What you need in the writing assignment:

1. Your name, affiliation, date (Fall, 2024),

2. Title of paper

3. Introduce the name of the pharmaceutical drug and what it is prescribed to treat.

4. Explain the normal physiology involved in the body function, and what is happening during abnormal function of that system.

5. Explain the physiology of HOW that drug treats the problem, trying to bring into the assignment as much material that you've learned in lecture as possible.

6. As with many drugs, what are the side effects, and the physiology of that?

7. Make sure and cite your sources within the body of the writing assignment as numerical superscripts (see example assignment). A numerical superscript looks like this¹.

8. End with a Literature Cited section. You must cite from the Wikibooks course textbook as a bare minimum, but you can find and use other reputable sources. If sources are online, give full https link.

I don't care if you use single or double space. Keep to regular fonts types between 11 – 12pt in size. Spelling and grammar will count! I have not set a specific page count for this writing assignment. Use what seems appropriate to get the information across to me. If you use acronyms, please explain what they stand for. (For example, ACh stands for acetylcholine.)

Example Lecture Writing Assignment Below:

(This means writing about Viagra, Levitra, Cialis, or other ED drug treatments that work as phosphodiesterase inhibitors is off limits).

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Viagra: What's Up With The Little Blue Pill?

Sildenafil (or Viagra) is a pharmaceutical drug advertised on television to treat erectile dysfunction (ED)¹. To understand how Viagra treats ED one must first understand the normal physiological process involved in an erection.

A normal erection occurs when sensory stimuli (caused by sexual arousal) cause a parasympathetic release of acetylcholine (ACh), which stimulates nitric oxide (NO), a gaseous neurotransmitter, to be released from motor nerves into the synapses with arteriole smooth muscle cells located within the corpus cavernosa (erectile tissue) of the penis. The corpus cavernosa are spongy tissues that can fill with blood when the arterioles within them vasodilate.³ The NO binds to muscarinic cholinergic receptors on the membrane of arteriole smooth muscle cells*. Receptor binding with NO activates an enzyme (guanylate

cyclase), and then activates the second messenger called cyclic guanosine monophosphate (cGMP). The cGMP then causes phosphorylation of protein kinases that function to open calcium channels on arteriole smooth muscle cells causing muscle relaxation and arteriole vasodilation. Arteriole vasodilation within the corpus cavernosum results in the increased blood flow necessary for an erection to occur². When sexual arousal wanes the production of NO decreases and the cGMP second messenger is broken down by an enzyme called phosphodiesterase. Without cGMP protein kinase phosphorylation decreases and, ultimately, vasodilation of penile arterioles decreases resulting in penile relaxation or detumescence.

ED typically involves decreased arteriole blood flow to the corpus cavernosum of the penis resulting in decreased penile tumescence. Most pharmacological treatments of ED involve increasing blood flow to the penis, and this is exactly what Viagra does. Viagra increases penile arteriole vasodilation by inhibiting phosphodiesterase – the enzyme that breaks down cGMP. The inhibition of phosphodiesterase results in increased cGMP levels, which promotes continued arteriole vasodilation within the penis and facilitates and maintains an erection. Therefore, Viagra is a cGMP agonist because it increases the activity of cGMP on arteriole vasodilation^{3, 4}.

Some side effects of taking Viagra include priapism (an erection lasting longer than three hours), blurred vision, dizziness, or faintness. These side effects are produced by the systemic wide vasodilation that occurs in arteries throughout the entire body – not just the penile arterioles. Patients taking nitratebased vasodilators for cardiovascular disease should consult with their doctor before taking Viagra as this ED drug can cause an unsafe drop in blood pressure when taken in conjunction with these other drugs.

*Some research also indicates that NO might act through acetylcholine- and epinephrine-independent receptors as well.

Literature Cited:

Viagra commercial video: http://www.youtube.com/watch?v=L7ojmDp_b5U&feature=player_embedded
Physiology of an erection: http://en.wikipedia.org/wiki/Biological_functions_of_nitric_oxide
Wikibooks Contributors, Human Physiology 2017. http://en.wikibooks.org/wiki/Human_Physiology (Pgs 287-288)

4. Viagra functions: http://www.arn.org/docs/glicksman/eyw_051201.htm