EXAM NUMBER _____

STRUCTURAL BASIS OF MEDICAL PRACTICE
EXAMINATION VII

October 23, 2003

Circle the correct answer(s). All, some, or none may apply. Mark all answers on attached answer sheet. (100 pts)

Limb and Muscle Development

1. Which of the following statement(s) is(are) true regarding muscle development?

a. Muscles develop by the process of membranous ossification

b. One somite gives rise to all muscles of the cervical, thoracic, and lumbar regions

c. Skeletal muscle is formed from somites which are distributed throughout the embryo

d. Skeletal muscle is derived from splanchnic mesoderm which then differentiates into sclerotomes

2. Which of the following statement(s) is(are) true regarding growth of the bone?

a. Primary centers of ossification appear around the 18th day of development

b. Secondary centers of ossification close prior to birth

c. Epiphyseal (2^o center of ossification) plates are areas of extension for long bones

d. Diaphyseal centers of ossification are located in the shaft of the bone

3. Which of the following is(are) true concerning skeletal development?

a. Bones formed *directly* from mesenchyme include long bones and the skull

b. Endochondral bone formation involves calcification of cartilage which is later replaced by bone

c. Membranous ossification may include formation of Haversian systems

d. Limb bone formation is called intracartilaginous formation

4. Rotation of the forelimb:

a. is a lateral rotation that is greater than or equal to 90^o

b. positions the elbows to point dorsally (or posteriorly)

c. positions the extensor muscles to lie on the lateral and posterior aspects of the limb

d. positions the flexor muscles to lie on the dorsal aspect of the limb

5. Rotation of the lower limb:

a. is a lateral rotation that is less than or equal to 90^{o}

b. positions the knee to point ventrally (forward) and anterior

c. positions the extensor muscles to lie on the lateral aspects of the limb

d. results in the ventral surface of the feet to be caudal

Respiratory Development

6. Tracheoesophageal fistula with esophageal atresia is(are) accompanied by:

a. excessive saliva and mucus

b. regurgitation after feeding

c. reflux of gastric contents into lungs

d. none of the above

7. Which of the following statement(s) is(are) true?

a. Lung development occurs in a distal to proximal direction

b. Lung development is homogeneous

c. The first period of lung development is the canalicular period

d. In the canalicular period the respiratory bronchioles and terminal sacs develop

8. Regarding the terminal sac period, which statement(s) is(are) true?

a. Type I pneumocytes develop

b. Surfactant is produced

c. Premature fetuses can survive

d. Premature fetuses cannot survive

Heart and Great Vessel Development

9. Lateral plate mesoderm:

a. gives rise to paraxial mesoderm

b. gives rise to somites

c. gives rise to vasculature

d. gives rise to dermis

10. At birth, which change(s) occur(s) to establish circulation:

a. lungs expand and the ductus arteriosus closes

b. pressure in the left atrium increases

c. pressure in the right atrium increases

d. Foramen ovale closes

11. Which statement(s) is(are) true regarding the 3rd aortic arch:

a. is paired in embryonic life but only the right side remains in the adult

b. is never paired in embryonic life

c. gives rise to the left common carotid artery

d. gives rise to the right common carotid artery

12. Regarding the primitive (day 23) heart:

a. truncus arteriosus is the inflow valves

b. the bulbus cordis eventually becomes the right ventricle

c. primitive ventricle is separated from the atrium by the atrioventricular sulcus

d. sinus venosus gives rise to a portion of the right atrium (coronary sinus)

13. Ventricular septation involves:

a. a 3 month process of dividing the ventricles

b. outgrowth of a muscular septum from the roof of the ventricles

c. connections of the interventricular septum with fused AV cushions

d. complete separation of the ventricles into 2 chambers which if not correct leads to the cause of the most congenital defects

Nervous System Development

14. What structure causes the overlying ectoderm to differentiate into the neural plate?

a. Lateral mesoderm

b. Intermediate endoderm

c. Notochord

d. Rostral neuropore

15. Neural crest cells will contribute to development of the following structures except:

a. Autonomic Nervous System (ANS)

b. Peripheral Nervous System (PNS)

c. Dura mater

d. Dorsal root ganglia

16. The notochord becomes which structure(s):

a. Annulus pulposus

b. Nucleus pulposus

c. Vertebral bodies

d. Spinous processes

17. White matter of the CNS develops from which structure(s)?

a. Ventricular Zone

b. Intermediate zone

c. Marginal Zone

d. Ependymal layer

Urogenital Development

18. Which of the following structure(s) are derived from the metanephric diverticulum (uteric bud)?

a. Ureter

b. Loop of Henle

c. Renal Pelvis

d. Bowman's capsule

e. Collecting tubules

19. With regards to the urinary bladder, which structure(s) split(s) the cloaca into the dorsal rectum and ventral urogenital sinus?

a. Metanephros

b. Urogenital Sinus

c. Urachus

d. Mesonephric ducts

20. Which of the following is not a correct part of the urogenital sinus?

a. Vesical part

b. Abdominal part

c. Pelvic part

d. Phallic part

21. Which layer(s) of the suprarenal gland is(are) not present at birth?

a. Zona glomerulosa

b. Zona fasiculata

c. Zona mesencyhmal

d. Zona reticularis

22. Migration of which of structure(s) is(are) necessary for genital formation?

a. Mesothelium

b. Mesenchyme

c. Primordial germ cells

d. Mesonephros

Head and Neck Development

23. Which structure(s) is(are) not a correct component of the pharyngeal apparatus?

a. Cartilage

b. Nerve

c. Muscle

d. Lymphatic

24. The maxillary and mandibular prominences form in which pharyngeal arch (s)?

a. 1st

b. 2nd

c. 3rd

d. 4th

25. The 4th pharyngeal arch is supplied by which nerve(s)?

a CN V2 (Maxillary nerve)

b. CN V3 (Mandibular nerve)

c. Recurrent Laryngeal nerve (CN X)

d. Superior Laryngeal nerve (CN X)

26. Muscle of facial expression is(are) derived from which of the following:

a. 3rd pharyngeal arch

b. 4th pharyngeal groove

c. 2nd pharyngeal arch

d. 1st pharyngeal membrane

Clinical Correlate: Critical Periods of Development

27. Maternal infection with which infections may cause congenital effects in the fetus:

a. rubella

b. chickenpox

c. influenza

d. strep throat

e. urinary tract infection

28. Exposure to a teratogen during the first 6 weeks of embryonic life may cause fetal abnormalities in which organ systems:

a. neural tube

b. heart

c. limbs (upper or lower)

d. lip (cleft)

e. eye

29. Fetal alcohol syndrome includes:

a. limb defects

b. bladder defects

c. growth failure - "failure to thrive"

d. cardiac malformations

e. microcephaly

Clinical Correlate: Heart and Great Vessel Development

30. A left to right shunt of blood occurs in:

a. coarctation of the aorta

b. pulmonic stenosis

c. aortic stenosis

d. patent ductus arteriosus

e. patent foramen ovale

31. In Tetralogy of Fallot, cyanosis (decreased blood content of oxygen) occurs because:

a. there is an atrial septal defect

b. aortic stenosis

c. right ventricular blood is directed to the aorta

d. pulmonary venous return is obstructed

e. right ventricular wall is hypertrophied (increase in muscle thickness)

32. A patent ductus arteriosus is associated with:

a. prematurity

b. left to right shunt

c. increased aortic pressure

d. increased pulmonary artery blood flow

e. pulmonic stenosis

Clinical Correlate: Limb and Muscle Development

33. Extreme weakness in the newborn infant is present with:

a. Duchenne muscular dystrophy

b. Becker muscular dystrophy

c. spinal muscular atrophy, Type I

d. central core disease

e. facioscapulohumeral dystrophy

34. Children who get up from a prone position by pushing on their thighs with the arms ("walking up their legs") are demonstrating:

a. Gower maneuver

b. Vagal reflex

c. Weakness of the pelvic girdle muscles

d. Dizziness from decreased blood flow to the brain

e. Lack of dietary protein

35. Myotonic dystrophy has(have):

a. expressionless facies

b. transverse smile

c. delayed relaxation of clinched muscles

d. increased incidence of endocrine abnormalities

e. cataracts in lens of the eye

Clinical Correlate: UG/GI/Respiratory Development

36. With tracheoesophageal fistula of the C type (upper esophagus ends in a blind pouch, and the lower esophagus connects to the trachea) the following is(are) true:

a. infant develops symptoms in the newborn period

b. infant shows inability to swallow milk (breast or formula)

c. symptoms develop after 2 years of age

d. the condition is always fatal

e. the condition can be repaired with surgery

37. An omphalocele :

a. is midline

b. may have abdominal organs in the protruding sac

c. sac may have contents pasted together with fibrous adhesions

d. always occurs to the right side of the inguinal ring

e. has a clear covering of epithelium

38. A gastroschisis :

a. is midline

b. may have abdominal organs in the protruding sac

c. sac may have contents pasted together with fibrous adhesions

d. always occurs to the right side of the inguinal ring

e. has a clear covering of epithelium

39. Hypospadias repair utilizes:

a. rectal mucosa

b. scrotal skin

c. peritoneum

d. foreskin

e. epidermis from anterior abdominal wall

Clinical Correlate: Head and Neck Development

40. A thyroglossal duct cyst may appear:

a. at the base of the tongue

b. near the sternocleidomastoid muscle

c. under an ear lobe

d. suprasternal notch

e. on the tragus

41. In regard to cleft lip/palate:

a. increased risk in subsequent sibling

b. may be unilateral or bilateral

c. may be associated with other syndromes

d. some cases do not need therapy

e. teeth eruption may be affected

42. Branchial fistulas may be seen as a defect in the formation of the following structure(s):

a. 1st pharyngeal pouch

b. 2nd pharyngeal pouch

c. 3rd pharyngeal pouch

d. external pinna

e. ear lobe

Clinical Aspects - Nervous System Development

43. The incidence of neural tube defects can be decreased by:

a. use of folic acid by the pregnant woman

b. use of multivitamins(without folic acid) by the pregnant woman

c. avoiding insecticides

d. prenatal exercise

e. cesarean delivery

44. Hydrocephalus is caused by:

a. obstruction to the flow of cerebral spinal fluid

b. failure of reabsorption of cerebral spinal fluid

c. lack of prenatal vitamins

d. lack of prenatal care

e. vitamin C deficiency

45. Agenesis of the corpus callosum is associated with:

a. mental retardation

b. increased head circumference

c. seizure disorder

d. folic acid deficiency in the mother

e. cerebral palsy

(No credit) Pediatricans (compared with other specialties) (as requested by Dr. Berlin):

a. are the most emotionally stable

b. get the most satisfaction in their work

c. are the most challenged intellectually

d. are the least materialistic

e. are the most intelligent