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Surface and Regional Anatomy

I. Introduction to Surface Anatomy

☞ *Concept:* Surface anatomy, a branch of gross anatomy, is the study of the form and markings on the surface of the body as they relate to deeper structures. Knowledge of surface anatomy is essential in performing a physical examination, treating diseases or dysfunctions of the body, and maintaining physical fitness.

A. Multiple Choice Questions

- ___ 1. Which of the following structures can be identified from the surface of the body?
(a) muscles (d) lymph nodes
(b) bones (e) all of the above
(c) glands
- ___ 2. Surface features and anatomical structures beneath the skin can be readily identified through
(a) observation. (c) both a and b.
(b) palpation. (d) none of the above.

B. True–False Questions

- ___ 1. With the use of modern medical technology, surface anatomy has become obsolete as a means of diagnosing illness.
- ___ 2. Obesity decreases the effectiveness of observation and palpation in medical diagnosis.
- ___ 3. A woman's body has a smoother surface contour than a man's because women have a thicker hypodermis.

II. Surface Anatomy of the Newborn

☞ *Concept:* The surface anatomy of a newborn infant represents an early stage of human development; therefore, it differs from that of an adult. Certain aspects of the surface anatomy of a neonate are of clinical importance in ascertaining the degree of physical development, general health, and possible congenital abnormalities.

A. Multiple Choice Questions


- ___ 1. In a newborn, certain areas of the skin may be more darkly pigmented than others because of maternal and placental hormones having entered the fetus. Which of the following is (are) *not* affected by such hormones?
(a) areola (c) umbilical cord
(b) linea alba (d) genitalia
- ___ 2. In a newborn, good blood circulation is best indicated by
(a) the nails. (d) the tongue.
(b) the skin. (e) the liver.
(c) the eyes.

- _____ 3. Which feature would be abnormal in a fully developed neonate?
 (a) milia (c) local edema in the face
 (b) vernix caseosa (d) absence of palm creases
- _____ 4. Which structure(s) cannot be palpated in a newborn?
 (a) kidneys (d) urinary bladder
 (b) liver (e) all can be palpated
 (c) fontanelles

B. True–False Questions

- _____ 1. Many newborns have silky angora hair on their shoulders and backs.
- _____ 2. About 90% of newborn Blacks, Asians, and American Indians have mongolian spots.
- _____ 3. The testes of a newborn male are palpable in the inguinal canals until they descend into the scrotum.

III. Head

 *Concept:* The head is the most highly integrated region of the body, since it communicates with and controls all of the body systems. The head is of clinical concern because it contains important sense organs and provides openings into the respiratory and digestive systems. Of social importance is the aesthetics (pleasing appearance) of the head, which in some cases is also of clinical concern.

A. Multiple Choice Questions

- _____ 1. Most facial muscles insert
 (a) on facial bones. (c) on other muscles.
 (b) into the dermis. (d) into the epidermis.
- _____ 2. The surface features in the ocular region
 (a) protect the eye. (c) provide support.
 (b) facilitate vision. (d) all of the above.
- _____ 3. The rim of the auricle is called
 (a) the helix. (c) the lobe.
 (b) the pinna. (d) the tragus.
- _____ 4. The tip of the nose is called
 (a) the dorsum nasi. (c) the apex.
 (b) the ala. (d) the root.

B. True–False Questions

- _____ 1. Cranium is another word for head.
- _____ 2. The skin of the forehead is actually part of the scalp.
- _____ 3. The earlobe of the auricle is a common site for ear piercing.
- _____ 4. The paired nasal bones form the bridge of the nose.

IV. Neck

☞ *Concept:* The flexible neck has a number of important external features. In addition, major organs are contained within the neck, and other vital structures pass through it.

A. Multiple Choice Questions

- ___ 1. In which region of the neck are the cervical lymph nodes?
(a) anterior region (c) posterior region
(b) cervical region (d) right and left lateral regions
- ___ 2. The “Adam’s apple” is a feature of
(a) the epiglottis. (c) the cricoid cartilage.
(b) the thyroid cartilage. (d) the voice box.
- ___ 3. The triangle of the neck that contains the cervical plexus and accessory nerve is
(a) the carotid triangle. (d) the supraclavicular triangle.
(b) the omotracheal triangle. (e) the omoclavicular triangle.
(c) the submental triangle.
- ___ 4. The inferior border of the mandible, the sternocleidomastoid muscle, and the median line of the neck form
(a) the submental triangle. (c) the anterior cervical triangle.
(b) the superior triangle. (d) the posterior cervical triangle.

B. True–False Questions

- ___ 1. *Nucha* is synonymous with *cervix*.
- ___ 2. The hyoid bone is the most prominent structure of the *cervix*.
- ___ 3. The sternocleidomastoid, posterior digastric, and omohyoid muscles form the boundaries of the carotid triangle of the neck.
- ___ 4. The internal jugular vein is enclosed in the carotid sheath.

V. Trunk

☞ *Concept:* The locations of vital visceral organs in the cavities of the trunk make the surface anatomy of this body region especially important.

A. Multiple Choice Questions

- ___ 1. The external genitalia of a female are located in
(a) the pelvic region. (d) the thoracic region.
(b) the abdominal region. (e) the gluteal region.
(c) the perineal region.
- ___ 2. Which structure does *not* form a border of the triangle of auscultation?
(a) vertebral column (c) latissimus dorsi muscle
(b) trapezius muscle (d) scapula
- ___ 3. The second rib is located at the level of
(a) the jugular notch. (c) the xiphisternal joint.
(b) the sternal angle. (d) the costal margin.
- ___ 4. The surface line that extends from the xiphoid process to the symphysis pubis is
(a) the linea semilunaris. (c) the linea abdominis.
(b) the midclavicular line. (d) the linea alba.

B. True–False Questions

- ___ 1. All of the ribs can be palpated on a thin person.
- ___ 2. The left costal arch of the rib cage is located over the liver.
- ___ 3. The abdomen has no bony landmarks.
- ___ 4. McBurney’s point, located at the right lower quadrant of the abdomen, is of clinical importance because it marks the ideal entry point for an appendectomy.
- ___ 5. The umbilicus is consistent in its location along the linea alba.

VI. Pelvis and Perineum

☞ *Concept:* The surface features of the pelvic region are important primarily to identify reproductive organs and clinical problems of these organs.

A. Completion Questions

- 1. The _____ ligament extends from the crest of the ilium to the symphysis pubis.
- 2. The external genitalia are located in the _____.

VII. Shoulder and Upper Extremity

☞ *Concept:* The anatomy of the shoulder and upper extremity is of clinical importance because of frequent trauma to these body regions. In addition, vessels of the upper extremity are used as pressure points and as sites for venipuncture in drawing blood, providing nutrients and fluids, and administering medicine.

A. Multiple Choice Questions

- ___ 1. Which structure(s) could be observed in an anterior view of the shoulder region?
 - (a) angle of acromion
 - (b) glenoid fossa
 - (c) acromion
 - (d) spine of the scapula
 - (e) both c and d
- ___ 2. A common site for an intramuscular injection is
 - (a) the deltoid muscle.
 - (b) the angle of acromion.
 - (c) the biceps brachii muscle.
 - (d) the deltopectoral triangle.
- ___ 3. The axilla is clinically important because of the subcutaneous position of
 - (a) sebaceous glands.
 - (b) major nerves.
 - (c) dermal cells.
 - (d) all of the above.
- ___ 4. Which pair of muscles forms the anterior and posterior borders of the axilla?
 - (a) deltoid and pectoralis minor
 - (b) biceps brachii and triceps brachii
 - (c) latissimus dorsi and pectoralis major
 - (d) triceps brachii and pectoralis major
 - (e) latissimus dorsi and deltoid
- ___ 5. The nerve located in the groove behind the medial epicondyle of the humerus in the elbow region is
 - (a) the ulnar nerve.
 - (b) the brachial nerve.
 - (c) the median nerve.
 - (d) the radial nerve.
 - (e) the cephalic nerve.

- _____ 6. An important site for the removal of venous blood for analyses and transfusions or for intravenous therapy is
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|--------------------------|------------------------------|
| (a) the axilla. | (c) the antebrachial groove. |
| (b) the popliteal fossa. | (d) the cubital fossa. |
- _____ 7. The thenar eminence is located on
- | | |
|------------------|-------------------|
| (a) the humerus. | (d) the shoulder. |
| (b) the hand. | (e) the ulna. |
| (c) the scapula. | |

B. True–False Questions

- _____ 1. The spine of the scapula and the acromion can be easily palpated.
- _____ 2. The axillary area should be examined during a breast self-examination (BSE) for lumps or enlargement of lymph nodes.
- _____ 3. The location for taking a radial pulse is the anteromedial surface of the forearm, near the wrist.
- _____ 4. The anatomical snuffbox is a depression seen on the posterior surface of the wrist as the thumb is extended.
- _____ 5. In anatomical position, the arms are relaxed at the sides of the body, with the thumbs positioned anteriorly, the palms positioned medially, and the digits slightly flexed at the interphalangeal joints.

VIII. Buttock and Lower Extremity

☞ *Concept:* The massive bones and muscles of the buttock and lower extremity are important as weight-bearers and locomotors. Many of the surface features of these regions are important with respect to locomotion or locomotor dysfunction.

A. Multiple Choice Questions

- _____ 1. When the buttock is used for an intramuscular injection, care must be taken to avoid
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| (a) the femoral artery. | (d) the sigmoid colon. |
| (b) the sciatic nerve. | (e) the obturator foramen. |
| (c) the inguinal ligament. | |
- _____ 2. Which of the following muscle groups is *not* located in the thigh?
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| (a) gluteal muscles | (c) hamstring muscles |
| (b) adductor muscles | (d) quadriceps muscles |
- _____ 3. Hernias are a frequent occurrence in
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| (a) the fold of the buttock. | (c) the femoral triangle. |
| (b) the popliteal space. | (d) the natal cleft. |
- _____ 4. A varicose vein is an abnormally enlarged
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| (a) great saphenous vein. | (c) popliteal vein. |
| (b) tibial vein. | (d) femoral vein. |
- _____ 5. The ball of the foot is located just proximal to
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| (a) the pollex. | (c) the first metatarsal bones. |
| (b) the hallux. | (d) the proximal phalangeal bones. |

B. True–False Questions

- ___ 1. The buttock is a preferred site for intramuscular injections because it is highly vascular and lacks extensive sensory innervation.
- ___ 2. The femoral triangle is the most important arterial pressure point for the lower extremities.
- ___ 3. The cubital fossa is to the brachium and antebrachium as the popliteal fossa is to the thigh and leg.
- ___ 4. Pulsations from the posterior tibial artery can be detected by palpating between the medial malleolus and the calcaneus.
- ___ 5. The sciatic nerve traverses the femoral triangle as it innervates the muscles of the thigh.

IX. Clinical Considerations

A. Multiple Choice Questions

- ___ 1. Pathogens readily gain access to internal structures of the head through
(a) the nostrils. (c) the external auditory canals.
(b) the eyes. (d) all of the above.
- ___ 2. Which of the following terms refers to a severe underdevelopment of the brain?
(a) microcephaly (c) anencephaly
(b) hydrocephaly (d) none of the above
- ___ 3. A cervical rib occurs in _____ of humans and is _____ in half of these cases.
(a) 0.5%/bilateral (c) 0.5%/unilateral
(b) 5.0%/bilateral (d) 5.0%/unilateral
- ___ 4. A patent foramen ovale is an example of
(a) a heart valve defect. (d) a ventricular defect.
(b) a pulmonary defect. (e) an auricular defect.
(c) a septal defect.
- ___ 5. Which of the following is *not* a clinical condition of the digestive system?
(a) pyloric stenosis (c) patent urachus
(b) enteritis (d) Meckel's diverticulum
- ___ 6. A fecal fistula is
(a) an obstruction of the lower bowel.
(b) a connection between the rectum and the urinary bladder.
(c) a blocked anal opening.
(d) an anomalous opening into the umbilicus.
- ___ 7. Descent of the testes into the scrotum is generally completed at
(a) 10 weeks of gestation. (c) birth.
(b) 28 weeks of gestation. (d) puberty.
- ___ 8. The most sensitive period of limb development is between weeks
(a) 2 and 4. (c) 9 and 12.
(b) 4 and 7. (d) 15 and 20.

- ___ 9. The most common limb deformity is
 (a) polydactyly. (c) amelia.
 (b) micromelia. (d) Sprengel's deformity.
- ___ 10. The most frequently broken bone in the body is
 (a) the clavicle. (c) the ulna.
 (b) the humerus. (d) the radius.
- ___ 11. A paralysis of the flexor muscles of the hand and adductor muscles of the thumb would indicate trauma to
 (a) the median nerve. (c) the radial nerve.
 (b) the ulnar nerve. (d) the musculocutaneous nerve.
- ___ 12. Shinsplints are thought to be associated with
 (a) sprains. (c) tendonitis.
 (b) synovitis. (d) stress fractures.
- ___ 13. Talipes is
 (a) a congenital malformation of the foot.
 (b) a dislocation of the hip.
 (c) a degenerative bone disease.
 (d) a specific type of bone fracture.
- ___ 14. Which statement is *false* concerning sprains?
 (a) They involve ligaments and tendons.
 (b) They are usually accompanied by synovitis.
 (c) They occur at synovial joints.
 (d) They always require surgery and/or casting.

B. Matching Questions

Set 1: Match the clinical term on the left with its description on the right.

- ___ 1. cleft palate (a) premature closure of the sagittal suture
 ___ 2. scaphocephaly (b) failure of the maxillary bones to unite
 ___ 3. torticollis (c) crooked skull
 ___ 4. plagiocephaly (d) wryneck
 ___ 5. acromegaly (e) enlarged nose

Set 2: Match the clinical term on the left with its description on the right.

- ___ 1. hemivertebrae (a) murmur
 ___ 2. tetralogy of Fallot (b) absence of ribs
 ___ 3. pneumothorax (c) blue baby
 ___ 4. stenosis (d) blood in the pericardial sac
 ___ 5. hemothorax (e) air in the pleural cavity
 ___ 6. BSE (f) blood in the pleural cavity
 ___ 7. cardiac tamponade (g) breast self-examination
 ___ 8. myocardial infarction (h) heart attack
 ___ 9. angina pectoris (i) chest pain
 ___ 10. hypotension (j) low blood pressure

Set 3: Match the clinical term on the left with its description on the right.

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|------------------------------|--|
| ___ 1. patent urachus | (a) narrowing of the pyloric orifice |
| ___ 2. fecal fistula | (b) opening of the urinary bladder through the umbilicus |
| ___ 3. pyloric stenosis | (c) opening of the intestine through the umbilicus |
| ___ 4. Meckel's diverticulum | (d) erosion of the mucous membrane of the stomach |
| ___ 5. enteritis | (e) failure of the yolk sac to atrophy |
| ___ 6. peritonitis | (f) inflammation of the intestinal mucosa |
| ___ 7. peptic ulcer | (g) inflammation of the peritoneum |

Set 4: Match the clinical term on the left with its description on the right.

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|-------------------------------|--|
| ___ 1. Sprengel's deformity | (a) underdeveloped, elevated scapula |
| ___ 2. polydactyly | (b) swelling of the bursae |
| ___ 3. syndactyly | (c) inflammation of synovial joints |
| ___ 4. Colles' fracture | (d) compression of the median nerve |
| ___ 5. lateral epicondylitis | (e) infection of the synovial tendon sheath |
| ___ 6. carpal tunnel syndrome | (f) tennis elbow |
| ___ 7. bursitis | (g) trauma to the distal portion of the radius |
| ___ 8. arthritis | (h) webbed digits |
| ___ 9. tendosynovitis | (i) extra digits |

Set 5: Match the clinical term on the left with its description on the right.

- | | |
|------------------------|--|
| ___ 1. osteoporosis | (a) shinsplints |
| ___ 2. Pott's fracture | (b) break at the distal end of the tibia or fibula |
| ___ 3. stress fracture | (c) torn ligaments and tendons |
| ___ 4. sprain | (d) demineralization and weakening of bone |
| ___ 5. synovitis | (e) inflammation of a joint capsule |
| ___ 6. talipes | (f) clubfoot |

C. Completion Questions

1. Congenital malformations may result from _____ or environmental causes during sensitive periods of development.
2. A congenital absence of all or a major part of the brain is a condition known as _____, which is always fatal.
3. The _____ bone, the weakest bone of the skull, is frequently broken in a contrecoup fracture.
4. The two most commonly fractured bones of the face are the _____ bone and the _____.

5. The absence of ribs resulting from incomplete development of the thoracic vertebrae is termed _____.
6. Improper closure of a heart valve causes a sound referred to as a _____.
7. A _____ is fluid compression of the heart caused by hemorrhage into the pericardial sac.
8. The most common malignancy in a woman is _____ of the breast.
9. Severe chest pains called _____ generally accompany a heart attack.
10. _____ is the most common anomaly of the small intestine.
11. A _____ is a congenital condition of the colon characterized by failure of ganglia to develop, resulting in loss of peristalsis.
12. In the normal development of the male fetus, the testes are in scrotal position by week _____ of gestation.
13. Inflammation of the serous membranes of the abdominal cavity is known as _____.
14. The upper trunk of the brachial plexus arises at the junction of C5 and C6, which is known as _____.
15. Tennis elbow is technically known as _____.

X. Chapter Review

A. Completion Questions

1. Surface features can be readily identified through visual _____, and anatomical features beneath the skin can be felt through _____.
2. At birth, the skin of a newborn is covered with a grayish, cheeselike substance called _____ and may contain some silklike hair called _____.
3. The _____ on an infant's skull permit molding during parturition and growth of the brain during infancy.
4. The _____ covering the cranium extends from the eyebrows anteriorly to the superior nuchal line posteriorly.
5. The vertical depression in the medial portion of the upper lip is known as the _____.
6. The common carotid artery, the internal jugular vein, and the vagus nerve are enclosed in a tough connective tissue sheath called the _____ sheath.

7. The anterior cervical and posterior cervical triangles of the neck are separated by the _____ muscles.
8. A region called the _____ forms the floor of the pelvis and includes the external genitalia.
9. Even in an obese person, a _____ can be seen on the back, where the vertebral spines are palpable.
10. _____ point is an important surface landmark on the abdomen because it overlies the appendix.
11. The lymphatic drainage of the breast is toward the _____.
12. It is the _____ artery that is constricted against the humerus with the cuff of a sphygmomanometer when monitoring the arterial blood pressure.
13. The anterior group of muscles of the thigh are the _____, and the posterior group are the _____.
14. The _____ veins of the leg are of clinical importance if they become varicose.
15. The depression on the posterior aspect of the knee is referred to as the _____.

B. Matching Questions

Set 1: Match the surface structure with its related body region.

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|---------------------------|----------------------|
| ___ 1. lateral commissure | (a) auricular region |
| ___ 2. cricoid cartilage | (b) foot |
| ___ 3. costal arch | (c) thigh |
| ___ 4. tragus | (d) ocular region |
| ___ 5. philtrum | (e) hand |
| ___ 6. natal cleft | (f) pelvis |
| ___ 7. inguinal ligament | (g) buttock |
| ___ 8. thenar eminence | (h) thorax |
| ___ 9. femoral triangle | (i) neck |
| ___ 10. plantar surface | (j) oral region |

Set 2: Match the body structure with the appropriate clinical consideration.

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|--------------------------|-----------------------------|
| ___ 1. brachial artery | (a) abdominal incision |
| ___ 2. inguinal ligament | (b) intravenous therapy |
| ___ 3. cubital vein | (c) pressure point |
| ___ 4. linea alba | (d) intramuscular injection |
| ___ 5. radial artery | (e) pulse rate |
| ___ 6. buttock | (f) femoral hernia |