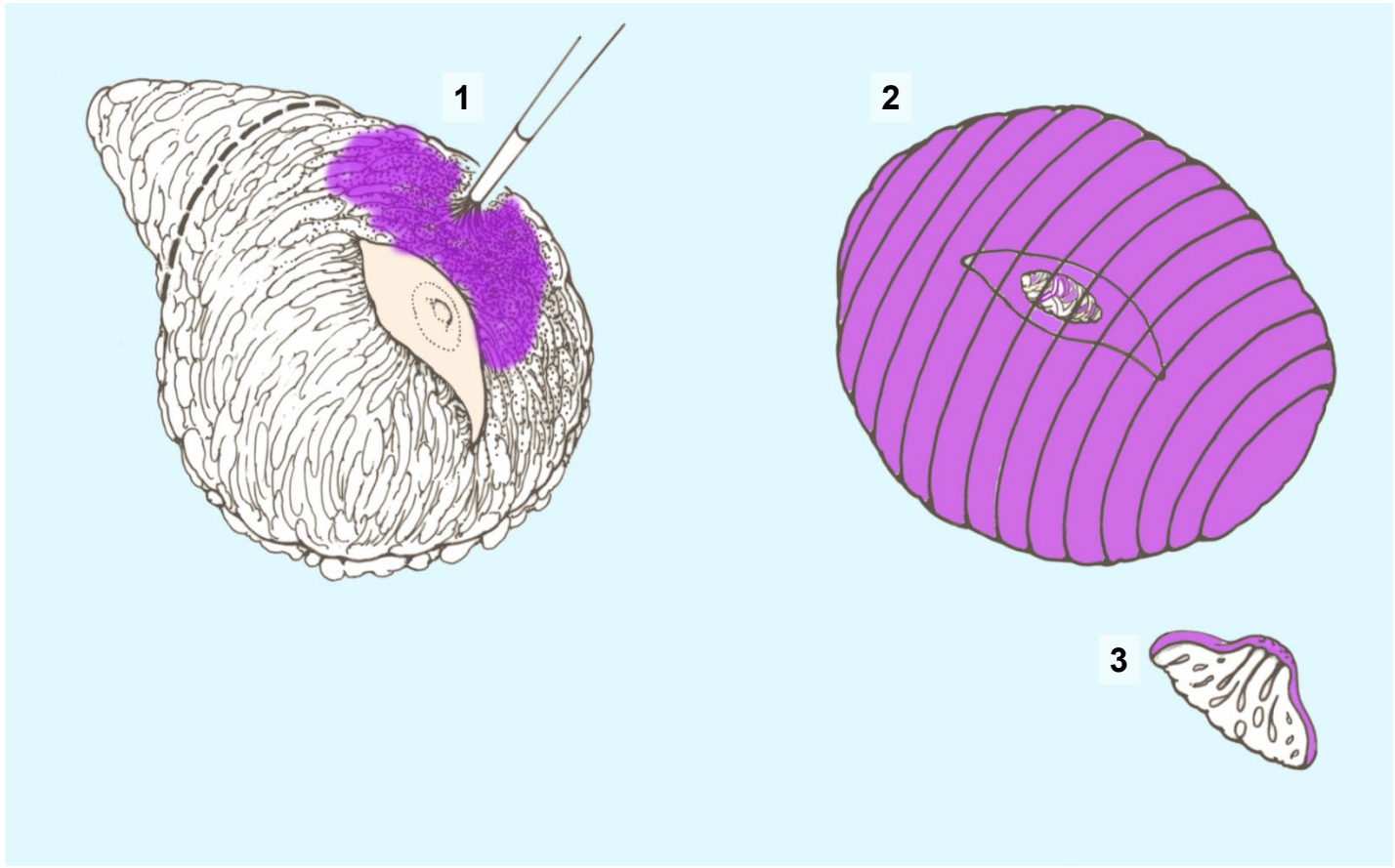


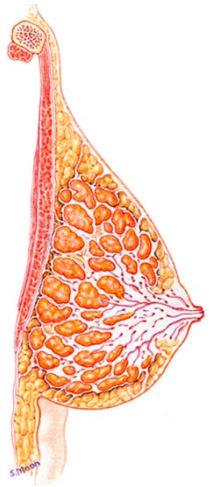


1. to be added
2. to be added

Breast

Procurement

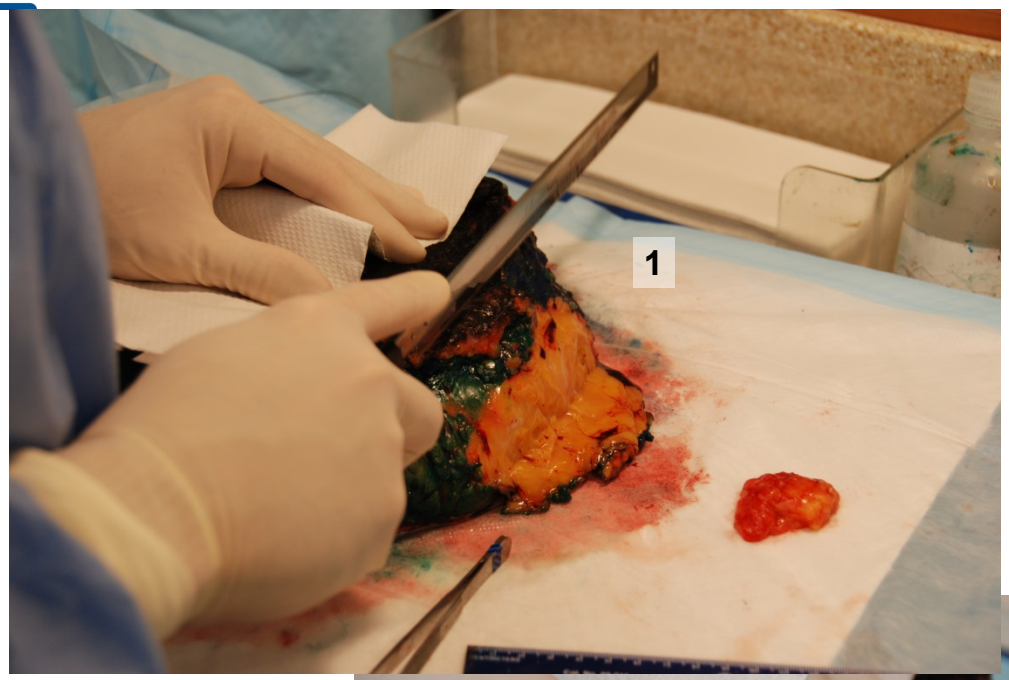


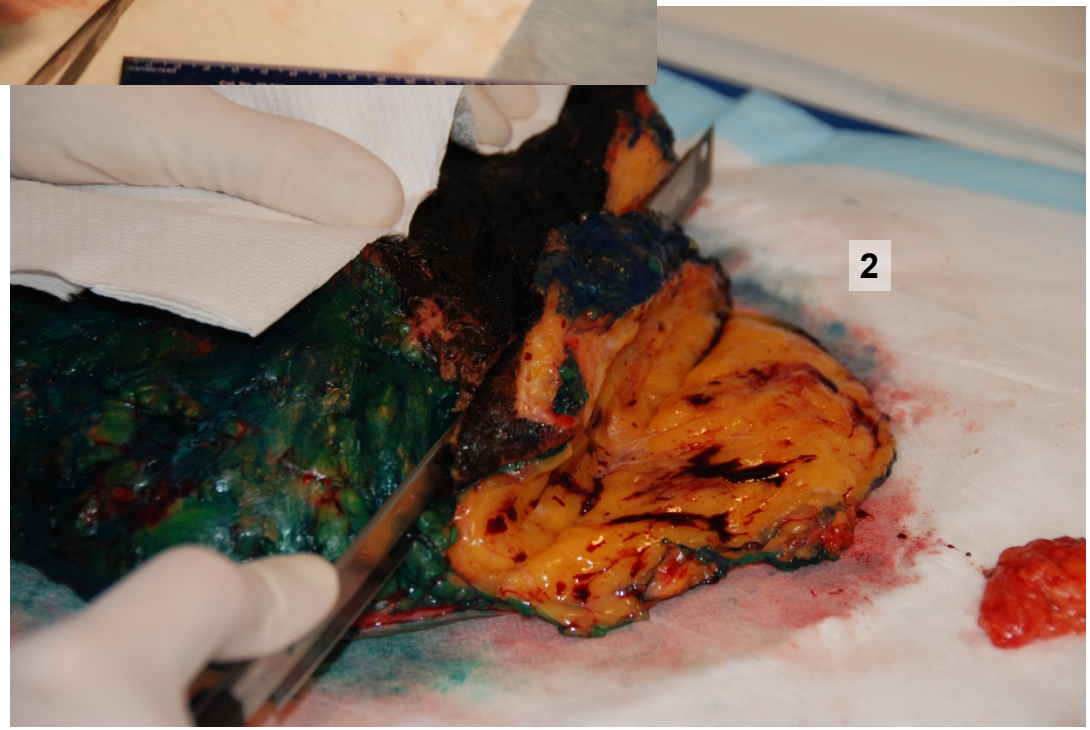


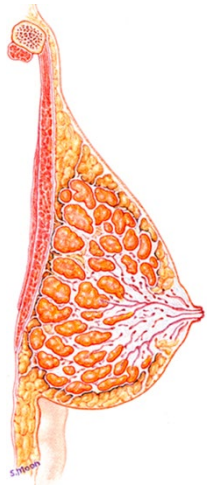
1. breast specimen inking
2. breast specimen sectioning
3. section

Breast

Procurement



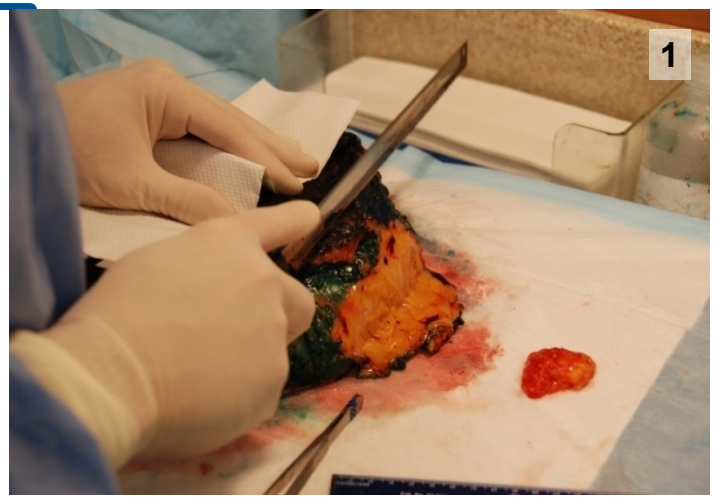


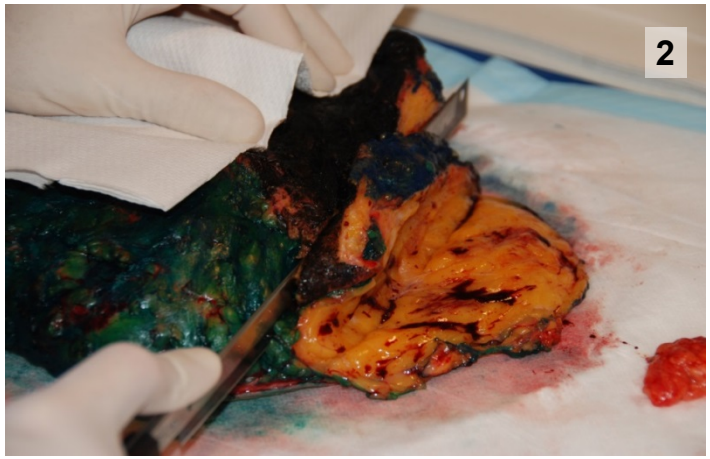


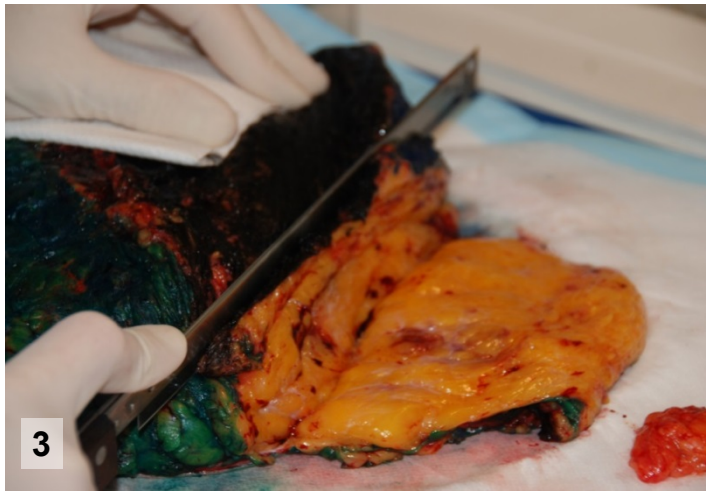
1. Serially section the posterior side of the breast at 2 cm intervals with a long blade.
2. Section perpendicular to skin ellipse, do not cut through the skin.

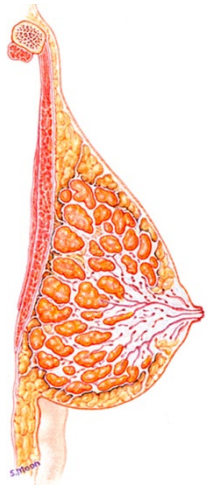
Breast

Procurement





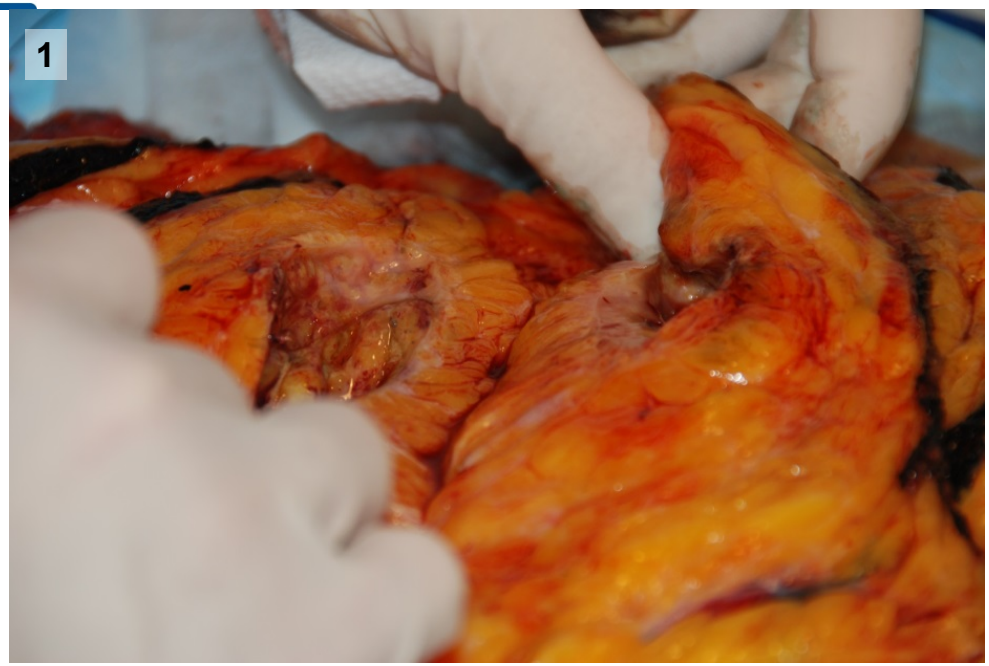




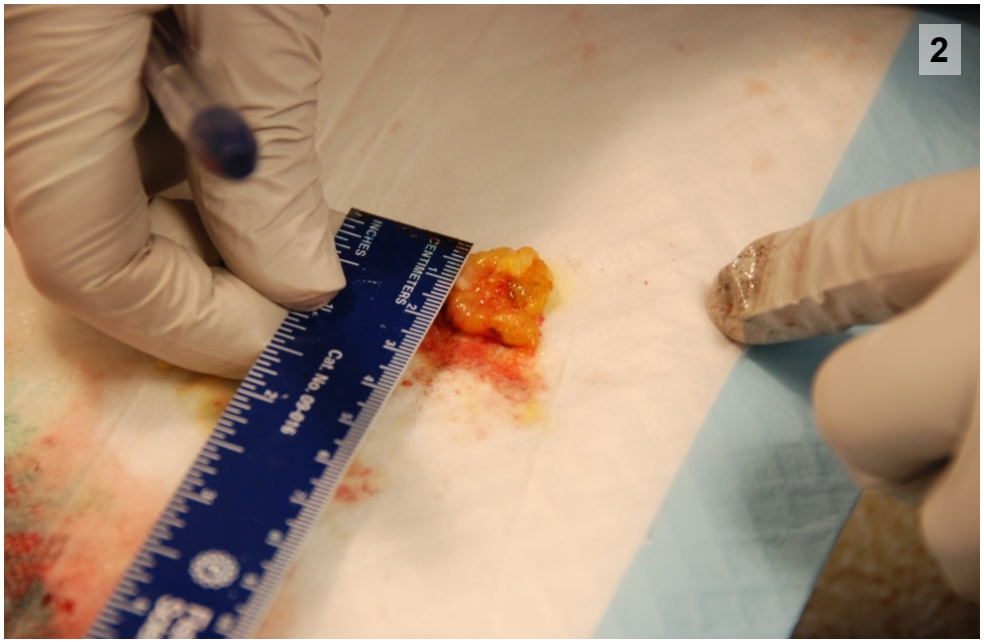
1. to be added
2. to be added
3. to be added
4. to be added

Breast

Procurement

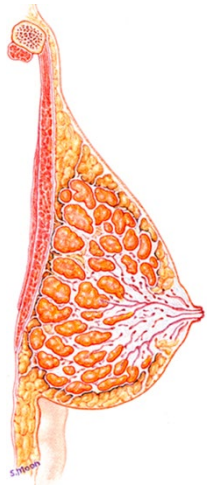


1. remove
2. measure



Breast

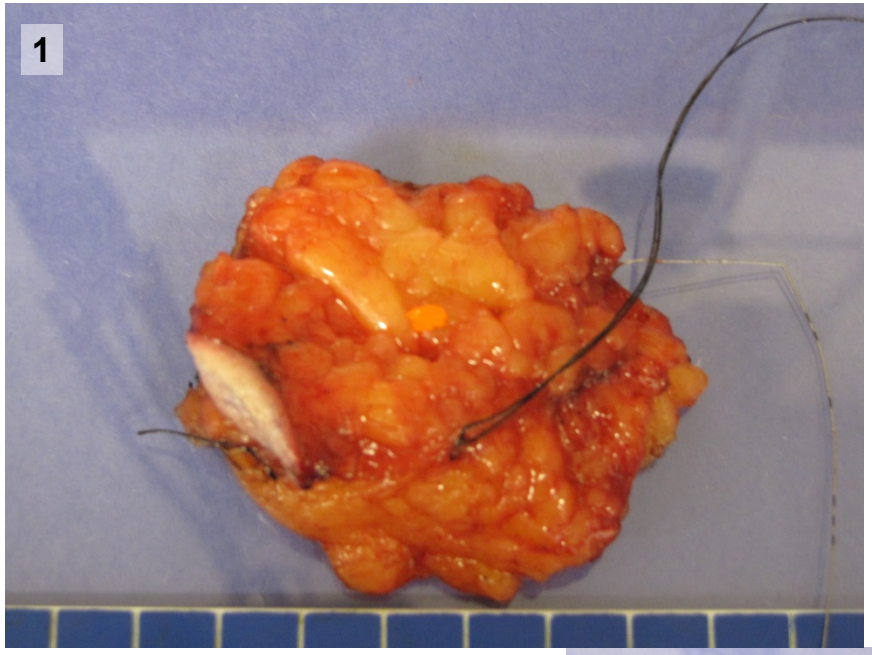
Procurement

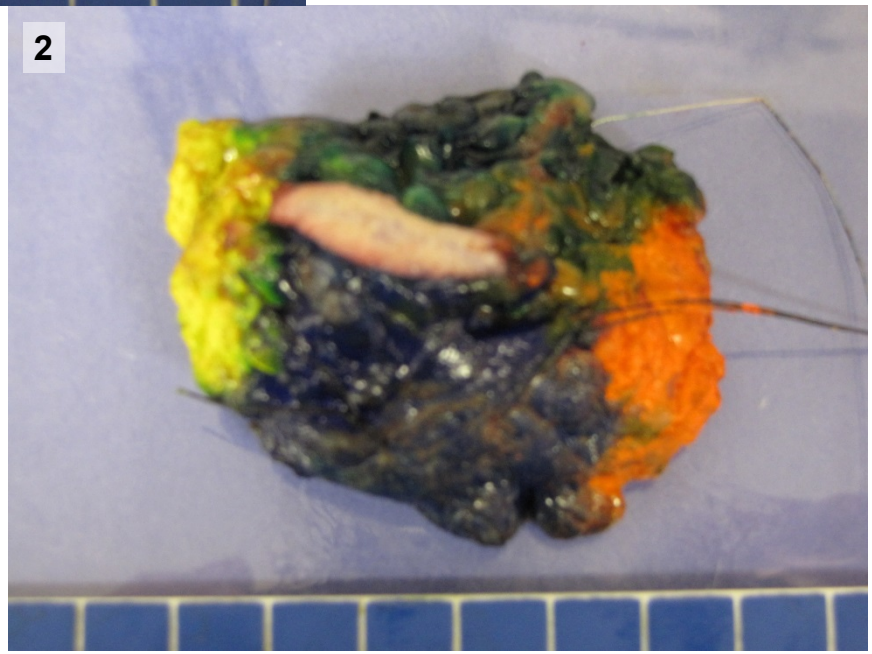


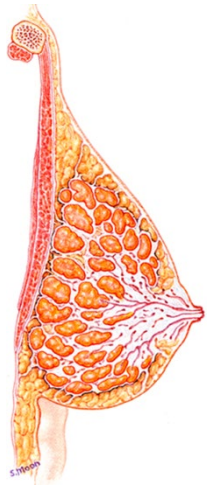
1. Serially section the posterior side of the breast at 2 cm intervals with a long blade.
2. Section perpendicular to skin ellipse, do not cut through the skin.

Breast

Procurement



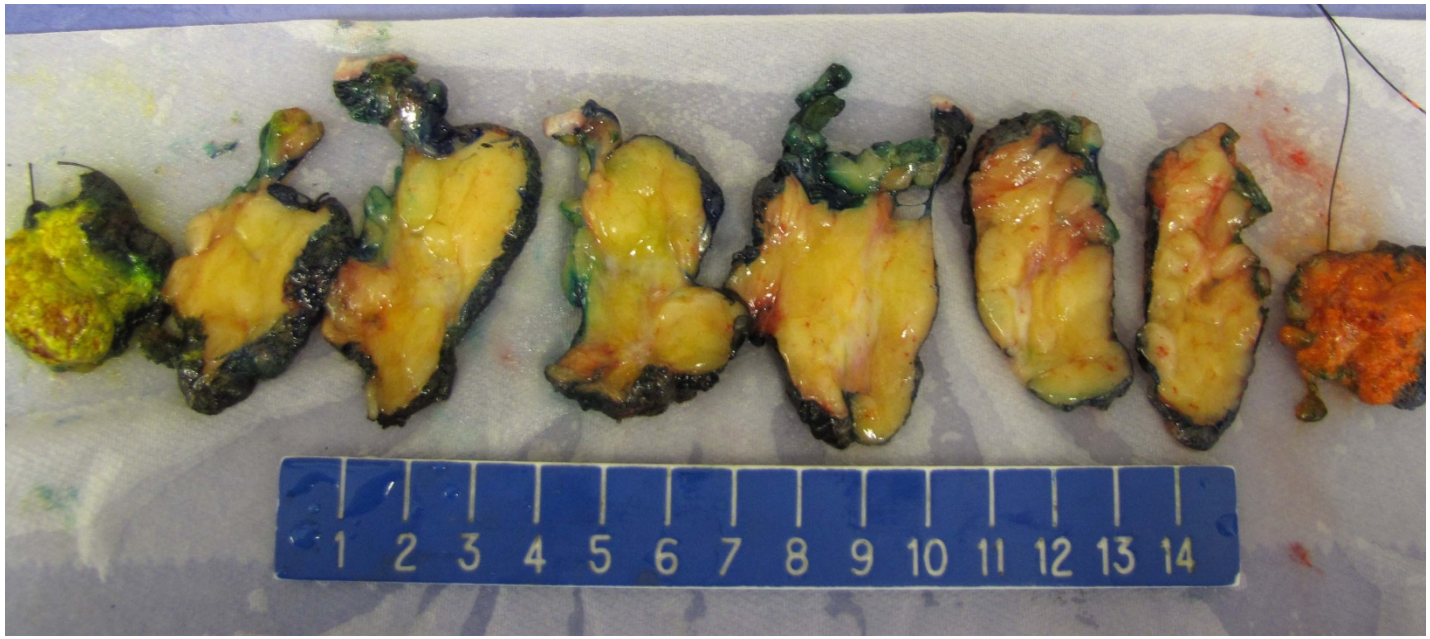




1. lumpectomy sample
2. inked specimen

Breast

Procurement

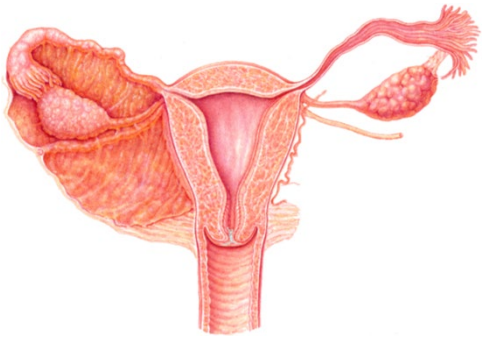


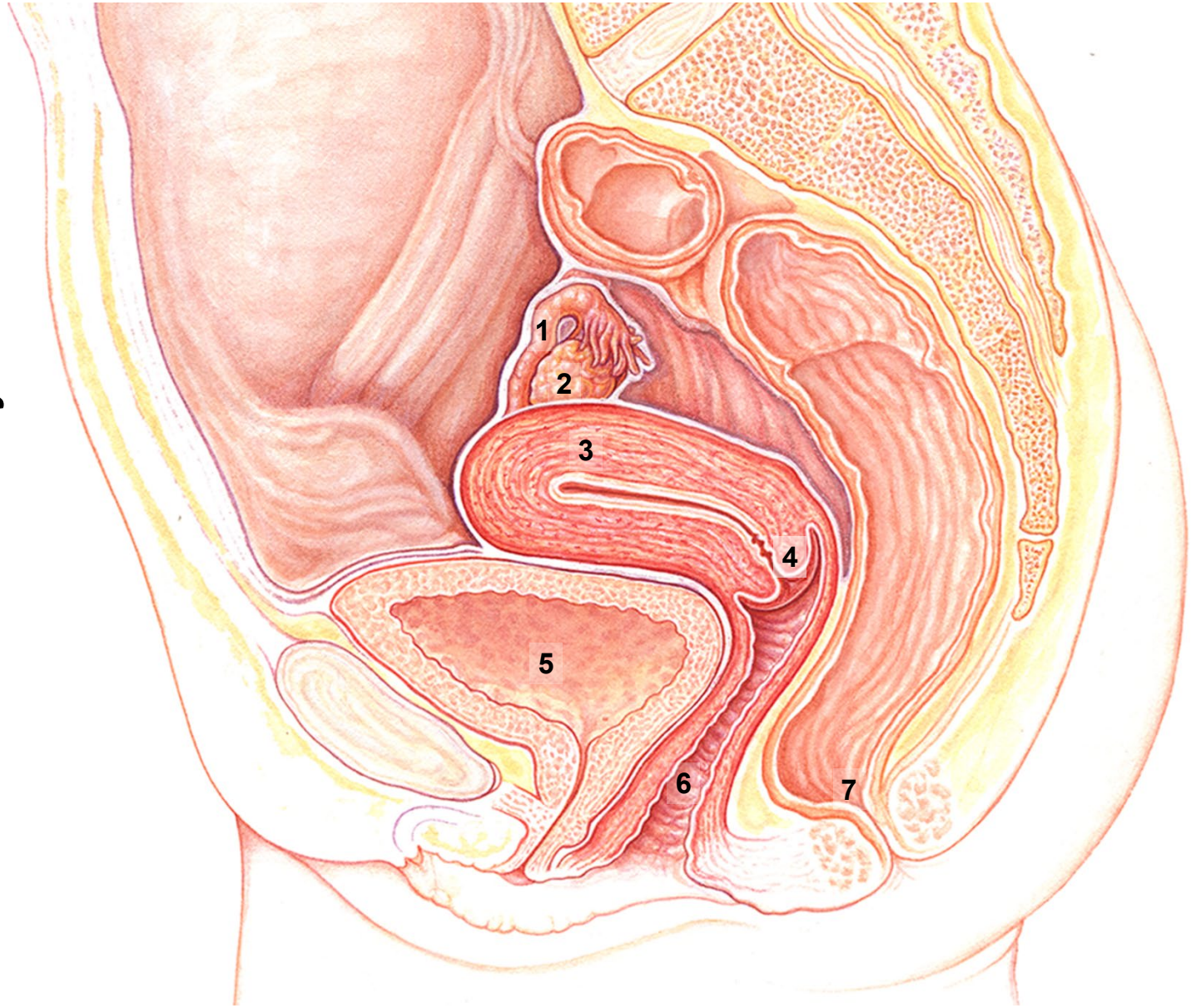
Breast

- To be added

Tips

Female Reproductive



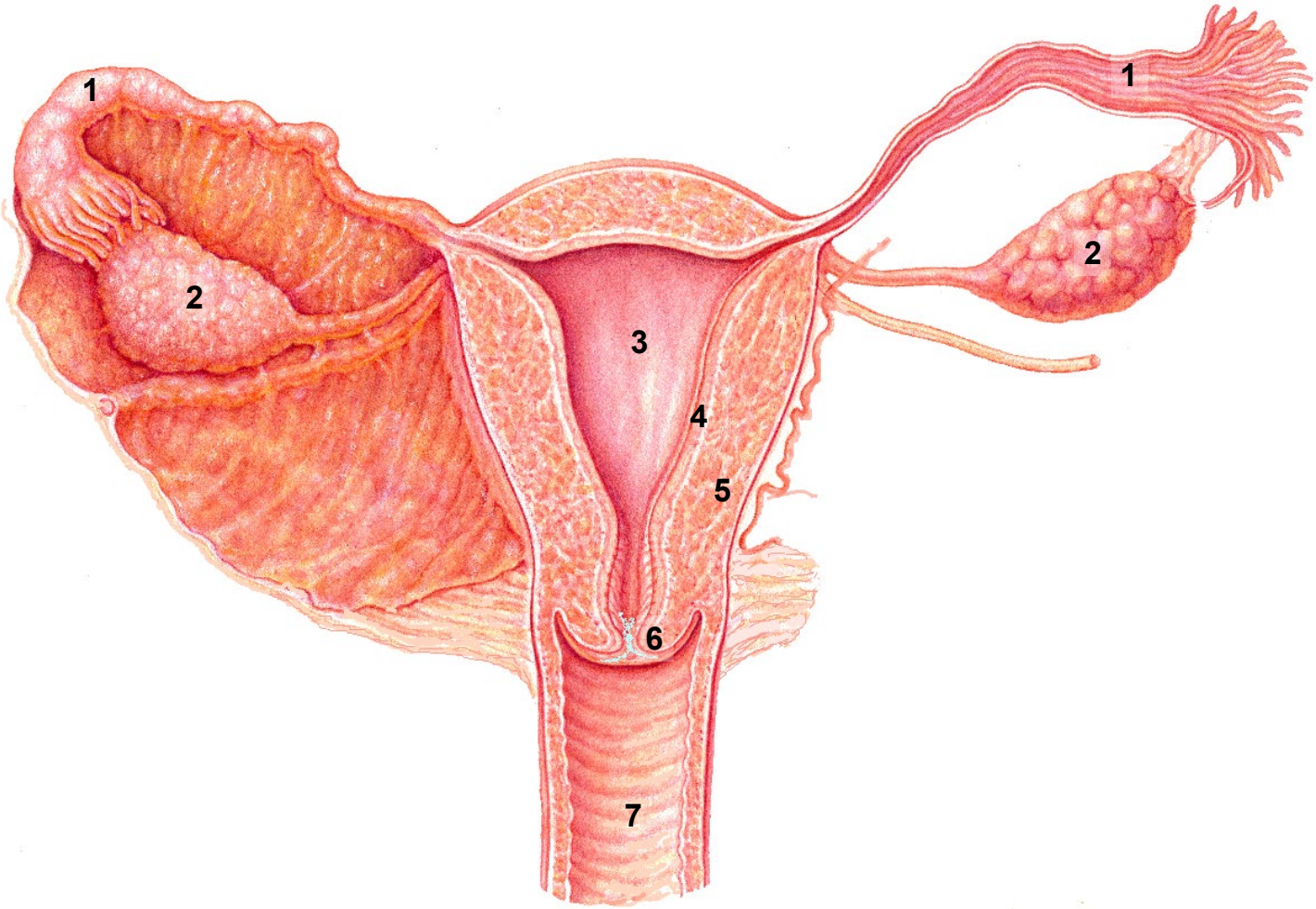


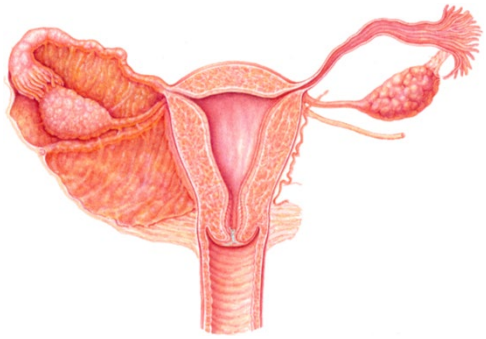
1. fallopian tube
2. ovary
3. uterus
4. cervix
5. bladder
6. vagina
7. rectum

Anatomy

Female Reproductive

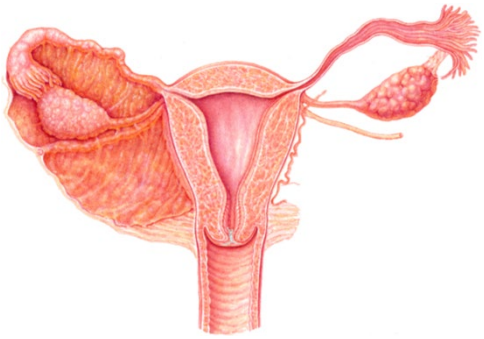
Anatomy



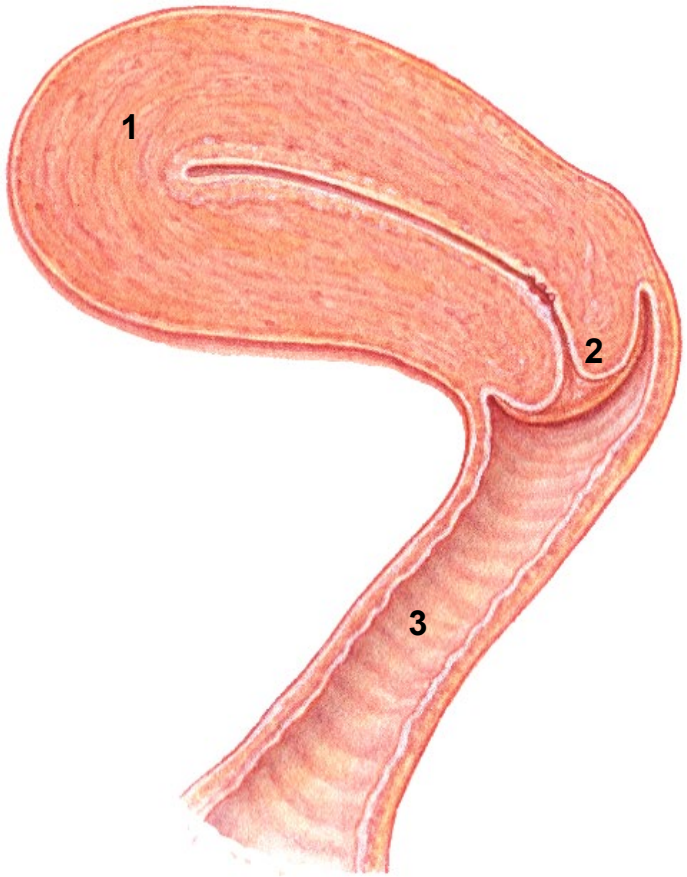


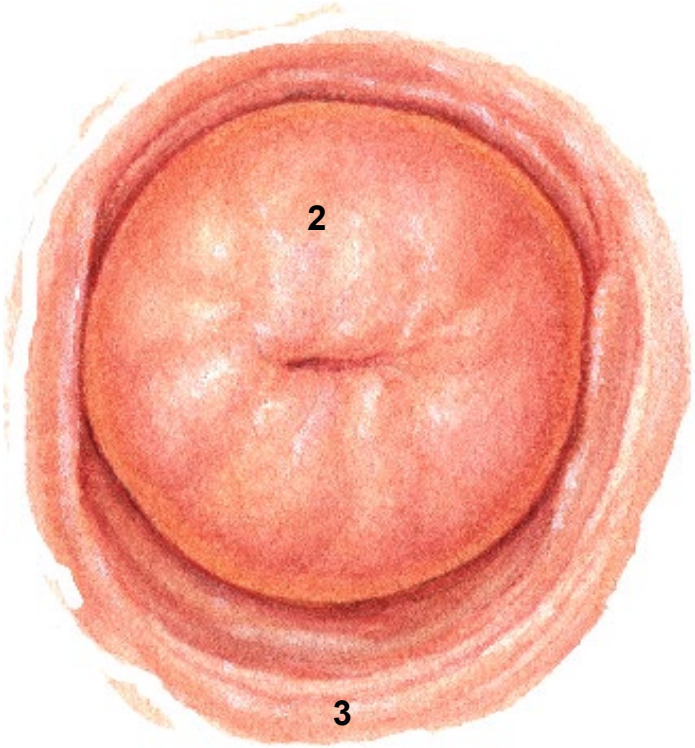
1. fallopian tube
2. ovary
3. uterus
4. endometrium
5. myometrium
6. cervix
7. vagina

Female Reproductive



Anatomy

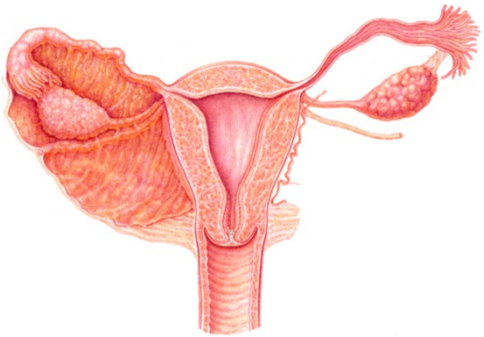




1. uterus
2. cervix
3. vagina

Female Reproductive

Anatomy

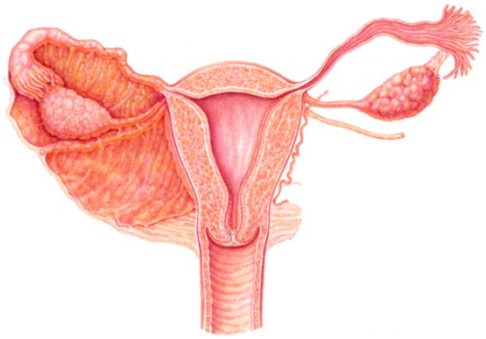


Inguinal, superficial and deep lymph nodes

Lymph node anatomy in other sections

- Head & Neck
- Lung
- Stomach
- Colon & Rectum
- Pancreas
- Spleen
- Lymphatic System

Ovary

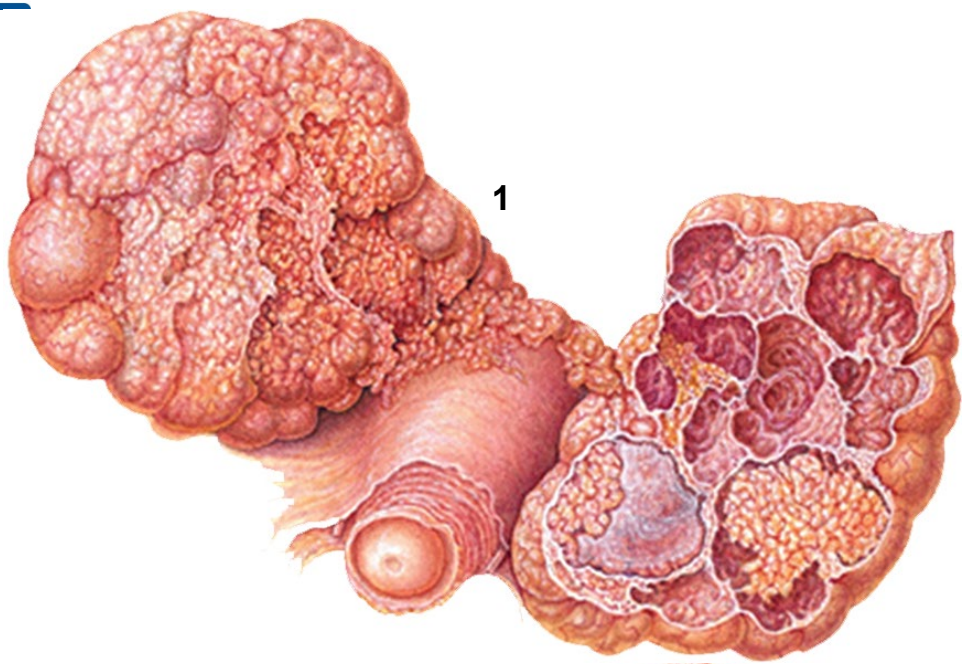


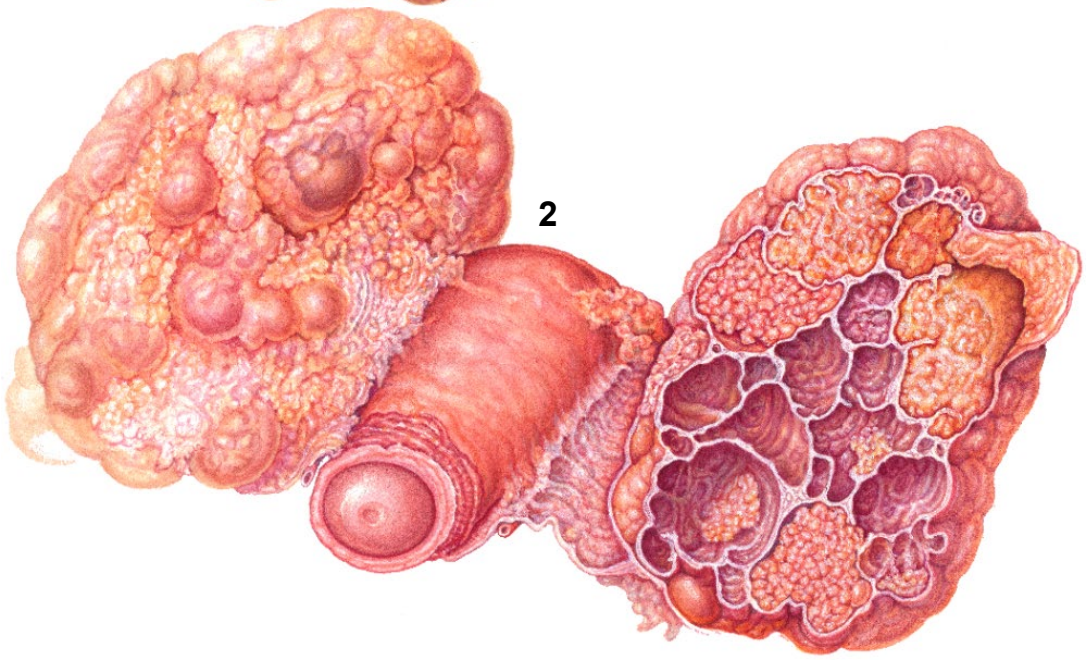
Anatomy

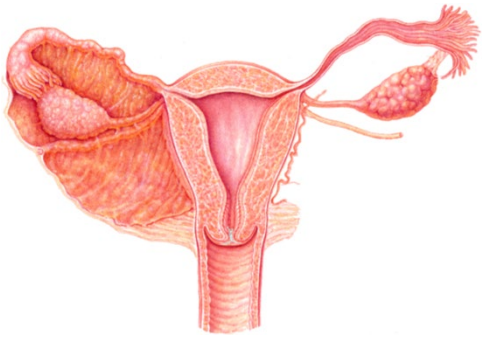
1. stroma
2. follicle
3. corpus albicans
4. corpus luteum

Ovary

Tumors

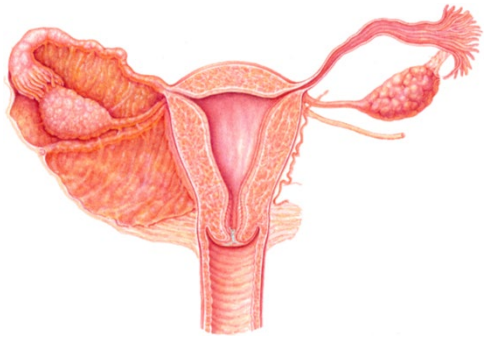






1. serous cystadenocarcinomas
2. mucinous cystadenocarcinomas

Ovary



Procedures

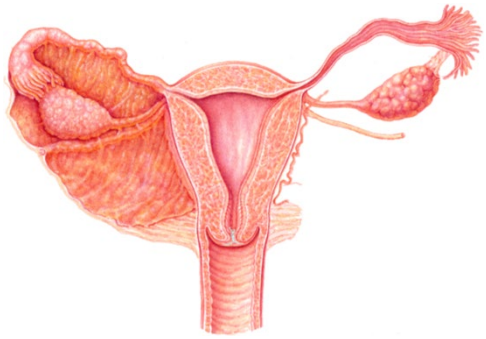
More likely to support procurement:

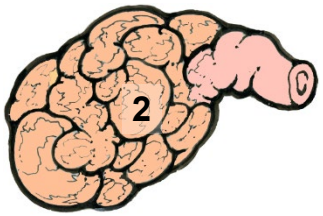
- oophorectomy - surgical removal of one or both ovaries; ovariectomy.
- bilateral salpingo-oophorectomy - surgery to remove both ovaries and both fallopian tubes.
- radical hysterectomy - surgery to remove the uterus, cervix, and part of the vagina. The ovaries, fallopian tubes, and nearby lymph nodes may also be removed.

Less likely to support procurement:

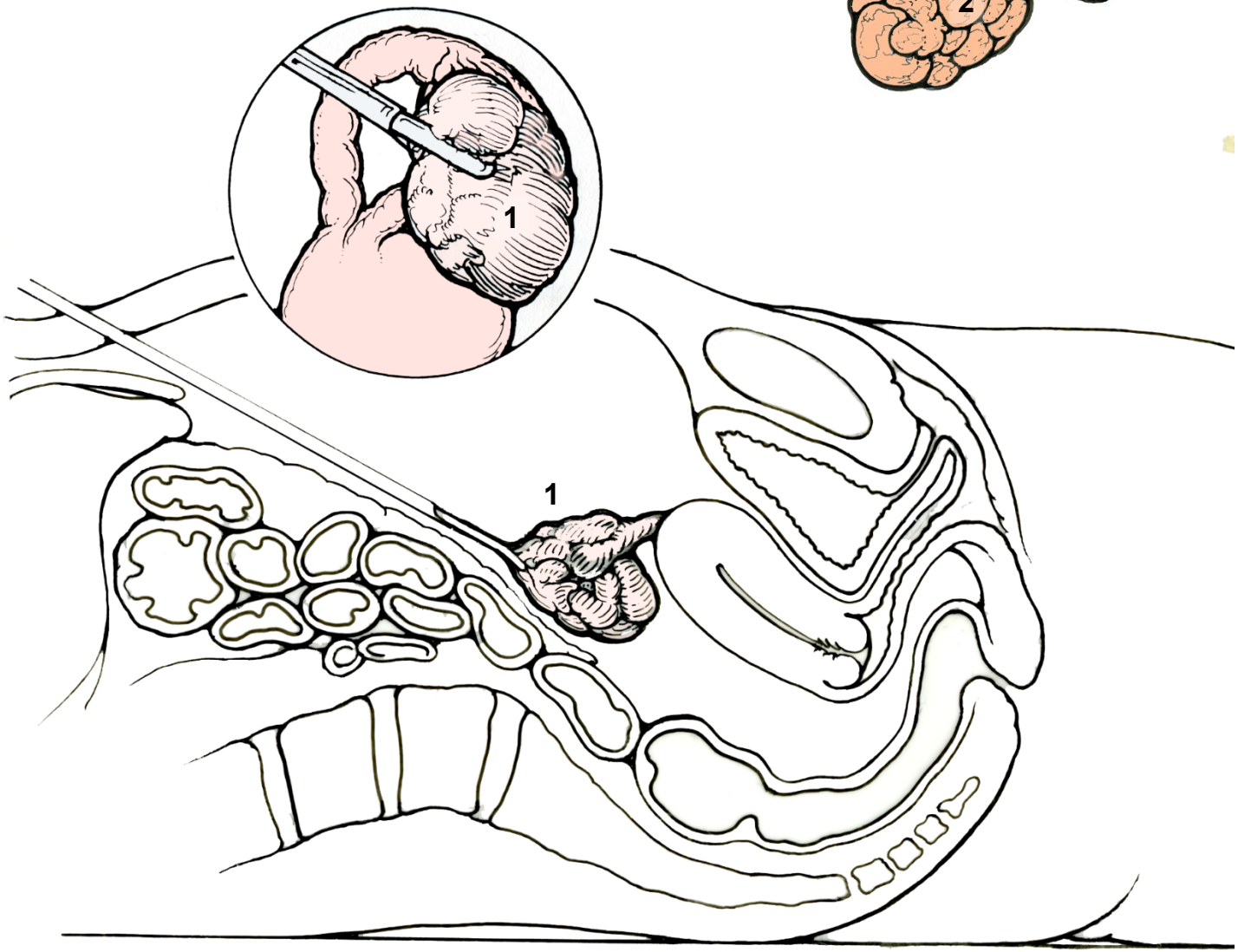
- none

Ovary





Procedure

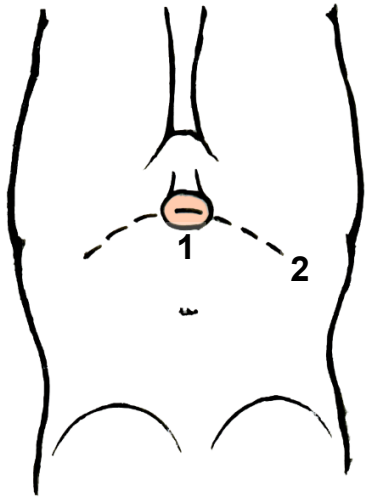


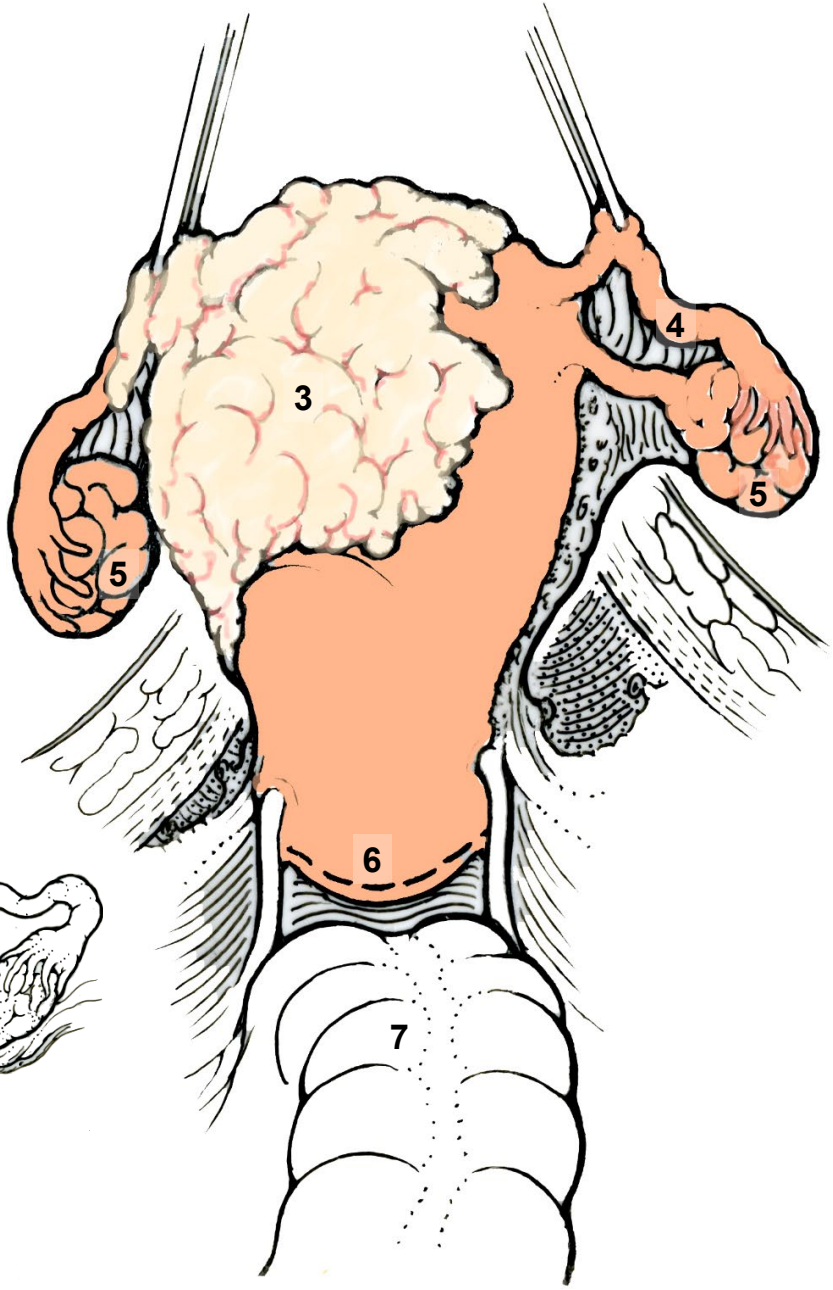
Oopheractomy (for “early stage” primary tumor)

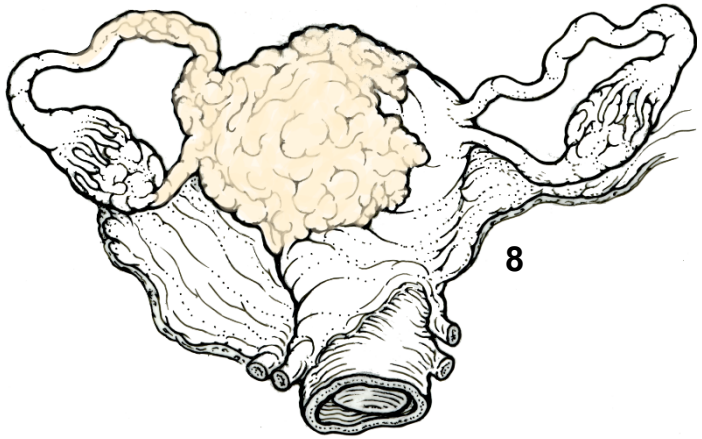
1. ovarian tumor
2. resected “early stage” ovary tumor

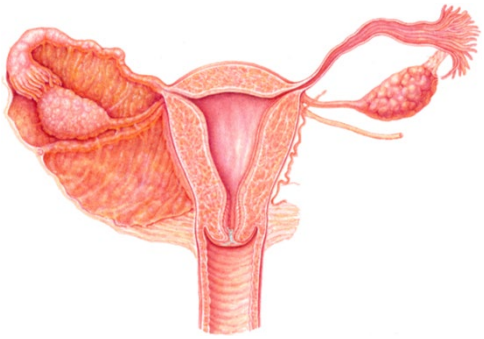
Ovary

Procedure





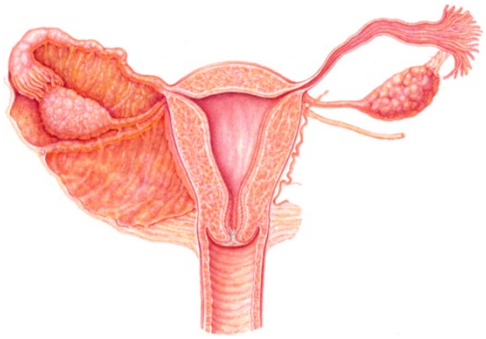




Radical hysterectomy

1. uterus
2. incisions
3. uterine tumor
4. uterine tube
5. ovary
6. incision at cervix
7. rectum
8. resected specimen: uterus, cervix, and part of the vagina. The ovaries, fallopian tubes, and nearby lymph nodes are shown as removed here but are not always resected.

Ovary

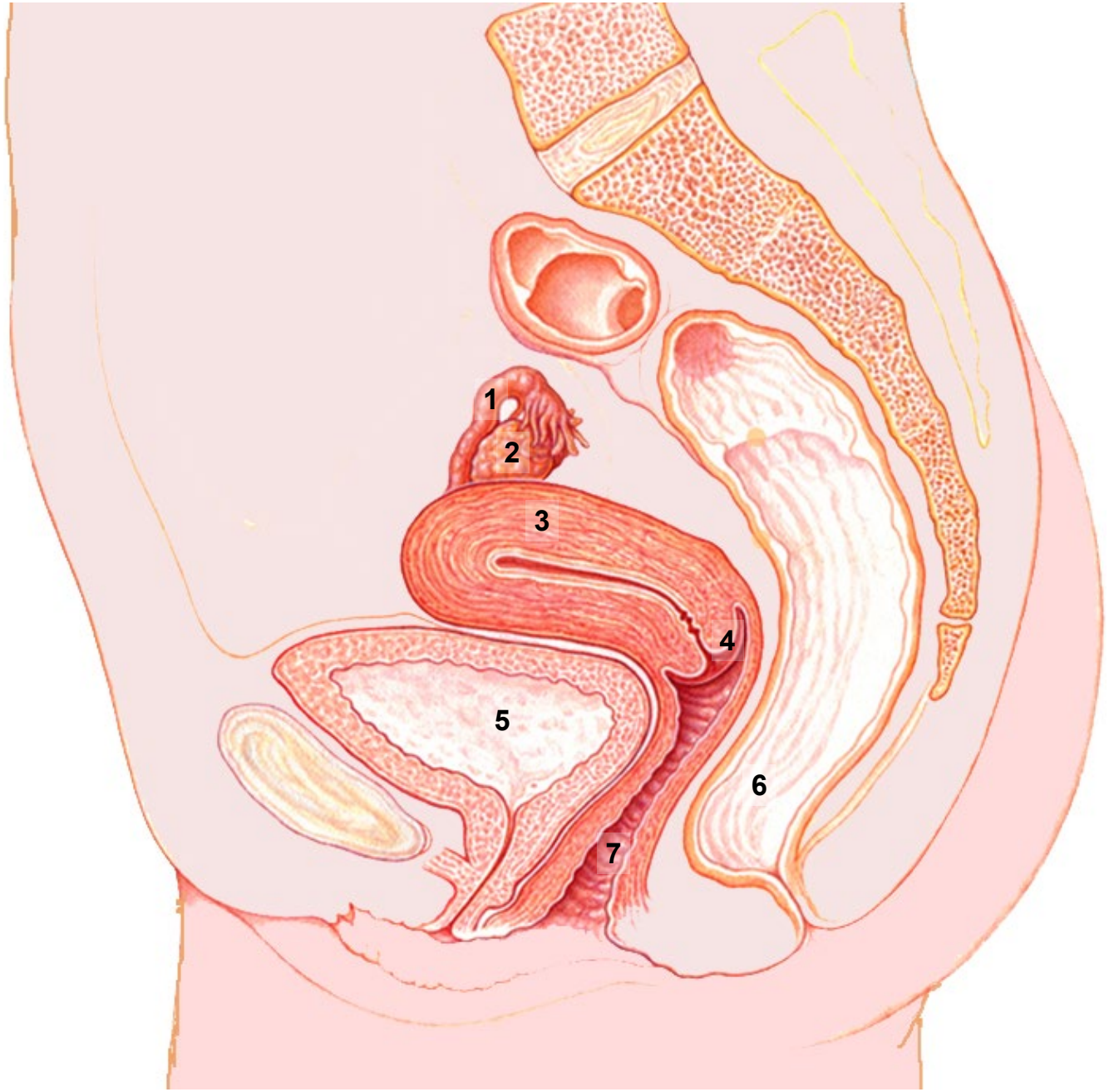


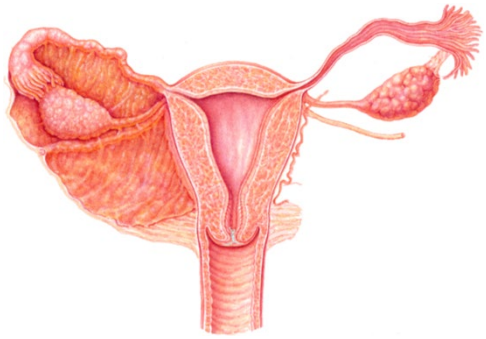
To be added

Procurement

Cervix & Vagina

Anatomy

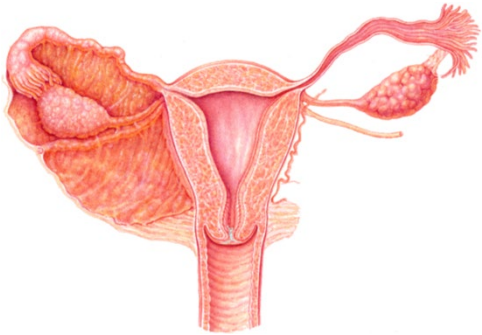


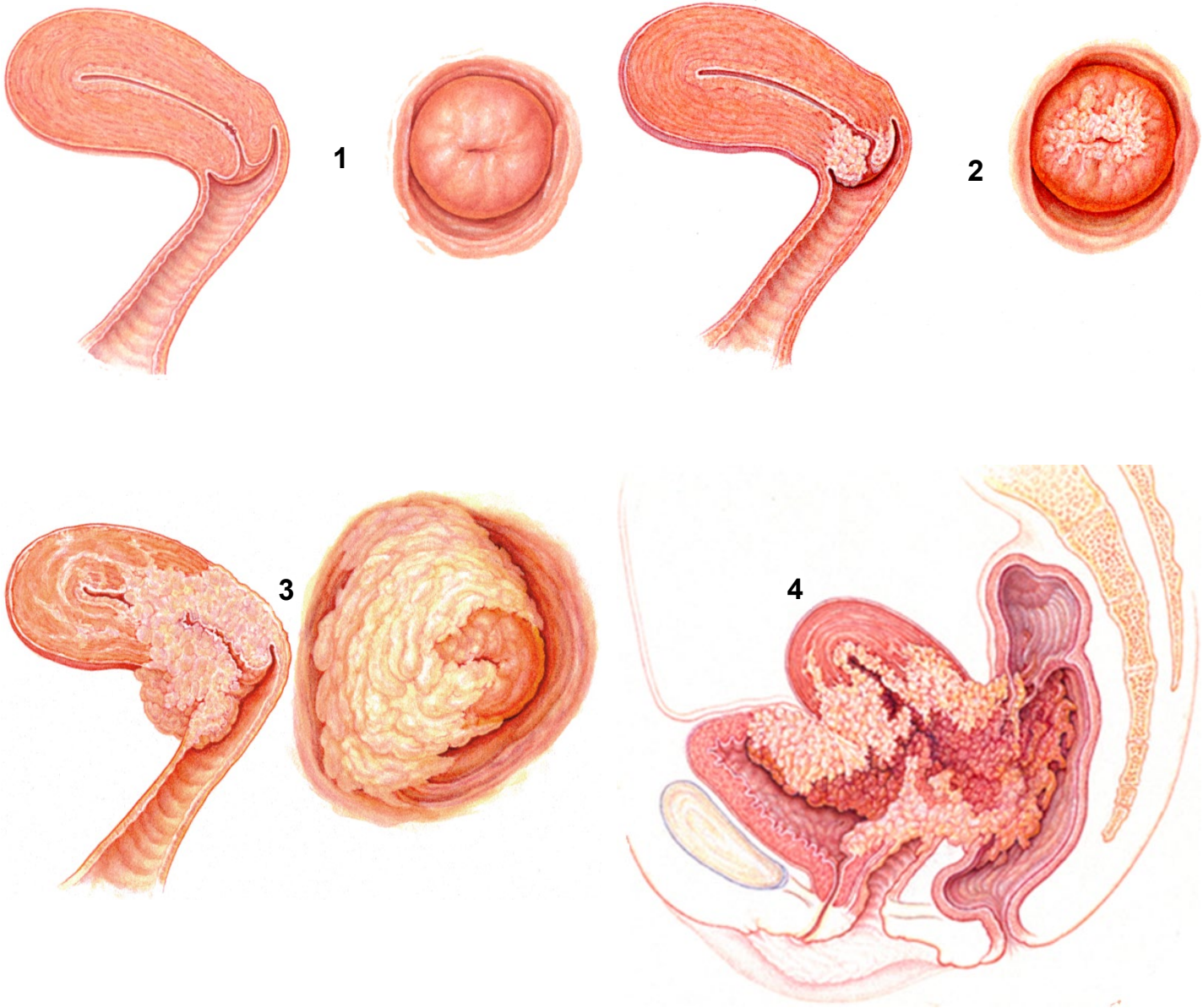


1. fallopian tube
2. ovary
3. uterus
4. cervix
5. bladder
6. rectum
7. vagina

Cervix & Vagina

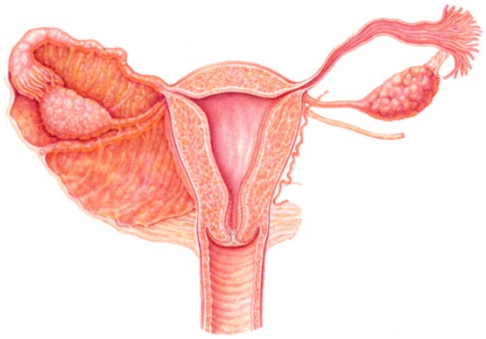
Tumors





1. cervical carcinoma tumors, stage 1
2. cervical carcinoma tumors, stage 2
3. cervical carcinoma tumors, stage 3
4. cervical carcinoma tumors, stage 4

Cervix & Vagina



Procedures

More likely to support procurement:

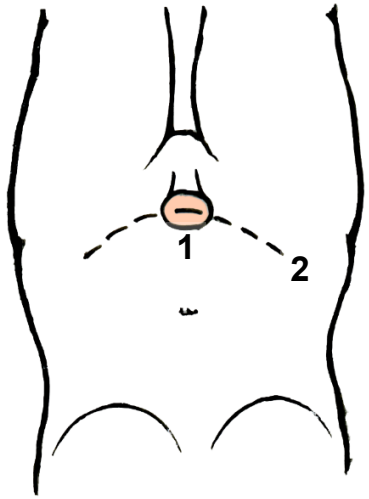
- conization - cone-shaped piece of tissue is removed from the cervix using a surgical or laser knife (cold knife cone biopsy) or using a thin wire heated by electricity (the loop electrosurgical, LEEP or LEETZ procedure).
- loop electrosurgical excision procedure (LEEP) - a small electrical wire loop is used to remove abnormal cells from your cervix.
- hysterectomy - surgery to remove the uterus and, sometimes, the cervix. When the uterus and the cervix are removed, it is called a total hysterectomy. When only the uterus is removed, it is called a partial hysterectomy.
- radical hysterectomy - surgery to remove the uterus, cervix, and part of the vagina. The ovaries, fallopian tubes, and nearby lymph nodes may also be removed.
- trachelectomy - surgical removal of the uterine cervix.
- radical trachelectomy - surgical removal of the uterine cervix, the upper part of the vagina and surrounding supporting tissues. As part of the surgery, lymph nodes in the pelvis are often removed to check whether cancer has spread beyond the cervix. A radical trachelectomy is also called a radical cervicectomy.
- pelvic exenteration (pelvic evisceration) - radical surgical treatment that removes all organs from a person's pelvic cavity including urinary bladder, urethra, rectum, and anus.
- vaginectomy - surgery to remove all or part of the vagina.

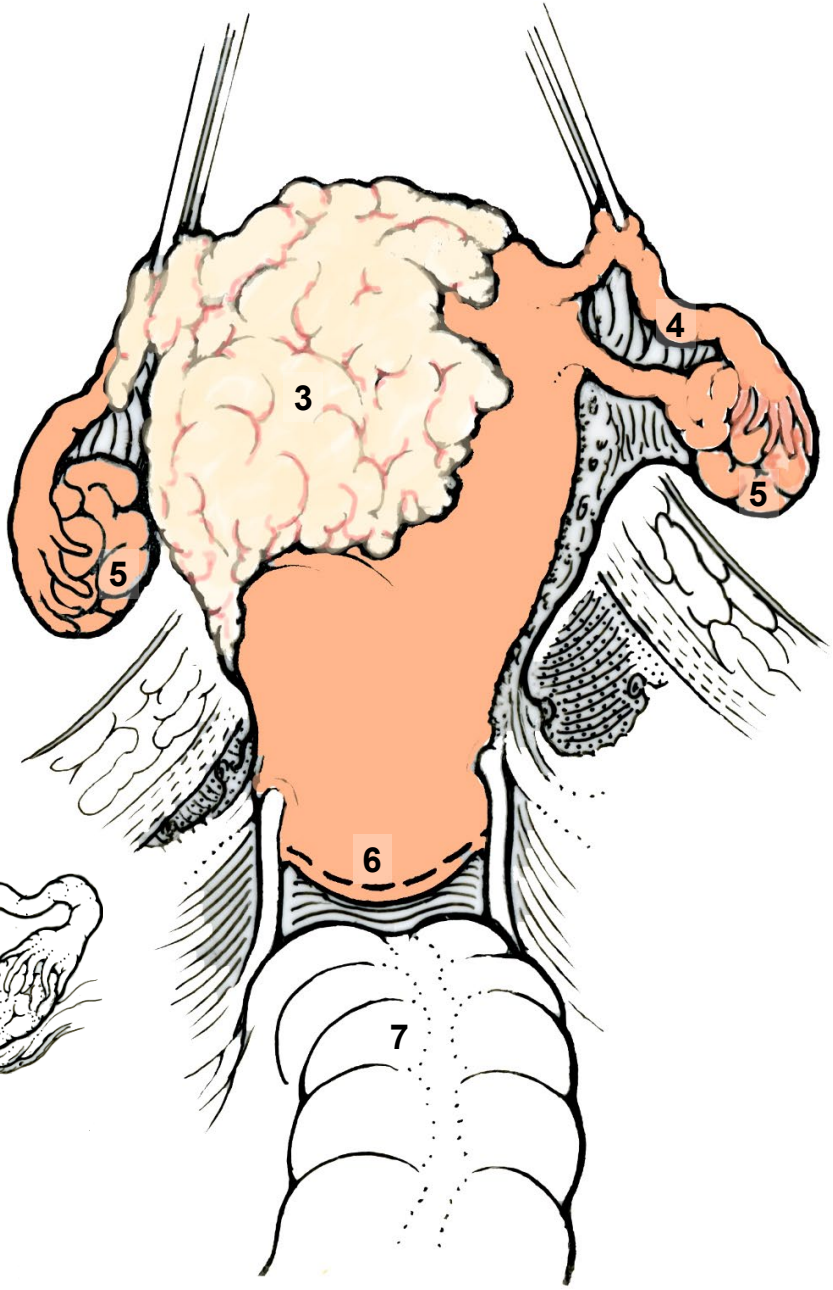
Less likely to support procurement:

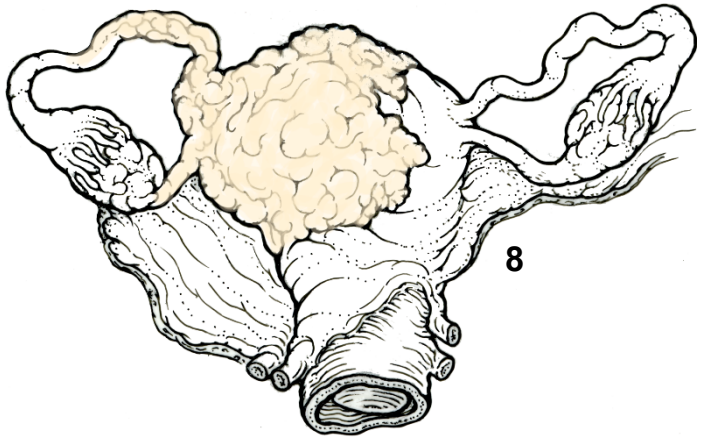
- cryosurgery - surgery using the local application of intense cold to destroy unwanted tissue.
- laser surgery (or laser ablation) - using a focused laser beam to create heat to remove abnormal cells.
- labiaplasty - plastic surgery on the labia that can be performed alone or with vaginoplasty.
- vaginoplasty - procedure to tighten a vagina that's become slack or loose.

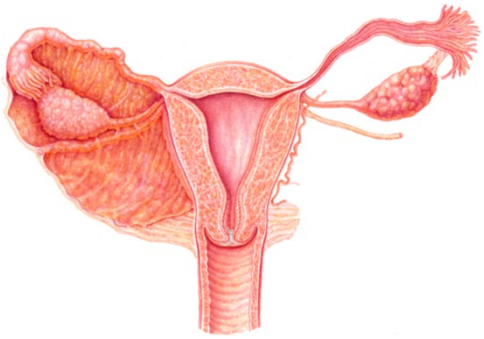
Cervex & Vagina

Procedure





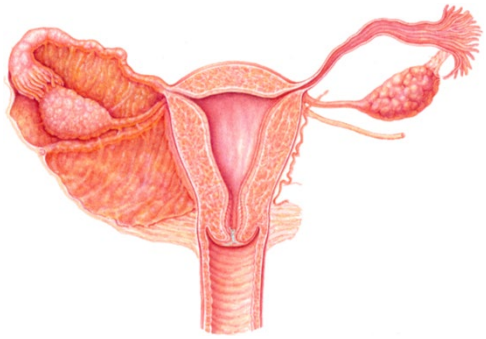




Radical hysterectomy

1. uterus
2. incisions
3. uterine tumor
4. uterine tube
5. ovary
6. incision at cervix
7. rectum
8. resected specimen: uterus, cervix, and part of the vagina. The ovaries, fallopian tubes, and nearby lymph nodes are shown as removed here but are not always resected.

Cervix & Vagina

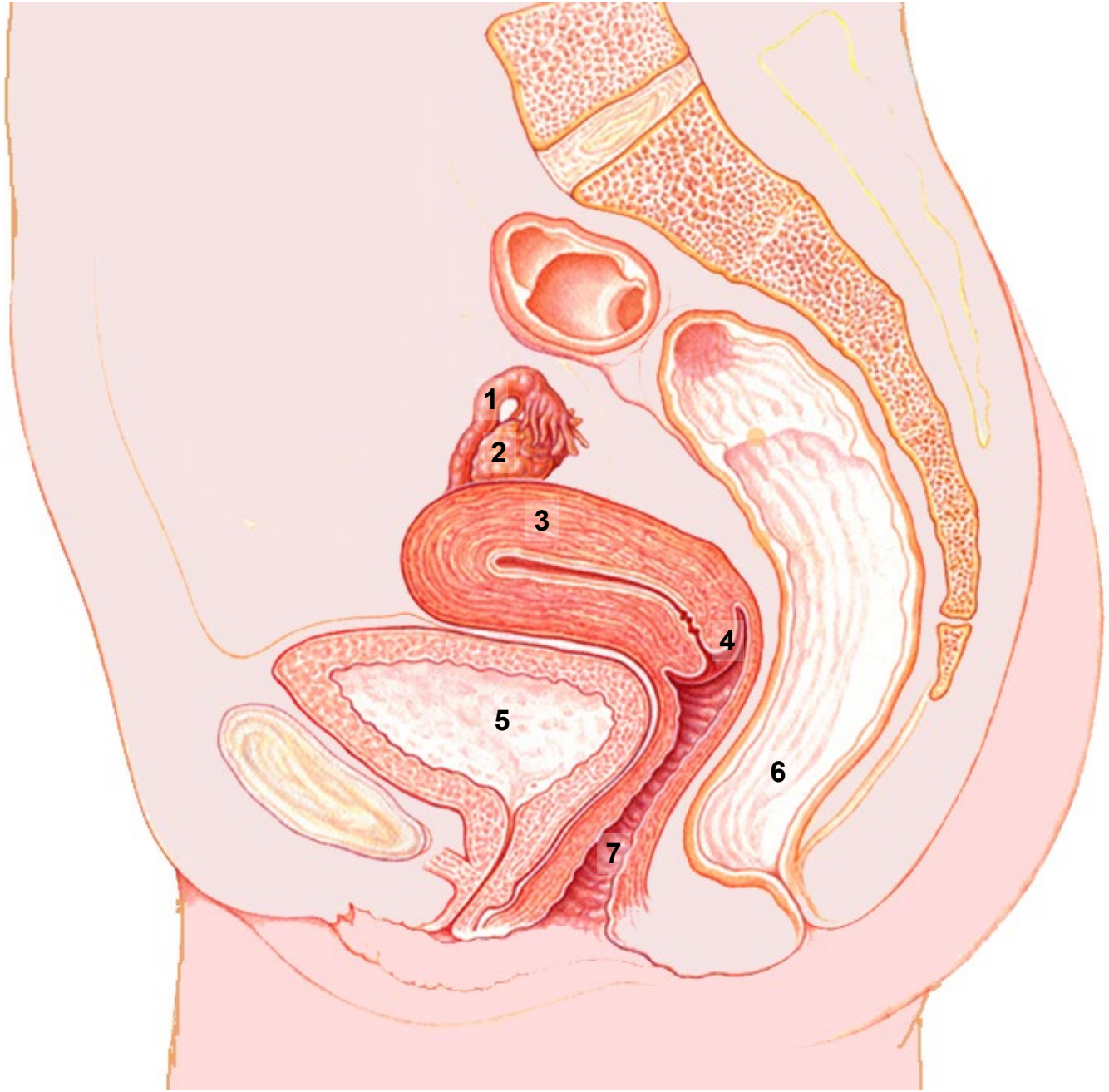


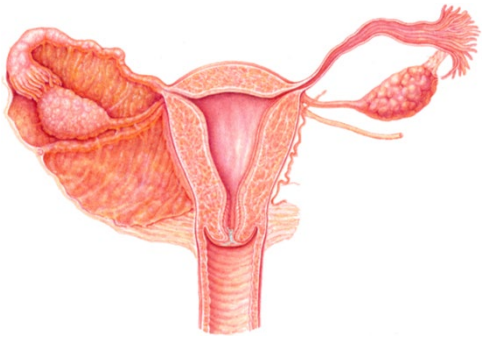
To be added

Procurement

Uterus

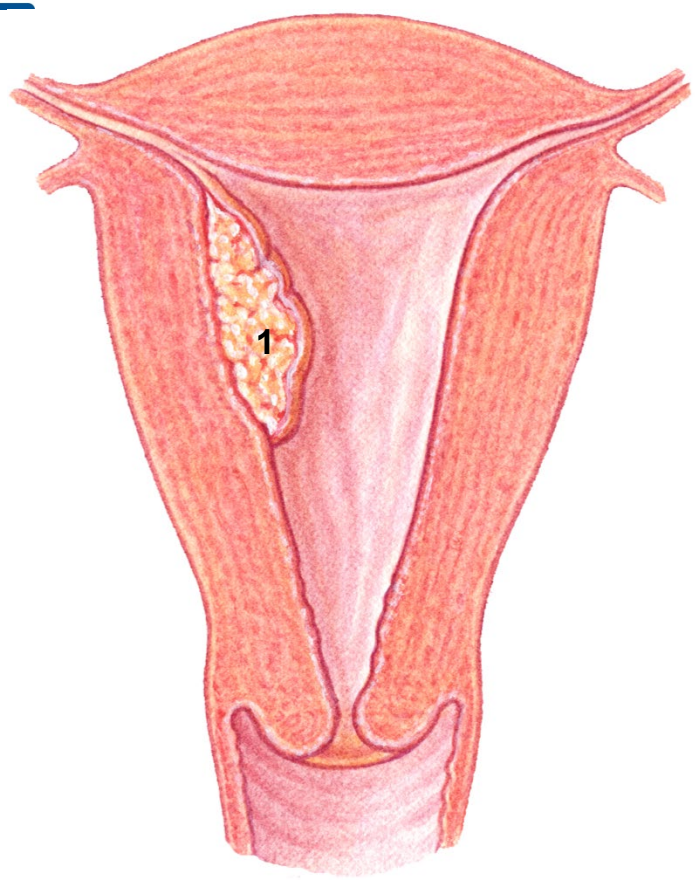
Anatomy

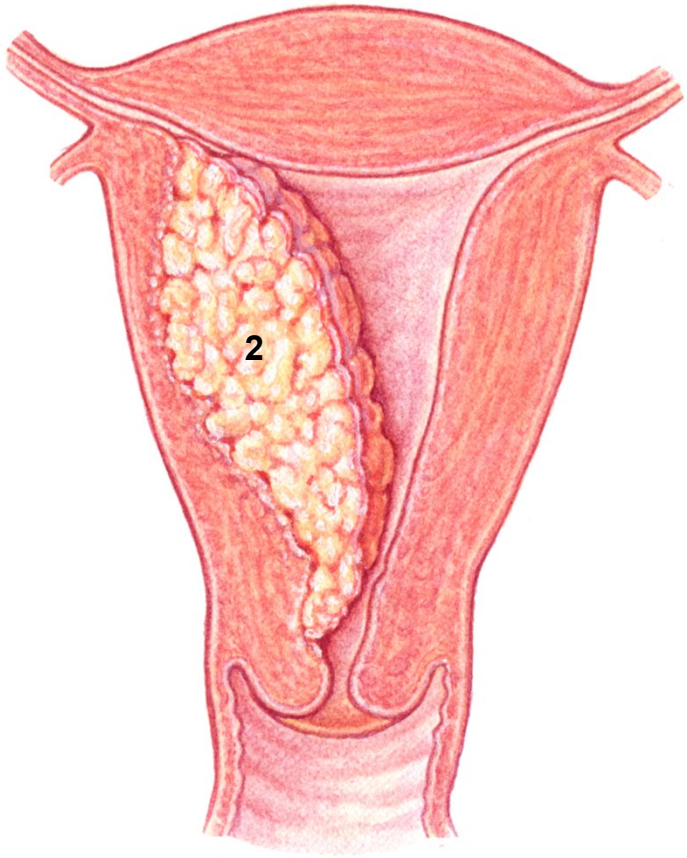


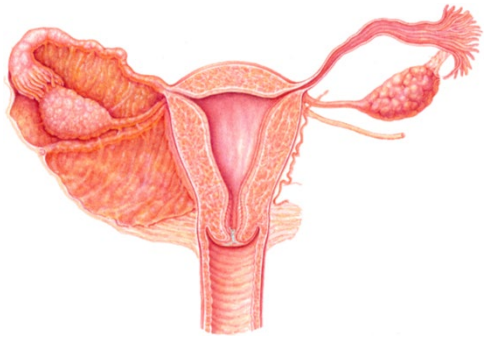


1. fallopian tube
2. ovary
3. uterus
4. cervix
5. bladder
6. rectum
7. vagina

Uterus



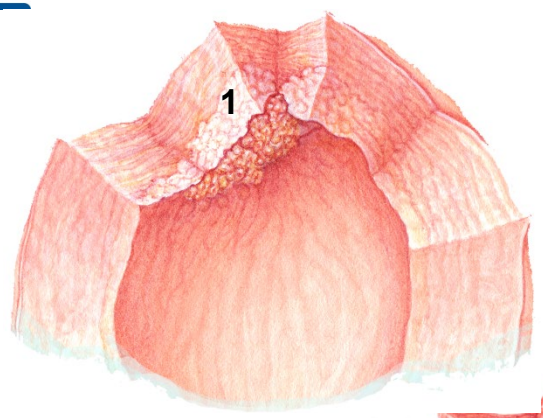


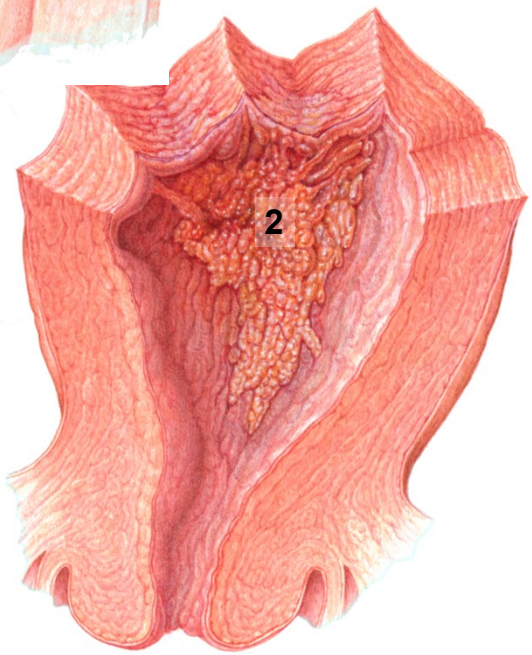


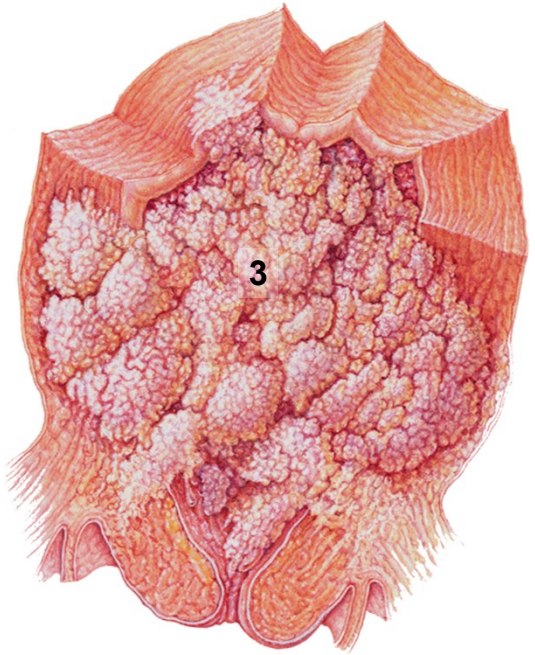
1. early stage adenocarcinoma
2. late stage adenocarcinoma

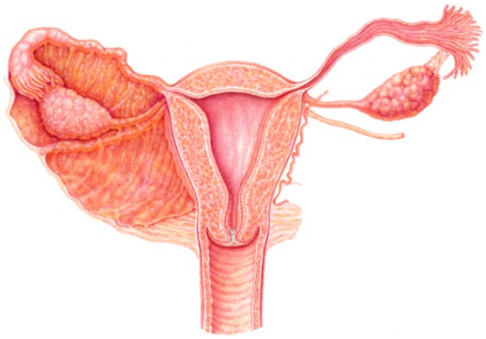
Tumors

Uterus





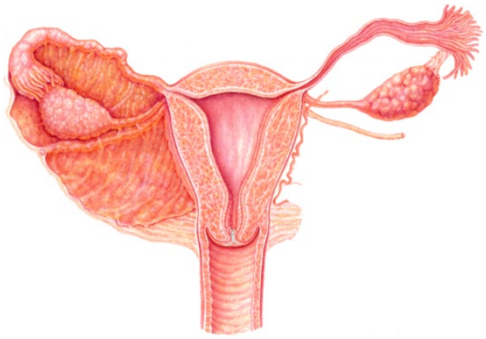




1. adenocarcinoma; early, stage
2. adenocarcinoma; mid stage
3. adenocarcinoma; late stage with infiltrative adenocarcinoma

Tumors

Uterus



Procedures

More likely to support procurement:

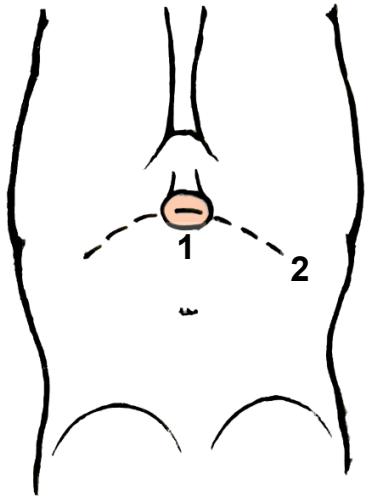
- myomectomy - surgical procedure to remove fibroids from the wall of the uterus.
- hysterectomy - surgery to remove the uterus and, sometimes, the cervix. When the uterus and the cervix are removed, it is called a total hysterectomy. When only the uterus is removed, it is called a partial hysterectomy.
- radical hysterectomy - surgery to remove the uterus, cervix, and part of the vagina. The ovaries, fallopian tubes, and nearby lymph nodes may also be removed.

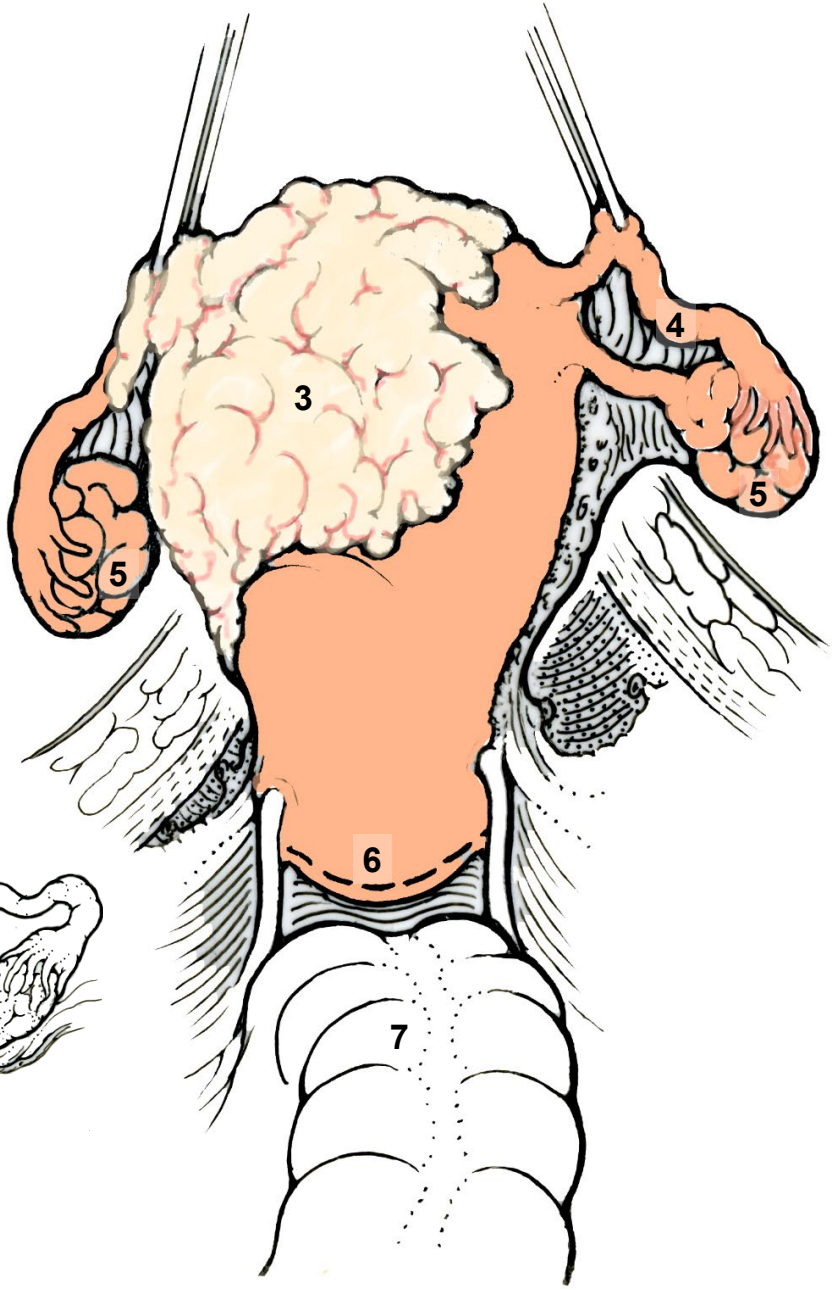
Less likely to support procurement:

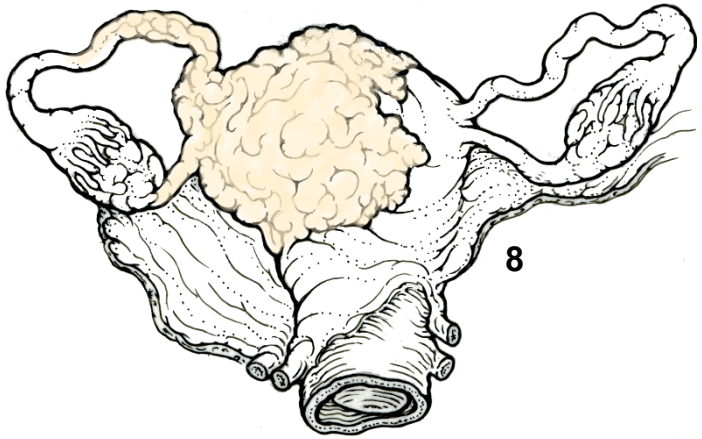
- none

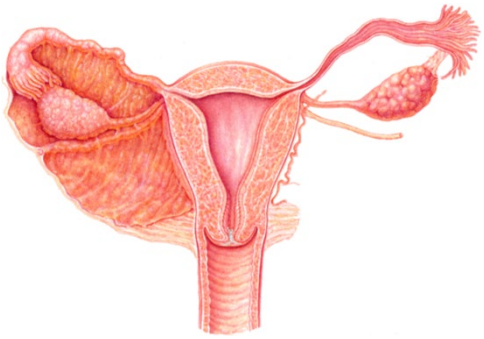
Uterus

Procedure





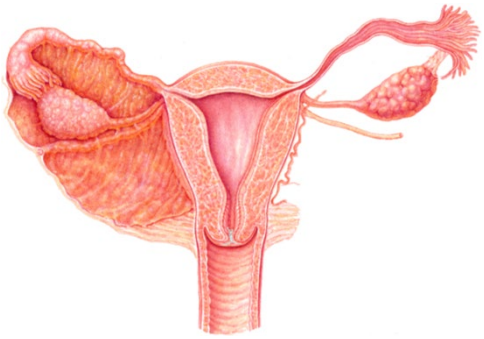




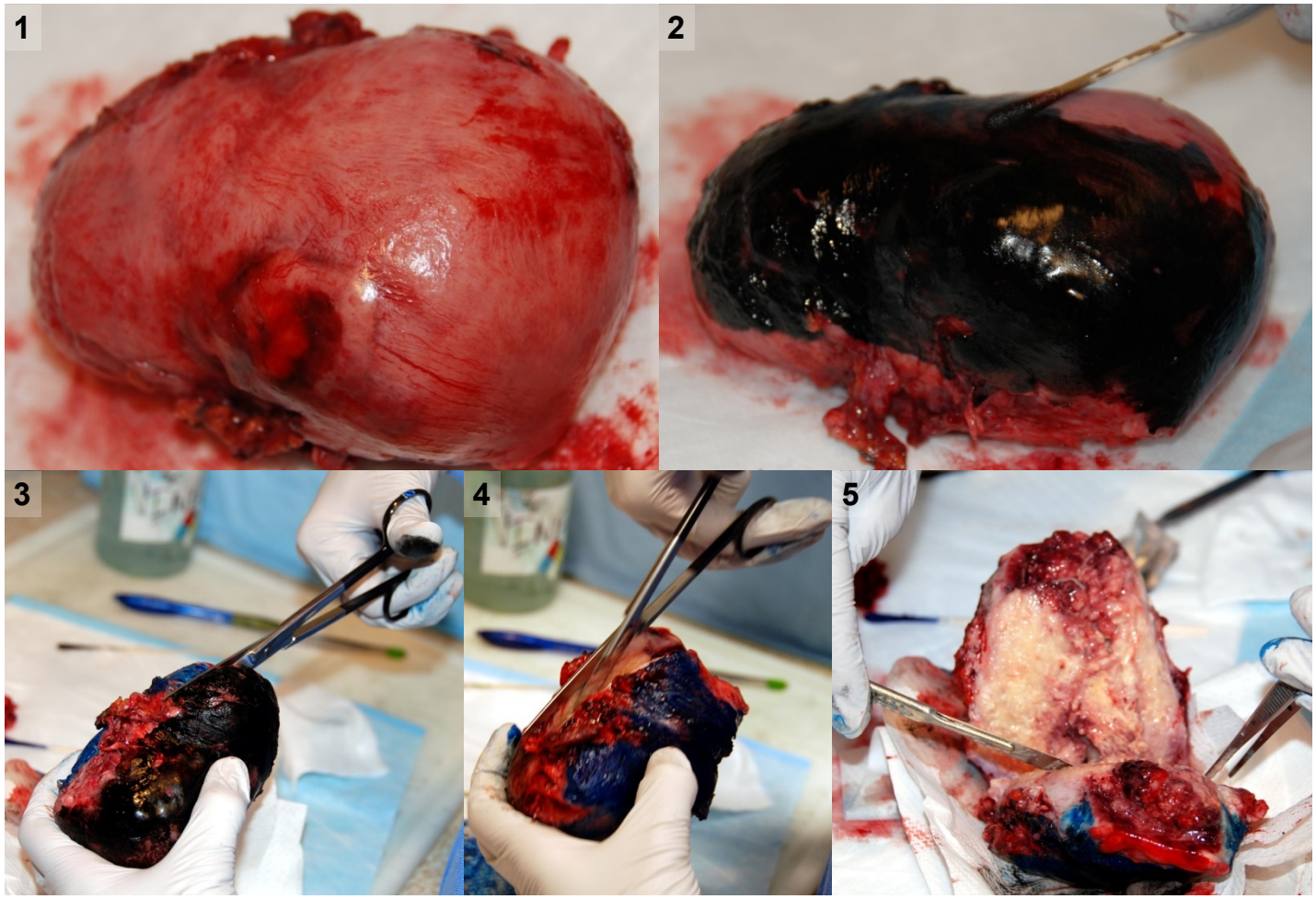
Radical hysterectomy

1. uterus
2. incisions
3. uterine tumor
4. uterine tube
5. ovary
6. incision at cervix
7. rectum
8. resected specimen: uterus, cervix, and part of the vagina. The ovaries, fallopian tubes, and nearby lymph nodes are shown as removed here but are not always resected.

Uterus



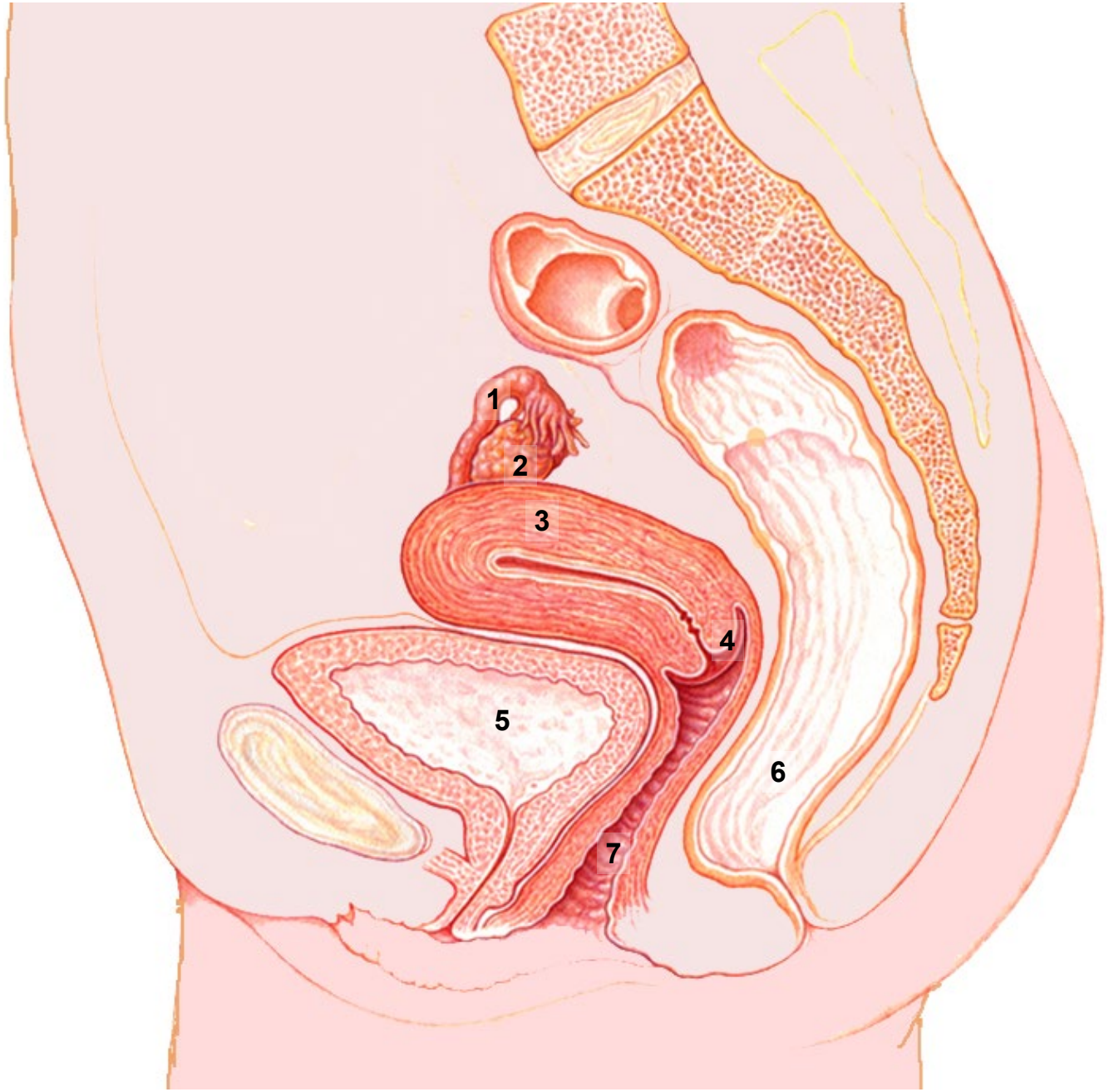
Procurement

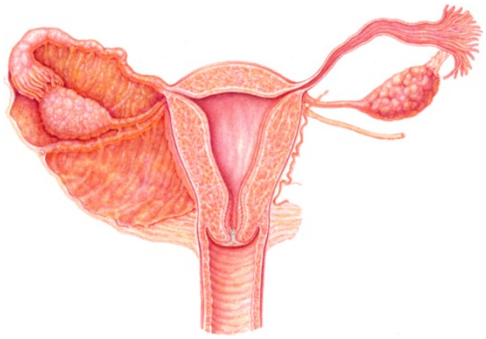


1. uterus before inking
2. inking uterus posterior
3. placing scissors in cervical os to cut along lateral aspect
4. completing lateral cut
5. opening cervical os

Fallopian Tube

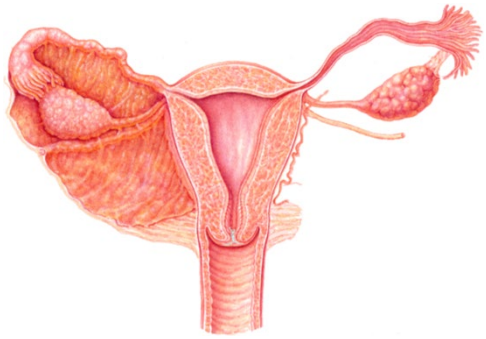
Anatomy





1. fallopian tube
2. ovary
3. uterus
4. cervix
5. bladder
6. rectum
7. vagina

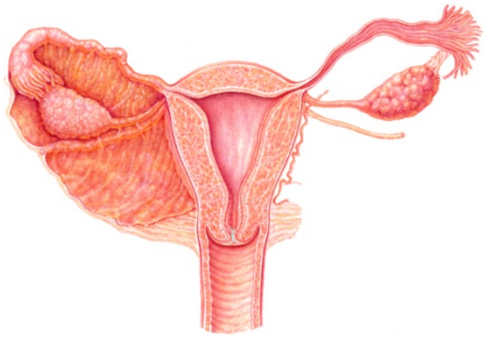
Fallopian Tube



Tumors

1. rare primary epithelial ovarian carcinoma (OC)

Fallopian Tube



Procedures

More likely to support procurement:

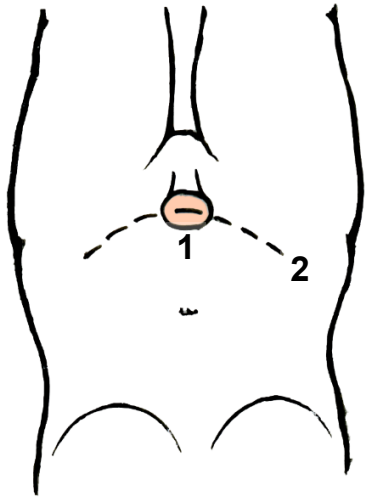
- radical hysterectomy - surgery to remove the uterus, cervix, and part of the vagina. The ovaries, fallopian tubes, and nearby lymph nodes may also be removed.
- salpingectomy - surgical removal of the fallopian tubes.
- bilateral salpingo-oophorectomy - surgery to remove both ovaries and both fallopian tubes.

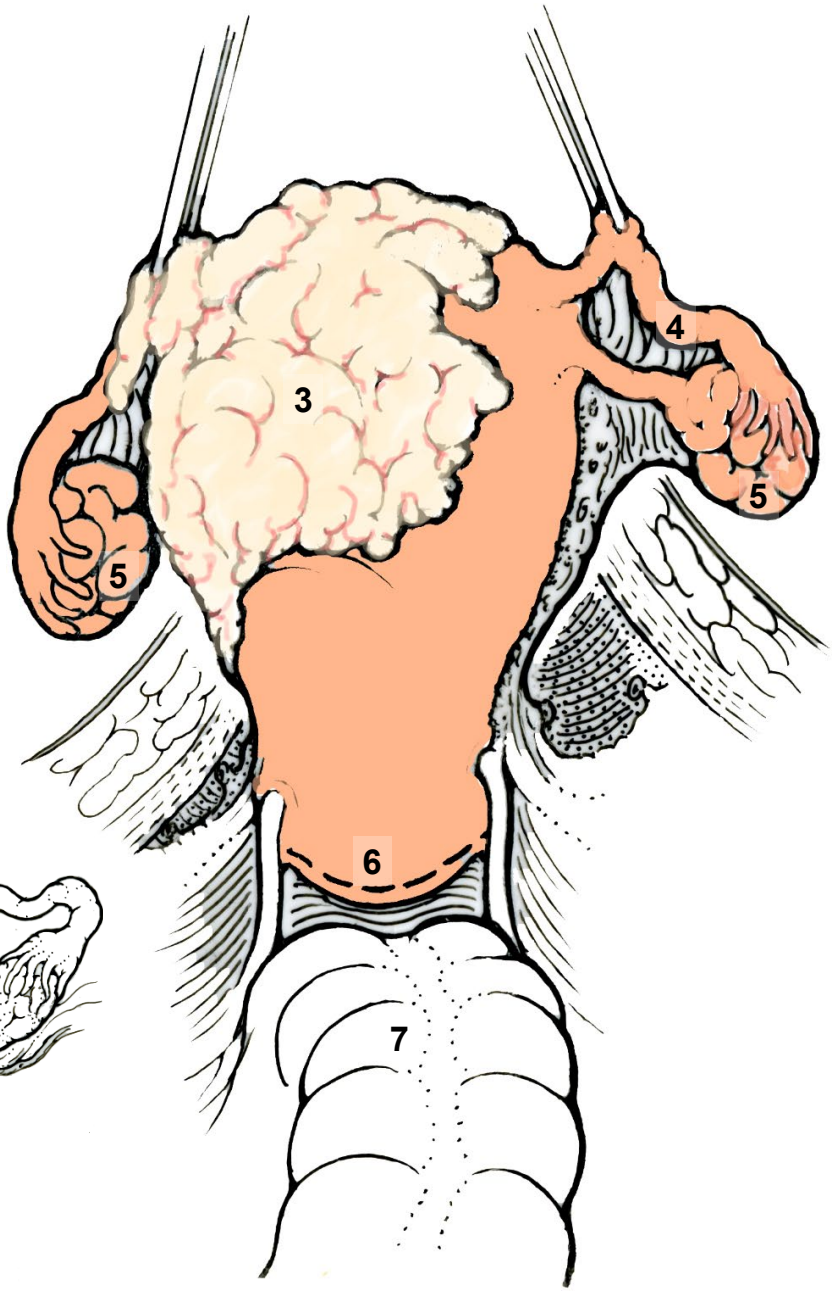
Less likely to support procurement:

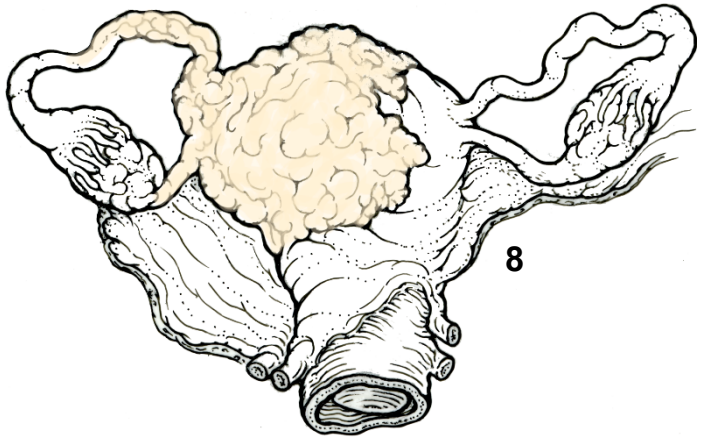
- salpingostomy - surgical unblocking of a blocked fallopian tube.

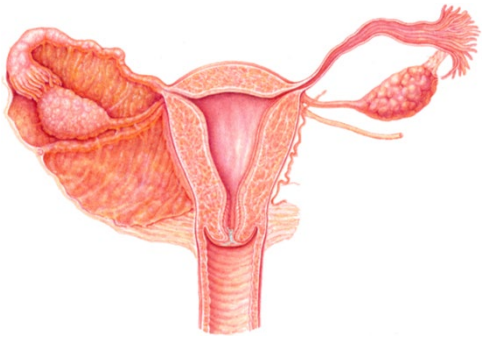
Fallopian Tube

Procedure





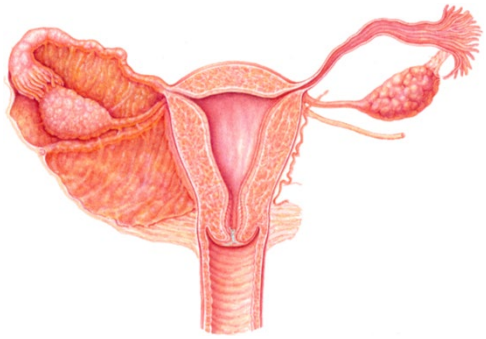




Radical hysterectomy

1. uterus
2. incisions
3. uterine tumor
4. uterine tube
5. ovary
6. incision at cervix
7. rectum
8. resected specimen: uterus, cervix, and part of the vagina. The ovaries, fallopian tubes, and nearby lymph nodes are shown as removed here but are not always resected.

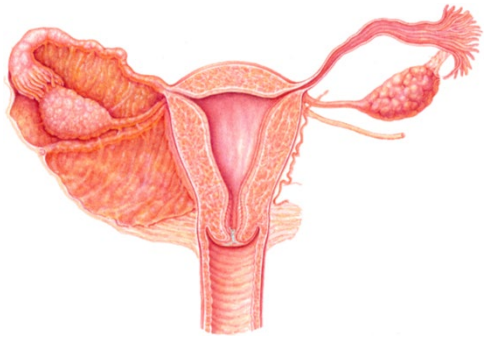
Fallopian Tube



To be added

Procurement

Female Reproductive

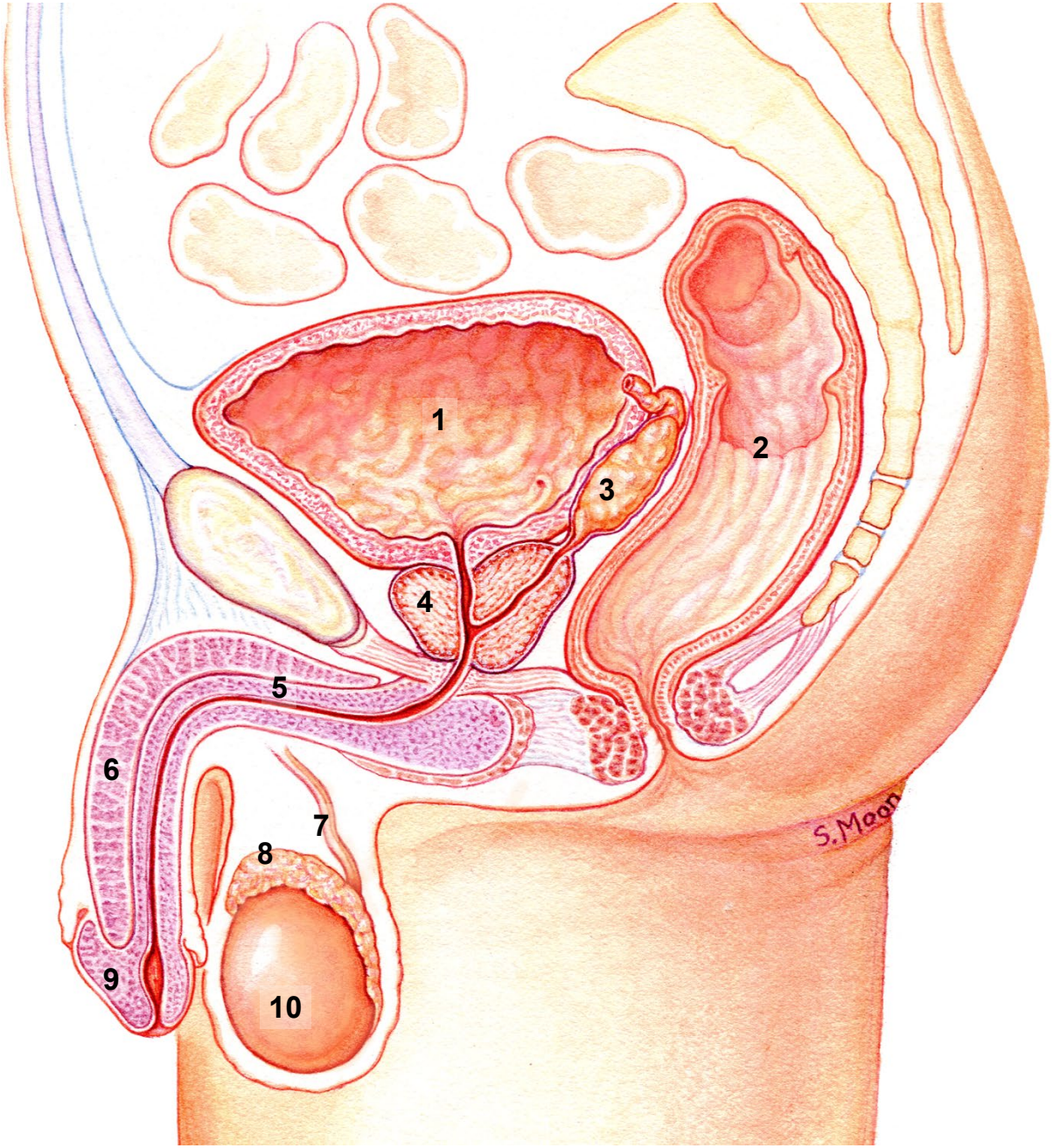


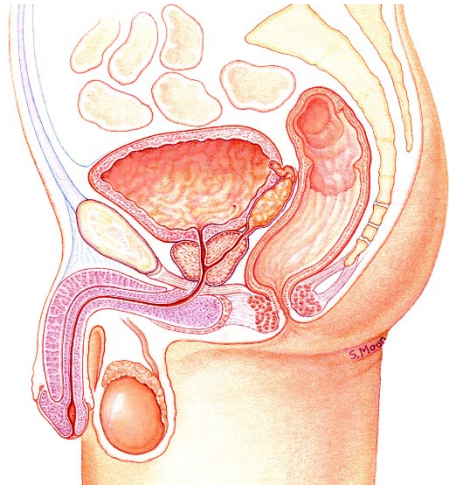
To be added

Tips

Male Reproductive

Anatomy

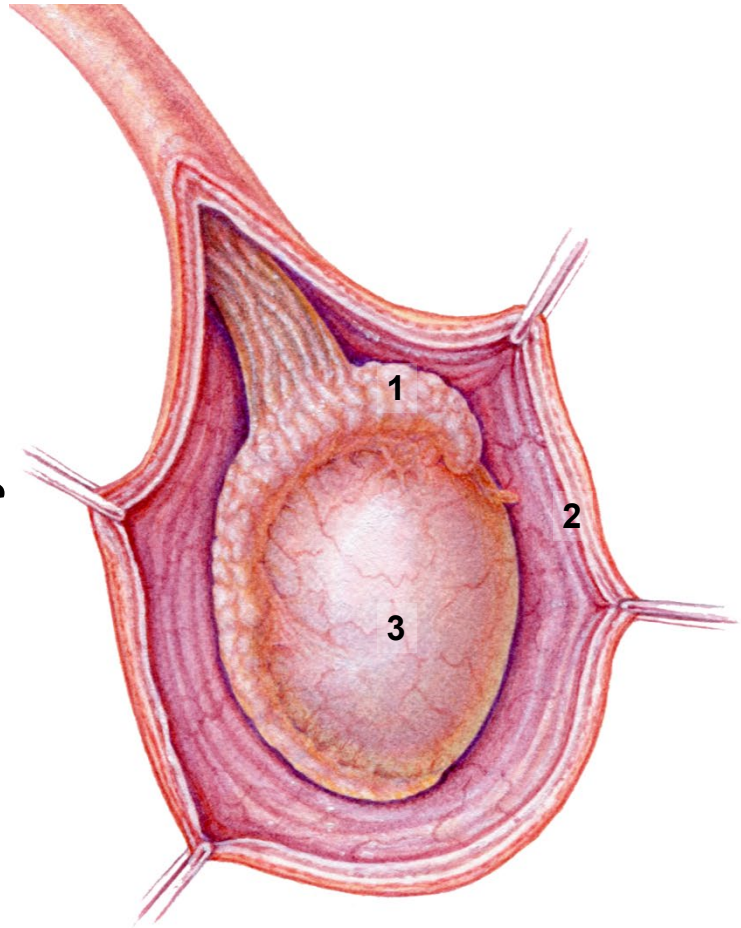


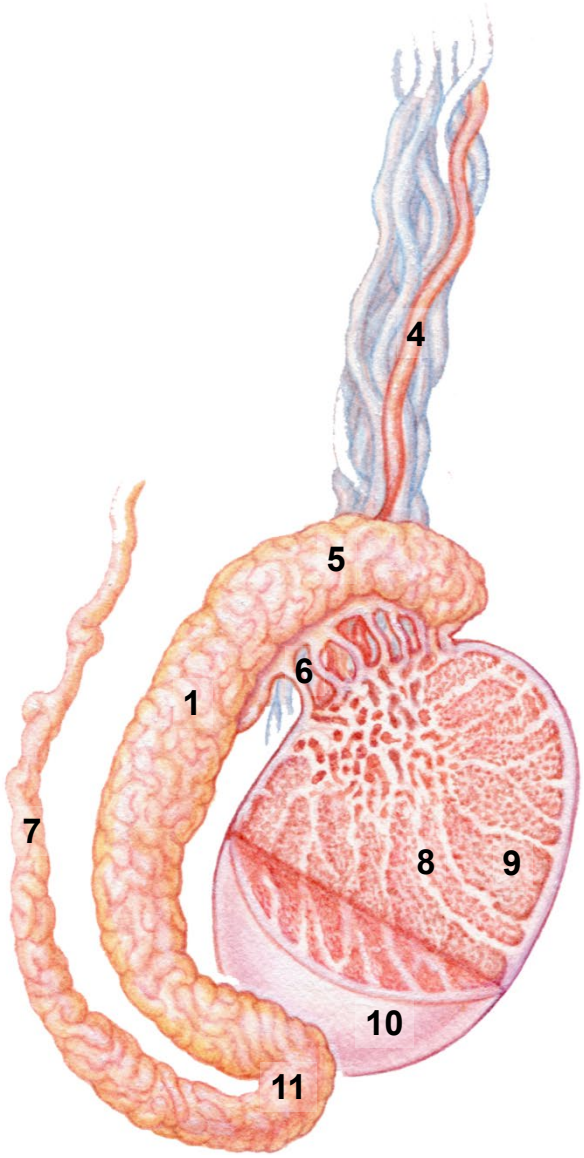


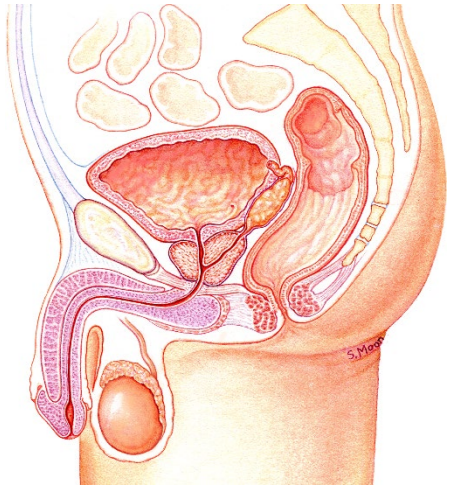
1. bladder
2. rectum
3. seminal vesicle
4. prostate
5. urethra
6. erectile tissue
7. vas deferens
8. epididymis
9. glans penis
10. testis

Penis & Testis

Anatomy



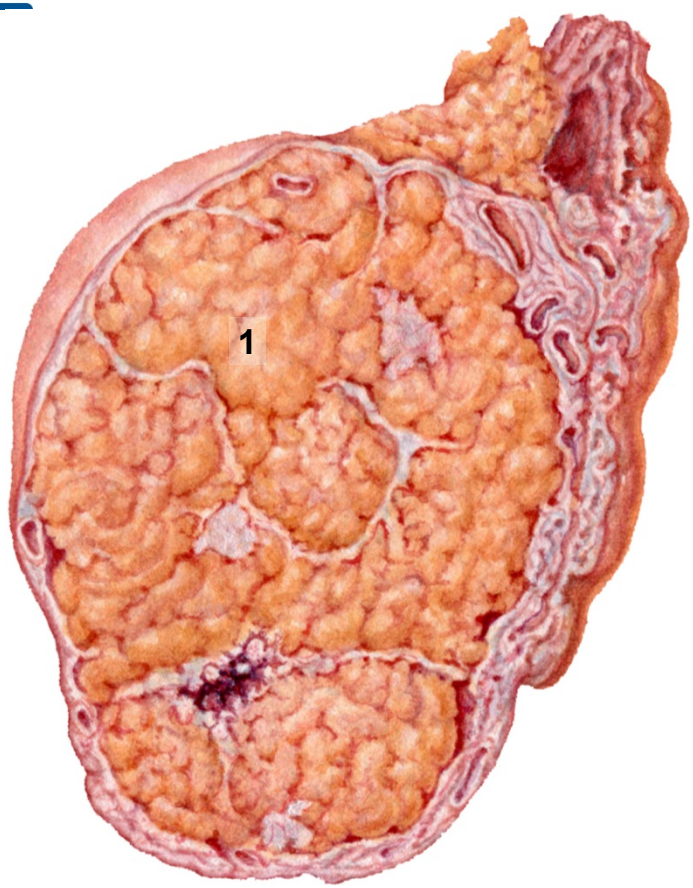


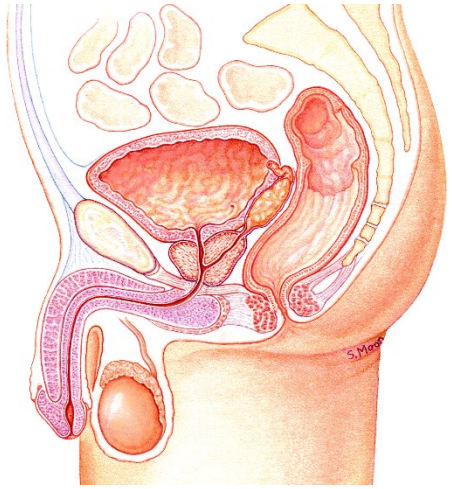


1. epididymis
2. tunica vaginalis
3. testis
4. testicular artery
5. head of epididymis
6. efferent ductules
7. ductus deferens
8. septa testis
9. seminiferous tubules
10. tunica vaginalis
11. tail of epididymis

Penis & Testis

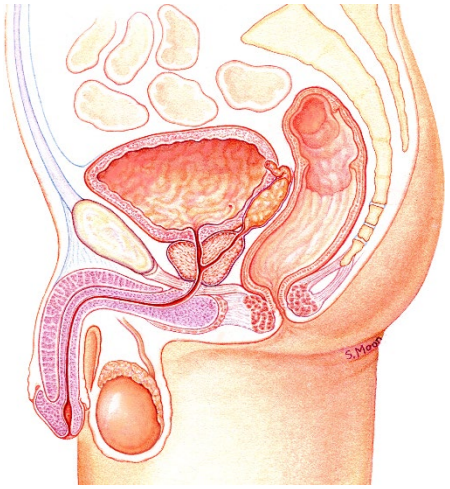
Tumors





1. seminoma – 35%
2. early carcinoma – 20%

Penis & Testis



Procedures

More likely to support procurement:

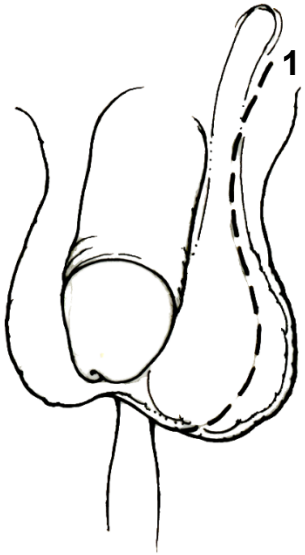
- circumcision - surgery that removes the foreskin (the loose tissue) covering the glans of the penis.
- total/partial penectomy – surgical amputation of all or part of the penis
- radical inguinal orchiectomy – surgical removal of one or both testicles. If radical, the majority of the spermatic cord will also be removed.
- orchiopexy (orchidopexy) - surgery to move an undescended testicle into the scrotum and permanently fix it there (also used for testicular torsion repair).
- retroperitoneal lymph node dissection - surgical procedure to remove abdominal lymph nodes.
- glansectomy – surgery to completely or partially remove the glans penis.
- orchiectomy – surgery to remove a testis

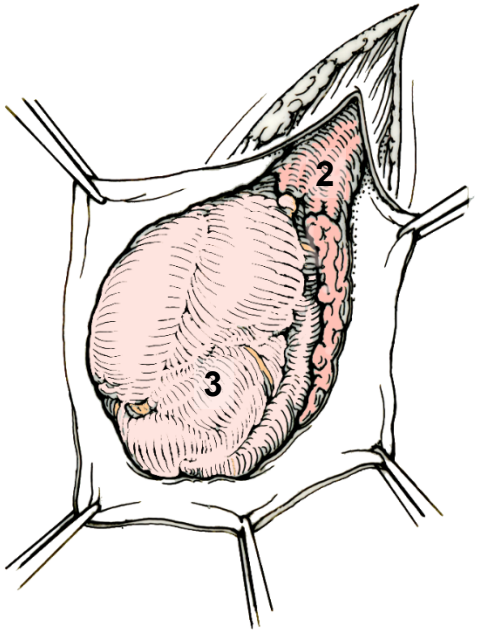
Less likely to support procurement:

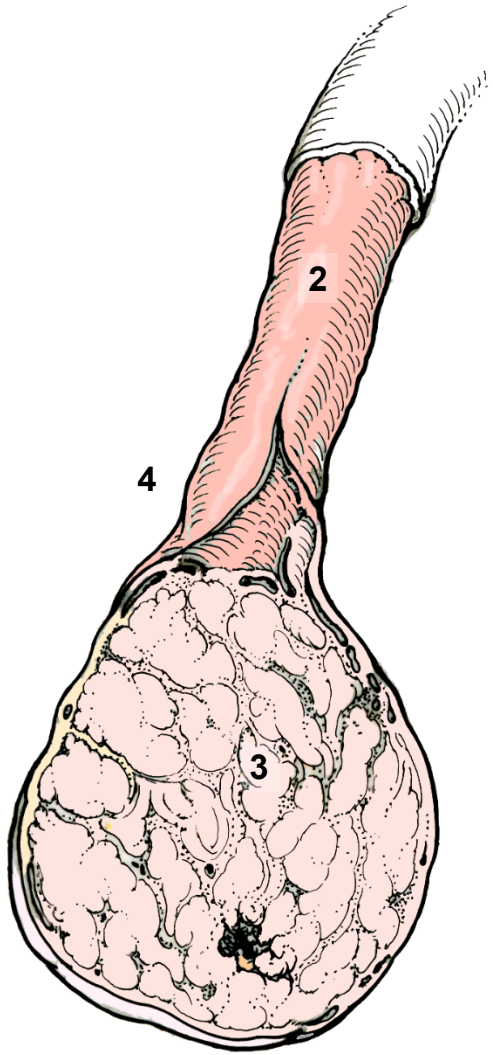
- none

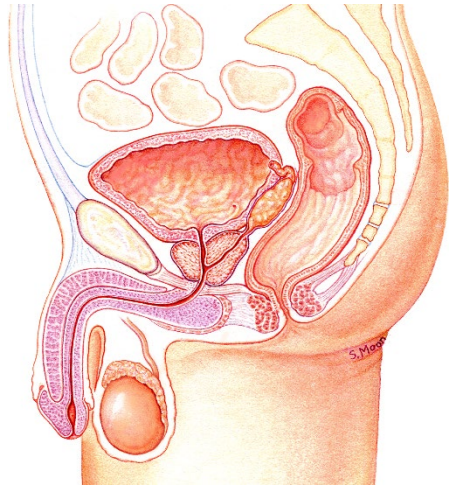
Penis & Testis

Procedures





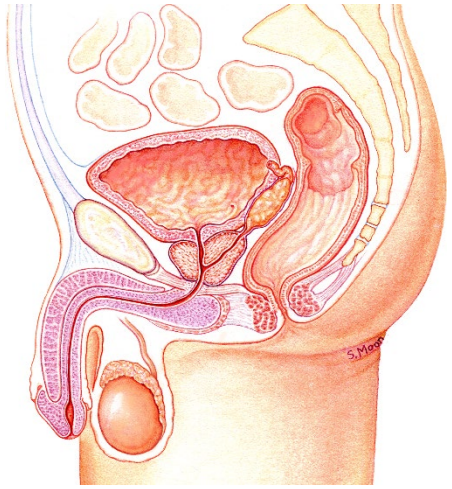




Orchectomy

1. scrotal incision
2. spermatic cord
3. tumor of testis
4. specimen

Penis & Testis

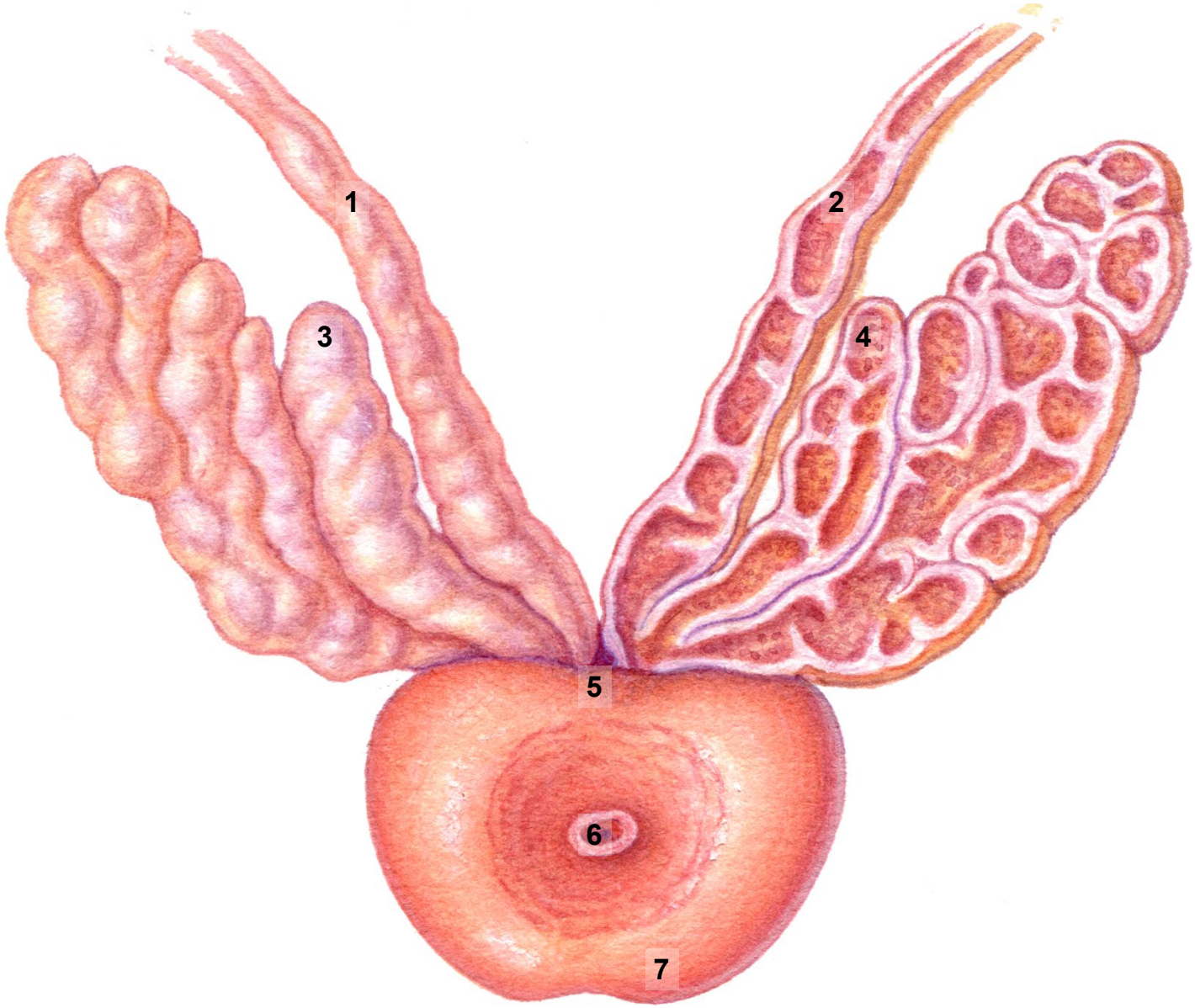


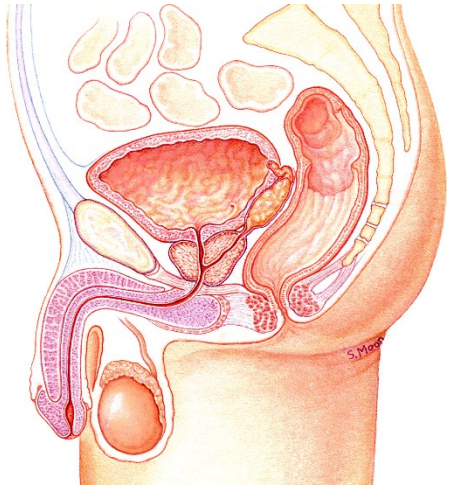
To be added

Procurement

Prostate

Anatomy

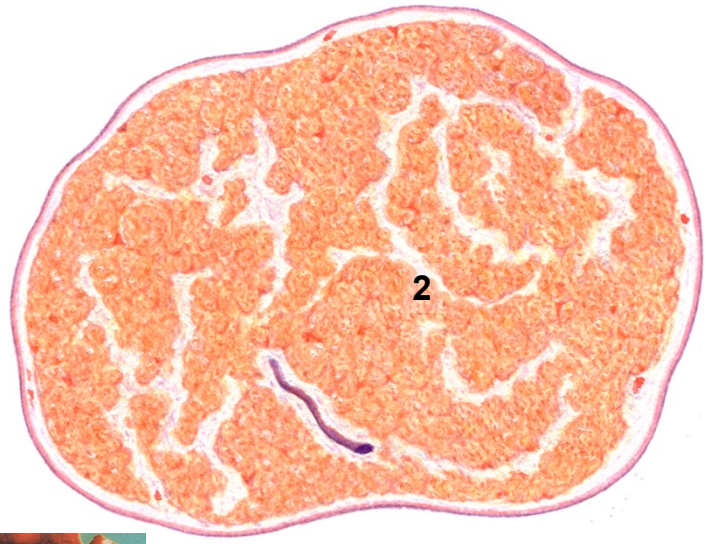


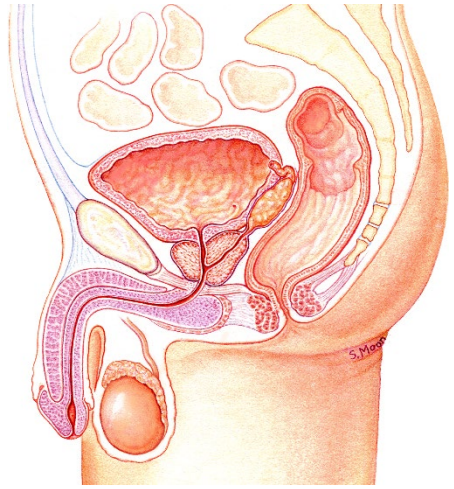


1. vas deferens (surface view)
2. vas deferens (cutaway view)
3. seminal vesicle (surface view)
4. seminal vesicle (cutaway view)
5. base of prostate
6. prostatic urethra
7. apex of prostate

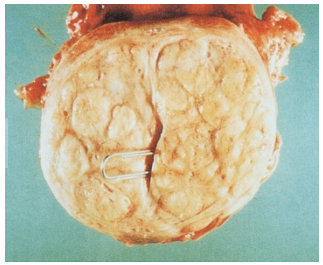
Prostate

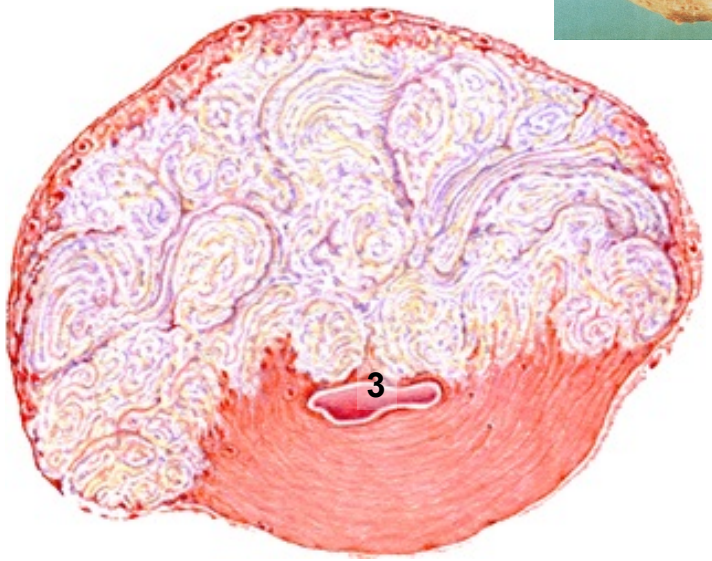
Tumors

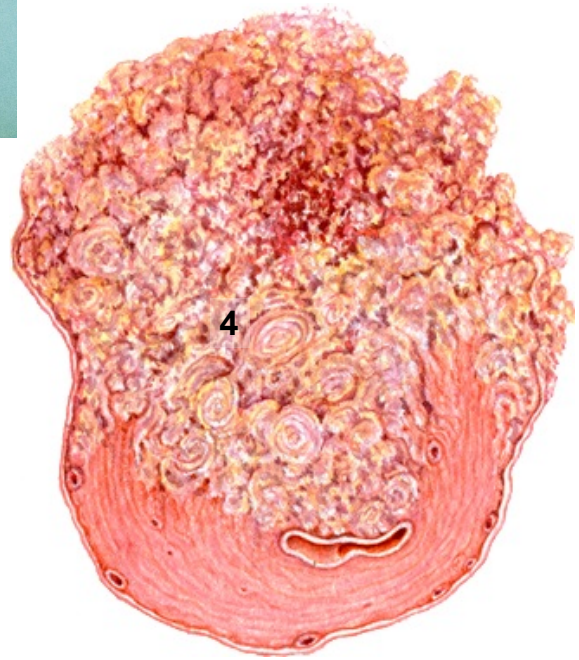




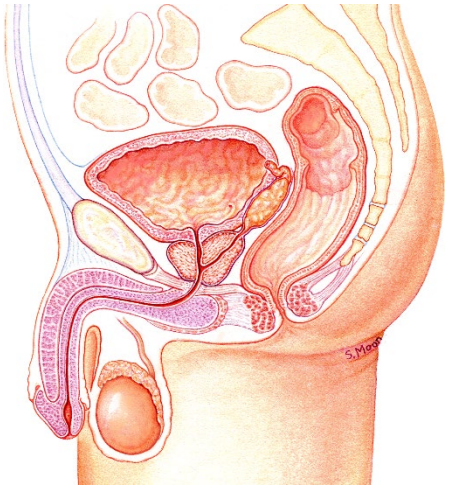
1. prostatic hyperplasia
2. nodular replacement BPH
3. prostatic carcinoma, in situ only
4. prostatic carcinoma, metastasis into bladder
5. prostatic hyperplasia







Prostate



Procedures

More likely to support procurement:

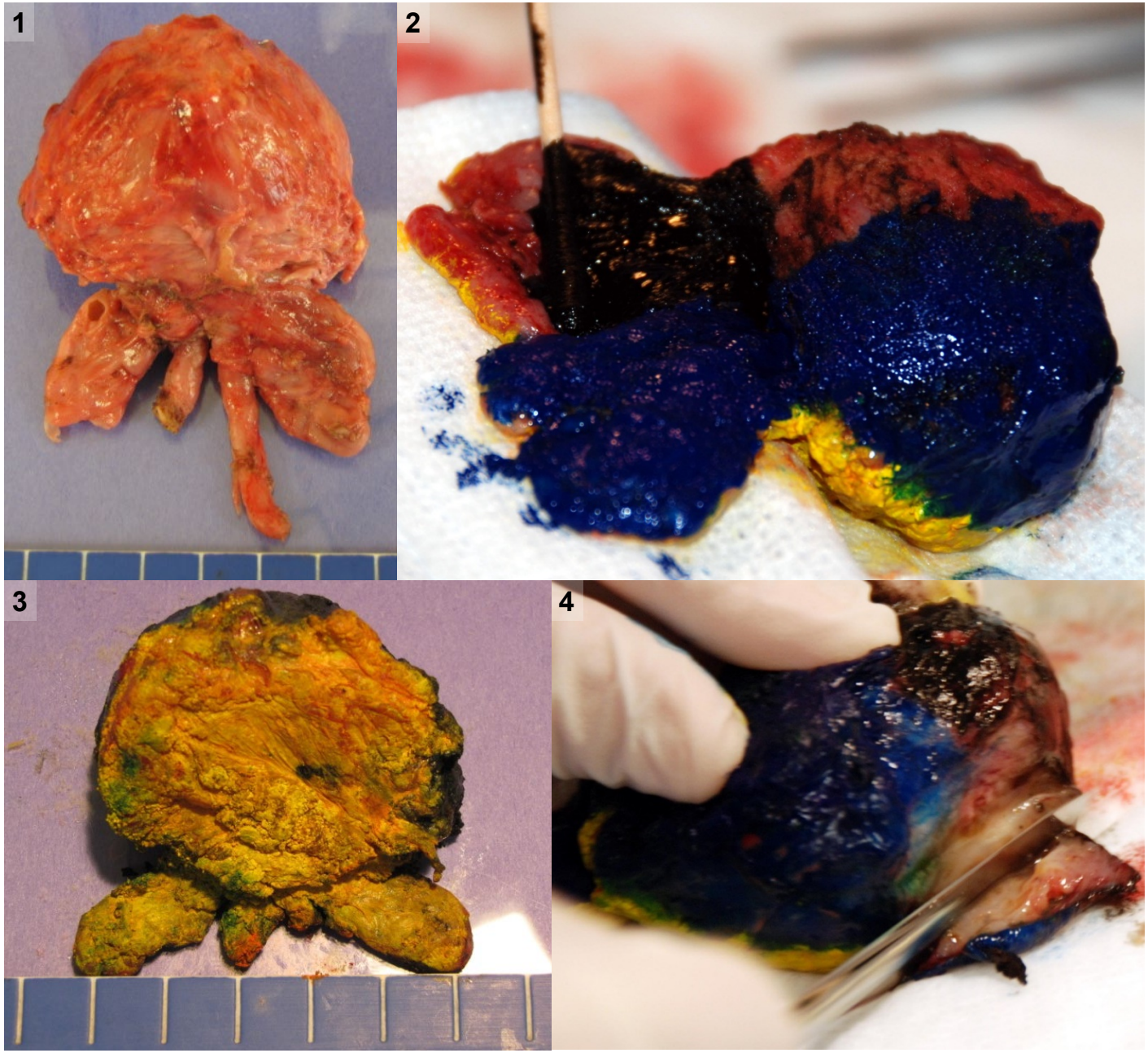
- transurethral resection of the prostate (TURP) - surgery to remove tissue from the prostate using an instrument inserted through the urethra.
- simple prostatectomy - a surgical operation to remove all or part of the prostate gland.
- holmium laser enucleation of the prostate (HoLEP) - laser is used to cut and remove the excess tissue that is blocking the urethra. Another instrument is then used to cut the prostate tissue into small pieces that are easily removed.

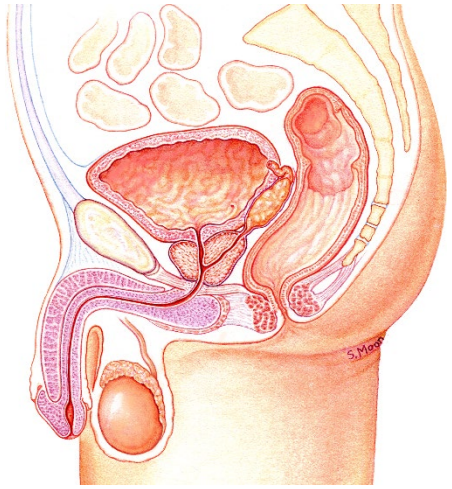
Less likely to support procurement:

- transurethral incision of the prostate (TUIP) - surgical procedure (small cuts in the prostate gland) for treating prostate gland enlargement.
- transurethral vaporization of the prostate (TVP) - uses a roller ball to heat the prostate tissue so that it is reduced to vapor.
- photoselective vaporization of the prostate (PVP) - laser is used to vaporize excess prostate tissue and enlarge the urinary channel.
- holmium laser ablation of the prostate (HoLAP) - holmium laser is used to vaporize excess prostate tissue and enlarge the urinary channel.

Prostate

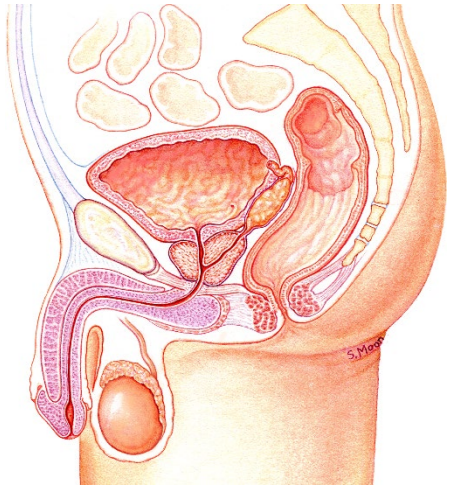
Procurement





1. uninked malignant prostate (cm scale)
2. inking left anterior malignant prostate (black) after inking right anterior (blue) and posterior (yellow)
3. seminal vesicle end of inked malignant prostate (cm scale)
4. thinly sectioning prostate

Male Reproductive

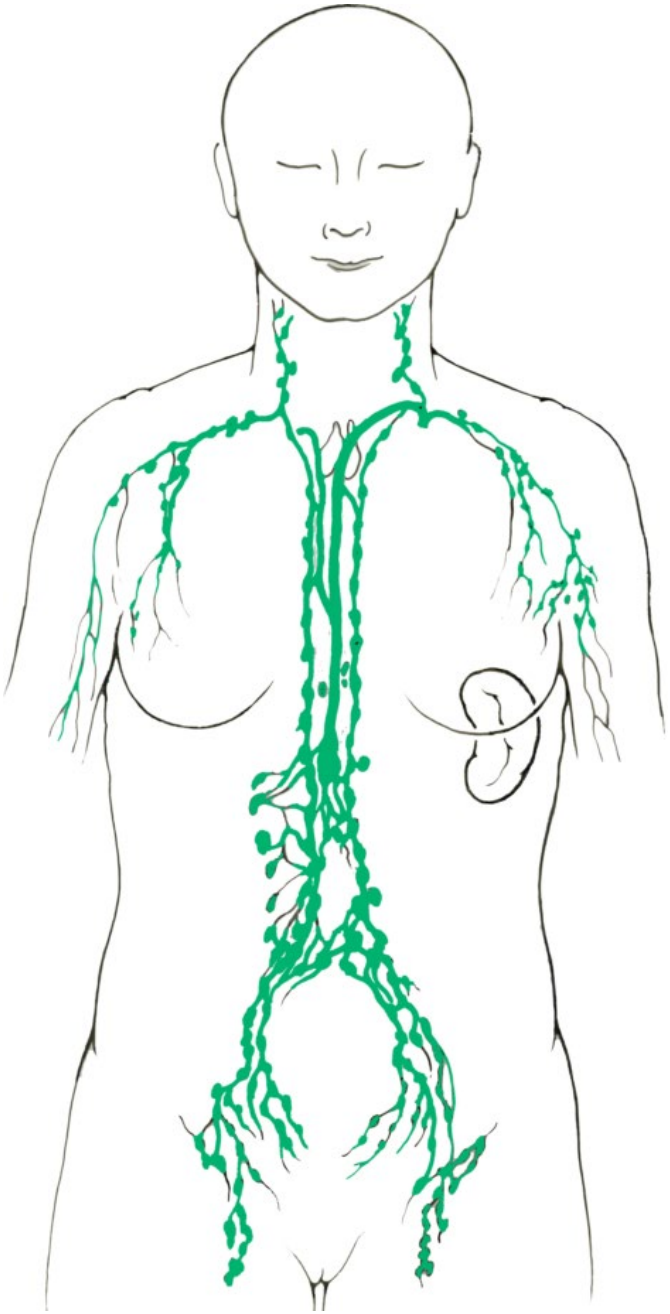


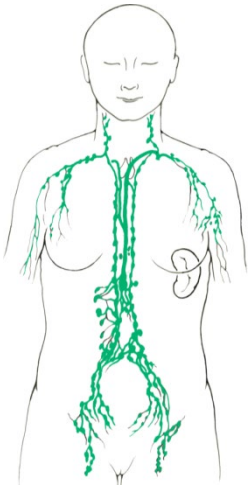
To be added

Tips

Lymphatic System

Anatomy





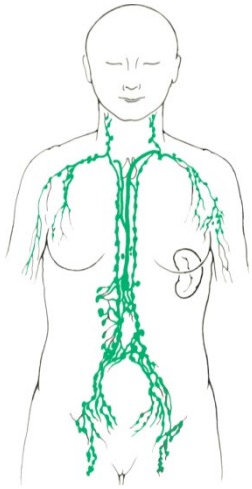
Anterior regional lymph nodes

Lymph node anatomy in other sections

- Head & Neck
- Lung
- Stomach
- Colon & Rectum
- Pancreas
- Spleen
- Female Reproductive

Lymphatic System

Anatomy



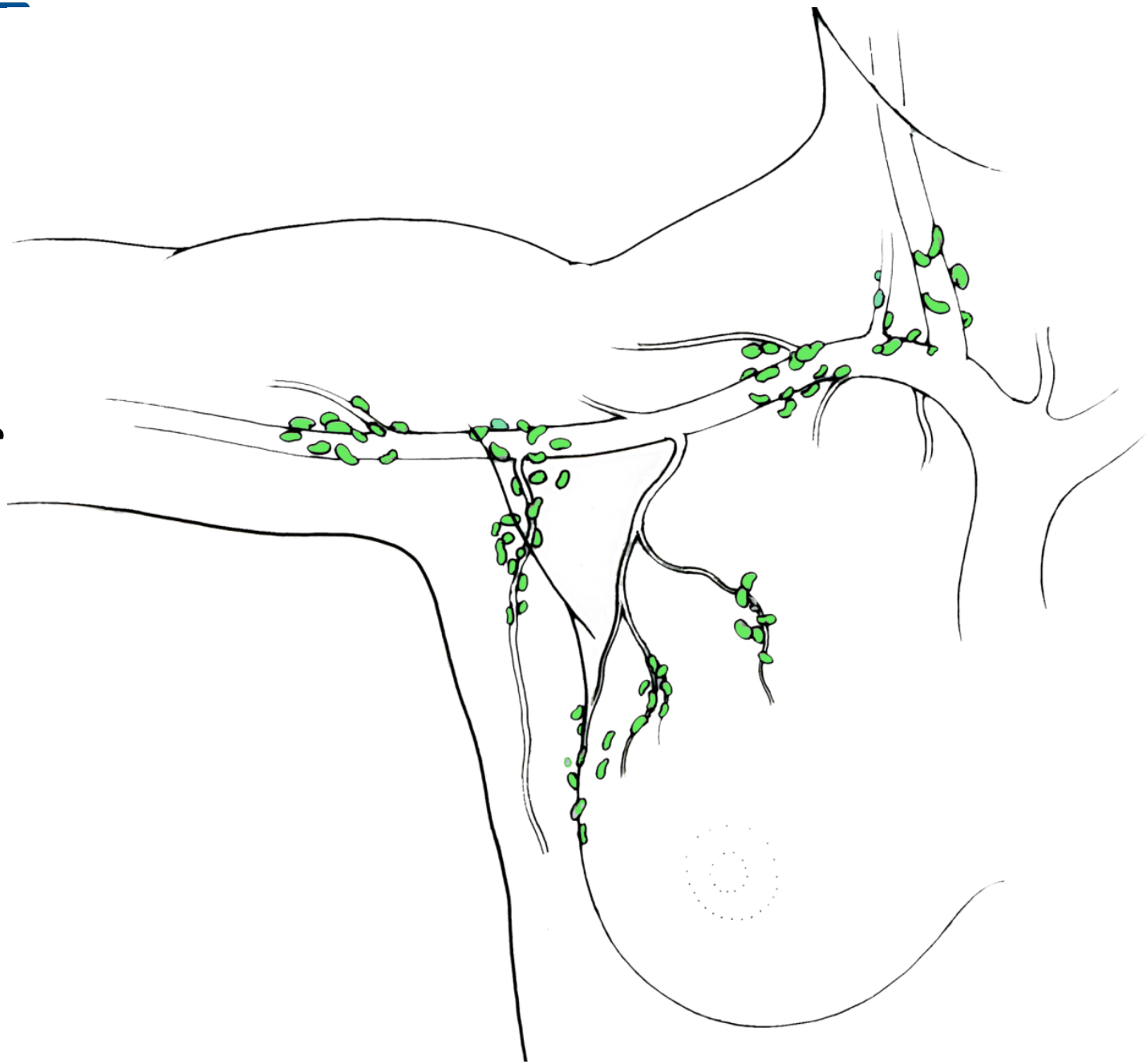
Anterior heart lymph nodes

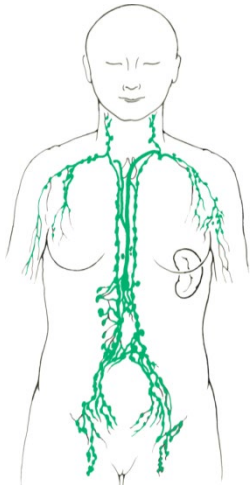
Lymph node anatomy in other sections

- Head & Neck
- Lung
- Stomach
- Colon & Rectum
- Pancreas
- Spleen
- Female Reproductive

Lymphatic System

Anatomy



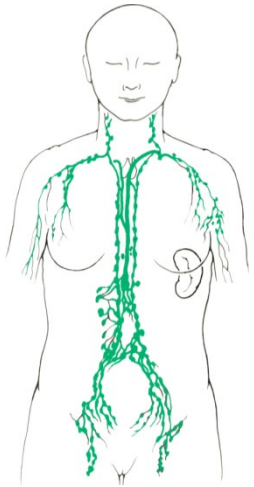


Axillary and cervical lymph nodes

Lymph node anatomy in other sections

- Head & Neck
- Lung
- Stomach
- Colon & Rectum
- Pancreas
- Spleen
- Female Reproductive

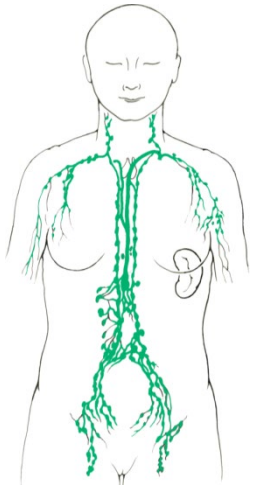
Lymphatic System



To be added

Tumors

Lymphatic System



Procedures

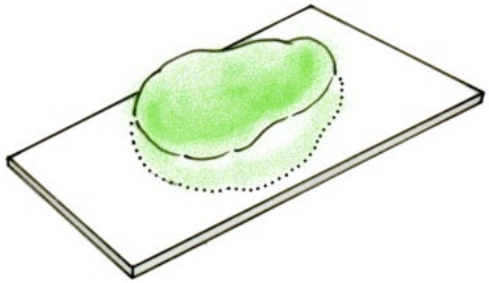
More likely to support procurement:

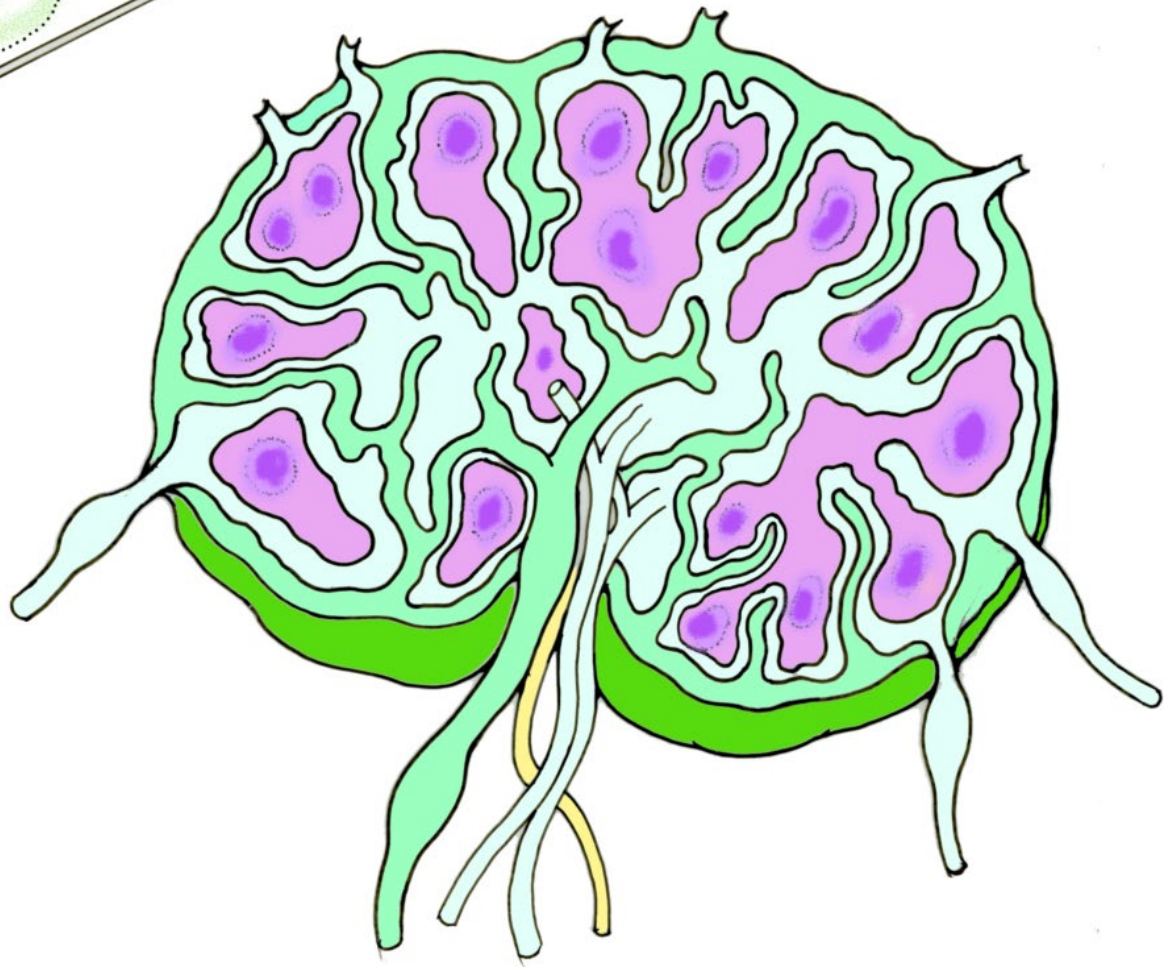
- lymph node biopsy - a piece of a lymph node is removed for examination under a microscope.
- sentinel lymph node biopsy - removal of the sentinel node (the first lymph node to which cancer cells are likely to spread from a primary tumor) for examination.
- lymphadenectomy (lymph node dissection) - surgical removal of one or more groups of lymph nodes.
- inguinal lymphadenectomy - surgery to remove the lymph nodes from the groin.
- radical hysterectomy - surgery to remove the uterus, cervix, and part of the vagina. The ovaries, fallopian tubes, and nearby lymph nodes may also be removed.

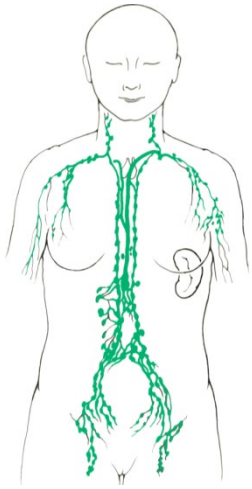
Less likely to support procurement:

- none

Lymphatic System



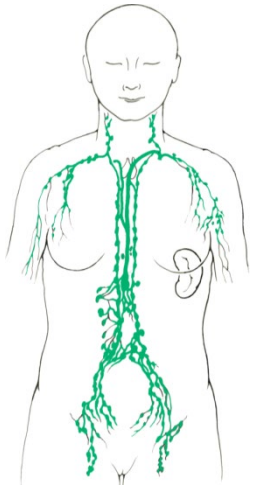




Sectioned lymph node

Procurement

Lymphatic System



To be added

Tips

References

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