Anatomy and Physiology II Final Review –Part 2

1. Know the terms on the back pages.

Reproductive system question:
2. Mix and match of reproductive morphology terms with pictures or descriptions of the male and female reproductive systems. What is the function of the different parts of these systems?

3. What 2 glands account for over 90% of the male ejaculate? What secretions are produced by the different glands in the male reproductive system?
Seminal vesicles (45-80%) and Prostate gland (15-30%).

Testes: Sperm (and testosterone)

Seminal Vesicle: A thick viscous slightly basic fluid (mostly water) that contains some prostaglandins, fructose, vitamin C and the protein semenogelin which causes the sperm to coagulate after ejaculation.

Prostate Gland: Produces a thin slightly acidic fluid, has citrate (used by sperm for ATP), acid phosphatase (use unknown), several proteolytic enzymes that liquefy coagulated semen (prostate-specific antigen PSA, pepsinogen, lysozymes, amylase and hyaluronidase), and some minerals

Bulbourethral Gland: Produces a slightly basic mucous like fluid that acts as a lubricant, can store up to 50,000 living sperm, ejected prior to ejaculation.

4. Describe what the hymen is and where it is located. Explain why the hymen is or is not a good indicator of virginity.
Hymen: A membrane at the opening of the vagina that partially occludes the opening.
The hymen is often broken prior to sexual contact and is so small in some women that it never breaks.

5. Explain the menstrual cycle. What happens at different points in the cycle and why? What do the different hormones in the cycle do?
Idealized menstrual cycle:
1-4. Menstrual bleeding.
1-13. GNRH(hypothalamus) → release of FSH & LH (pituitary)
GNRH Gonadotropin releasing hormone
FSH Follicle stimulating hormone
LH Luteinizing hormone
FSH & LH cause follicles to mature and release estrogen & inhibin. Increased estrogen causes more GNRH to be released, causing increased FSH/LH to be released, increased inhibin inhibits the release of FSH.
14. Estrogen levels peak, causing hypothalamus to release peak amount of GNRH, pituitary releases peak amounts of LH & FSH (more LH then FSH) causing ovulation. After ovulation what is left of the follicle is called the corpus luteum.
The corpus luteum produces estrogen, progesterone and inhibin. High levels of estrogen and progesterone together cause:

- complete development of the endometrium
- inhibits the release of GNRH, reducing the levels of FSH & LH

High levels of inhibin inhibits the release of FSH & LH which prevents new follicles from developing and prevents ovulation

26-28. The corpus luteum breaks down, causing a rapid drop in estrogen, progesterone, and inhibin.
The rapid drop of estrogen & progesterone causes:

- breakdown of endometrium
- stops the inhibition of GNRH

The rapid drop of inhibin, increases the levels of LH and FSH which causes the follicles to start to develop starting the whole cycle all over again…

6. Explain oogenesis using the terms egg, secondary oocyte, primary oocyte, second polar body, and first polar body.
What do the ovaries release at ovulation? What causes an egg to be formed?
Oogenesis is the process of creation of an egg through two cycles of meiosis. The process starts with a primary oocyte (a cell that undergoes meiosis). This cell divides into two cells, the secondary oocyte and the first polar body. The first polar body degenerates, while the secondary oocyte continues and is released from the ovary. If fertilized by a sperm cell, the secondary oocyte then undergoes a second meiosis which forms the egg and the second polar body. The second polar body also degenerates.

7. What is in birth control pills and how do they work? (explain in detail)
Birth control pills contain estrogen and progesterone which inhibit LH and FSH preventing ovulation.

8. What is RU486 and how does it work?
RU486 inhibits progesterone receptors. RU486 must be followed by misoprostol which produces uterine contractions causing the abortion of the fertilized egg.

9. How are prolactin and oxytocin involved in milk production?
Prolactin: Stimulates milk production
Oxytocin: Causes milk to be ejected from the gland.

10. Prolactin is a hormone produced by breast feeding woman. How does it prevent pregnancy ? Explain why breast feeding doesn't always prevent pregnancy?
Prolactin inhibits the GNRH, which causes the pituitary to not release FSH & LH preventing ovulation.
In women who are poorly nourished and breast feeding the prolactin does not seem to inhibit the GNRH. In addition women must breast feed their children three times a day to inhibit the GNRH.

11. Explain what is happens during the different parts of the birth process. Be sure to use the appropriate terms to describe the parts of the body affected. What hormones are involved in the birth process (i.e., progesterone, estrogen, oxytocin, prostaglandins, and relaxin) and what do they do.

12. Explain what is done in a cesarean section and a episiotomy.
Cesarean section: A cut is made across the abdominal wall of the woman and through the wall of the uterus to deliver the baby.
Episiotomy: A cut is made on the lower wall of the vagina to increase the size of the birth canal and make birth easier.

13. What is the difference in how maternal and fraternal twins are formed.
Materinal (identical): Single fertilized egg that splits during development to form two separate embryos. Share a single placenta.
Fraternal (non-identical): Multiple eggs are fertilized and grow separately. Separate placentas,

usually from artificial insemination.

14. Explain 3 ways you could increase the chances of having a female or male child.
Increase female likelihood:
A. No female orgasm – "X" carrying swimmers are stronger.
B. No sex for several days prior, makes vagina more acidic.
C. Shallow penetration during sex.
D. Ultra-centrifuge the sperm to separate the "X" and "Y" sperm (hold on honey, where did you put the test tubes again?).

15. Explain factors that could reduce a male's sperm count making him functionally sterile. Explain factors causing female infertility and how you can treat for these.
Men:
A. Stress (like nagging)
B. Unexplained increase in sterile men over age 30.
C. Clothing that is too tight, keep the testes too warm (bake the bastards)
D. Too much sex, deplete the supply.
Women:
A. No ovulation – Give LH and FSH (danger multiple ovulation)
B. No implantation – May be due to low progesterone, give progesterone.
C. Endometriosis – overgrowth of the endometrium blocks the uterine tubes.

16. List three indicators of ovulation in woman (be specific).
A. Temperature increase (6/10-8/10 of 1°F).
B. LH hormone surge
C. Mucus stretch – mucus on cervix becomes thicker and stretches further at ovulation
D. Vaginal pH slightly increases at ovulation

17. Be able to arrange different of birth control methods from most effective to least effective.
18. Be able to explain how different birth control methods work.
A. Sterilization (99.7%) – snip, snip.
B. Birth Control Pills (98%) – hormonal control of ovulation
C. IUD (97-92%) – cause inflammation which stops implantation
D. Condom (92-83%) – catch the swimmers
E. Vaginal sponge (87-83%) – contains sperm killers (spermicidal jelly)
F. Coitus interruptus (85-77%) – frustrates partner into leaving
G. Diaphragm (89-72%) – blocks the opening to the uterus and kills sperm (spermicidal jelly)
H. Spermicidal jellies, creams and foams (91-60%) – kills sperm.
I. Rhythm (86-42%) – doesn't work.
J. None (60-20%)

19. Miss irregular has a short cycle of 26 days and a long cycle of 36 days, using the rhythm method what is her unsafe period? Be able to solve a problem similar to this.
Short cycle – 18 = 8 (start of unsafe period)
Long cycle – 10 = 26 (end of unsafe period)

20. What is a virus? Explain the difference between HIV and AIDS.
Virus: A small piece of genetic material (DNA or RNA) surrounded by a protein coat.
HIV: Human immunodeficiency virus, a retro virus that causes the disease AIDS.

21. What are the stages of HIV? How long does the latent period in AIDS usually last?
Stage 1 (Latent Period): No signs of disease, usually lasts 3-5 years, but can last up to 10 years.

Sometimes has slightly swollen lymph nodes.
Stage 2 (AIDS related complex): Begins to show symptoms:
- Swollen lymph nodes
- Weight loss
- Night sweats
- Fatigue
- Fever
- Diarrhea

Stage 3 (Full blown AIDS):
- Skin cancers – reddish purple quarter sized spots (Kaposi's sarcoma)
- Mental problems may occur
- Immune system stops functioning properly

22. What is reverse transcriptase and what does AZT do?
Reverse transcriptase is the enzyme needed to take the RNA and modify the DNA (reverse of normal). AZT is a drug that inhibits reverse transcriptase keeping the RNA in the virus from being implanted into the cells DNA.

23. How does HIV affect the immune system?
HIV knocks out the T-4 helper cells, so the specific immune systems (T-Cells and B-Cells) can't be activated.

24. Which body fluids have the greatest risk of transmitting HIV? Be able to rank different behaviors with regard to the risk that they will transmit HIV.
High risk body fluids (highest → lowest):
A. Blood
B. Semen
C. Vaginal secretions
D. Breast milk

Low risk (highest → lowest):
A. Tears
B. Sweat
C. Urine
D. Feces

High risk behaviors (highest → lowest):
A. IV drug use (sharing needles)
B. Unprotected sex
- Anal sex
- Vaginal sex

C. Multiple sexual partners
D. Oral sex

Low risk behaviors (highest → lowest):
A. Vaginal or anal sex w/ condom
B. Blood transfusions – 2.55/100,000
C. Tattoos – mostly older
D. Dental procedures
E. Organ Donors
F. Ear piercing
G. Manicures
H. Sharing shaving razors
I. Bit by an infected person
J. Wet kissing

25. How do we test for the HIV virus? How long can a person be infected with the HIV virus and still have a negative HIV test? Can we conclusively show a person is not infected with HIV? What tests are necessary to show a person probably free of the HIV virus?

The test determines if there are antibodies in the blood for the HIV virus. There are two HIV viruses (HIV-2 is 99% of the cases in the US, HIV-2 is most prevalent in South Africa).
It can take 6 weeks – 6 months after infection before a person will produce the antibodies for the HIV virus.
The test is only 99.9% accurate, so we can not conclusively determine that a person is not HIV positive.
Two tests, three months apart are required to show a person is probably free of the HIV virus.

26. When did the first cases of HIV infection occur and when were the first cases in the United States?

The first AID cases were detected in Africa in 1958-1960. The first cases in the US is believed to be 1978-1980.

27. How can people reduce the chance that they will become infected with HIV? Are condoms 100% effective in preventing the spread of HIV?

A. Use a condom – not 100% effective
B. Reduce the number of sexual partners
C. Wear gloves while working on patients.
D. Get two HIV tests three months apart before having unprotected sex with someone.