**Neurochemistry, Psychopharmacology, & Drug Abuse**

1. Know the key differences between small & large molecule transmitters – as we discussed in class.
2. Be able to describe how transmitters can get “de-activated.” Could you identify degradation or re-uptake from a figure illustrating these 2 forms of de-activation?
3. Be able to identify the 4 major classes of small molecule neurotransmitters, and be able to identify particular neurotransmitters that belong to each class as we discussed in class. In other words, you may be asked a question that would test your ability to classify dopamine and serotonin as monoamines, but distinguish them as belonging to the sub-classes of catecholamines and indolamines, respectively. In your studying, make a blank table like the one from class slides and try to fill in the boxes.
4. Again, be able to identify examples of some of the large molecule transmitters that were discussed in class (e.g., opioid peptides), and know that neuropeptides / peptides are synonymous with large molecule transmitters.
5. Understand the differences between ionotropic and metabotropic effects of neurotransmitters – and be able to understand the figure from class depicting ionotropic and metabotropic actions. In other words, could you distinguish between an ionotropic vs. a metabotropic receptor? What are their general mechanisms of action?
6. Know the material from class relating to where different concentrations of neurons are (i.e., brain areas) that produce and release different kinds of transmitters (i.e., be able to label these areas and pathways on a picture of a brain
   1. DA = VTA, SN in midbrain
   2. NE = LC in midbrain, upper metencehpalon
   3. 5-HT = raphe in pons, medulla
   4. ACH = pons, midbrain
7. Know the main differences between the different catecholamines, including their pathways and associated key functions (e.g., attention, movement, etc.).
8. Know the difference between the Nigrostriatal, Mesolimbic, and Mesocortical dopamine pathways in the brain. Be able to distinguish them in a figure and understand what psychological functions and disorders they relate to.
9. Know what endocannabinoids are, and know what one blissful example of them is. Know what THC is and how it works. Is THC an endocannabinoid?
10. Know what endogenous opiates are, as well as what psychological processes endogenous opiates are associated with.
11. Know what agonists and antagonists are, and how they can affect neurotransmitters at any point in their life cycle (e.g., synthesis, storage, release, etc.) – **Important:** Know the figures that were shown in class labelled “Some Mechanisms of Drug Action” and “7 Steps in Neurotransmitter Action”.
12. Know what addiction means, and how it is not the same thing as dependence or related terms.
13. Understand what drug tolerance means, and how it is measured (what is a dose response curve, how would it be produced?). Emphasize the different forms of tolerance that we discussed in class.
14. Know what is thought to produce withdrawal symptoms from a biopsychological view. Be familiar with the suspected mechanisms underlying withdrawal, as well as the roles of learning (conditioning) that influence withdrawal symptoms. Be familiar with the example we discussed in class about alcohol, hypothermia, and conditioned drug tolerance. Be able to extrapolate from this example.
15. Emphasize in your studying the material regarding the 5 commonly abused drugs discussed BOTH in class and in the text. There are drugs discussed in the text that are fair game for the exam, so please read and study the chapter.
16. Know the material on relapse covered in class. What are the main triggers of relapse, and why are these important to address in addiction treatment?
    1. Priming = small exposure, single occasion use of drug.
    2. Environmental cues – anything paired with a drug thru learning.
17. Be able to compare and contrast incentive-sensitization perspectives vs. physical dependence perspectives on addiction as discussed in class.
18. Know the main goals and forms of different treatments for addiction discussed in class, emphasize what appeared both in class and in the text.
19. The following material from Chapter 4 will NOT be covered on the exam (safe to ignore, skip):
    1. Section on the Role of Genes in Addiction (pp. 136-38)

##### Biopsychology of Emotion, Stress, and Health:

* How do biological psychologists define emotions? What are the key elements of emotions?
* What aspects of emotions did Darwin emphasize and why?
* Can you distinguish between the James-Lange, Cannon-Bard, and 2 Factor Theory of Emotion?
* What and where are the main brain areas that are thought to be important for emotion?
* What kinds of aggression have been most studied in emotion research, and what brain areas are thought to be important for aggression?
* What is conditioned fear? How has it contributed to understanding of specific pathways and brain areas that are important for fear?
* What is currently thought about the hemispheric specialization of emotion, beginning on p. 220 of the text (this was not discussed in class).
* How have case studies and studies of people with Williams syndrome contributed to our understanding of the amygdala in fear?
* Know the general characteristics of Kluver-Bucy Syndrome.
* What is important about the orbitofrontal cortex and ventromedial prefrontal cortex in emotion regulation? What might these parts of the prefrontal cortex do? What might damage to this area lead to? Could you identify these in a figure?
* You do not need to be able to explain somatic marker hypothesis – ok to skip in your studying.
* Know the 2 stress response pathways covered in class and in the text, the hypothalamic pituitary adrenal cortex axis and the sympathetic adrenal medulla pathway.
* Know what cortisol is and how it comes to be produced and released. Likewise, for epinephrine and norepinephrine.
* Know the material on the immune system covered in class and in the text (emphasize in your studying what’s common or overlaps).
* Does brain imaging suggest that emotions can be localized to particular brain areas? Or is it more likely that distributed areas working together via networks are involved in emotion?
* You do not need to read or study the material on Pain as an Adaptive Emotion on p. 227 – we will cover this later. Ok to skip in your studying.

**Alzheimer’s and Parkinson’s Disorders**

* Know the characteristics of these 2 disorders
  + behavioral or cognitive symptoms
  + brain areas, transmitters that are affected
  + Brain hallmark abnormalities - like amyloid, tau, neurofibrillary tangles, etc.
* What are some treatment options for Parkinson’s?
* Know about MPTP and how its relevant to the study of Parkinson’s