Bi231-233 "Book-To-Bedside" Assignment instructions

There are 3 "book-to-bedside" assignments, where I would like you to apply some of the information you are learning in class to a more practical or medical situation (i.e. a *patient's* bedside). You will be given a choice of topics, you are to pick one and write a 2-page essay on the subject.

The goal is to take some of the boring facts you have learned and regurgitated in class, and **apply** them to a more real-world situation. In doing so, you should be doing *a little* outside research beyond your text and lectures. This should be a fairly open-ended assignment, but these are the main rules I have:

What to do:	What to avoid:
1. Show me that you learned some A&P material in class. This is not a book report or a research paper, please keep your focus on class material, and expand upon it. If you make the same mistakes on your report that you did on your midterm, I won't be awarding you any extra credit.	1. **Do not plagiarize.** I can look up things on WebMD and Wikipedia, and if I find you used one sentence from another source without citing it, I will give you 0 points and a warning. The second time is an F in the class.
2. This is also not an account of your own illness or a family member's illness *(if you are not familiar with HIPAA yet, you should be).* Remember, the goal is to show me you learned something <u>in class</u>, not that you already knew everything you think you need to know before coming to class. I encourage you to research something meaningful to you, just **please focus on the science.**	2. **Do not quote.** The point of the assignment is to show me you *understand* the facts you are learning in class well enough to apply them to a more realistic situation. I am not looking for your ability to *regurgitate* facts. Therefore, you must **write everything in your own words** (anything you paraphrase from another source should be *cited* properly still, see below)
3. Show me how the class material is relevant to a real word situation. You do not have to cover an entire chapter. To help you focus: **Avoid lists (and colons).** Focus on <u>one aspect</u> of the disease or procedure you are discussing, don't list out everything (zzzzzzzzz). **Pick a thesis statement** and put it at the end of your introduction. This sentence should sum up your entire 2-page paper, the rest is just details. **Avoid posing questions,** try rewording them into statements. Your goal is to come across as the knowledgeable one!	3. **Don't use semicolons; a new sentence is better.** Amaze me with your grip on biology, not your ability to sound like a college student. On the other hand, if writing in English does not come easily to you, please see me or check with the tutoring center in the library for help *before* the assignment is due. When it is time to grade, please let me be your A&P instructor, not your writing instructor.
4. I need just one primary research article in your bibliography. You do not need to actually read it and understand it—just know that it is a real article and it is relevant to your paper. The goal is to <u>look</u> as professional as you can.	**4. Do not cite websites. Do not cite advertisements. Do not include anecdotal evidence** (my friend the sales-rep says his product works great). **And never put "http://blahblah.blah.com" in your bibliography.** I can't click on it, so why are you putting it there?

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Each is worth a maximum of +25/25 points, applied to your overall grade. Your score will determine how many points the assignment is worth (i.e. your grade will never go down by doing or not doing these assignments.) Roughly, you can assume this sort of bump to your last midterm score:

Approximate test score bump: A = +2%, B = +4%, C = +6%, D = +8%, F = +10%.

Note: this is not a total grade bump! This assignment will boost a bad test score, it will not make up for a bunch of 0's in the grade-book. The points you earn will be assigned as follows:

Grading rubric	0% - (needs improvement)	50% (competent)	100% (proficient)
10 pts – Scientific Knowledge	Does not contain any class material, or contains errors in class material.	**Recites** some class material	**Applies** knowledge from class to a medical situation (disease ,treatment, etc..).
5 pts - organization	Hard to follow	Poses a clear question and answers it logically	Poses a clear question and makes it sound **interesting/ important** (i.e. why should I care about it)**,** and answers it clearly.
5 pts - grammar	Did not use spell-check before handing in—has a typo, punctuation error (especially a semicolon), an incomplete sentence or a run-on-sentence.	used English properly, used spell-check before handing in	Uses some difficult medical or scientific terminology correctly (and hopefully simplifies it)
5 pts - references	Cites websites or general magazines/newspapers.	Cites a credible medical website	Correctly cites at least 1 primary research article.

You will be given multiple options. Pick **one** of the questions and write a 2 page (double spaced) answer. You will need to do research above and beyond the textbook (this is *extra credit*, after all). When writing your essay, the goal is to show me you learned something in Anatomy & Physiology, and can **apply** that information to a more "real-world" situation. If you can think of something else you'd prefer to write about, feel free, just make sure that you are primarily discussing facts you learned in A&P class, not your feelings on the health care industry or what it was like when your relative got cancer.

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Extended instructions:

Here is an example outline. You may wish to use it, adapt it to your subject, or ignore it completely.

1. Introduction
a. Briefly introduce your topic.
b. Tell the reader **why they should be interested.**
i. Does this disease or injury affect a lot of people (e.g. scars, heart disease)?
ii. Does it only affect a few people, but does so severely (e.g. Cystic Fibrosis, Leukemia)?
iii. Does the disease have a toll on the family or on society as well as the patient (e.g. Alzheimer's Disease, obesity)
c. Your **thesis statement** should go last—this single sentence summarizes your central argument. If you can't summarize what you are trying to say in one sentence, you need to focus.
2. Paragraph I – Normal Physiology
a. What should happen in a healthy patient? (what is the homeostatic mechanism involved)
b. This should mostly be class material
3. Paragraph II – Disease Physiology
a. What is going wrong in the patient? (Why isn't the patient in homeostasis?)
b. This should build on what you covered in paragraph I, but may require a little outside research.
4. Paragraph III – Why does treatment X work?
a. Given what you have covered in paragraphs I and II, how is this information relevant to your patient? i.e. how does this explain why treatment X works? Don't cover every possible treatment, just one.
b. Focus on the general physiology, I do not need specific details about patient care (e.g. doses, times, etc…)
5. Outro
a. Do not summarize everything you just said, there is no need for such with such a short paper.
b. The last paragraph is a good place to briefly mention things such as:
i. How might the treatment from paragraph III be improved in the future?
ii. What is still unknown, and could be very helpful to patient care if it were to be studied? (You can pose a hypothesis)

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Citing Primary Journal Articles:

When writing about your findings, be sure to cite your references. Wikipedia or WebMD can be a good place to go to first, but do not cite them. **Websites do not count as reliable sources**.

To get full credit, you must cite one primary-source article. You *can* cite the sources Wikipedia cites, presuming you make sure they aren't fake or not primary literature (i.e. Time magazine does not count when they report on something someone else published. If you do not know how to do citations or how to format a bibliography, I can help, or the tutoring center can help, too. What I will need is:

Authors. Title of article, (year) Journal/Book Name. Issue #, page numbers.

If you go to Wikipedia, notice that they list the actual articles that they have summarized and cited. USE THOSE! Don't cite Wikipedia (or other websites)

Reading Primary Research Articles:

I don't expect anyone to actually read more than just the *abstract* of a primary research article for Bi231-233. I do expect you to be able to **identify** a primary research article, and correctly **cite** it within your paper to make your report look more scientific.

Do not plagiarize

.Make sure to **rephrase** (simplify!) all scientific data in your own words, and then cite the source at the end of the sentence like this[1], or like this (Sheldahl, et al, 2011) and include a bibliography at the end of your paper.

For example, if you found this link on www.neuroendocrine.com, and wanted to use this information:

> *Neuroendocrine tumors (NETs) are a group of malignant tumors that are believed to originate from neuroendocrine cells found throughout the body.[1] They are more prevalent than many GI malignancies, including stomach and pancreatic cancer combined.[2] [3] This section provides an in-depth discussion around the characteristics of NETs, as well as their impact from a clinical perspective.*
>
> *1 Jensen RT, Doherty GM. In: Cancer: Principles & Practice of Oncology. 7th ed. Philadelphia, PA: Lippincott Williams & Wilkins; 2005:1559-1574.*
>
> *2 Yao JC, Hassan M, Phan A, et al. J Clin Oncol. 2008;26(18):3063-3072.*
>
> *3 National Cancer Institute. http://seer.cancer.gov/csr/1975_2004/results_merged/topic_prevalence.pdf. Accessed April 29, 2010.*

This is about how you should go about it:

> Neuroendocrine tumors are a large group of tumors which originate from many cell types. [1] They are, In fact, more common than many GI malignancies.[2], [3] What distinguishes them from other cancers……..
>
> **Bibliography:**
>
> 1 Jensen RT, Doherty GM. In: Cancer: Principles & Practice of Oncology. 7th ed. Philadelphia, PA: Lippincott Williams & Wilkins; 2005:1559-1574.

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Paraphrasing versus Quotations and Plagiarism:

Don't copy and paste. And unless you are quoting poetry, **do not quote**!! As a general rule, you should never quote anything in science-- always keep the focus on you. Quotations are for English and Psych classes. If you quote me a bunch of work by Dr. So-and-so, I will give the points to Dr. So-and-so.

Put it in your own words I want to see that you have *found* some technical information and *understood it* well enough to explain it to another student (or college-educated patient).

Realize that when you use professional abbreviations (like "NETs") or long words (like "neuroendocrine malignancies") it is a tipoff for me to go check google for that specific phrase to see if it is plagiarized, versus something you just knew or got from the textbook before coming to class.

Can I use my family member/coworker/friend who is a medical professional as a resource?

Yes! If you talk to a medical professional, it is OK to cite them[2]

[2] Steve McQueen, RN, professional communication 2011

However, I can't find this information in a library. If at all possible, use only sources I can find in a library

But is it a *primary* research article?

It is if you can find in on http://www.pubmed.net. This is a good resource, although many of the journals are by subscription only. For Bi231-233, reading the abstracts will probably be good enough. Alternately, you can go to www.mhcc.edu, and click on "Library" in the upper tab. From there, click "databases", then "Health and Medicine", then "Nursing and Allied Health Collection" or "ScienceDirect" to get full access to many scientific journal articles.

Can I have an example?

Yes, there is an example at the end of this .pdf

Bi231 Book to Bedside 1

See syllabus for due dates

Questions (pick one):

1. Melanoma is much less prevalent than other forms of skin cancers (such as squamous cell carcinomas), but accounts for the vast majority of skin cancer-related deaths. What makes melanomas so much more deadly than other forms of skin cancer? Things to focus on: subnormal cellular differences between keratinocytes and melanocytes (or melanoblasts).

2. What is scar tissue, and how easily can it be removed for cosmetic reasons? Focus on items we have discussed in Bi231, such as tissue types, collagen, tissue repair and angiogenesis.

3. Obese patients diagnosed with Metabolic Syndrome are at an elevated risk of developing (type II, adult onset, or insulin-resistant) diabetes. Focusing on what you have learned in Bi231 regarding homeostasis, negative feedback, and adipocytes, how might metabolic syndrome lead to insulin-resistant Diabetes?

4. Recently, many people have touted the benefits of “anti-inflammatory diets” which, among other things, include foods rich in Omega-3 fatty acids. How do Omega-3 fatty acids reduce inflammation? What sort of diseases or disorders would someone undertaking an “anti-inflammatory

diet” hope to control? Lastly, is there any evidence that such diets work? Be sure to focus on the materials we learned in class, including healthy fatty acid chemistry and the steps of inflammation and tissue repair.

Bi231 Book to Bedside 2

See syllabus for due date

QUESTIONS

1. What are the effects of cola consumption on bone density? Be sure to relate this to terms we used in class (such as hormones and cell types).

2. How do surgeons reattach or repair a torn ACL? Duct Tape? You may wish to discuss properties of connective tissues as well as relevant anatomy of the knee. What's the best way? (there is no right answer to the last question, but tell me what you think and back it up)

3. What are Electrical Bone Stimulators used for, and what is the theory behind how they aid in bone healing? How effective are they? (Again, there is no right answer to the last question, but tell me what you think and back it up).

4. Our textbook suggests Rheumatoid Arthritis may be triggered by infections or allergies—however, there is no evidence to support these claims. Focusing on what we've learned about different types of arthritis as well as the process of inflammation, what is the idea/theory behind an allergy triggering this type of arthritis?

Bi231 Book to Bedside 3

Due: Final exam day-- no late submissions!

QUESTIONS (pick 1)

1. Much attention has been generated recently regarding increased rates of obesity in the U.S., especially among children. While the subject is surely complicated—it has even led neuroscientists to question the concept of "free will"—one possible culprit are endocrine disruptors, such as bisphenol A (BPA) or perfluorooctanoic Acid (PFOA). Using what you have learned about the anatomy & physiology of the endocrine system, how could exposure to endocrine disruptors lead to weight gain? Are they high in calories? Do they taste good? How does that work?!? (note: you may have to discuss a little embryology, as exposure as a fetus or newborn seems to be more detrimental than exposure as an adult)

2. Write a 2 page (double spaced) paper about type II Diabetes, focusing on the role Insulin normally plays in the body. Here are some questions you should consider answering:

a. What does insulin regulate?

b. Where is insulin made? (which organ and what cell type)

c. What triggers insulin release into the bloodstream?

d. Does insulin raise or lower blood glucose levels? (hint: see next question)

e. How does insulin lower blood glucose levels? In your answer to this part, please

mention the insulin receptor and what it causes most cells in the body to do.

f. Are type-II diabetics insulin-deficient or insulin resistant? What does that mean? What molecule would be absent (or in low levels) in a type I versus a type II diabetic?

g. What happens to blood glucose levels in type-II diabetes?

h. Why is that bad?

i. The primary treatments are diet and insulin. Why change a person with type-II diabetes' diet? Why are insulin injections effective? Does this seem like the best long-term treatment, considering the underlying cause of type-II diabetes?

3. What is Duchene Muscular Dystrophy? In your 2-page paper, please focus on things we have discussed in class, such as important muscle molecules and their functions (actin, myosin, fiber types and what occurs during resistance training--for instance, do type I and type II fibers have the exact same myosin molecules? What does "nature versus nurture" have to do with the amount of fast-twitch and slow-twitch fibers in an endurance athlete versus a body builder? How do some common supplements fit into the equation? Discuss the theory behind them, any *scientific* evidence supporting their effectiveness (spokesmodel testimony does NOT count) and whether this seems likely to be effective.

Extra Credit #1 Name: Fakey McFakerson Bi232 sec 04 Professor L. Sheldahl

Inserted: please include your name, the class and section ,and the assignment name when handing in or emailing papers to me.

Melanin does more than absorb light: how albinism affects vision

Inserted: The title should be informative, not just "Albinos!"¶

Albinism is a heritable disorder caused by mutations to genes controlling the production of melanin. Melanin is a pigment, synthesized by melanocytes from the amino acid Tyrosine, which can absorb UV light and protect the skin from DNA damage. This pigment is one of the major contributing factors to skin, hair and eye color. In albinism, the lack of brown pigments leads to paleness of the skin and hair, changes to the color of the irises, as well as a number of visual defects. In fact, there is a type of albinism—ocular albinism—that is characterized by a lack of pigment specifically in the eyes and nowhere else (1). Visual problems associated with albinism include fairly predictable deficits caused by the lack of pigment in the retina, but also include a number of congenital defects in proper neural wiring of the eyes, which cannot be explained by the mere lack of a light-absorbing pigment.

Inserted: start with a broad introduction, to help bring everyone up to speed on your subject. I, for instance, don't have every piece of A&P memorized.

Inserted: please cite any controversial or highly technical information. There are many ways to format citations. JUST DON'T PLAGIARIZE. I didn't know this info off the top of my head, so I found it, rewrote it in my own words, and cited the authors.

Inserted: This is my thesis statement, which sums up my major argument in 1 sentence. If you don't have a main point, perhaps you should! With just two pages, you wont be able to have lots of arguments or topics..

Commonly, people with albinism suffer from decreased vision due to the scattering of light within the retina. A healthy retina contains a pigmented layer behind the rods and cones, which absorbs light that passes through the rods and cones without being absorbed by retinal. This prevents light from bouncing and activating photoreceptors elsewhere in the retina. Similarly, a lack of pigment in the irises can cause photophobia, or a pain-induced intolerance to light, due to a decreased ability to block light from entering the eye.

Inserted: try to not call your patients by the name of their disease.

However, many other eye defects associated with albinism cannot be explained by reduced light-absorption. A number of visual problems are associated with improper routing of neurons, such as the misrouting of neural projections across the optic chiasm and nystagmus, or involuntary eye movements caused by defects in vestibular reflex wiring (2). It is interesting to speculate how a lack of a pigment in the retina can affect how axons grow from the eye and connect to the brain during early development. One current hypothesis is that melanin is produced in a gradient across the retinal

epithelium, and the amount of melanin instructs axons leaving the retina to decide whether or not to cross at the optic chiasm (3). This would suggest that melanin, produced by retinal epithelial cells, can somehow signal to the neuronal retinal ganglion cells, and influence fate decisions those ganglion cells make (such as whether or not to cross the optic chiasm during axon outgrowth).

This raises an interesting question: If melanin can function as a signaling molecule in the eye, orchestrating cell fate and proper mapping of retinal axons, could this explain the role of melanin found in the brain? Parkinson's Disease is characterized by a loss of domaminergic neurons in the midbrain, which normally express a form of melanin called neuromelanin (4). The role of neuromelanin is not understood (4), but because it is inside the skull it seems unlikely it plays a role in absorbing UV light, as seems to be the major function of eumelanin and pheomelanin in the skin and hair. It seems plausible that the neuromelanin may play an active role in proper wiring of the midbrain, rather than simply be a by-product of catecholamine synthesis (5).

Inserted: feel free to pose questions that have no answer, these usually go at the end, like a scene at the end of the movie that lets you know there's gonna be a sequel.

Bibiolography

1. Summer GS. Albinism: classification, clinical characteristics, and recent findings. *Optom Vis Sci*. 2009;86:659-662
2. Chen, Harold *Atlas of genetic diagnosis and counseling*. (2006): Humana Press. pp. 37–40.
3. Engle , EC. Human Genetic Disorders of Axon Guidance. (2011) *Cold Springs Harbor Perspectives in Biology*, Oct
4. Fedorow H, *et al*. Neuromelanin in human dopamine neurons : Comparison with peripheral melanins and relevance to Parkinson's disease. *Prog. in Neurobiology*, v75.2 (2005)
5. Zecca, L *et al.* A proposed dual role of neuromelanin in the pathogenesis of Parkinson's Disease. *Neurology* (2006) 67: S8-11.

Inserted: there is no single way to write a bibliography. Get the needed info (author, title, jornal, publication date and page numbers) and be consitent. You should be citing mostly books and primary research articles, not websites or newspapers, unless you are discussing the social aspects of a disease.

Inserted: *if there are a ton of authors, feel free to cite the first one plus "et al" in italics, to save space.*