Amanda, Grace (with purple comments)

Name ______________________________________ Tutor

IN 753. Human Body Course 2008
WRITTEN EXAMINATION
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13. Which of the following nerve fibers are LEAST likely to travel in this structure
A. Visceral afferent fibers
B. Sympathetic preganglionic fibers
C. Sympathetic postganglionic fibers
D. Parasympathetic postganglionic fibers

14. The stethoscope is best positioned to listen to which of the following heart valves?
   A. Mitral
   B. Pulmonary
   C. Aortic
   D. Right atrioventricular (tricuspid)

15. The structure indicated by the tip of the arrow is the
   A. Sympathetic trunk
   B. Celiac plexus
   C. Greater splanchnic nerve
   D. Vagus nerve
   E. Lesser splanchnic nerve

   See Plate 319 in Netter's. The sympathetic trunk runs along the vertebral column (even in the cervical sacral regions, even though we know that sympathetic fibers only emanate from the thoracolumbar region). The celiac plexus synapses around the celiac trunk. Nerves from this plexus will follow the blood vessels to organs of the foregut (which is the GI track up to the proximal part of the duodenum; this includes spleen, liver, and part of the pancreas).

16. Pain from which of the following organs is LEAST likely to refer to the dermatome indicated by the tip of the arrow?
   A. Ileum
   B. Hepatic flexure of colon
   C. Appendix
   D. Jejunum
   E. Rectum

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17. The structure indicated by the tip of the arrow is the
   A. Iliacus muscle
   B. Psoas major muscle
   C. Psoas minor muscle
   D. Quadratus lumborum muscle
   E. Erector spinae muscle

18. The vessel indicated by the tip of the arrow is the
   A. Ovarian artery
B. Uterine artery
C. Vaginal artery
D. Internal pudendal artery
E. Internal iliac artery

see plate 370 in Netter’s

19. The artery is passing through what connective tissue structure at the point indicated by the tip of the arrow?

Cardinal Ligament (also known as the Mackenrodt’s ligament)

20. What structure runs inferior to this vessel just lateral to the cervix? (The structure has been divided in the diagram at right.)

__________________________Ureter______________________________

21. The muscle indicated by the tip of the arrow is the
A. Piriformis
B. Obturator internus
C. Levator ani
D. Obturator externus
E. Ischiocavernosus

22. True or false. The muscle indicated is a striated muscle.
______   True________________________________________

23. The structure indicated by the tip of the arrow is the
__________________________Parotid Duct______________________________

24. The indicated structure drains into the
__________Oral Cavity_______________(opposite the 2nd molars on each side)

25. The tip of the arrow lies within which space
A. Frontal sinus
B. Epidural space
C. Subdural space
D. Cavernous sinus
E. Subarachnoid space

26. The muscle indicated by the tip of the arrow has which of the following as its primary function?
A. Closes the space between the vocal ligaments (Lateral circoarytenoid)
B. Opens the space between the vocal ligaments (Posterior circoarytenoid)
C. Tenses the vocal ligaments (cricothyroid)
D. Relaxes the vocal ligaments (thyroarytenoid and vocalis)
E. Folds the epiglottis posteriorly to cover the vocal folds (oblique arytenoid)

27. This structure is innervated by which cranial nerve?

vagus nerve—recurrent laryngeal branch

*Cricothyroid, which tenses the vocal ligament, is the only muscle of the larynx innervated by the superior laryngeal branch of the vagus nerve; the rest are the recurrent laryngeal nerve**

28. The structure indicated by the tip of the arrow is the
palatine tonsil (see Plate 51 of Netter's)
29. The structure indicated by the tip of the arrow lies between the ___Palatopharyngeal arch (in the back)____________________________fold and the ___Palatoglossal Arch (in the front)____________________________fold.

30. Which of the following sinuses does NOT drain into the space indicated by the tip of the arrow (middle meatus)?
   A. Frontal sinus
   B. Maxillary sinus
   C. Anterior ethmoidal sinuses
   D. Middle ethmoidal sinuses
   E. Sphenoidal sinus (this drains into the sphenoethmoidal recess; the posterior ethmoid drains into the superior meatus)

31. Contraction of the muscle indicated by the tip of the arrow produces which of the following motions of the eye.
   A. The gaze is directed laterally and down. ("cheater's muscle")
   B. The gaze is directed laterally and up.
   C. The gaze is directed medially and down.
   D. The gaze is directed medially and up.
   E. The superior eyelid is elevated.

32. This structure passes through a connective tissue support called the ___trochlea. A trochlea is a sling. This also explains the name of Cranial Nerve IV.___

33. Which of the following structures does not contain the tissue type (smooth muscle) shown in this image?
   A. Large intestine
   B. Prostate
   C. Hepatic sinusoids
   D. Uterine tube
   E. Arteries

34. The epithelium shown in this image is found in which of the following organs? (Simple columnar) (Can we email T/C just about this question?)
   A. Colon [Altaf, confirmed with tutorial leader Dave] Thanks, I thought so. -Joe G (Cindy said it was ileum...)
   B. Esophagus
   C. Stomach
   D. Ileum (Are you sure? What distinguished it from colon?) (ileum has villi.. sorry my bad... the image IS a villus... see how the epithelial layer curves at the right to form the other side of the villus? colon has crypts/plica, but no villi. I also think if they're going to show us colon, they'll use an image that shows one or more taenia coli) microvilli = fuzz, villi not shown in this picture
   E. Gallbladder (no isolated goblet cells in gallbladder epithelium)
   Note: This slide looks identical to the one on P. 300 in netter's. It is labeled as duodenum in the book.

36. All of the following can be seen in this image except
   A. Primary follicle (primary follicles can be found around the edges of the ovary)
   B. Zona pellucida (a protein coat surrounding the oocyte)
C. Oocyte
D. Antral fluid (a glycoprotein, tacky fluid secreted by the granulosa cells)
E. Cumulus or follicle cells (layer of granulosa cells nearest the oocyte; this layer is released with the egg at ovulation)

37. This image shows an abrupt epithelial transition. Which of the following statements is true of this transition?
A. The veins from this zone drain directly into the inferior vena cava
B. The image shows the rectoanal junction (you'd see a switch to stratified squamous keratinizing if moving to the anal epithelium)
C. The image shows the gastroesophageal junction
D. The wall of this junction contains skeletal muscle (pyloric sphincter=smooth muscle)
E. The image shows the gastroduodenal junction

38. The epithelium shown in this image
A. Lines part of the female reproductive tract
B. Has stereocilia
C. Lines the seminiferous tubules
D. Lacks a basal lamina
E. Is modified for carrying urine

39. Which of the following statements is true regarding the lumen in the center of the image (central vein), on the right?
A. It drains into the portal vein
B. It carries mostly arterial blood
C. It drains into the hepatic ducts
D. It is lined by endothelium
E. It leads to the epididymus

40. Which statement is not true regarding structure “B” in the image at the right?
A. It is always accompanied by an artery
B. It has pseudostratified ciliated columnar epithelium with goblet cells
C. It has plates of cartilage in its walls
D. It has its own separate arterial supply
E. Gas exchange occurs directly through the wall (there is cartilage surrounding structure "B"--no gas exchange occurs at this level)

41. Which of the following statement is FALSE? (see: dorsal root ganglia histo slide; you can see axons (central black dots) surrounded by myelin sheath, with Schwann cells. DRG is derived from neural crest)
A. This structure contains sensory neurons
B. This structure is derived from neural crest
C. This tissue is found in the gallbladder.
D. This structure is located near the spinal cord
E. This structure contains Schwann cells

42. Which of the following structures is shown in this image?
A. Prostate (notice the prostatic concretions in the lumen)
B. Breast
C. Cervix
D. Fallopian tube
E. Efferent ductules

43. The tissue shown in this image is most likely to have been taken from the
A. Parotid gland
B. Pancreas
C. Brunner’s glands
D. Submandibular gland (note the demilunes)
E. Thyroid gland

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44. Which of the following statements is NOT true of the organ shown in this image.
A. Gastric pits are found on the surface
B. Parietal cells secrete hydrochloric acid (HCl)
C. It will empty into the jejunum (image is stomach, which empties into the duodenum)
D. Chief cells secrete pepsin at the base
E. The luminal surface is protected by mucous

45. Identify the organ shown in this image.
A. Bladder
B. Ureter (note star-shaped lumen, flattened transitional epithelium, reversed orientation (compared to GI tubes) of smooth muscle--inner longitudinal, then outer circular, and a THIRD outermost layer--longitudinal muscles)
C. Transitional epithelium
D. Urethra
E. Renal papilla

46. Which of the following statements is NOT true of the hollow organ shown in this image? (image is of gall bladder, beneath the gray mass that is the liver)
A. The organ is lined with simple columnar epithelium.
B. The epithelium has microvilli.
C. The epithelium is in contact with stool.
D. The epithelium is in contact with bile
E. The organ is partly covered by peritoneum.

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47. Which of the following statements is NOT true of the tissue shown in this image?
A. The principle protein component is collagen
B. Most of its outer surface is covered by a layer of fibroblasts and collagen fibers
C. Blood supply is provided through Haversian and Volkmann’s canals
D. Osteocytes exchange nutrients and waste products through cell processes in the canaliculi
E. The tissue is resorbed by multinucleated megakaryocytes

49. Which of the following statements is NOT true of the
organ containing the cells shown in the image (cardiac muscle, see intercalated disks)
A. The organ is innervated by sympathetic fibers
B. It is found in the thorax
C. It is a mesodermal derivative
**D. It is found within the pelvis**
E. It is innervated by parasympathetic fibers

50. Which statement is true of the structure in the center of the image (glomerulus) ?
A. The vascular and urinary compartments are continuous
B. The flow through the vascular compartment is regulated by the efferent arterioles (the afferent arteriole forms the juxtaglomerular complex and secretes the renin; however, I do find this point a bit confusing because I believe it is the level of constriction of the efferent [out-going] arteriole determines how long it will take for blood to flow through the glomerulus...)
C. The macula densa consists of modified endothelial cells (epithelial cells)
D. The juxtaglomerular apparatus is composed of specialized proximal tubule cells (distal tubule)
**E. Cells in the glomerulus include podocytes, endothelium, and mesangial cells (?)**

51. Which of the following statements is not TRUE of the structure shown in the image?
A. There are two layers of smooth muscle
B. The lens shaped structure between the layers is a ganglion
C. Sympathetic visceromotor fibers synapse here
D. Parasympathetic visceromotor fibers synapse here
E. It could be located in the wall of the GI system

52. Which of the following statements about this tissue is NOT true? (image is of skeletal muscle, note striations and multiple nuclei)
A. The tissue is derived from mesoderm
B. It is found extensively throughout the gastrointestinal tract inferior to the diaphragm
C. Individual cells have multiple nuclei (forming a syncytium)
D. It is richly supplied with capillary networks
E. Neurons found in the ventral horn of the spinal cord provide the motor innervation.

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53. The structures indicated by lines in this anteroposterior (AP) chest film are
A. Bronchi
**B. Pulmonary vessels**
C. Kerly B-lines
D. Collections of pus
E. Bronchopulmonary segments
54. Which statement of the following statements is **true** of the contrast-filled structure filled in this image? **(image of colon)**
A. The lumen has plicae and villi  
B. It receives blood from several sources  
C. It primarily absorbs glucose  
D. It has no anatomic relationship to the spleen  
E. The taenia coli are formed by three condensations of skeletal muscle

55. Which structure cannot be seen in the axial CT?
A. Descending aorta **(huge white circle to the right of the vertebral body in image)**  
B. Ribs  
C. Scapulae **(skinny white oblique lines at the bottom sides of image)**  
D. Origin of primary bronchi **(the black holes anterior to vertebral body)**  
E. Liver

56. Which structure is NOT visible in this coronal CT?
A. Right brachiocephalic vein  
B. Bronchi **(which would appear black on CT, but the structures we see on the image are in front of the bronchi)**  
C. Superior Vena Cava  
D. Liver  
E. Left brachiocephalic vein

57. The structure indicated by the arrow in this abdominal radiograph is derived from **(renal pelvis/calyxes)**
A. Somites  
B. Splanchnic lateral plate mesoderm  
C. Intermediate mesoderm  
D. Axial mesoderm  
E. Somatic lateral plate mesoderm

**Explanation:** Ureter/Kidney are derived from intermediate mesoderm.

58. All of the following structures are visible in this axial CT EXCEPT the **(image is taken at near the level of thoracic plane, or just above the heart: descending aorta is white circle to the right of vertebral body in image, trachea is still visible, esophagus is squished (2 small black holes is the esophageal space))**
A. Ascending aorta  
B. Descending aorta  
C. **Inferior vena cava**  
D. Right pulmonary artery  
E. Esophagus

See plate 245 in Netter's to confirm answer...

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59. The tip of the arrow is pointing to which of the following structures in this axial CT?
A. Right atrium  
B. Right ventricle
61. In this sagittal MRI, the arrow is pointing to which of the following structures?
A. Rectum
B. Prostate
C. Uterus
D. Bladder
E. Ileum

62. In this axial CT image, the arrow is pointing to which space?
A. Morrison’s pouch
B. Foramen of Winslow
C. Right colic gutter
D. Pouch of Douglas
E. Space of Retzius

63. Which of the following statement NOT true of somites?
A. Somites form as blocks from a continuous field of paraxial mesoderm by a “clock and wave front” mechanism
B. Skeletal muscle is derived from somites
C. The somites are patterned by a combination of dorsal and ventral signals
D. Somites are the origin of dermis
E. Somites develop into the urogenital ridge

65. All of the following statements are true of cardiac development EXCEPT
A. Heart field precursors are located anteriorly as the cardiac crescent in the early trilaminar embryo.
B. As head growth and cranial folding continues, heart precursors are moved to the thorax.
C. Different transcription factors specify the heart field, heart tube formation, chamber formation and chamber specific morphogenesis.
D. Morphogenesis of the atrioventricular valves follows the same pattern as the semilunar valves (pulmonary and aortic). (These valves open in opposite direction; also the mitral and tricuspid valves form complexes with the papillary muscles via the chordae tendinae; the cusps themselves comprise the semilunar valves in the aorta and pulmonary trunk)
E. The fetus maintains two bypasses to shunt blood to the left atrium (foramen ovale) and from the pulmonary artery to the aorta (ductus arteriosus).

66. Asymmetry of organs and patterning of the heart are important events for establishing the structure and assisting the function of the organs in the body. Which statement below is FALSE?
A. During development of the body there is asymmetric morphogenesis, induction and regression.
B. Congenital heart disease is the most prevalent human malformation and often results from truncations in developmental pathways.
C. Looping of the heart tube to the right is one of the first asymmetric events in the embryo.
**D. No organs except the heart exhibit left-right asymmetry**
E. Failure of intestinal rotation can lead to midgut volvulus.

67. Which statement pertaining to the embryologic development of the reproductive system is FALSE?
A. The Müllerian ducts will form the male genital duct system.
B. The Sertoli cells produce Müllerian inhibitory substance.
C. The pronephros degenerates in both genders.
D. The metanephric duct arises from the mesonephric duct.
E. Primordial germ cells migrate to the gonadal ridge from the yolk sac.

Explanation: the Wolffian ducts form the male genital duct system.

68. Which of the following statements about head and neck development is NOT correct?
A. The only bone that forms from the first pharyngeal arch is the mandible.
B. The nerve of the second pharyngeal arch carries motor fibers to the muscles of facial expression.
C. Cleft palate and/or cleft lip occur if the lateral palatal shelves do not fuse with the primary palate.
D. The origin of the genioglossus muscle is primarily from the first and third arch.
E. The tympanic membrane is formed by the fusion of the first pharyngeal groove (ectoderm) and the first pharyngeal pouch (endoderm).

70. Which of the following statements are NOT true of the development of the lower gastrointestinal and genitourinary systems?
A. The primitive cloaca is divided by the urorectal septum. (true; see Urogenital lecture; the urorectal septum grows to divide the cloaca)
B. The upper portion of the vagina is derived from the paramesonephric ducts. (Paramesonephric ducts, aka Mullerian ducts; the uterovaginal canal of the paramesonephros [top 1/3] fuses with sinovaginal bulb [bottom 2/3] to form the complete vagina)
C. The testis begins development as a retroperitoneal structure.
D. The middle portion of the vagina is derived from endoderm.
**E. The urinary bladder is lined with ectoderm. (endoderm lining)**

71. Which of the following organs is NOT considered retroperitoneal or extraperitoneal?
A. Kidney
B. Ureters
C. Cervix
**D. Transverse colon**
E. Rectum, lower one-third

72. Which of the following statements about veins is NOT correct?
A. The common iliac veins form the inferior vena cava
B. The renal veins are unequal in length
C. The mesenteric veins join the splenic vein to form the portal vein  
D. The umbilical vein is obliterated  
**E. The hepatic veins contain valves.**

73. Which of the following statements about the ureter is **NOT correct**?  
A. The ureter crosses the psoas major muscle to reach the pelvis.  
**B. The ureter passes posterior to the internal and external iliac arteries.**  
C. The ureter enters the bladder at the trigone.  
D. The ureter is directly continuous with the renal pelvis.  
E. The ureter receives its blood supply from several different vessels. **Which vessels are these?**

74. Which of the following statements is **NOT** correct?  
A. The puborectalis muscle plays an important role in fecal continence.  
B. The levator ani muscle attaches to the obturator internus fascia.  
**C. The obturator nerve provides motor innervation to the muscles of the pelvic floor.**  
D. Contraction of the levator ani and abdominal wall muscles can increase intraabdominal pressure in conjunction with the abdominal wall muscle.  
E. Sensation from the perineum is conveyed in the pudendal nerve.

75. An obstetrician injects local anesthetic to block sensation from the perineum during the third stage of labor. After verifying a bony landmark transvaginally, she blocks the pudendal nerve. Which of the following bony landmarks should she use to locate the pudendal nerve? **(pudendal block)**  
A. Ischial spine  
B. Ischial tuberosity  
C. Sacral promontory  
D. Pubic symphysis  
E. Tip of the coccyx

76. While reading an abdominal plain film, a radiologist notices that the inferior poles of the left and right kidneys are fused. The fused kidney is most likely to be associated with which of the following arteries? **(horeshoe kidneys, pressing up on the IMA)**  
A. Left common iliac artery  
B. Right common iliac artery  
C. Superior mesenteric artery  
**D. Inferior mesenteric artery**  
E. Superior vesical artery

78. You examine the oral cavity of a patient with nasopharyngeal inflammation. The tongue depressor you use to examine the throat is rough and tastes like mint. Which of the following statements does NOT correctly describe the innervation of the tongue?  
A. The facial nerve conveys the minty taste from the anterior two-thirds of the tongue.  
B. The mandibular division of the trigeminal nerve conveys general sensation from the anterior two-thirds of the tongue.  


C. The glossopharyngeal nerve conveys general sensation from the posterior one-third of the tongue.

D. The vagus nerve conveys special sensation taste from the entire posterior one-third of the tongue.

E. The hypoglossal nerve provides motor innervation to most of the muscles of the tongue.

A 28 year-old construction worker sustains head injuries during a fall from a scaffold. Upon her arrival at the Emergency Department, you conduct a thorough neurologic examination. For each of your findings on the neurologic examination, write the name of the CRANIAL NERVE(S) tested.

79. The face appears asymmetrical at rest. The patient can blink her right eye but not her left eye.
   Facial Nerve (VII)

80. The patient is able to clench her teeth and grind them from side to side.
   Mandibular branch of Trigeminal (V)

81. The patient cannot detect the scent of soap on your fingers.
   Olfactory (I)

82. Sensation is absent over the left side of the forehead and the left upper eyelid.
   Ophthalmic division of Trigeminal (V)

83. The uvula is situated to the right of the midline.
   Vagus

84. Sensation is absent over the posterior one-third of the tongue. The gag reflex is lost.
   Glossopharyngeal and Vagus (motor for gag reflex)...although the vagus nerve might still be in tact--we would need to test something that stimulates the vagus nerve directly

85. Taste is absent over the anterior two-thirds of the tongue. The patient complains that her mouth feels dry.
   Facial nerve via chorda tympani for taste and mandibular nerve via the lingual nerve for general sensation

86. and 87. A light directed into the patient’s right eye causes constriction of the right pupil.
   Oculomotor and Optic

88. The patient’s right eyelid is ptotic (drooping). The right pupil is dilated. The gaze is directed downward and laterally.
   Oculomotor

89. In the Emergency Department, you examine a 42-year-old police officer who was stabbed in the left fourth intercostal space approximately 2 cm lateral to the sternum. The patient’s pulse rate is 140 beats per minute. On auscultation, his heart sounds are muffled and difficult to hear. The left and right jugular veins appear distended. Breath sounds are normal in all lung fields, but his respiration rate is higher than normal. Ultrasound reveals a collection of blood within the thorax. Which of the following diagnoses best explains these findings?
   A. Hemothorax
   B. Cardiac tamponade (tachycardia as the HR increases to compensate for the
diminished stroke volume secondary to the indistensible fibrous pericardial sac filling with blood...)?  YES--we talked about this in today's Clinical Correlation session.
C. Pulmonary embolus
D. Hemomediastinum
E. Hemorrhage into the extrapleural space

91. A patient with an inoperable pancreatic tumor elects to have palliative surgery for intractable pain. The best relief for this patient will be achieved by ablation (destruction) of which of the following nerves?
A. Left vagus nerve
B. Sympathetic nerves surrounding the celiac axis (trunk) (foregut structure)
C. Sympathetic nerves surrounding the inferior mesenteric plexus
D. Parasympathetic fibers originating at the S2, S3, and S4 spinal cord levels.
E. Tenth, eleventh, and twelfth intercostal nerves

95. One of your patients has a history of duodenal ulcer disease. You receive a call from the Emergency Department of the local hospital informing you that your patient has been rushed to the hospital with severe abdominal pain of acute onset. You learn that the patient has abdominal tenderness and low blood pressure. You are concerned that the ulcer may have eroded through the posterior wall of the duodenum and caused hemorrhage from an artery in this vicinity. Which of the following arteries is MOST likely to have been eroded by the ulcer.
A. Right gastric
B. Gastroduodenal (see page 9 of the retroperitoneum lecture; it appears that the gastroduodenal artery runs along the posterior wall of the duodenum)
C. Splenic
D. Right gastroepiploic
E. Splenic

SHORT ANSWER. Please limit your answer to the space provided on this side of the page only.
Questions 96 and 97. Describe the two types of INGUINAL hernia. In your description, include the pathway taken by the herniated bowel and the layers of the abdominal wall covering the surface of the hernia.

Inguinal hernias may be direct or indirect. The pathway taken by an indirect inguinal hernia follows the pathway taken by the testis during its descent through the inguinal canal. The hernia begins lateral to the inferior epigastric vessels and leaves the abdominal cavity through the deep inguinal ring. The layers of the abdominal wall covering the surface of the herniated bowel include parietal peritoneum, transversalis fascia, internal oblique fascia, and external oblique fascia. The hernia may exit the inguinal canal at the superficial ring. A direct hernia leaves the abdominal cavity medial to the inferior epigastric vessels and passes directly through the abdominal wall may also exit the inguinal canal through the superficial inguinal ring. The same layers of the abdominal wall would cover the surface of
an direct inguinal hernia: parietal peritoneum, transversalis fascia, internal oblique fascia and external oblique fascia.

Questions 98, 99, and 100. Describe the normal pathway taken by blood returning to the systemic circulation from the gastrointestinal tract and spleen. Describe three portal systemic shunts that can occur with portal hypertension.

In the most common pattern, the portal vein receives three tributaries. Blood from the hindgut returns through the inferior mesenteric vein, blood from the midgut returns through the superior mesenteric vein, and blood from the foregut and spleen returns through the splenic vein. The portal vein enters the liver and passes through the liver sinusoids to the central vein. The central veins join to form the hepatic veins, which enter the inferior vena cava. In portal hypertension, small anastomoses between portal and systemic tributaries enlarge as blood is shunted away from the fibrotic liver through alternate pathways to the superior or inferior vena cava. The most important portal systemic shunts are:

1. Esophageal veins (portal tributaries) to veins in the azygos/hemiazygos network (systemic tributaries) (esophageal varices).
2. Superior rectal (portal tributaries) to middle rectal and inferior rectal veins (systemic tributaries) (hemorrhoids).
3. Paraumbilical veins adjacent to the ligamentum teres (portal tributaries) to the inferior and superior epigastric veins (systemic tributaries). The paraumbilical veins surround the ligamentum teres between the liver to the umbilicus (caput medusae) and anastomose with small cutaneous veins on the anterior abdominal wall.
4. Veins draining the retroperitoneal organs (portal tributaries) to segmental veins of the posterior abdominal wall (systemic tributaries).
5. The ligamentum venosum, the embryonic shunt between the umbilical vein and inferior vena cava, may also recanalize.