# 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.

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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. Pesticides—Insecticides: organophosphates

Exposure- There is two key exposure sites for pesticides. The first location is occupational such as agricultural workers in fields, greenhouses, pesticide industry, and exterminators. The second is the general population through the foods we eat and water we drink. However, the general population can also come across pesticides through the occupational locations as well.

Toxicokinetics- The toxicokinetics of pesticides has a large range depending on the compounds within the specific pesticide. Anthrax for example involves several complex steps. A spore is taken up by immune cells then transported to local lymph nodes, which then produce deadly toxins. These toxins spread systematically, which leads to death of the host. In other words the spores are ingested by macrophages where they then germinate within other target tissues causing high toxicity levels in these tissues/organs leading to cell death.

Toxicodynamics (acute, chronic toxicity, effects on physiology and eliciting pathologies)- Children have the greatest susceptibility to the toxic effects of pesticides. The Natural Resource Defense Council has shown higher incidences of leukemia, brain cancer and birth defects in children exposed to pesticides, which are neurotoxins. Some of the effects include pre mature birth with decreased growth, lower cognitive scores, fewer nerve cells, lower birth weight, and greater risk of Parkinson’s disease. The effects of the pesticides range greatly from one pesticide to another.

* 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

Acute/ Chronic toxicity- In a literature review study based on acute and chronic exposure those who should be concerned with SO2 exposure are children and asthmatics (when the pollutant is of respiratory exposure). The studies expressed acute toxicity can cause postnatal somatic and behavioral alterations after maternal SO2 exposure during pregnancy. The exposure expressed a complex toxic hazard, which may alter the developmental processes in offspring. Also, chronic exposure has been link to being carcinogenic.

Can wine be produced without SO2? Yes, there are wines produced without SO2. However, SO2 is necessary for the longevity of the wine. It has an antioxidant and antimicrobial effect, which makes the wine last longer.

* 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. Antacids

Nutrient absorption- Antacids cause irritation of the gastric lining, which decreases the amount of gastric juices secreted. The gastric juices being secreted play a crucial role in the breakdown of foods into absorbable nutrients. With that being said, Antacids decrease gastric juices, which leads to a decrease in the breakdown of food. Ultimately leading to a decrease in available nutrients for absorption.

Alternative- I would not recommend an alternative drug. However, I highly recommend further investigation of the underlining need for an antacid. Commonly antacids are used to GERD. GERD is thought to be an increased amount of acidity as well as a weak esophageal sphincter. However, a change in the individual’s diet which includes acidic fluids/ foods (e.g., lemon water, apple cider vinegar) will help manage the production of H. Pylori, which attributes to GERD.

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

1. Flibanserin’s goal is to increase dopamine and norepinephrine levels while decreasing serotonin levels. By balancing out these neurotransmitter ratios the women should experience a healthy sexual drive. The molecular compound is trifluoromethyl phenyl poperazin-1-y ethyl-1, 3-dihydro-2H-benzimidazol-2-one.

b. I recommend chiropractic adjustments (e.g., lumbo-pelvic, sacral), proper diet and exercise. With adjustments, proper diet and exercise one should be able to maintain proper hormonal balance. After the patient has these components down and if they contain to experience a decreased sex drive then I will re-evaluate and consider dietary and lifestyle changes.

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