# Pathology 438 Final Examination due: 15 June 2015

Spring 2015

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The electronic responses to this examination are due on Monday, 15 June 2015 at end of day (5:00 pm). Submit them to [shalloran@lifewest.edu](mailto:shalloran@lifewest.edu) OR to [smhbizness@gmail.com](mailto:smhbizness@gmail.com). You will be sent an acknowledgement receipt.

You are not allowed to consult with classmates or any individuals *other than* the instructor as you research, prepare and compose your responses to the questions posed in this examination. Lecture content (slides) and your oral presentations are on MOODLE for you to use in preparing answers, in addition to access to the LCCW library, reference books and course text books, and on-line resources. Please proofread and organize your work and assemble the exam before submitting it.

Some answers require you to include a citation of the sources you consult to formulate your response. Format your citation according to MLA or APA standards. (If you wish, you can use the built-in Word feature that formats your references: under the References tab, use Insert Citation and fill in the fields as much as possible. Later you will use Bibliography->Insert Bibliography at the point of the cursor. You might learn how to use Section Break too in order to insert bibliographies under separate answers. I have put in section breaks in this document between questions.)

By working the examination and submitting it for grading you are agreeing to work independently of all other individuals and you are certifying that all the responses and answers to the examination questions are your own work.

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Within group A through C, choose ONE of any of the choices answer.  
Choose between D or E, and within D, choose ONE of any of the choices

* 1. Environmental Toxicants. Pick one from the three class of substances below and discuss exposure (places where it might be encountered), its toxicokinetics (ADME) and toxicodynamics (acute, chronic toxicity, effects on physiology and eliciting pathologies). You are allowed to focus on one compound in the class or discuss the toxicology of the class generally
     1. Polyaromatic hydrocarbons (PAHs)

PAHs are released when fuels are burned, things like petroleum, coal or charring meat. Soot is an example the CDC uses for a substance that contains many of these potentially carcinogenic chemicals. it has been found that the least damaging way to absorb these chemicals is via the skin becuase they are more easily excreted and therefore have less chance to do damage. Unfortunately they are everywhere and very small so they are easily inhaled and eaten without our knowledge.

Toxicokinetics: absorbed via consumption, inhalation or skin contact. They have been found to be mainly excreted in feces in animals. It may be easier to excrete PAHs after dermal exposure via sweat and urine.

When inhaled The mucus membrane absorbs PAHs and when consumed they are absorbed by the GI tract. PAHs are fat soluble and are passively diffused into the skin.

Toxicodynamics: When the PAHs are in the system they can bind to DNA strands performing mutagenesis and possibly carcinogenic issues.

Polycyclic Aromatic Hydrocarbons (PAHs). (2011, March 3). Retrieved June 16, 2015.

TOXICOLOGICAL PROFILE FOR POLYCYCLIC AROMATIC HYDROCARBONS. (1995, August 1). Retrieved June 16, 2015, from http://www.atsdr.cdc.gov/toxprofiles/tp69.pdf

* 1. Food Toxicants.

1. Sulfur dioxide (SO2) is added to wine during its production. Discuss what is known about acute and chronic toxicity and other toxicodynamic features. Can wine be produced without using it? Are there are alternatives

When Sulfur dioxide dissolves into a water based liquid like the mucosa of the eye or lungs it creates Sulfurous acid which has a pH of 1.5, very acidic, this can cause irritation or corrosion and also create issues with the movement and changing of the cilliary mucus. The bisulfite ion that is created can cause bronchial constriction. When this chemical gets to the GI system it can cause nausea, vomiting and abdominal pain. respiratory symptoms can include asthma like symptoms as well as pulmonary fibrosis, RADS, and bronchopneumonia with bronchiolitis. There have been studies saying that colloidal silver can be used effectively instead of sulfur dioxide as a preservative and antiseptic. Colloidal silver is a non-prescription supplement used to boost the immune system and fight illness.

Acid Base Definitions. (n.d.). Retrieved June 16, 2015, from https://www.chem.tamu.edu/class/majors/tutorialnotefiles/ph.htm

Pedro M. Izquierdo-Cañas, Esteban García-Romero, Belén Huertas-Nebreda, Sergio Gómez-Alonso, Colloidal silver complex as an alternative to sulphur dioxide in winemaking, Food Control, Volume 23, Issue 1, January 2012, Pages 73-81, ISSN 0956-7135, http://dx.doi.org/10.1016/j, from http://www.sciencedirect.com/science/article/pii/S095671351100243X?np=y

Sulfur Dioxide. (n.d.). Retrieved June 16, 2015, from http://www.atsdr.cdc.gov/MHMI/mmg116.pdf

* 1. Drug-Nutrient Interactions. Select any of the drugs or drug classes below and explain how it affects diet (nutrient absorption). Either suggest an alternative drug and/or explain how an individual can compensate for any effect on nutrition

1. Anticonvulsants

Anticonvulsants have been linked to malabsoprtion of folic acid, vitamin D and possibly other vitamins and minerals. It has been recommended to get a folate and vitamin D supplement prescribed along with them. There are many other depletions that can happen due to anticonvulsant medications like many minerals as well. The patient may take to their GP or neurologist about a overall vitamin supplement to make up for the depletion of nutrients. The depletion of nutrients can either happen via mal absorption or increased metabolism of the nutrient.

Ketogenic diet: A diet high in vegetables and fat with some protein that is meant to limit the amount of glucose in the body and brain. This diet forces the brain to start running off of ketone bodies that come from fat metabolism. The difference and balance in nutrients may help balance the brain's functions.

Matsui MS, Rozovski SJ. [Drug-nutrient interaction.](http://www.ncbi.nlm.nih.gov/pubmed/7046936) Clin Ther. 1982;4(6):423-40. Review. PubMed PMID: 7046936 from http://www.ncbi.nlm.nih.gov/pubmed/7046936

(n.d.). Retrieved June 16, 2015, from http://www.merckmanuals.com/professional/nutritional-disorders/nutrition-general-considerations/nutrient-drug-interaction

Abscesses - Clark's Nutrition. (2011). Retrieved June 16, 2015, from http://www.clarksnutrition.com/ns/DisplayMonograph.asp?StoreID=2691b1fe187d41acb869a85ca5957a0a&DocID=depletions-anticonvulsants

Diet and Nutrition. (2014, June 1). Retrieved June 16, 2015, from http://www.epilepsysociety.org.uk/diet-and-nutrition#.VX9YyvlViko

Ketogenic diet. (2013, October 1). Retrieved June 16, 2015.

* 1. Sexual dysfunction therapy. A medication for hypoactive sexual arousal disorder recently was in the news. This medication, flibanserin, is being called a “female Viagra.”  
     (a) Discuss the effect of the drug both at clinical and molecular level

The manufacturer believes that it increases dopamine and norepinephrine levels in the mind and body by postsynaptically blocking certain serotonin receptors on pyramidal neurons and activating others. The goal of this chemical activity is to prevent the process stopping effect of serotonin on certain functions of the brain and body. This drug also promote activation of dopamine and norepinephrine and further prevents serotonin producing neurons from activating by reducing the amount of glutamate transmission that happens to the brain stem.

The effects of this interaction cause a better environment for the reward centers in the brain to be activated creating a more positive experience and higher desire for sexual activity.

(b) Discuss alternative therapies, including those in chiropractic medicine

Chiropractic: Women who are pre menopausal seem to be put in high stress situations in our society. Stress puts people in high sympathetic mode neurologically and that reduces sexual drive. If the chiropractic adjustment targeted the sympathetic ganglion levels (thoracic and sacral spine) this can help improve sexual desire and allow the woman to become more relaxed and allow a more parasympathetic lifestyle. This would create a better environment around the woman to be able to achieve arousal. Women may also have some sort of sexual dysfunction that can affect them differently than males so a sacrum adjustment may benefit.

Ginseng gives an energy and mood boost that may help with sexual desire and ability.

Black Cohosh can be helpful with premenstrual and premenopausal symptoms like hot flashes, night sweats and vaginal dryness.

Chasteberry may increase dopamine and progesterone levels to increase female libido.

Most alternative treatments for females with low libido involve relaxation or meditative techniques.

FLIBANSERIN FOR THE TREATMENT OF HYPOACTIVE SEXUAL DESIRE DISORDER IN PREMENOPAUSALWOMEN NDA 022526 ADVISORY COMMITTEE BRIEFING DOCUMENT. (2015, June 4). Retrieved June 16, 2015, from http://www.fda.gov/downloads/AdvisoryCommittees/CommitteesMeetingMaterials/Drugs/DrugSafetyandRiskManagementAdvisoryCommittee/UCM449090.pdf

Female sexual dysfunction. (2012, September 25). Retrieved June 11, 2015, from http://www.mayoclinic.org/diseases-conditions/female-sexual-dysfunction/basics/alternative-medicine/con-20027721

Flibanserin - Prescription for Female Hypoactive Sexual Desire Disorder HSDD. (2015). Retrieved June 11, 2015, from http://www.flibanserin-hsdd.com/

Kiefer, D. (Ed.). (2010, December 17). Natural Sex Boosters: Can You Rev Up Your Libido? Retrieved June 11, 2015, from http://www.webmd.com/vitamins-and-supplements/lifestyle-guide-11/natural-sex-boosters-can-you-rev-up-your-libido?page=2