Brown Medical School
The Integrated Final Exam

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Questions 1-76 (Case Vignettes)—Choose the one best answer

Case Vignette 1

You have proudly obtained your Brown Medical School degree, and, after a few more years, have finished residency. Your first patient is a 30 year old male complaining of erectile dysfunction. The patient’s history is significant for injuring his perineum by falling on a fence. He was told that his pudendal arteries were permanently injured.

1. ___ You explain to the patient that
   a. The pudendal arteries supply the corpora but not the urethra or glans.
   b. The pudendal arteries supply the corpora, urethra, and glans.
   c. With pudendal arterial injuries, ejaculation can not occur.
   d. His erectile dysfunction is probably psychogenic, because the arterial supply to the penis does not involve the pudendal arteries.
   e. He should obtain psychogenic erections since these do not depend on the pudendal arteries.

2. ___ The patient has big plans for his trip to Cancun next month. He wants to know about normal male sexual function. Which of the following is correct?
   a. Normal erections require increased arterial inflow into the corpora that continues at high rate throughout the erection.
   b. Neurotransmitters have a role only in detumescence.
   c. The attainment of an erection requires constriction of the penile arteries and sinusoids.
   d. Cyclic GMP is not normally required during the erectile process.
   e. Nitric Oxide is required for normal erections.

3. ___ After a thorough evaluation, you decide to treat the patient. To attain a physiologic erection your treatment must
   a. Decrease blood flow out of the corpora cavernosa while increasing blood flow into the corpora.
   b. Decrease arterial flow into, and decrease venous flow out of the corpora cavernosa.
   c. Cause contraction of the vas deferens and seminal vesicles.
   d. Cause contraction of skeletal muscles around the corpora cavernosa.
   e. Close the bladder neck.
4. ___ The patient fails oral pharmacotherapy. After a discussion of the options, you elect to try intra-corporal injection therapy. This approach depends on
   a. The inhibition of phosphodiesterase type 5.
   b. Normal functioning of the parasympathetic nervous system.
   c. Normal penile sensation.
   d. Relaxation of intra-corporal smooth muscles.
   e. Contraction of smooth muscles in the venous outflow.

Your second patient that day is a 75 year old male complaining of erection problems. He is married and has had erectile dysfunction for 5 years. His medical history is significant for hypertension, coronary artery disease, and smoking. His physical exam reveals normal sized testes and a normal male pattern of androgenization.

5. ___ You explain that as men age the following are true except:
   a. It takes longer to obtain erections.
   b. More direct stimulation to the penis is required to induce an erection.
   c. Men require a longer rest period between sexual episodes.
   d. Libido invariably decreases.
   e. The prevalence of erectile dysfunction increases with age.

6. ___ Given this patient’s medical history, which of the following is likely the etiology of his erectile dysfunction?
   a. Lack of desire.
   b. Vascular insufficiency.
   c. Neurologic dysfunction.
   d. Testosterone deficiency.
   e. Performance anxiety.

7. ___ The patient asks about normal ejaculatory processes. You explain that during orgasm:
   a. The prostate and bladder undergo rhythmic contractions.
   b. The bladder neck opens during ejaculation.
   c. The vas deferens and the seminal vesicles contract.
   d. Periurethral skeletal muscles are not involved.
   e. The external (urethral) sphincter stops contracting.

8. ___ Following much diagnostic testing, you determine that the patient has almost no blood supply to the corpora. Based on this, you decide the following treatment will most likely be successful in allowing this patient to resume intercourse:
   a. Phosphodiesterase type 5 inhibitors
   b. Intra-urethral prostaglandin E1
   c. Apomorphine
   d. Penile prosthesis
   e. Intra-corporal injection therapy with papaverine and prostaglandin E1
Case Vignette 2

9. One of your patients has concerns about pregnancy and sexuality. She is 8 weeks pregnant and has noticed some changes in her sexual function. You tell her that:
   a. Women in the first trimester usually have increased sexual drive.
   b. During the second trimester, there is decreased desire and sexual responsiveness.
   c. There is increased coital frequency during the third trimester.
   d. Coitus should be avoided during pregnancy when there are ruptured membranes or a history of preterm labor.

10. After delivery she asks you again about sexual function. All of the below are true except:
   a. Nursing women may experience milk let down in response to sexual stimulation.
   b. Sexual desire is greatly diminished in most postpartum women.
   c. Vaginal atrophy symptoms may be treated with lubricants.
   d. Her small episiotomy will heal quickly and she can initiate intercourse in 4-6 weeks.

Another patient on that day is a 35 years old woman who is requesting routine gyn care. She denies the need for contraception and states “I don’t think I am going to get pregnant”. She then states that she is in a long-term lesbian relationship.

11. Which of the following statements is correct?
   a. You mark clearly on the chart that she is lesbian and always disclose this clearly to your staff at every visit.
   b. She doesn’t need to worry about getting annual exams.
   c. You don’t need to ask about sexual practices because it isn’t an issue.
   d. She is at higher risk of endometrial cancer.

Case Vignette 3

A 24 years old G0 married woman calls the office. Her period is 1 day late.

12. You tell her:
   a. A qualitative measurement of urine human chorionic gonadotropin (HCG) level will determine if she is pregnant.
   b. It is too early to get a pregnancy test. She has to wait until at least 1 week after her missed menses.
   c. A urine pregnancy test will be sent to the lab because office tests are unreliable.
   d. Her blood can be tested for the presence of 17 alpha hydroxyprogesterone to see if she is pregnant.
13. She calls the office 1 week later and tells you she is bleeding. She is now 5 weeks and 1 days from her last menstrual period.
   a. You draw a serum estriol level to assess the pregnancy health. It is lower than you expect and you think she might have twins.
   b. You order an ultrasound to assess the fetal heart rate. ✗
   c. You are concerned about the pregnancy health when you run serial quantitative serum HCG levels and the value increases from 1500 to 2000 in 2 days.
   d. You reassure her that bleeding is common in early pregnancy and to go on bed rest.

14. She continues to bleed over the next 2 weeks very lightly. She states that her heart is racing and she feels very jittery. Her HCG level is 120,000.
   a. Her symptoms are probably related to pregnancy related anxiety.
   b. She probably has been drinking too much caffeine.
   c. She should have an ultrasound.
   d. She needs a full thyroid evaluation.

15. Her second pregnancy at age 27 is uncomplicated but she delivers after induction at 42 weeks. The male infant has unusual skin (skin peeling, scaling). You wonder if there might have been a problem such as:
   a. High alpha-fetoprotein levels
   b. Trisomy 18
   c. Excess production of progesterone
   d. Low serum estriol levels as a result of placental sulfatase deficiency

Case Vignette 4
A couple presents for an infertility evaluation. He is 27 years old and has never been involved in a pregnancy. His wife is 25 years old and has 7 children from a previous relationship. His physical exam demonstrates no vas deferens and an ultrasound shows no seminal vesicles.

16. You would expect his semen analysis to show:
   a. A high volume ejaculate.
   b. A low volume, acidic ejaculate.
   c. A low volume ejaculate with a high pH.
   d. Low sperm motility with a low ejaculate volume.
   e. A normal volume, normal pH ejaculate.

17. The patient asks about normal sperm production. You explain that spermatogonia:
   a. Contain 2N DNA and are diploid.
   b. Contain 1N DNA and are haploid.
   c. Divide and produce spermatids.
   d. Are produced by meiosis.
   e. Reside in the luminal compartment of the seminiferous tubules.
18. ___ The patient’s testosterone level is normal. You explain that testosterone production:
   a. Is stimulated by LH.
   b. Requires constant secretion of GnRH.
   c. Requires proper Sertoli cell function but does not require Leydig cell function.
   d. Involves negative feedback by inhibin.
   e. Occurs within the seminiferous tubules.

19. ___ You elect to retrieve sperm from the epididymis. For these sperm to be able to fertilize an egg normally, the sperm must
   a. Undergo capacitation before undergoing the acrosome reaction.
   b. Undergo the acrosome reaction before undergoing capacitation.
   c. Divide to become haploid after they are retrieved from the epididymis.
   d. Secret inhibin to stimulate the ova.
   e. Not come in contact with the zona pellucida.

20. ___ Which of the following statements is true concerning gametogenesis?
   a. Meiosis produces identical “offspring” cells from the parent cells.
   b. Meiosis occurs throughout human life.
   c. Meiosis allows a transformation of a primary to a secondary spermatocyte.
   d. Meiosis is the key reason for a woman’s menopause.
   e. Meiosis allows for the cortical reaction to occur.

21. ___ Which of the following is NOT true in comparing male and female gametogenesis?
   a. Both have primary and secondary gametes (oocytes and spermatocytes).
   b. Males potentially can continue producing gametes forever, females are limited.
   c. Females don’t complete the process of gametogenesis until fertilization.
   d. Only female gametogenesis requires mitosis.
   e. Males produce a higher total number of lifetime gametes.

Case Vignette 5
A 35 year old male presents for an infertility evaluation. He and his 32 year old wife have been trying to conceive for 3 years without success. His physical exam is normal. His semen analysis demonstrates a normal sperm count but the sperm are not moving (no motility).

22. ___ You order electron microscopy which shows a defect in the axoneme. This involves:
   a. The acrosome
   b. The flagella
   c. Capacitation
   d. The sperm mitochondria in the midpiece
   e. Nuclear DNA packing
23. __The patient asks about his sperm production. You explain that he makes normal numbers of sperm and his testicles should have
   a. Spermatogonia, spermatids, but no spermatocytes.
   b. Sertoli cells between the seminiferous tubules.
   c. Haploid and diploid cells.
   d. Leydig cells within the seminiferous tubules.
   e. Motile sperm.

24. __The patient also has a history of getting hit in the testicles with a baseball causing rupture of the testicle which required surgical repair. You suggest that the blood:testis barrier may have been disrupted. This barrier involves:
   a. Tight junctions between the epididymis and vas deferens.
   b. Leydig cells.
   c. Tight junctions between Sertoli cells.
   d. The smooth muscles cells in the arterial walls.
   e. Gap junctions in the sperm membrane.

25. __The patient is also found to have a history of frequent respiratory infections, and you determine he has immotile cilia syndrome. The patient is inquisitive and he asks what spermiogenesis is. You explain that it involves all of the following except:
   a. Nuclear elongation
   b. Loss of excess cytoplasm
   c. Acrosome formation
   d. Flagella formation
   e. The first meiotic division

Case Vignette 6

During an office visit, a 48 year-old Caucasian mother of 2 complains about irregular, often mid-cycle bleeding for the past 4 months. Her periods had always been somewhat regular, although she had experienced spotting now and then. She has currently been bleeding for the last 5-6 days.

26. __The symptoms may be due to the following:

   a. Persistent high progesterone level
   b. High estrogen and progesterone levels
   c. Persistent high estrogen level in the absence of progesterone
   d. Persistent low estrogen level
   e. Low levels of both estrogen and progesterone
27. An endometrial biopsy obtained during the office visit at this time is likely to show the following:

   a. Secretory endometrium with glandular and stromal breakdown
   b. Proliferative type endometrium with stromal and glandular breakdown
   c. Regular subnuclear vacuolation in the endometrial glands
   d. Spiral arterioles with pseudodecidual changes
   e. Marked secretion within the gland lumen

28. If this condition persists for a long period of time there is a likelihood that she may develop the following:

   a. Endometrial hyperplasia
   b. Chronic endometritis
   c. Leiomyoma
   d. Adenomyosis
   e. Leiomyosarcoma

29. Which of the following answers is true?

   a. The underlying cause of this patient’s symptoms is anovulation
   b. It is common in perimenopausal state
   c. It is different from Stein-Leventhal syndrome
   d. The ovaries may show few cystic follicles
   e. All of the above

Case Vignette 7

A 17 years old high school student with regular menstrual cycles presents complaining of severe abdominal cramping starting one day prior to her periods. She has missed several days of classes. Her symptoms disappear towards the end of her period. The rest of her history is unremarkable except for smoking a few cigarettes per day. She takes acetaminophen for the cramps but it does not help. She is not sexually active. On physical exam no abnormalities are found. You suspect that the patient suffers from primary dysmenorrhea.

30. This condition is most likely related to:

   a. Hormonal imbalance
   b. An underlying pathological process that will require surgery
   c. An excess of prostaglandin-F release from the uterus
   d. A congenital reproductive tract abnormality
   e. None of the above
31. In this type of condition the goal of first line therapy is to:
   a. Create a pseudomenopausal state to eliminate her periods
   b. Decrease prostaglandin synthesis by inhibiting the cyclooxygenase pathway with NSAIDs
   c. Prepare for surgery
   d. Obtain a diagnosis by an imaging study before treating the patient

One year later she returns to you reporting that her symptoms are not all that better. She is now a pre-med student in college and heard that oral contraceptive pills (OCPs) may help her symptoms.

32. You explain to her that she is right because OCPs will:
   a. Prevent ovulation and the subsequent effects on the uterus seen on the second half of the menstrual cycle (luteal phase)
   b. Decrease the build up of prostaglandin within the uterus
   c. Decrease the amount of menstrual flow
   d. All of the above

She returns 6 months later saying that her symptoms have worsened. She has been taking the OCPs throughout the cycle and trying different over the counter pain killers during her periods without success. She now reports that her mom underwent some type of surgery for menstrual cramps at age 21 years. You suspect that the patient has secondary dysmenorrhea.

33. Your next step is:
   a. Obtain a pelvic ultrasound to rule out polycystic ovary syndrome.
   b. Order a laparoscopy for diagnosis of endometriosis and possible treatment during the procedure.
   c. Order an explorative laparotomy to look for structural abnormalities of the uterus.
   d. Order an abdominal CT.

34. She refuses to have any surgical procedure or evaluation at this point. You then offer her a trial of:
   a. Prozac
   b. GnRH agonist such as leuprolide acetate for 6 months
   c. Danazol (an adrogenic steroid)
   d. A selective estrogen receptor modulator (SERM)
   e. An aromatase inhibitor
Case Vignette 8

You arrive at your office to start your day at 8:30AM and a 25 year old primiparous patient presents with a bruise on her forehead. She is 26 weeks pregnant. She reports that she woke up at 7:30AM, rose out of bed to shower, and lost consciousness in the shower.

35. The most likely cause for her episode in the shower was:
   a. Cardiac arrhythmia
   b. Epileptic seizure
   c. Eclamptic seizure
   d. Syncope due to orthostatic hypotension

36. On cardiovascular examination, her blood pressure is 90/58 and pulse is 82 beats per minute. Which of the following physical findings would be unexpected on cardiovascular examination in a healthy pregnant patient?
   a. Lateral and superior displacement of the apex of the heart
   b. Apical rumbling diastolic murmur
   c. Peripheral edema
   d. Left sternal border systolic flow murmur

37. You send her to the cardiology practice in your office building for an EKG. Which EKG finding would warrant further investigation in a gravida with this history?
   a. Left axis deviation
   b. Sinus tachycardia
   c. Low voltage QRS complexes
   d. Ventricular premature beats

38. Which of the following physiologic mechanisms may have contributed to this episode?
   a. The patient slept on her back overnight with her enlarged uterus compressing her inferior vena cava. Decreased venous return to the heart resulted in hypotension.
   b. The hot shower caused vasoconstriction in her skin vasculature, resulting in hypotension.
   c. Decreased systemic vascular resistance of pregnancy resulted in hypotension.
   d. A and C
Case Vignette 9

A 30 year old multiparous patient presents at 20 weeks gestation for her routine prenatal visit, scheduled for 10:00AM. Family history reveals that her mother suffered from gestational diabetes. You learn that the patient has not eaten breakfast. You note that she has gained 2 pounds since she conceived and now weighs 110 pounds. Her blood pressure is 100/64. Her urine dip is negative for protein, negative for glucose, and 1+ for ketones.

39. This clinical presentation can most likely be explained physiologically as:
   a. Average weight gain for a patient with an initial weight of 108 pounds, and mild dehydration.
   b. Below average weight gain for a patient with an initial weight of 108 pounds. The urine dipstick findings can be explained physiologically by a prolonged overnight fast. Morning hypoglycemia leads to low levels of morning circulating insulin, resulting in increased lipolysis leading to ketonuria.
   c. Below average weight gain for a patient with an initial weight of 108 pounds. The urine dipstick findings can be explained physiologically by prolonged overnight fasting combined with elevated circulating insulin levels of pregnancy. The result is morning hypoglycemia. Ketonuria reflects protein and fat breakdown as the mother seeks alternate sources of energy.
   d. Below average weight gain for a patient with an initial weight of 108 pounds. The ketonuria alerts the clinician to the strong possibility of diabetic ketoacidosis.

40. Which of the following does not cross the placenta from the mother to the fetus?
   a. Glucose
   b. Insulin
   c. Ketones
   d. Amino Acids

41. Which of the following hormones is known to induce insulin resistance ("diabetogenic state") during pregnancy?
   a. Human Placental Lactogen
   b. Human Chorionic Gonadotropin
   c. Estrogen
   d. Prolactin
42. A neonate born to a mother with gestational diabetes may experience which of the following?
   a. Neonatal hypoglycemia due to increased fetal islet cell insulin secretion with sudden loss of maternal glucose substrate.
   b. Neonatal hypoglycemia due to increased maternal insulin levels in the fetal circulation with sudden loss of maternal glucose substrate.
   c. Both A and B
   d. Hyperthermia

Case Vignette 10

An 18 year old woman presents with menstrual cycle abnormalities. The young lady was prescribed risperidone (anti psychotic) 4 months ago. On breast exam galactorrhea is noticeable. You suspect that her hypothalamic pituitary ovarian (HPO) axis is not functioning properly.

43. Which of the following statements concerning the normal HPO axis is NOT true?
   a. Upon GnRH stimulation, pulses of FSH and/or LH are noticed every 8 hours during the follicular phase
   b. Estrogen exerts negative feedback on FSH secretion
   c. Inhibin B exerts negative feedback on FSH secretion
   d. Estrogen is produced by the growing follicle
   e. Inhibin B is produced by the granulosa cells of the ovary

44. Which of the following statements concerning GnRH is NOT true?
   a. It directly stimulates the release of FSH
   b. It directly stimulates the release of LH
   c. It directly stimulates the release of estrogen
   d. It is a critical hormone in the regulation of the menstrual cycle
   e. It can be affected by neurotransmitters

45. The most likely reason for this woman's menstrual irregularity is:
   a. Increase in GnRH pulsatility
   b. Decrease in insulin levels
   c. Increase in prolactin levels
   d. Decrease in prolactin levels
Case Vignette 11

A mother brings her 7 months old son, Gregory, to your office. You find that the baby's weight, length and head circumference are all appropriate for age. The baby's diet consists of a routine infant formula and baby fruit from a spoon. The mother asks you if she can transition her son from formula to whole milk.

46.____ You advise against this because:
   a. There is less protein in whole milk than in formula.
   b. There is less fat in whole milk than in formula.
   c. Formula is a superior source of vitamins and minerals and the baby's diet is not varied enough.
   d. Seven months old babies can't digest lactose.

47._____ You also recommend to the mother that she start offering the following foods to her 7 month old infant:
   a. French fries as finger foods
   b. Baby vegetables and baby meats
   c. Extra juice to make up for the lack of formula
   d. Rice milk because it is inexpensive and has the same number of calories per ounce as formula

48.____ One of the nutrients you are most concerned about is iron, because iron deficiency can limit Gregory's interest in interacting, paying attention, and ultimately, learning. To provide extra iron, you recommend:
   a. Green beans
   b. Yogurt
   c. Infant fortified rice cereal
   d. Orange juice

Case Vignette 12

Both parents bring their 3 years old daughter, Emily, to your office for a routine, well child visit. They both came to the visit because the father is concerned that his daughter looks "pudgy", and he is very worried about this. You plot the weight and height and find that the weight is at the 75th percentile and the height is at the 50th percentile on the growth charts. The BMI is at the 65th percentile.

49.____ You advise:
   a. Careful adherence to a calculated diet providing 30% fewer calories than Emily is currently consuming
   b. Increased active play time as long as Emily is enjoying herself
   c. Limiting bread
   d. Diet soda
50. The parents wonder if they should eliminate snacks. You tell the parents that young children often need snacks to take in sufficient calories and nutrients because:
   a. A lot of young parents don't know how to cook meals.
   b. Young children can't learn how to like foods with strong flavors such as meats and vegetables.
   c. Young children have small gastric capacities and a short attention span for sitting for long meals.
   d. Snack foods are always extra high calorie foods such as ice cream and fruit punch.

51. In suggesting snacks you are aware that toddlers' and preschoolers' diets tend to be low in the following:
   a. Vitamins A, E, and K
   b. The B vitamins
   c. Iron, Calcium, and Zinc
   d. Carbohydrates

Case Vignette 13

A 28 year-old Gravida 3 para 1, with a history of preterm delivery in her previous pregnancy and now at 30 weeks gestation (by reliable dates), calls you at 11 pm and describes painful, rhythmic tightening of her belly. These remind her of her labor pains from her last pregnancy, and have been occurring every 3 minutes for the past hour.

52. By dating conventions, she has actually (literally) been pregnant for:
   a. 26 weeks
   b. 28 weeks
   c. 30 weeks
   d. 40 weeks

53. She is:
   a. In preterm labor, again
   b. In latent phase labor
   c. Experiencing an infection of the amniotic membranes, resulting in prostaglandin release
   d. Don’t know yet
54. The best course of action for you is:

a. Reassure the patient that the majority of patients delivering early in their first pregnancy deliver at term in their second
b. Instruct the patient to present immediately for obstetrical evaluation ✓
c. Instruct the patient to take an ibuprofen to block the prostaglandins that are probably responsible for her contractions ✓

55. Whatever your advice, she demands to be evaluated right away. The nurse examines the patient and finds her cervix to be 3 cm dilated and 50% effaced. As you complete your assessment of mother and baby, options you can consider for treatment include all of the following EXCEPT:

a. Magnesium sulfate
b. Prostaglandin vaginal suppository
c. Beta-adrenergic agonist
d. Cyclo-oxygenase inhibitors
e. Calcium channel blockers

Case Vignette 14

A healthy woman at 41 weeks gestation comes for a prenatal visit; she has experienced no contractions or any other sign of labor. Her cervix is closed, and not effaced.

55. You counsel her that:

a. Labor will likely ensue in the next few weeks, and that nothing needs to be done until she reaches 43 weeks of gestation
b. Some sort of testing to be sure of fetal well-being is warranted
c. Intervention to promote labor should be considered sometime in the next 1 1/2 weeks
d. All of the above ✓
e. B and C

56. Options to provide reassurance that this baby is doing well and does not require delivery right away include all of the following EXCEPT:

a. An ultrasound to perform a biophysical profile
b. A non-stress test, using external, ultrasound sensor to detect patterns of the fetal heart rate
c. Electronic monitoring of the fetal heart rate using internal monitor (scalp electrode), to provide greater accuracy than the external (ultrasound monitor)
d. Inducing uterine contractions (e.g., with intravenous oxytocin) and performing a contraction stress test
57. As luck would have it, she enters labor on her own 2 days later. You and she agree to perform continuous electronic fetal monitoring, especially since she has chosen an epidural for pain control. Which of the following is most likely to raise concern about fetal well-being?

   a. A heart rate baseline of 160 beats per minute
   b. Increases in heart rate that last for 15-20 seconds before returning to a normal baseline
   c. Sharp decline in heart rate, occurring during a contraction, that returns rapidly to the previous baseline when the contraction is over
   d. Subtle, shallow decelerations occurring towards the end of a contraction

58. She asks what position the baby’s head should be in for the safest and easiest delivery. You say that we usually hope for:

   a. Occiput posterior
   b. Occiput anterior
   c. Occiput transverse
   d. Footling or frank breech

**Case Vignette 15**

HC is a 28 year old P4 G5. She is 18 weeks pregnant and has gained about 10 pounds during this pregnancy so far. Her appetite is good.

60. About how many pounds should HC gain per week during her second and third trimesters?

   a. 0
   b. 0.5
   c. 1.0
   d. 1.5
   e. 2

61. About how many calories (kcal) should HC be consuming during her second trimester and third trimester (respectively) above her pre-pregnancy caloric intake?

   a. 200, 300
   b. 300, 300
   c. 350, 450
   d. 450, 500
62. ___ About how much protein should HC consume during her pregnancy?
   a. 71 g per day
   b. 80 g per day
   c. 0.8 grams per kg of pregnant body weight
   d. 0.8 grams per kg of pre-pregnant body weight
   e. 1.22 g per kg of body weight

63. ___ HC has decided that she will breastfeed this baby. How many calories above her pre-pregnancy caloric intake should she consume during breastfeeding?
   a. 200
   b. 300
   c. 400
   d. 500

Case Vignette 16

You have been chosen by the Wagner family to take care of their son Frank. During your first encounter with the family, Frank shows symmetric tone and movements of extremities, face, and eyes. He doesn't lift his head & shoulders off bed in prone.

64. ___ How old is Frank most likely to be?
   a. Birth/newborn
   b. 2 months old
   c. 4 months old
   d. 6 months old
   e. 8 months old

65. ___ When you return from a sabbatical you see Frank again. During this encounter Frank smiles responsively and reaches with raking grasp - both hands. He rolls from prone to supine and from supine to prone but is unable to sit well alone. How old is Frank most likely to be?
   a. 2 months old
   b. 4 months old
   c. 6 months old
   d. 9 months old
   e. 10 months old
66. During your third encounter, Frank takes a few steps alone. He is able to hold a book upright with help but is unable to put a cube in a cup. He is unable to play ball with you. How old is Frank most likely to be?
   a. 6 months old
   b. 9 months old
   c. 12 months old
   d. 15 months old
   e. 18 months old

67. The family was out of town for a few months and is happy to return to your service. Frank is able to kick a ball and points to pictures in his book. He is unable to stand on one foot, and cannot put a tee-shirt on. How old is Frank most likely to be?
   a. 12 months old
   b. 15 months old
   c. 18 months old
   d. 24 months old
   e. 36 months old

Case Vignette 17

A 36-week old infant was delivered unexpectedly at home on a cold winter night, transported to the hospital by conventional ambulance, and hand carried into the emergency room where admission temperature was 35C. (95F.). The baby was placed in an incubator to correct the hypothermia.

68. A thermal neutral zone for this baby will be:
   a. Above the normal body temperature (i.e., a very hot incubator)
   b. A geographical location closer to the equator
   c. A bed-to-body temperature gradient with the least metabolic energy cost to re-warm the baby
   d. None of the above

69. You learn that the amniotic membranes were ruptured all day and the mother has a fever. The baby has a persistent low temperature in spite of adequate warming equipment. You should:
   a. Check the baby for metabolic acidosis
   b. Start a glucose infusion to prevent hypoglycemia induced by cold stress
   c. Consider amniotic fluid infection, and ask for a white count and blood culture
   d. All of the above
70. The most common cause of severe neonatal infection in North America is:

a. Human Immunodeficiency Virus  
b. E. Coli  
c. Beta hemolytic Streptococcus, Group B  
d. Cytomegalovirus

**Case Vignette 18**

Beth, a 6 year old Caucasian girl, and her mother present to your clinic. The mom is concerned about some enlargement of Beth's breasts. When you plot Beth's weight and height on the growth chart you notice that both are at the same percentile (75th%) as 6 and 12 months ago. Physical exam reveals Tanner II breasts, but there is no pubic hair and there is no development of the labia minora and majora. You obtain a left hand X Ray and the bone age is read as 5 years and 10 months.

71. The most likely diagnosis is:

a. True precocious puberty  
b. Delayed puberty  
c. Premature thelarche (isolated development of the breasts)  
d. Delayed adrenarche

Six years later they present again and the mom is concerned about Beth's menstrual periods. Beth attained menarche 6 months ago. Her first period lasted 5 days. The second period occurred 3 months later and lasted 7 days. The third period started 6 days ago, is ongoing, and is somewhat heavy. The periods are painless.

72. The most likely explanation for this menstrual irregularity is:

a. LH surge occurs too early in the cycle  
b. Too much progesterone is secreted during the luteal phase  
c. Lack of LH surge resulting in non ovulatory cycles  
d. Increase in prostaglandin F2 alpha.
Four years later Beth is 16 years old and has a boyfriend. Her mom suspects that Beth is sexually active and asks you to put Beth on Depo Provera. Beth has read about Depo Provera but has some questions.

73. Which of the following information about Depo Provera is true?

a. Depo Provera is a combined estrogen & progesitin contraceptive
b. She can expect regular menstrual periods while using the method
c. Depo Provera induces a relative estrogen deficiency which may lead to irregular menstrual bleeding and loss of bone density
d. Swimming is the most recommended sport for women using this method

Case Vignette 19

You are managing the labor of a 31 year old gravida 2, para 1 woman at term. The fetal heart rate and uterine contraction pattern are being monitored externally. As the patient approaches the time of delivery, the fetal heart rate begins to show decelerations that are not reassuring as to the fetal status.

74. 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?

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

75. 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. Facilitated diffusion
b. Active transport
c. Countercurrent flow
d. Concurrent flow
76. The baby is born, and 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. Foramen ovale closes in response to increased left atrial pressure
   c. Neonatal oxygen tension rises as respiration begins
   d. Local release of prostaglandin E in ductus arteriosus is diminished

In questions 77-93 choose the one best answer

77. As the key regional health care provider for the county, you are responsible for monitoring public health trends. While investigating the rate of ectopic pregnancies, you see a trend of decreasing frequency in this occurrence. Which of the following statements is most likely related to this?
   a. A decrease in sexually transmitted diseases has led to decreased incidence of ectopic pregnancies.
   b. Less women are infertile which is a known risk factor for ectopic pregnancies.
   c. A greater percentage of ectopic pregnancies are not being captured via inpatient databases.
   d. As fewer women have ectopics, since this is a risk factor for repeat ectopics, the total number is decreasing over time.
   e. The definition of ectopic pregnancy has changed to include whether it is an intended pregnancy and, as such, the total number is lower.

78. A college student presents to you at 8 weeks gestation considering her options for terminating the pregnancy. In taking her history, you compare your notes to the most common profile of a woman seeking a pregnancy termination. Which of the following aspects of this patient's history DO NOT fit that most common profile?
   a. Pregnancy is unintended.
   b. The patient was not using contraception.
   c. The patient is white.
   d. The patient is 19 years old.
   e. The patient is unmarried.

79. Which of the following may increase the risk of bleeding in a patient taking anticoagulant or antithrombotic medications?
   a. Fish Oil
   b. CoEnzyme Q10c
   c. Glucosamine
   d. Cranberry
   e. Kava
80. ___ Which of the following dietary supplements is allowed by the FDA to use labeling that reflects benefit in reducing cardiovascular disease?
   a. CoEnzyme Q
   b. Fish Oils
   c. Plant Sterols
   d. b & c only
   e. All of the above

81. ___ All of the following dietary supplements have been reported to be beneficial in treating osteoarthritis except:
   a. S-adenosylmethionine
   b. Chondroitin
   c. Soy Isoflavones
   d. Glucosamine

82. ___ Which of the following has been reported to cause elevation of serum transaminases (AST / ALT) or other signs of hepatotoxicity?
   a. Kava
   b. S-adenosylmethionine (SAMe)
   c. Black Cohosh
   d. a and c only
   e. a, b, and c

83. ___ Which of the following dietary supplements is an inducer of Cytochrome P450 (3A4) which can lead to increased clearance and decreased efficacy of OCP?
   a. Kava
   b. Black Cohosh
   c. Echinacea
   d. St John’s wort
   e. Cranberry

84. ___ CoEnzyme Q10 has recently been shown to:
   a. reduce frequency and severity of migraine headaches
   b. decrease bone loss in postmenopausal women
   c. improve joint function in osteoarthritis
   d. enhance the antidepressant effects of other drugs
   e. reduce cholesterol
85. In a 3 year old with untreated growth hormone deficiency:

   a. Bone age is less than height age, and height age is similar to chronological age.
   b. Bone age is similar to height age, and both are significantly less than chronological age.
   c. Bone age is greater (older) than height age, and is significantly less than chronological age.
   d. None of the above.

86. A 14 year old with familial delayed onset of puberty probably has

   a. a delayed (younger) bone age and height age.
   b. a bone age closer to her chronological age than to her height age.
   c. a bone age closer to her height age than to her chronological age.
   d. Both A and B
   e. Both A and C

87. When treated with thyroid hormone replacement, a newly diagnosed 4 year old with congenital hypothyroidism will exhibit significant catch up in:

   a. Both growth and development
   b. Growth but not development
   c. Development but not growth
   d. Neither growth nor development

88. A 17 year old child who has been raised in a stable and nurturing home environment and who is cognitively and adaptively functioning at the 6th grade level has an approximate IQ of:

   a. 71-85
   b. 55-70
   c. 35-54
   d. 20-34
   e. Below 20

89. An infant of a well-controlled diabetic mother has a normal exam and good Apgar scores. Birth weight is normal for gestational age. Nursery screening for hypoglycemia shows a cord blood glucose of 86 mg/dl after a maternal glucose of 104 mg/dl just before delivery. Neonatal glucose is 58 mg/dl at one hour post delivery, and 52 mg/dl at age 3 hrs. How should the pediatrician respond to this information?

   a. Start intravenous glucose immediately
b. Don't feed the baby for 12 hours  
c. Call an endocrinologist to evaluate the baby for hypoglycemia  
d. Feed the baby at age 4 hours, as scheduled

90. A 32 week newborn was delivered by C-section for maternal complications (hypertension with decreasing renal function). At age 2 hours, the baby has intercostal retractions, grunting, cyanosis in room air, occasional apneic spells, and an arterial pCO2 of 62 mmHg. Our plan should include:

a. Administering oxygen  
b. Beginning assisted ventilation  
c. Giving intratracheal surfactant  
d. All of the above

91. Which of the following is true?

a. The frequency of congenital anomalies in pregnancies without known exposure to teratogens is 5-10%.  
b. Pregnancy induced hypertension is an example of a non-pharmacological teratogen.  
c. Fetal exposure to thalidomide during the first 2 weeks after fertilization may lead to phocomelia.  
d. Fetal exposure to thalidomide between day 21 and 36 of gestation may lead to phocomelia.

92. A 32 year old in her second trimester of pregnancy complains of "increasing daytime fatigue". She has gained 20 kg thus far during the pregnancy and has a history of iron deficiency anemia during her first trimester. A sleep history reveals difficulty falling asleep; her husband complains that she snores. What is the most likely explanation for her daytime fatigue?

a. Normal increase in sleepiness in second trimester of pregnancy  
b. Sleep disordered breathing related to weight gain  
c. Onset of narcolepsy related to hormonal changes  
d. Delayed sleep phase related to changes in melatonin secretion during pregnancy

93. Sleep disordered breathing during pregnancy may increase the risk of which of the following?

a. Pregnancy induced hypertension  
b. Pre-eclampsia  
c. Low birth weight  
d. All of the above
The microphoto below is from a case of adenocarcinoma of the uterine fundus.

**True (A) or false (B) (1 point each)**

94. The type of adenocarcinoma illustrated is clear cell, the most common type.  

95. Invasion of endometrial carcinoma into the cervix is classified as stage 2.  

96. The various types of carcinoma of the uterine fundus are also seen in epithelial tumors of the ovary.
97. In carcinosarcoma (malignant mixed mullerian tumor) only the epithelial component is malignant; the mesenchymal component shows only a reactive proliferation

Match the entity(ies) A-D with the features below. (1 point each)

98. All, or at least a portion, of the tumor consists of small, blue, round cells

99. Triphasic histology

100. Sometimes presents with a stage (4S) in which spontaneous regression may occur in spite of metastases to skin, liver, and or bone marrow

101. Worse prognosis with N-Myc amplification

102. Sometimes associated with deletion 11p13 and aniridia

A. Retinoblastoma
B. Neuroblastoma
C. Wilms tumor
D. All of the above
Match A-D with the anomalies below: (1 point each)

103. Clubfoot associated with oligohydramnios

104. Isolated ventricular septal defect

105. Osteogenesis imperfecta

106. Early amnion rupture sequence (amniotic bands)
   A. Malformation
   B. Deformation
   C. Disruption
   D. Dysplasia

True (A) or false (B) about chromosomal disorders (1 point each)

107. Holoprosencephaly often occurs with trisomy 13 and can also be seen in diabetic embryopathy

108. Common AV canal (AV communis) occurs in about 50% of cases of trisomy 18 and about 50% of patients presenting in cardiac clinics with common AV canal have trisomy 18

109. Most embryos and fetuses with monosomy X survive in utero only to expire in the neonatal period with respiratory insufficiency
A male infant is delivered. If one performed in-situ hybridization for the Y chromosome on the following tissues or cells which would show (A) negativity and which would show (B) positivity

110. Smooth muscle of vessels within chorionic villi

111. Amniotic epithelium

112. Vessels in the decidua of the basal plate

The gross and microscopic findings illustrated below were from a 16 week pregnancy. The maternal serum showed an hCG level of 1 million mIU/ml.
True (A) or false (B) (1 point each)

113. It is likely that a 10 cm fetus was also present

114. The markedly elevated hCG level might be accompanied by secondary hyperthyroidism

115. Though this condition is usually benign, the patient should be followed by serial hCGs until the level returns to normal

Fill in the blanks regarding embryogenesis (1 point each)

116. Embryonal life ends and fetal life begins at 11 weeks of gestation (postmenstrual age) which is equivalent to 11 + 9 = 20 weeks of developmental age

117. A mature cell with a haploid chromosome set that participates in sexual reproduction is called a

118. The diploid product formed by the union of a haploid sperm and a haploid ovum is called a

119. The spleen and the urogenital system are derived from (ectoderm, mesoderm, or endoderm)
The microscopic photo below is from the cervix.

Fill in the blanks.

120. The mucosal epithelium on the left is __________ and that on the right is __________. (2 points)

121. When, as the result of HPV infection, there is progressive change from normal endocervical mucosa to invasive squamous cell carcinoma there are 2 intervening histological changes; __________ and __________. (2 points)

122. Name another non-stromal, HPV-induced malignancy of the cervix besides squamous cell carcinoma. __________ (1 point)
Tissue from an endometrial biopsy is illustrated below.

Fill in the blanks (1 point per question)

123. The subnuclear vacuoles (piano keys) indicate that _______ has occurred.

124. The patient is in the early _______ phase of the menstrual cycle.

125. At this time granulosa cells are accumulating lipid, becoming golden-yellow and forming a _______ _______ in the ovary.
126-127. Match the numbered goal below with the single most appropriate prenatal lettered drug treatment:

126. Stimulation of immature lung development
127. Prevention of neural tube malformation

A. Retinoic Acid
B. Folate (folic acid)
C. Warfarin
D. Betamethasone
E. Phenytoin

128. The use of ritodrine to inhibit labor is based upon its ability to:

A. Inhibit oxytocin receptors
B. Stimulate Alpha-2 adrenergic receptors
C. Inhibit cyclooxygenase-1 activity
D. Inhibit Alpha-1 adrenergic receptors
E. Stimulate Beta-2 adrenergic receptors

129. At birth, the following abnormalities were noted in the newborn: short nose, thin upper lip, short palpebral (eyelid) fissure, smooth philtrum (groove in the middle of the upper lip). The most likely drug use by the mother during pregnancy that would cause these abnormalities:

A. Ethyl alcohol
B. Betamethasone
C. Cocaine
D. Selective serotonin reuptake inhibitor such as fluoxetine (Prozac)
E. Heroin

130. Indicate which of the following contraceptive agents can directly block uterine progesterone receptors:

A. Ethinyl estradiol
B. Norethindrone
C. Mifepristone (RU-486)
D. Nonoxynol-9
E. Mestranol
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