Unit Two Homework Assignment
Addiction Videos

Opioid Addiction - Addiction and Overdose - Part Two (16 min)
1. Where does addiction start in the brain? Responsible for what? Activated by?
2. What sensation is felt when the reward pathway is activated? Causes what behavior?
3. What are the two most important structures in the reward pathway? Neurotransmitter released?
4. What type of interneurton inhibits the ventral tegmental area? Causing what? 5. What type of receptor is on the GABAergic interneuron? Ligand for this receptor?
6. What is "drug liking"? Drives what?
7. What may influence the rate of drug liking and make some people more vulnerable to addiction?
8. What are the three factors associated with opioid Use Disorder?
9. What is drug tolerance?
10. What is the risk associated with opioid tolerance? higher the intake the greater for overdose and death
11. What is currently the most studied theory of opioid tolerance? cyclic AMP pathway
12. What is cAMP effect on a neuron? more cAMP activates neuron // less cAMP inhibit neurons

13. What occurs after chronic use of opioids? Causes what? no longer decreases cAMP and results in tolerace
14. What role is homeostasis in causing tolerance? opioids reduce cAMP levels below normal so homeostasis tries to restore cAMP levels to normal levels but overshoots target causing higher levels of cAMP // taking opioid now brings cAMP levels only back to normal // to inhibit neuron then more and more opioid is required
15. How may changes in opioid receptor also contribute to tolerance? receptor phosphorylation, receptor internalization, receptor uncoupling
16. How is withdrawal symptoms related to cAMP? What happens to cAMP levels during withdrawal? cAMP levels now unusually higher than normal // certain neurons now overactive and cause withdrawal symptoms
17 What are the brain's three areas associated with withdrawal? ventral tegmental area, locus ceruleus, samll and large intestines
18. What is the pattern of neuron function seen during opioid use and withdrawal? use = opposite of normal function (inhibition) // withdrawal causes excess of normal functions (overactivation)
19. Where is the locus ceruleus located? Functions? brainstem // wakefulness, psycological stress plus activates the sympathetic nervous system when activated causes sweating, pupil dialation, increase heart-reperation rate
20. What occurs to cAMP when LC becomes tolerant to opioids? What then happens during withdrawal? higher than normal camp level // no opioids to bring back to normal level // over stimulation with jittersiness, aniety-panic-stress, excess sweating, extreme dialated pupils rapid heart-respiratory rate // all extreme versions of normal LC functions
21. What happens in the digestive system during opioid use? Why?
22. What happens in the digestive system during withdrawal? Why?
23. What happens in the ventral tegmental area after chronic opioid use or during withdrawal?
24. Do people chronically addicted to opioids take the opioids to get high (pleasure) or to feel normal?
25. How do addicts die during an overdose?
26. How may you reverse an opioid overdose? Mechanism?

Addiction 101
1. What is the number one injury related cause of death in US?
2. Why do we need dopamine?
3. How much dopaimine do you need to motivate you to start your day?
4. What about a really bad day?
5. The best day?
6. Favorite food?

7. Sex? 92 nanograms per deciliter
8. What about methamphetamine?
9. Why does it become a survival issue for the brain?
10. What two limbic brain structues are directly responsible for the reward pleasure pathway?
11. What happens with chronic use of methamphetamine?
12. How low may dopamine be in withdrawal? Condition of patient?

Serotonin VS Dopamine (10 min)

1. What is the neurotransmitter dopamine telling you?
2. What is the neurotransmitter serotonin telling you?
3. What is the role of cortisol? What part of the brain is the target for cortisol? Function?
4. What does a broken prefrontal cortex turn you into? Leads to what?
5. How are serotonin receptor affected by cortisol? Leads to what?
6. What condition occurs when a substance causes higher than normal levels of dopamine?
7. What happens if you do not receive reward? Will you get out of bed?
8. What are the differences between reward-pleasure and contentment-happiness?
9. What neurotransmitters are responsible for pleasure and happiness?
10. What is the post-synaptic affect to dopamine?
11. What is the post-synaptic affect to serotonin?
12. How will a post-synaptic neuron protect itself from death due to excess dopamine? Condition called what?
13. Why may dopamine kill a neuron but serotonin will not kill a neuron?
14. What down regulates serotonin?
15. Why do you have less happiness when you seek more pleasure?
16. What three events occur if you have a lack of dopamine?
17. What is the brain telling the drug addict if they can not get their drug of choice?
18. What area of the brain "lights up" to indicate survival behavior?
19. How will the brain light up for the following stimuli: dehydrated, starvation, drug craving?
19. What type of behavior occurs with craving?
20. How long will it take after the addict stops taking the drug for the craving to stop?
21. Why is methadone used to help patients recover from opioid use disorder?
22. What do you need to think when you hear dopamine? = motivation
23. What is the purpose for reducing craving? stop relapse
24. What is decision fatigue?
25. How may society help treat the opioid epidemic?
26. What is the key idea to take away from this video?