Brown Medical School
The Integrated Final Exam

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Bio 280 Systemic Pathology
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Questions 1-48 (Case Vignettes)–Choose the one best answer

Case Vignette 1

A 57-year-old male presents complaining of erectile dysfunction. Over the past year he has gradually lost the ability to obtain erections. His medical history is significant for peripheral vascular disease, hypertension, coronary artery disease, and hyperlipidemia. He is in a stable married relationship to a former model who, by the patient's description, is as lovely now as she was when they were married 25 years ago.

1. **b** Counseling the patient you explain that

The attainment of a normal erection includes:

a. Contraction of smooth muscle cells inside the corpora cavernosa
b. Release of nitric oxide and increased levels of cGMP
c. Primarily sympathetic nerve input
d. Increased blood flow in and an increased blood flow out of the corpora cavernosa
e. Increased activity of PDE5

2. **D** After your evaluation you conclude:

a. Given his relatively young age of 57, he most likely has psychogenic erectile dysfunction
b. Testosterone replacement therapy will likely improve his erections
c. He likely has a subtle neurological deficit causing his erectile dysfunction
d. He will be a candidate for treatment that would increase the blood flow into his penis, such as a PDE5 inhibitor or intra-corporal PGE1
e. He is not a candidate for any treatment except the implantation of a penile prosthesis

Case Vignette 2

A 19-year-old female college freshman student is interested in initiating the use of the long-acting progestin-only contraceptive Depo-Provera. Review of her past medical history is unremarkable and her physical exam is normal. Her weight is 130 pounds and her height is 5'4".

In response to the patient's questions you explain that the:
3. Contraceptive effectiveness Depo-Provera is due to:

a. Suppression of ovulation
b. Thickening of cervical mucus
c. Alteration of the endometrial lining of the uterus
d. Inhibition of tubular ovum transport
e. All of the above

4. Which of the following is the most common side effect of Depo-Provera?

a. Weight loss
b. Pelvic inflammatory disease (PID)
c. Dysmenorrhea
d. Euphoric mood
e. Menstrual irregularities

5. Two months after the second shot she presents to your clinic with a request to stop her spotting/bleeding that has been going on for the past 12 days. She reports consistent condom use and her abdominal exam is normal. Her CBC shows: HGB 13.1 g/dL, hematocrit 37.5%. Urinary BHCG is negative.

The best approach will be to:

a. Prescribe vitamin C 500 mg QD for 10 days
b. Delay the administration of the third shot of Depo-Provera
c. Prescribe a short course of estrogen (such as Premarin 1.25 mg/d for 7 days)
d. Perform an endometrial biopsy
e. Explain that no treatment is available to stop her spotting/bleeding.

6. The patient's mother was not satisfied with your recommendation and took her daughter to the gynecologist that she herself had been seeing for 30 years. That gynecologist performed an endometrial biopsy.

The most likely report from pathology was:

a. Peak stromal edema
b. Hypersecretory endometrial glands with nuclear atypia (Arias-Stella reaction)
c. An endometrium with discordant glandular and stromal changes—the glands are small and lined by inactive epithelium whereas the stroma shows decidual changes
d. Subnuclear vacuoles containing glycogen, and pseudostratified nuclei
e. Long curving glands and edematous stroma with numerous mitotic figures
Case Vignette 3

A twenty-three year old woman comes in to see you on July 18, 2002. She tells you that her last menstrual period began on March 3, 2002 and that her menses generally occur every 28 days. She has had one previous pregnancy, which ended in a miscarriage at 8 weeks prior to the LMP.

7. What is her estimated date of confinement?
   a. December 3, 2002
   b. December 10, 2002
   d. January 30, 2003

8. On physical exam, where is the uterine fundus?
   a. Palpable on bimanual exam only
   b. Palpable just above the pubic symphysis on abdominal exam
   c. Palpable at the level of the umbilicus
   d. Palpable 5 cms above the umbilicus

9. In your office, you find that the patient is 5 feet 3 inches (160 cms) tall and weighs 110 pounds (50 kg). Calculate her body mass index in kg/m². According to the Institute of Medicine, how much weight gain would be appropriate during the pregnancy?
   a. 28-40 pounds
   b. 25-35 pounds
   c. 15-25 pounds
   d. at least 15 pounds

Case Vignette 4

A 25-year-old Asian-American woman presents to the office with a complaint of vaginal bleeding for 2 days, after not having a period for the past 2 1/2 months. Her menstrual cycles had been regular until 2 1/2 months ago. The nurse informs you that the patient’s serum hCG level is 120,000 mIU/ml.
10. □ All of the following are true regarding hCG except:
   a. Both the alpha and beta subunits are immunologically specific to hCG
   b. Plasma hCG reaches a maximum at about 10 weeks gestation
   c. Plasma hCG levels double every 2-3 days during the first trimester of pregnancy
   d. HCG has a weak thyrotropic activity
   e. HCG is synthesized by the syncytiotrophoblast of placenta

11. □ On physical exam the patient's pulse is 110 and her BP is 148/90. On pelvic examination there is blood in the cervical OS and grapelike vesicles in the vagina. Her HGB and HCT are normal. Pelvic ultrasound reveals a large uterus with a "snowstorm" pattern with no fetus present in the uterus.

   Your most likely diagnosis is:
   a. Ectopic pregnancy
   b. Pregnancy with uncontrolled essential hypertension
   c. Intrauterine infection
   d. Eclampsia
   e. Complete hydatiform mole

12. □ Your next step is:
   a. Admit the patient to the hospital for bed rest and antibiotic I.V.
   b. Start magnesium sulfate I.V.
   c. Admit the patient for immediate removal of the uterine content
   d. Since the HCT and HGB are normal the patient can be D/C home on a low salt diet and bed rest for a few days
   e. Repeat pelvic ultrasound in 2-3 days

13. □ Seven months later you meet the patient again during your clerkship in Internal Medicine. The patient was admitted because of severe headaches, dizziness, and blackouts for three days. She states that she was back to normal life until a few days ago. Head MRI reveals a space-occupying lesion. Repeat serum hCG is 130,000 mIU/mL. The most likely diagnosis:
   a. Brain tumor secreting hCG
   b. Brain hemorrhage secondary to uncontrolled essential hypertension
   c. Brain abscess
   d. Choriocarcinoma
Case Vignette 5

You are managing the labor of a 22-year-old gravida 2, para 1 woman at term. The fetal heart rate and uterine contraction pattern are being monitored externally. The patient is near the time of delivery, when the fetal heart rate begins to show decelerations that are not reassuring as to the fetal status.

14. You are concerned that the fetus may be hypoxemic. You decide to give the mother oxygen. Which of the following values are you trying to increase?

a. Maternal venous pH
b. Fetal umbilical artery pO₂
c. Fetal blood O₂ content
d. Fetal umbilical venous pO₂

15. The fetal umbilical venous pO₂ can be no higher than the maternal uterine venous pO₂ because placental gas exchange is governed by the principle of:

a. Countercurrent flow
b. Concurrent flow
c. Facilitated diffusion
d. Active transport

16. The baby is born, cries lustily. All of the following factors contribute to the closure of the ductus arteriosus shortly after birth except:

a. First breath of the neonate expands lungs and decreases pulmonary vascular resistance
b. Neonatal oxygen tension rises as respiration begins
c. Local release of prostaglandin E in ductus arteriosus in diminished
d. Foramen ovale closes in response to increased left atrial pressure

Case Vignette 6

A 35-year-old 10 week pregnant woman presents for prenatal screening.

17. All of the following can be ordered at this point of time except:

a. Maternal serum B-hCG
b. Maternal serum plasma protein-A
c. Ultrasound examination
d. Maternal serum α-fetoprotein
The patient's results were inconclusive and you decided to see her back at 16 weeks of gestation. The quadruple screen at this point shows:

AFP-0.6 MoM  
Urinary E₃-0.6 Mom  
HCG-1.9 Mom  
Inhibin A-25

18. [ ] The most likely diagnosis is:
   a. Turner syndrome  
   b. Anencephaly  
   c. Down syndrome  
   d. Klinefelter syndrome  
   e. Cri-du-chat syndrome

19. [ ] The woman decided to carry the pregnancy to term. On physical examination of the male infant you notice all of the following except:
   a. Epicanthal folds  
   b. Simian crease  
   c. Small tongue  
   d. Slanted palpebral fissures  
   e. Hypotonia

20. [ ] Which chromosome is affected in this disorder?
   a. X  
   b. 13  
   c. 18  
   d. 21  
   e. 5
Case Vignette 7

A 25-year-old woman at 34 weeks of gestation has had headaches for 2 days and is worried about pre-eclampsia. Her first pregnancy was complicated by pre-eclampsia. She did change her partner between the two pregnancies.

21. □ All of the following are true about the risk of pre-eclampsia during subsequent pregnancies except:
   a. Induced abortions have been reported to protect against pre-eclampsia in the next pregnancy
   b. The risk of recurrent pre-eclampsia may be decreased with the use of a low-dose aspirin during subsequent pregnancies
   c. The risk of recurrent pre-eclampsia in a future pregnancy is greater than 25%
   d. Pre-eclampsia can occur only in the first pregnancy
   ✔ There is an increased risk of recurrent pre-eclampsia in a woman who carries a pregnancy by a new father

22. □ Which of the following findings is not a characteristic of pre-eclampsia?
   ✔ Hypertension
   b. Nondependent edema of face and hand
   c. Right upper quadrant pain
   d. Proteinuria
   ❒ Petit mal seizures

23. Which of the following will best describe the changes in the uterine vessels observed in this figure?

   See separate slide for Question 23

   a. The walls of the vessel show granulomatous inflammation
   b. There are endothelial cell proliferations
   c. Fibroid necrosis of the vessel walls, subendothelial macrophages, and perivascular lymphocytic infiltrate
   d. Venous thrombosis
   e. None of the above
24. JC, a 24-year-old G1P0 presents to triage with contractions every 2 minutes for the last 3 hours. Her cervical exam reveals: dilation of 6 cm, effacement of 100%, 0 station and the fetal head is in the occiput anterior position. Her membranes are intact (Her membranes are not ruptured). Two hours later, her exam is 7cm dilated, 100% effaced and 0 station. What labor abnormality is present and what is an acceptable therapy?

a. Prolonged latent phase; Therapeutic rest (administer 15 mg of morphine sulfate subcutaneously)

b. Primary dysfunctional labor; amniotomy and intravenous oxytocin administration

c. Secondary arrest of labor; Cesarean section

d. Combined disorder; amniotomy and intravenous oxytocin administration

25. The same patient presents to labor and delivery and the tracing below is noted. This fetal heart tracing is most accurately described as:

- Normal baseline, moderate variability, accelerations present, early decelerations
- Tachycardia, minimal variability, accelerations absent, variable decelerations
- Normal baseline, minimal variability, accelerations absent, early decelerations
- Normal baseline, minimal variability, accelerations absent, late decelerations
Case Vignette 9

26. A 16 year old girl comes to the office requesting information about contraception. She has had two partners in 5 months--this is her second and they have been together 3 months. She has intercourse at different locations--sometimes at his house, sometimes at hers. She is currently using condoms, but is not sure if her partner will continue to use that method. She is on the fourth day of her menstrual period and her pregnancy test is negative. You tell her that:

(a) She cannot start birth control pills without a complete exam including a pelvic exam
b. Because she smokes cigarettes, she cannot use Depo-Provera
c. She is a good candidate for the diaphragm
d. She can receive the birth control shot (Depo-Provera or Lunelle) or apply the first patch (Ortho-Evra) at the clinic today
e. The fourth day of the period is too late for initiation of hormonal contraception

27. If she chooses the oral contraceptive method, she should be aware that:

(a) She is likely to experience more dysmenorrhea symptoms
b. The current oral contraceptives are not recommended for girls under age 18
c. Most women have irregular periods on the combination oral contraceptives
d. Combination oral contraceptives all contain ethinyl estradiol and levonorgestrel
e. Women with a history of thromboses should not use the combination (estrogen & progestin) oral contraceptives

28. She was also wondering about the new IUD. You tell her that:

(a) The IUD always causes irregular periods
b. She is an excellent candidate for the IUD since she is young
c. The IUD creates a spermicidal intrauterine environment
d. All IUD's are removed and reinserted annually
e. The new intrauterine system Mirena releases both ethinyl estradiol and levonorgestrel into the uterine cavity and is effective for up to 5 years
29. She starts the contraceptive patch and uses it faithfully for one month. She forgets to use it again the next month. On a Tuesday, ten days after her period, she has sex but doesn't use a condom. She calls the office frantic the next day saying that she might get pregnant. The following statement is true:

a. It is too late for postcoital contraception  
B. She should put on two patches for the next 24 hours  
c. You can call in postcoital contraception with Plan B which she would begin on Sunday  
d. If she uses postcoital contraception with Preven, she is likely to have nausea  
c. Plan B consists of levonorgestrel and ethinyl estradiol

Case Vignette 10

30. A 24-year-old G0 married woman calls the office. Her period is 2 days late. You tell her that:

a. It is too early to get a pregnancy test; she has to wait until at least 5 days after her missed menses  
b. A urine pregnancy test will take 30 minutes to get results  
c. Her blood can be tested for the presence of progesterone to see if she is pregnant  
d. A serum human chorionic gonadotropin level may be useful

31. She calls the office 1 week later and tells you she is spotting. She is now 5 weeks and 2 days from her last menstrual period.

a. You are reassured about the pregnancy health when you repeat the pregnancy test and find out that the BHCG value has doubled every 2 days  
b. You draw a serum human placental lactogen level to assess the pregnancy health  
c. You order an ultrasound to assess for fetal anomalies  
d. You tell her to go on bed rest

32. One week later she finally presents for her first complete prenatal visit. The spotting has stopped and she feels well. Her exam is normal. She has a question about the human placental lactogen (hPL).

All of the following are true regarding hPL EXCEPT:

a. hPL is synthesized in syncytiotrophoblast of placenta  
b. Level correlates well with placental mass  
c. Presents in maternal serum as early as six seeks after the last menstrual period  
d. Amniotic fluid levels are higher than maternal plasma levels  
e. Has an anti-insulin effect
33. Her next pregnancy at age 27 is much more uneventful. She does deliver, however, at 42 weeks. The male infant has unusual skin. You wonder if there might have been a problem such as:

a. High alpha-fetoprotein levels  
b. Trisomy 21  
c. Low serum estriol levels due to sulfatase deficiency  
d. Progesterone excess production

Case Vignette 11

A 23-year old recently married G2P0 woman presents to your office for counseling. She had an uneventful termination by suction curettage at age 19. She is currently 8 weeks pregnant by last menstrual period. She has heard a lot of information through her friends and by researching via the Internet and would like your opinion. She also has guilt concerning her prior termination. This pregnancy was conceived despite being on the birth control pill.

34. In an attempt to give the patient general information concerning unplanned pregnancies you state the following:

a. 10% of all pregnancies in the United States are unplanned  
b. 25% of all pregnancies in the United States are unplanned  
c. 50% of all pregnancies in the United States are unplanned  
d. 75% of all pregnancies in the United States are unplanned  
e. 90% of all pregnancies in the United States are unplanned

35. You counsel the patient about any increased risk associated with her prior termination as follows:

a. Terminations are a relatively common cause of infertility, but since she is pregnant this is part of her past history and is no longer an issue  
b. Terminations are a relatively common cause of cervical incompetence (loosening of the cervix) and she needs extra attention to prevent premature delivery  
c. An appropriately and carefully performed termination should increase neither her risk of infertility nor the risk of a miscarriage  
d. Answers a and b  
e. None of the above
36. In counseling the patient concerning her risk of miscarriage you state the following:

a. Roughly 50% of pregnancies are likely to miscarry
b. Roughly 20% of pregnancies are likely to miscarry
c. Her risk of miscarriage is not affected by her age
d. If she does miscarry, this is statistically most likely be due to a hormonal issue
e. If a fetal heart is seen on ultrasound at this time it does not decrease her risk of miscarriage
   although it may suggest a lower chance of any chromosomal anomaly

37. During an examination later in the pregnancy you find that the patient's cervix is
   somewhat loose and suggestive of potential cervical incompetence. You counsel the patient that:

a. This is something that should be observed with no intervention
b. An amniocentesis is the best diagnostic tool for this
c. A cerclage (cervical stitch) is the best treatment
d. Hormonal therapy can be utilized for this
e. None of the above

Case Vignette 12

A 19-year old woman presents to you on oral contraceptives. She questions how this impacts
on her menstrual cycle.

38. You state that oral contraceptive's mechanism for the prevention of ovulation is:

a. Positive feedback on her hormones
b. Negative feedback on her hormones
c. Interference at the level of her hormone receptors
d. Down regulation of GnRH
e. Embryotoxic
39. The high levels of systemic estrogen achieved from the birth control pill act differently from the CYCLICAL high level of estrogen in a "normal" cycle. The high levels of estrogen in a patient not on OCP's cause:

a. A LH surge when the high levels are sustained  
b. An increase in their own (estrogen) receptors  
c. An increase in the numbers of LH receptors  
  d. A and B  
  e. B and C

40. In evaluating the patient which of the following would you find if you check her FSH and LH levels:

a. Gonadotropins (FSH and LH) levels similar to what is seen in a patient with hypergonadotropic hypogonadotropism  
  b. Gonadotropins (FSH and LH) levels similar to what is seen in a patient with hypogonadotropism  
  c. Gonadotropins (FSH and LH) levels similar to what is seen in a patient on Clomiphene citrate.  
  d. Normal fluctuating levels of FSH and LH

Case Vignette 13

A 27-year old woman presents complaining of two years of infertility during which time she has conceived once and subsequently miscarried.

41. From the prospective of making eggs and sperm you counsel her that:

a. Her husband started making sperm with puberty  
  b. She started making eggs with puberty  
  c. She should never stop making eggs as long as she is healthy  
  d. A sperm takes approximately 2 to 4 weeks from the time spermatogenesis begins until it is viable  
  e. An egg can last for one week following ovulation

42. The patient's cervix performs the following roles during gametogenesis and fertilization:

a. It prevents morphologically abnormal sperm from entering the uterus  
  b. It makes mucus that allows sperm to survive longer  
  c. It is the site for fertilization  
  d. Is a source of nutrients for the egg  
  e. Is a source of hormones to stimulate ovulation
43. Which of the following is NOT true about events surrounding the penetration of the egg by the sperm?

a. With fertilization, the cortical reaction takes place, preventing the fertilization by more than one sperm
b. The sperm are aided in passing through the cells surrounding the egg by the enzyme hyaluronidase
c. Upon completion of fertilization the first polar body is ejected
d. The number of pronuclei relate to the bundles of male and female DNA

44. Which of the following is true about the role of the fallopian tubes in reproduction?

a. The fallopian tube provides nutrients to facilitate the egg’s movement into the uterine cavity where it is fertilized
b. The fallopian tube, when abnormal (as with prior exposure to Chlamydia), starts having contractions which prevent the normal transport of the egg
c. The fimbrias of the fallopian tubes are critical for the pick up of the egg
d. The fallopian tube provides a place where the sperm can survive for up to 72 hours
e. The fallopian tube is critical for sperm capacitation

Case Vignette 14

During your first encounter with a mom and her first full term born male infant the mother is very excited about her son being able to recognize her voice and smell and about the fact that he sometimes imitates a surprised expression

45. What is the youngest age at which all of these skills have been tested and found to be present?

a. 1 week old
b. 1 month old
c. 2 month old
d. 3 month old
e. 4 month old
During your second encounter with the family the infant smiles responsively, laughs, follows object 180 degrees, coos responsively, and rolls prone to supine.

46. How old is he most likely to be?
   a. 2 week old  
   b. 1 month old  
   c. 2 month old  
   d. 3 month old  
   e. 4 month old  
   [ ] 4 month old

During your third encounter the child babbles, transfers objects hand to hand, and sits with support.

47. The child’s age now is most likely:
   a. 2 month old  
   b. 3 month old  
   c. 4 month old  
   d. 5 month old  
   e. 6 month old  
   [ ] 6 month old

The family was out of town for a few months and is glad to return to your service. The child now holds a cup and drinks from it. The mom enjoys seeing you play ball with her son.

48. The child’s age is most likely:
   a. 6 month old  
   b. 9 month old  
   c. 10 month old  
   d. 12 month old  
   e. 15 month old  

Questions 49-65 choose the one best answer

49. Normal ejaculation includes all of the following except:
   a. Sympathetic nerve input  
   b. Contraction of the smooth muscle of the vas deferens, seminal vesicles, and prostate  
   c. Opening of the bladder neck  
   d. Expulsion of seminal fluid out of the urethra  
   e. Rhythmic contraction of the external sphincter
50. A 65-year-old male presents to you with complaints of sexual dysfunction. He explains that he is not obtaining erections as quickly as he used to, and it seems to take more physical contact to obtain and maintain his erections. After you finish your evaluation, you explain to the patient that:

a. His symptoms suggest a severe defect in arterial inflow to the penis
b. Many of these symptoms are normal in the aging male
c. He would best be treated with a penile prosthesis
d. Erectile dysfunction is an inevitable result of aging that responds poorly to most treatments
e. Testosterone deficiency is most likely the cause of his symptoms

51. A 25-year-old male presents for an infertility evaluation. You perform a most thorough evaluation. His physical exam is normal, the semen analysis reveals very low volume, azoospermia (no sperm seen) with a seminal pH of 6.0 (acidic). FSH and LH are normal. You conclude his infertility is most likely due to:

a. Obstruction of the ejaculatory ducts
b. Hypogonadotropic hypogonadism (Kallman's Syndrome)
c. Sertoli Only Syndrome
d. Obstruction of the epididymis (bilaterally)
e. Excess inhibin production

52. Spermiogenesis does not include:

a. Acrosome formation
b. Nuclear elongation and DNA condensation
c. Flagella formation
d. Loss of excess cytoplasm
e. Reduction from diploid to haploid status (second mitotic division)

53. An 18-year-old female comes to the College Health Services with concern that she has not had a period for two months. She indicates that she has had unprotected intercourse for the six months prior to the present visit with the last episode of intercourse five weeks ago. Physical examination including pelvic is normal; a highly sensitive urinary BHCG is normal. The most appropriate next step would be:

a. Start her on oral contraception with a return appointment in three months
b. Draw serum LH, FSH, and prolactin levels with a return appointment in one month
c. Discuss the advisability for barrier contraception and schedule a follow-up appointment in one month or within her next menstrual period whichever comes first
d. Schedule for HEAD CT scan immediately
e. Draw serum for HCG level and schedule return in 3-4 days
54. _____ A true statement about the sequence of development of secondary sexual characteristics in boys is:

a. Maximum height has been reached when pubic hair extends onto the thighs
b. Peak height velocity occurs at the start of testicular enlargement (Tanner 2)
c. Testicular enlargement (>3 ml volume >2.5 cm length) is the earliest sign of pubertal development in boys
d. Pubic hair development is usually the first sign of puberty
e. Scrotal darkening occurs before testicular enlargement

55. _____ The endometrium in dysfunctional uterine bleeding shows features of

a. Secretory phase
b. Proliferative phase
c. Early secretory phase
d. Menstrual phase
e. None of the above

56. _____ Anovulatory cycle is characterized by

a. Persistent high level of progesterone in blood
b. Low level of estrogen in blood
c. Persistent high level of estrogen in blood
d. High level of estrogen and progesterone in blood
e. Low level of estrogen and progesterone in blood

57. _____ The endometrium is most suitably prepared for the implantation of the fertilized ovum on days

a. 16 - 17
b. 23 - 24
c. 25 - 26
d. 14 - 15
e. 21 - 22
58. The endometrium at interval phase of the menstrual cycle shows the following characteristics:
   a. Regular subnuclear vacuoles
   b. Marked stromal edema
   c. Decidualized stromal cell
   d. Scattered subnuclear vacuoles
   e. Saw-tooth type endometrial glands

59. A mother of a 5-year old Caucasian girl is concerned about enlargement of her daughter's breasts. Which of the following will be indicative of precocious puberty?
   a. Her height linear curve has changed from the \textit{50}th to the \textit{70}th percentile
   b. Genitalia changes (such as redness and secretions)
   c. Bone age of 8 years
   d. Bone age of 5 years
   e. a, b, \& c

60. A 3200-gram female infant was delivered at 10\:00 PM. At 10\:11 the baby was crying with good respiratory effort and perfect muscle tone. Heart rate was 110 (compared with 160 on fetal monitoring at 9\:40 PM). The baby's color was pink except the extremities, which were blue. Suction of nasal secretions resulted in sneezing. You inform the mother that her daughter's Apgar score at 1 minute was:
   a. 6
   b. 7
   c. 8
   d. 9
   e. 10

61. A 15 year-old girl with regular menstrual periods complains of severe cramps and occasional vomiting during the first 2 days of her period. All of the following are correct regarding dysmenorrhea except:
   a. Dysmenorrhea symptoms are caused by prostaglandins and leukotrienes.
   b. Most girls will experience cramps and other menstruation associated symptoms at menarche.
   c. Girls that attain menarche earlier will experience dysmenorrhea symptoms earlier.
   d. Girls with heavy menstrual bleeding have more severe dysmenorrhea symptoms
   e. NSAIDs and OCPs may alleviate dysmenorrhea symptoms.
62. _____ An individual who suffers from moderate mental retardation can be expected to have, as an adult, a mental age of approximately

a. 12-13 years of age  
b. 10-11 years of age  
c. 7-8 years of age  
d. 5-6 years of age  
e. 4-5 years of age

63. _____ Which of the following regarding fetal ultrasonography is true?

a. Fetal growth can be assessed as early as 6-8 weeks  
b. Crown-rump length is used to assess gestational age during the first trimester  
c. Biparietal diameter is used to assess gestational age in the second trimester  
d. Measurements of abdominal circumference and femur length can assess the gestational age at term  
e. All of the above

64. _____ All the following regarding antepartum non stress test (NST) are true except:

a. A reactive (normal) NST demonstrates 2 fetal heart rate accelerations of at least 15 beats/minute lasting 15 seconds  
b. A non reactive NST requires further assessment with a test such as the contraction stress test  
c. The NST has low false-negative rates and high false-positive rates.  
d. The NST is contraindicated in a woman with a prior uterine scar from a classic C-section

65. _____ All of the following are considered risk factors for abruption placenta except:

a. Maternal hypertension  
b. Advanced maternal age  
c. Substance abuse  
d. First pregnancy  
e. Vascular disease

66. _____ Which of the following is not a uterine relaxant?

a. Terbutaline  
b. Nifedipine  
c. Indomethacin  
d. Oxytocin  
e. Magnesium sulfate
Questions 67-69 - Please match the following regarding fetal heart tracing

67. C  Cord compression

68. C  Placental insufficiency and fetal hypoxemia

69. F  Fetal head compression
Questions 70-80

True (A) or False (B)

70. T(A) / F(B) Phosphatidyl glycerol is the first-appearing surfactant component

71. T(A) / F(B) Primary amenorrhea in Turner syndrome is associated with increased FSH levels

72. T(A) / F(B) Oxygenated blood is carried to the fetus by the umbilical vein

73. T(A) / F(B) The finding of a retroplacental hematoma on the maternal surface of the placenta is indicative of placental abruption

74. T(A) / F(B) Fetal hemoglobin has a lower O2 affinity than adult hemoglobin

75. T(A) / F(B) The risk of fetal loss with percutaneous umbilical blood sampling is lower than the risk with amniocentesis

76. T(A) / F(B) The relation of the fetal head to the ischial spines of the female pelvis during labor is known as station

77. T(A) / F(B) A bluish discoloration of the vagina and cervix is one of the signs of early pregnancy

78. T(A) / F(B) Infertility work up for both the female and her male partner is recommended in the event of inability to conceive after 6 months of unprotected intercourse

79. T(A) / F(B) All pregnant women are screened for diabetes between 8 and 12 weeks of gestation

80. T(A) / F(B) The volume of urine required to excrete a given solute load by the neonate is greater than that required by the older child or adult
Questions 81-83 Multiple Choice (Pick the single best answer):

81. Which of the following statements are true regarding atrial septal defect (ASD)?
   
   A. ASD is a malformation characterized by incomplete septation
   B. Atrial septation is completed in the 19th week of pregnancy (gestational age)
   C. The causation of ASD is thought to be multifactorial
   D. All of the above are true
   E. A and C are true

82. Which of the following are features of the oligohydramnios sequence (Potter sequence)?
   
   A. Amnion nodosa
   B. A characteristic facies
   C. Talipes equinovarus (clubfoot)
   D. Amniotic tears
   E. A, B, and C

83. Embryonal tumors (blastomas) can originate in which of the following tissues? (Check one only)
   
   __ Kidney
   __ Cerebellum
   __ Adrenal gland
   __ Liver
   __ All of the above
Questions 84-89 Matching: Select the single best answer:

Match the following statement with an embryo (A), a fetus (B) or both (C)?

84. A The developing product of conception prior to 8 weeks developmental age
85. C Brain development including neuronal migration
86. A Failure to complete closure of the neural tube results in myelomeningocele
87. C Nephrons are formed
88. C Deformations can result from mechanical forces
89. C The first heart beat

Questions 90-95 must be answered on the separate answer sheet!!!!!!!

Match each of the following with A) Turner syndrome, B) trisomy 18, C) trisomy 21, D) trisomy 13, E) triploidy, or F) paternal chromosomes only? Give the single best answer, recognizing that there can be overlap of phenotypic features.

90. C AV communis (endocardial cushion defect)
91. C Cleft lip and palate
92. C Partial hydatidiform mole
93. C Intrauterine growth retardation
94. C Complete hydatidiform mole
95. C Nuchal cystic hygroma and/or hydrops fetales
Questions 96-100 True or False:

Indicate whether True (A) or False (B) regarding pediatric tumors.

96. ___ Patients with familial retinoblastomas are at increased risk for developing sarcomas later in life

97. ___ The three basic elements of nephroblastomas are blastema, stroma, and mesothelium

98. ___ Serum tumor markers can be helpful in the diagnosis of neuroblastoma and are of even greater help in postoperative follow up

99. ___ The only possible sites of origin of neuroblastomas are below the diaphragm

100. ___ Anaplasia is a sign of poor prognosis in Wilms’ tumor

Questions 101-103

• The three questions below refer to the specimen photographed below:
101. The gross pathology demonstrated in this specimen is:
   A) Cirrhosis of the liver
   B) Hydropic villi in a complete hydatidiform mole
   C) Warts
   D) Herpes simplex sores on the cervix

102. Which of the two histologic photos shown below is consistent with the gross specimen?
103. The histologic change that allows you to distinguish a complete from a partial mole is all EXCEPT:
   A) presence of fetal parts
   B) edematous villi
   C) some normal villi
   D) fetal vessels in the villi
   E) extensive hyperplasia of cytotrophoblasts

Questions 104-108 True (A) or False (B)

104. ____ The image above is a fluorescence method to identify chromosomal abnormalities

105. ____ The three bright dots indicate that this patient is triploid

106. ____ This technique can be used to identify translocations from one chromosome to another

107. ____ Three triploid states that are compatible with life are 21, 18 and 4.

108. ____ If the triploid chromosome were 21, the newborn should be examined for cardiac anomalies

109. C.W., a 68-year-old male Parkinson's patient, is suffering from hallucinations as a result of his L-DOPA therapy. Indicate which of the drugs below would be the most appropriate to use to reduce the hallucinations.

A. Carbidopa
B. Haloperidol
C. Tolcapone
D. Clozapine
E. Benztropine
110. All of the following statements concerning pramipexole are correct EXCEPT:

A. It is a dopamine D2 receptor agonist
B. Following peripheral administration it gains access to the central nervous system
C. It is free of hallucinatory side effects
D. It doesn't need dopa decarboxylase activity to produce an active drug
E. It can produce nausea

111. Donepezil (Aricept) is used in the treatment of Alzheimer’s disease because of its ability to:

A. Inhibit dopamine reuptake
B. Stimulate acetylcholine synthesis
C. Inhibit monoamine oxidase activity
D. Inhibit COMT activity
E. Inhibit acetylcholinesterase activity

112. All of the following statements concerning deprenyl (selegiline) are correct EXCEPT:

A. When used in the treatment of Parkinson's disease it should not be combined with L-DOPA therapy
B. In primates, it protects against MPTP-induced dopamine neuron toxicity in the CNS
C. At moderate doses, it can avoid producing the tyramine-induced wine and cheese effect
D. It is more selective for inhibiting MAO_B compared to MAO_A
E. It will lower the concentration of HVA in the CSF

113. Indicate which of the following statements concerning carbidopa are CORRECT.

A. Following peripheral administration it gains access to the CNS
B. It reduces L-DOPA-induced cardiac stimulation
C. It reduces L-DOPA-induced hypotension
D. A and B
E. B and C
114. All of the following are drug therapies used in the treatment of Parkinson's disease EXCEPT:

A. A combination of L-DOPA + carbidopa  
B. L-Tyrosine  
C. Amantadine  
D. Trihexyphenidyl  
E. Ropinirole

115. Memantine is a drug being tested in the United States as a possible therapy for Alzheimer's disease. In the brain, this drug can act as:

A. A monoamine oxidase inhibitor  
B. A muscarinic receptor antagonist  
C. A NMDA receptor partial agonist  
D. A GABA receptor antagonist  
E. An acetylcholine reuptake inhibitor

116. Indicate which of the following statements concerning St. John's Wort are CORRECT:

A. In order to be put on the market, this agent had to obtain FDA approval with regard to safety and efficacy  
B. It's major usage is as a treatment of mild to moderate depression  
C. It can increase the metabolism of other drugs because of its induction of metabolizing enzymes in the cytochrome P450 system  
D. A and B  
E. B and C

117. Indicate which of the following statements concerning SAM-e (S-adenosylmethionine) are CORRECT:

A. It can produce mania in patients with manic-depressive disorder  
B. It serves as a methyl donor in biochemical reactions  
C. It inhibits the conversion of norepinephrine to epinephrine  
D. A and B  
E. B and C
118. All of the following statements concerning Echinacea are correct EXCEPT:

A. It contains high molecular weight polysaccharides
B. It is beneficial in the treatment of systemic lupus erythematosus (SLE)
C. One of its major usages is for influenza-like upper respiratory infections
D. It contains flavonoids
E. It can produce an allergic hypersensitivity reaction

119. Indicate which of the following statements concerning Ginkgo Biloba are CORRECT:

A. It has antioxidant action against free radicals
B. It is a stimulator of platelet aggregation
C. It is contraindicated for asthmatic patients
D. A and B
E. B and C

120. Indicate which of the following statements concerning glucosamine are CORRECT:

A. It sensitizes cell membranes to insulin-induced glucose uptake
B. It improves the symptoms of patients with osteoarthritis of the knee
C. It increases the formation of hyaluronic acid
D. A and B
E. B and C

121. Sulfonamide antibiotics (such as sulfamethoxazole) should not be given to newborns and infants less than 2 months of age, nor to pregnant women at term because:

A. It will form a toxic metabolite that newborns cannot excrete
B. It is mutagenic
C. It displaces bilirubin from plasma protein binding
D. It is nephrotoxic in newborns
E. It inhibits glucose uptake into the CNS of newborns
122. For which effect on the fetus is dexamethasone most commonly given to pregnant mothers?

A. To stimulate the fetal immune system
B. To induce fetal liver metabolic enzymes
C. To stimulate the fetal heart
D. To stimulate fetal production of lung surfactant
E. To inhibit fetal bilirubin formation

123. Indicate which of the following statements concerning alterations that occur in the elderly compared to young adult are CORRECT:

A. A decrease in % body fat for elderly men
B. A decrease in plasma albumin acidic drug binding
C. An increase in glomerular filtration rate
D. A and B
E. A, B and C

124. Indicate which of the following statements concerning anti-cholinergic drug toxicity in the elderly are CORRECT:

A. It can be produced by diphenhydramine (Benadryl)
B. A CNS symptom is increased forgetfulness
C. An autonomic symptom is diarrhea
D. A and B
E. A, B and C

125. Indicate which of the following is the most common side effect of birth control pills that contain an estrogen-related component:

A. Thromboembolism
B. Endometrial cancer
C. Ovarian cancer
D. Migraine headaches
E. Hypotension
126. Indicate which of the following statements concerning the "morning-after" pill are CORRECT:

A. It is greater than 95% effective in preventing pregnancy following unprotected intercourse during the 2nd or 3rd week of the menstrual cycle
B. It can be a pill containing a progestin + an estrogen
C. It can be a pill containing a progestin alone
D. A and B
E. B and C

127. Indicate which of the following statements concerning raloxifene (Evista) are CORRECT:

A. It is used for treatment of metastatic breast cancer in post-menopausal women with estrogen receptor positive tumors
B. It is used in women in combination with a progestin as a birth control pill
C. It is used in women to prevent or minimize osteoporosis
D. A and B
E. B and C

128. Indicate which of the following statements concerning birth control pills are CORRECT:

A. The hormone levels in the pills being used today are greater than the hormone levels used in the first birth control pills introduced around 1960
B. A major mechanism of action is via inhibition of ovulation
C. Most birth control pills being used today contain a combination of an estrogen and a progestin
D. A and B
E. B and C

129. Side effects that might be anticipated in treating an Alzheimer's patient with rivastigmine (Exelon):

A. Dry mouth
B. Constipation
C. Lacrimation (teary eyes)
D. A and B
E. B and C
130. Indicate which of the following statements concerning tolcapone are CORRECT:

A. It is a COMT enzyme inhibitor
B. It can help reduce the “on/off” phenomenon observed with L-DOPA treatment in Parkinson’s patients
C. It is a MAO enzyme inhibitor
D. A and B
E. B and C

131. Recommended route of administration for newborns requiring drug treatment:

A. Oral
B. Intravenous
C. Rectal
D. Subcutaneous
E. Gastric tube for administration directly into the stomach

132. J.R. is a 75-year-old female who is prescribed the antibiotic gentamicin, a drug which is eliminated primarily via the kidney. J.R.’s creatinine clearance rate is found to be 40 ml/min, about 40% of the standard normal value. Assuming the volume of distribution (V_d) for this drug is not altered from the standard value, indicate which of the following match-ups are CORRECT:

A. Gentamicin will have a shorter half-life in J.R. than the standard value: J.R. should take a higher dose than standard at the standard dosing interval
B. Gentamicin will have a shorter half-life in J.R. than the standard value: J.R. should take a lower dose than standard at the standard dosing interval
C. Gentamicin will have the standard half-life in J.R.: J.R. should take the standard dose at the standard dosing interval
D. Gentamicin will have a longer half-life in J.R. than the standard value: J.R. should take a higher dose than standard at the standard dosing interval
E. Gentamicin will have a longer half-life in J.R. than the standard value: J.R. should take a lower dose than standard at the standard dosing interval
133. All of the following statements concerning drugs and breast-feeding are correct EXCEPT:

A. The only way for drugs to pass into breast milk from the mother’s circulation is via diffusion
B. The intake of methotrexate by the mother is contraindicated
C. One way to reduce drug transfer from mother to infant is for the mother to carry out breast-feeding just before the mother’s intake of the drug
D. The intake of lithium by the mother is contraindicated
E. Breast-feeding should be suspended if the mother is going to be given iodine-131 isotope as part of a diagnostic procedure
Infectious disease and Female Reproduction, BI280
E.L. Bearer, MD/PhD

Infectious disease and Female Reproduction, (100 pts total, 20% of Pathology Grade)

Multiple Choice Questions: Select the letter corresponding to the single best answer.
(5 pts each question)

1. Risk factors that involved in cervical cancer include all of the following EXCEPT:
   a) multiple sexual partners
   b) early sexual activity
   c) infection with human papilloma virus serotype 16/18/31/33
   d) infection with human papilloma virus 6/11/42/44
   e) high parity

2. Cervical squamous metaplasia is a condition in which:
   a) new immature epithelium is transformed from glandular to squamous
   b) squamous epithelium is transformed to glandular epithelium
   c) the squamocolumnar junction moves down out of the cervical canal
   d) the squamous cells turn pinker than usual

3. A 36 yr old married woman with no other sexual partners presents with CIN III on Pap smear. Her biopsy would look like:

   A
   B
   C
   D

4. The following statements are true EXCEPT:
   a) Low grade CIN usually does not progress to cancer
   b) peak incidence of high grade CIN is 30 yr old
   c) invasive cervical cancer often involves the ureters
   d) CIN II always progress to cancer
   e) HPV also infects the glandular epithelium and can cause adenocarcinoma

Exam Score

Extra Credit

Total
5. A 45 yr old woman complains of hot flashes, sleep disturbance and depression. She has noticed some spotting and irregular bleeding. An endometrial biopsy would most likely look like: 

6. Which of the images in #5 above might be seen in a woman with an ovarian tumor of the theca-fibroma type? 

7. The most common condition affecting the function of the Fallopian tubes is:
   a) granulomatous salpingitis caused by tuberculosis 
   b) acute suppurative salpingitis 
   c) Hydatid of Morgagni 
   d) ectopic pregnancy 
   e) endometriosis 

8. List two ovarian conditions correlated with hirsutism (each blank 1/2 pt)
   a) polycystic ovarian disease
   b) Sertoli-Leydig cell tumor (sex-cord tumor)

9-12. A 15 yr old boy presents to you with a 4 day history of high fever, severe headache and rash. He has been traveling in the Middle East. His parents are missionaries and he has not been vaccinated.

9. Your differential diagnosis include all of the following EXCEPT:
   a) chicken pox 
   b) measles 
   c) small pox 
   d) mumps 
   e) meningitis with Neisseria meningitidis 

10. Important signs to notice on his INITIAL physical exam include all EXCEPT:
    a) distribution of the rash—palms, soles, mouth 
    b) whether his finger nails are clean 
    c) rectal exam for blood in the stool
d) nucal rigidity
e) spinal tap with culture

11. His mother is pregnant. Is there a risk of malformation of the fetus if she catches this infection from him?
a) yes
b) no

12. On closer inspection, the rash is most likely to look like:
a) dew drop on a rose
b) shotty and hard with a red rim and a central indentation,
\(\square\) small petechial hemorrhages
d) flat warts
e) Blotchy, reddish-brown rash caused by a hypersensitivity reaction to virus antigens in the skin

13. The most common ovarian tumor is:
a) epithelial arising from the cells that line the surface of the ovary
b) metastatic from the kidney
c) germ cell tumors, particularly teratomas
d) Sertoli-Leydig cell tumors because of their androgen secretion
e) endometriod, resembling the Fallopian tube epithelium

14. Microinvasion in breast cancer is associated with:
\(\square\) a) significant increased risk of metastatic disease
b) lymph node metastasis
c) a common feature of all comedo intraductal carcinoma
d) not important in determining prognosis

15. Fibrocystic disease is all EXCEPT:
a) common benign change in breast tissue
b) decrease in fat and increase in fibroplastic tissue in the breast
\(\square\) associated with HPV infection
d) increases the risk of undetected breast cancer because the breast tissue becomes dense and difficult to examine.

16. Put the following events in order of occurrence by assigning them numbers (you must have the complete sequence correct to receive any credit, 5 pt):

1. exposure to infection agent
2. infectious agent gets past the normal barriers and enters the body
3. infected cells die
4. fever and other symptoms begin
5. microbial replication
6. immune response initiated
7. death
8. leukocytes increase in the blood
17. Name 3 of the 4 pathogens from the TORCH group that cause fetal malformations and death in utero (you must get all three right to get credit, 5 pt):

- Rubella
- CMV
- Toxoplasma gondii

18. BRCA1 is associated with ____________ type of ovarian cancer (5 pt).

19. Of those women with ovarian cancer, only approximately __________% carry the BRCA1 gene mutation. In these women, onset of disease is most often between the ages of __________ and __________ (5 pt total)

20. Another cancer associated with BRCA1 is ____________ cancer (5 pt).

EXTRA CREDIT (5 pts):

19. In Q 9-12,
Which disease is most likely? ____________ (+5 pt)

If the rash is shotty and hard, what is your next step? ____________ (+5 pt)

20. What are the three things a sick person most wants to know when they go to you, a doctor? (+5 pts)

- What is making them sick
- When they will get better
- What they need to take to get better
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