GEORGETOWN UNIVERSITY
School of Continuing Studies
Summer and Special Programs

Drugs & Human Behavior (PSYC 127)

Dates: June 4 – July 27
Location: Online
Faculty: Paul Merritt
Faculty Contact Information: Please email through the Canvas Inbox. If you have issues with the Canvas Inbox, you can use – psm55@georgetown.edu
Virtual Office Hours: By appointment through Canvas Conference. Contact me by email to set up an appointment.

COURSE DESCRIPTION

PSYCH 127 surveys fundamental concepts and current issues in the field of *psychopharmacology*, understanding how drugs affect human behavior. Topics covered include the understanding how drugs are administered to the body and how different routes of administration influence the effects of individual drugs, how drugs are metabolized and eliminated from the body, the neuronal effects of drugs, how pain is treated using analgesics, the effects of both legal and illicit recreational drugs affect behavior, and how mental illness and disease are treated with modern pharmacotherapeutics, including pharmacogenetics. Throughout the course, public policy issues are considered on how best to handle issues involving psychoactive drugs.

COURSE OBJECTIVES

By the end of this course, students will be able to:

- Develop an understanding of the complex interactions between an individual's physiology and drugs of use and abuse.
- Learn how research is conducted to examine psychological principles through drug administration and the emerging importance of this area of research.
- Learn the nature of the psychological disorders and the role of drugs in treating such disorders.

- Understand the importance dose-response relationships in drug effects and how adaptation changes drug dosage effects.
- Understand the nature and causes of drug abuse and addiction and current models of treatment.
- Understand the role of pain management in healthy recovery of patients.

REQUIREMENTS

Textbook : Advokat, C.D., Comaty, J.E., & Julien, R.M. (2014). *A Primer of Drug Action.*

Films

Teenage Drinking: Facts and Fiction

Frontline – Chasing Heroin

http://www.pbs.org/wgbh/frontline/film/chasing-heroin/

Articles and Chapters

Platt ML, Watson KK, Hayden BY, et al. Neuroeconomics: Implications for Understanding the Neurobiology of Addiction. In: Kuhn CM, Koob GF, editors. Advances in the Neuroscience of Addiction. 2nd edition. Boca Raton (FL): CRC Press/Taylor & Francis; 2010. Chapter 6. Available from: http://www.ncbi.nlm.nih.gov/books/NBK53362/

Heinz A, Beck A, Mir J, et al. Alcohol Craving and Relapse Prediction: Imaging Studies. In: Kuhn CM, Koob GF, editors. *Advances in the Neuroscience of Addiction.* 2nd edition. Boca Raton (FL): CRC Press/Taylor & Francis; 2010. Chapter 4. Available from: http://www.ncbi.nlm.nih.gov/books/NBK53355

Meyer, J. S. (2013). 3,4-methylenedioxymethamphetamine (MDMA): current perspectives. *Substance Abuse and Rehabilitation*, *4*, 83–99. http://doi.org/10.2147/SAR.S37258

Caulkins, J. P., PhD., Kasunic, A., M.S., Kleiman, M., PhD., & Lee, M. A. C., M.S. (2014). Understanding drug legalization. *International Public Health Journal,6*(3), 283-294. Retrieved from http://search.proquest.com/docview/1625577341?accountid=11091

Straus, M. M., Ghitza, U. E., & Tai, B. (2013). Preventing deaths from rising opioid overdose in the US – the promise of naloxone antidote in community-based naloxone take-home programs. *Substance Abuse and Rehabilitation*, *4*, 65–72. http://doi.org/10.2147/SAR.S47463

Vlahov, D., & Junge, B. (1998). The role of needle exchange programs in HIV prevention. *Public Health Reports*, *113*(Suppl 1), 75–80. http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1307729/

Rich JD, Adashi EY. Ideological Anachronism Involving Needle and Syringe Exchange Programs: Lessons From the Indiana HIV Outbreak. *JAMA.* 2015;314(1):23-24. doi:10.1001/jama.2015.6303. http://jama.jamanetwork.com/article.aspx?articleid=2299643#jvp150087r6

Bajbouj M & Heuser I. (2009). Stimulating the brain to treat depression. *Experimental Neurology. 219*(1),1. doi:10.1016/j.expneurol.2009.03.033

Padberg, F. & George, M.S. (2009). Repetitive transcranial magnetic stimulation of the prefrontal cortex in depression. *Experimental Neurology. 219*(1), 2-13. doi:10.1016/j.expneurol.2009.04.020

Nitsche, M.A., Boggio, P.S., Fregni, F., & Pascual-Leone, A. (2009). Treatment of depression with transcranial direct current stimulation (tDCS): A Review. *Experimental Neurology. 219*(1), 2-13. doi:10.1016/j.expneurol.2009.03.038

Merkl, A., Heuser, I. & Bajbouj, M. (2009). Antidepressant electroconvulsive therapy: Mechanism of action, recent advances and limitations. *Experimental Neurology. 219*(1), 20-26. doi:10.1016/j.expneurol.2009.04.027

COURSE RESOURCES

Georgetown Library

Students enrolled in online School of Continuing Studies SCS coursework have access to the University Library System's eResources, including 500+ research databases, 1.5+ million ebooks, and thousands of periodicals and other multimedia files (films, webinars, music, and images). Students can access these resources through the Library's Homepage by using their University username (NetID) and password (this is the same login information used to access email). The Library does not mail physical items to students.
SCS students may make an appointment with a librarian to discuss a research topic, develop a search strategy, or examine resources for projects and papers. Librarians offer an overview of and in-depth assistance with important resources for senior or master's theses, dissertations, papers and other types of research. Appointments are conducted using Zoom videoconferencing software. It is recommended that students request appointment at least one week in advance of their desired appointment time (appointments are generally accepted between noon and 7PM EST Monday through Thursday). This service is available to currently enrolled students who need assistance with Georgetown-assigned projects and papers. Please review the Services & Resources Guide for Online Students for additional information.

STUDENT EXPECTATIONS

This course consists of 8 modules and an orientation. All modules are open and available to you at the start of the course for your planning purposes. However, the modules and activities must be done sequentially and certain activities and assignments must be completed by certain dates.
You are expected to complete all the course material. Each modules includes…
Participation is essential to your success in this class. In distance education courses you are required to participate just as if you were in a face-to-face course. This means that in order to get full credit for participation, you will have to complete all of your module activities and assignments by the assigned dates.

TIME EXPECTATIONS

Our online classes are designed to meet the same academic standards as our place-based (face-to-face) courses. Our accelerated modules truncate a 15-week class into 7.5 weeks

while requiring the same level of participation, commitment, and academic rigor. Thus students should plan on spending 15-20 hours per week on the work for any online module.

COMMUNICATION STRATEGIES

Canvas

Georgetown University School of Continuing Studies (SCS) uses Canvas as its Learning Management System. This course will be taught entirely through the Canvas platform. To learn more about Canvas, please go through the Canvas Guide for Students.

Communication with Peers

You will be expected to communicate with your peers via the discussion board.

Email

In this course we will use Canvas to send email for private messages. You can either check your messages in the Canvas system or set your notifications to your preferred method of contact. Please check your messages at least once per day. When submitting messages, please do the following:

- Put a subject in the subject box that describes the email content with your name and module.
- Do not send messages asking general information about the class, please post those in the NEED HELP? question forum.

Questions

In online courses, everyone will likely have many questions about things that relate to the course, such as clarification about assignments, course materials, or assessments. Please post these in the NEED HELP? question forum, which you can access by clicking the DISCUSSIONS button in the course navigation links. This is an open forum, and you are encouraged to give answers and help each other.

Turnaround / Feedback

If you have a concern and send me a message, you can expect a response within 2 business days. Please allow 3 business days for assessment submission feedback.

Netiquette Guidelines

To promote the highest degree of education possible, we ask each student to respect the opinions and thoughts of other students and be courteous in the way that you choose to express yourself. The topics in this course are often controversial and promote debate. Students should be respectful and considerate of all opinions.
In order for us to have meaningful discussions, we must learn to genuinely try to understand what others are saying and be open-minded about others' opinions. If you want to persuade someone to see things differently, it is much more effective to do so in a polite, non-threatening way rather than to do so antagonistically. Everyone has insights to offer based on his/her experiences, and we can all learn from each other. Civility is essential.

And finally, what happens in a class discussion stays in a class discussion unless you receive permission from the instructor to share something outside the class.

COURSE ACTIVITIES AND ASSIGNMENTS

Quizzes: For each learning module, you will complete a brief quiz. Quizzes will need to be completed by midnight on Sunday evening of each week. The quizzes will be multiple choice, true-false and fill-in-the-blank type questions and worth 20 points each. I will drop your lowest quiz grade.

Discussion Board Assignments: There will be 4 discussion board assignments worth 20 points each.

Drugs in the News Assignments: You will complete 4 drugs in the news assignments, each worth 20 points. You will find a news item and write a brief (less than one page) summary of the item. You may turn in NO MORE than ONE PER WEEK. You may otherwise do these at your own pace.

Exams: There will be a midterm exam and a cumulative final exam.

COURSE GRADES

Your course grade will be based on the following:

Quizzes: 140 points (20 points each, dropping lowest score)
Discussion Board & Drugs in the News Assignments 140 points (20 points each, dropping lowest score)
Midterm Exam: 100 Points
Cumulative Final Exam: 170 points
Total Points: 550

ABSENCES

There are no absences in an online course. Students are expected to complete all work by the due date. If a student fails to submit and/or complete any of the assignments due in a module, including participating in discussion postings, writing and research assignments, quizzes, and/or pear review activities, the student will receive a zero on the assignment.

MAKE-UP POLICY

In order to be excused from any assignment or activity in a module, you must have a doctor's excuse and permission from your Dean, and/or have secured my permission well in

advance. I will drop your lowest quiz grade and lowest assignment grade – if you miss one of these I will drop that as your lowest grade.

ACCOMMODATION

Under the Americans with Disabilities Act (ADA) and the Rehabilitation Act of 1973, individuals with disabilities are provided reasonable accommodations to ensure equity and access to programs and facilities. Students are responsible for communicating their needs to the Academic Resource Center, the office that oversees disability support services, (202-687-8354; arc@georgetown.edu; http://academicsupport.georgetown.edu/disability) before the start of classes to allow time to review the documentation and make recommendations for appropriate accommodations. The University is not responsible for making special accommodations for students who have not declared their disabilities and have not requested an accommodation in a timely manner. Also, the University need not modify course or degree requirements considered to be an essential requirement of the program of instruction. For the most current and up-to-date policy information, please refer to the Georgetown University Academic Resource Center website. Students are highly encouraged to discuss the documentation and accommodation process with an Academic Resource Center administrator.

ACADEMIC INTEGRITY

All students are expected to maintain the highest standards of academic and personal integrity in pursuit of their education at Georgetown. Academic dishonesty in any form is a serious offense, and students found in violation are subject to academic penalties that include, but are not limited to, failure of the course, termination from the program, and revocation of degrees already conferred. All students are held to the Honor Code. The Honor Code pledge follows:
In the pursuit of the high ideals and rigorous standards of academic life, I commit myself to respect and uphold the Georgetown University Honor System: To be honest in any academic endeavor, and To conduct myself honorably, as a responsible member of the Georgetown community, as we live and work together.

Plagiarism

Stealing someone else's work is a terminal offense in the workplace, and it will wreck your career in academia, too. Students are expected to work with integrity and honesty in all their assignments. The Georgetown University Honor System defines plagiarism as "the act of passing off as one's own the ideas or writings of another." More guidance is available through the Gervase Programs at http://gervaseprograms.georgetown.edu/honor/system/53377.html. If you have any doubts about plagiarism, paraphrasing, and the need to credit, check out http://www.plagiarism.org.

COMPUTER REQUIREMENTS

Students need to have sufficient technology and Internet access to complete this course. Here are the requirements listed by Canvas:

Operating Systems

- Windows XP SP3 and newer
- Mac OSX 10.6 and newer
- Linux - chromeOS

Mobile Operating System Native App Support

- iOS 7 and newer
- Android 2.3 and newer

Computer Speed and Processor

- Use a computer 5 years old or newer when possible
- 1GB of RAM
- 2GHz processor

Internet Speed

- Along with compatibility and web standards, Canvas has been carefully crafted to accommodate low bandwidth environments.
- Minimum of 512kbps

Audio and Video Capability

- You will need an internal or external microphone. Most computers now come with them built in.
- You will need an internal or external camera. Most computers now come with them built in.

TECHNICAL SKILLS REQUIREMENTS

As an online student your "classroom" experience will be very different than a traditional student. As part of your online experience, you can expect to utilize a variety of technologies, such as:

1. Communicate via email including sending attachments
2. Navigate the internet using a Web browser
3. Use office applications such as Microsoft Office or Google Docs to create documents
4. Learn how to communicate using a discussion board and upload assignments to a classroom Web site
5. Upload and download saved files
6. Have easy access to the Internet
7. Navigate Canvas, including using the email component within Canvas

8. Use a microphone to record audio through your computer
9. Use an internal or external camera to record video through your computer

TECHNICAL SUPPORT

Canvas

Click on the Help link (on top-right of page in Canvas) to reach Canvas Support, including the Canvas Student Guide and 24 hour Canvas Support Hotline at 855-338-2770.

Google Apps

Use of Georgetown University-issued accounts (Links to an external site.) for Google Mail, Calendar, Groups, Talk, Docs, Sites, Video, and Contacts is governed by the contract between Georgetown University and Google. For help managing your Google Documents, visit Google Drive Help Center (Links to an external site.)

STUDENT SUPPORT SERVICES

Learning Resources

SCS offers a host of learning resources to its students. Two that you might find particularly helpful in this course are the Writing Center and Refworks.

- The Writing Center offers professional writing support through its online peer tutoring service.
- Refworks is an online research management tool that aids in organizing, storing, and presenting citation sources for papers and projects.

Support Services

SCS offers a variety of support systems for students that can be accessed online, at the School of Continuing Studies downtown location, and on the main Georgetown campus:

- **Academic Resource Center**
  202-687-8354 | arc@georgetown.edu
  http://academicsupport.georgetown.edu/
- **Counseling and Psychiatric Services**
  202-687-6985
  http://caps.georgetown.edu/
- **Institutional Diversity, Equity & Affirmative Action (IDEAA)**
  (202) 687-4798
  https://ideaa.georgetown.edu/

COURSE CONTENT OUTLINE

This course is divided into 8 modules plus an orientation to the course and Canvas. Below is a detailed outline for each module.

Orientation

MODULE 1: Introduction to Psychopharmacology

LEARNING OBJECTIVES

At the end of Module 1 each student should be able to:

1a: Identify and describe major brain structures and their functions.

1b: Identify and describe the role of neurotransmitters in regulating behavior, including the role of neurotransmitters in regulating neuronal functions such as the action potential.

1c: Describe the role of the cellular membrane of neurons in regulating the resting potential of neurons and the specific steps involved in the generation of an action potential.

1d: Enumerate the advantages and disadvantages of the various methods of administering drugs.

1e: Describe the role of the liver and the hepatic enzyme system in drug metabolism, including metabolic half-life, steady state plasma concentrations of a drug, calculating time to steady state plasma concentration as well as total clearance time of a drug based on metabolic half-life.

1f: Describe what a drug receptor is, including explaining the major types and how they differ and the receptor phenomena of up regulation and down regulation and the role of these phenomena in drug use and abuse.

1g: Describe the factors that influence drug safety and toxicity and explain how drug safety is measured.

1h: Define the placebo response and discuss the history and the major factors that influence this response

MODULE ACTIVITIES & ASSESSMENTS

Lecture: Brain Structure & Function
https://www.youtube.com/watch?v=vfhU7mrX4fM
Reading: Chapter 1

Lecture: Pharmacokinetics: Routes of administration, drug metabolism
https://www.youtube.com/watch?v=JtTcl-8yZxo
Reading: Chapter 2

Lecture: Pharmacodynamics
https://www.youtube.com/watch?v=DKVKMFmWZnM
Reading: Chapter 3
Quiz 1

MODULE 2: Drug Addiction & Alcoholism

LEARNING OBJECTIVES

At the end of Module 2 each student should be able to:

2a: Describe the relationship between drugs and abuse potential in specific populations.

2b: Explain how the propensity for abusing drugs is related to characteristics of the user, as well as the drug in particular.

2c: Explain the neurobiological mechanisms that underlie the reinforcing effects of abused drugs and how individual differences moderate this effect.

2d: Explain how chronic drug use can eventually become addiction

2e: Describe the pharmacological properties of ethyl alcohol including the metabolism of alcohol, the enzymes involved and how women and men differ in their metabolism of alcohol.

2f: Describe the drugs and techniques used in treating alcoholism including medications that might be used to ameliorate alcohol withdrawal including the disease concept of alcoholism and the comorbidity of alcohol dependence with other psychological disorders.

2g: Describe the teratogenic effects of alcohol

2h: Describe the effects of both acute and chronic inhalant abuse.

MODULE ACTIVITIES & ASSESSMENTS

Lecture: Epidemiology & Neurobiology of Drug Addiction
https://www.youtube.com/watch?v=w_YUYhU_JMA
Reading: Chapter 4
Video: *Teenage Drinking: Facts and Fiction*
Reading: Platt ML, Watson KK, Hayden BY, et al. Neuroeconomics: Implications for Understanding the Neurobiology of Addiction. In: Kuhn CM, Koob GF, editors. Advances in the Neuroscience of Addiction. 2nd edition. Boca Raton (FL): CRC Press/Taylor & Francis; 2010. Chapter 6. Available from: http://www.ncbi.nlm.nih.gov/books/NBK53362/

Lecture: Alcohol, Alcoholism & Inhalants
https://www.youtube.com/watch?v=w29ng6i6OH0
Reading: Chapter 5
Reading: Heinz A, Beck A, Mir J, et al. Alcohol Craving and Relapse Prediction: Imaging Studies. In: Kuhn CM, Koob GF, editors. *Advances in the Neuroscience of Addiction.* 2nd edition. Boca Raton (FL): CRC Press/Taylor & Francis; 2010. Chapter 4. Available from: http://www.ncbi.nlm.nih.gov/books/NBK53355

Discussion Board Post: Should the US retain a national drinking age?
Quiz 2

MODULE 3: Stimulants

LEARNING OBJECTIVES

3a, Describe the pharmacokinetics and pharmacodynamics of caffeine including how the mechanism of action explains the clinical effects of the drug, and the positive and negative effects of caffeine including the psychoactive effects of nicotine and nicotine withdrawal and how these effects contribute to nicotine dependence.

3b. Evaluate the public policy issues related to tobacco

3c. Describe and provide informed opinions on both pharmacotherapeutic options for smoking cessation and alternative therapies including nicotine replacement therapy.

3d. Compare and contrast the pharmacological effects of cocaine and amphetamine and differentiate the mechanism of action for cocaine and amphetamine.

3e. Describe the behavioral consequences of chronic high doses of psychostimulants.

3f.Illustrate the neurotoxic effects of methamphetamine on the brain and describe the behavioral consequences of these effects.

MODULE ACTIVITIES & ASSESSMENTS
Lecture: Caffeine & Nicotine
https://www.youtube.com/watch?v=44BIfezRQHA
https://www.youtube.com/watch?v=UAKSW9S_iQQ
Reading: Chapter 6

Lecture: Cocaine & Amphetamines
https://www.youtube.com/watch?v=cl8Nhwn4Dz8
Reading: Chapter 7
Quiz 3

MODULE 4: Woodstock Redux: Psychedelics & Marijuana

LEARNING OBJECTIVES

4a. Describe the major classes of psychedelic drugs presented in this chapter and the respective mechanisms of action that differentiate them and how they differ in their psychological/subjective effects.

4b. Appraise the potential therapeutic potential of psychedelic drugs including the potential for acute adverse psychological reactions and potential for long-term physical, neurological, or psychological consequences of all psychedelics.

4c. Define endocannabinoids, explain how cannabis and the endocannabinoid system works including the major acute and chronic physiological effects of cannabis on the body.

4d. Describe the known cognitive effects of short-term and long term cannabis use, as well as the psychological/psychiatric effects of cannabis and the potential effects of cannabis on neural development.

4e. Clearly articulate the public policy reasons maintaining current policies banning marijuana use as well as arguments in favor of legalizing use.

MODULE ACTIVITIES & ASSESSMENTS

Lecture: Psychedelics
https://www.youtube.com/watch?v=aSjW0Tk8Rao
Reading: Chapter 8
Reading: Meyer, J. S. (2013). 3,4-methylenedioxymethamphetamine (MDMA): current perspectives. *Substance Abuse and Rehabilitation*, *4*, 83–99. http://doi.org/10.2147/SAR.S37258

Lecture: Cannabis aka Marijuana
https://www.youtube.com/watch?v=edOBFNEInVY
Reading: Chapter 9

Lecture: Focus on the Effects of Legalization
Reading: Caulkins, J. P., PhD., Kasunic, A., M.S., Kleiman, M., PhD., & Lee, M. A. C., M.S. (2014). Understanding drug legalization. *International Public Health Journal,6*(3), 283-294. Retrieved from http://search.proquest.com/docview/1625577341?accountid=11091

Discussion Board on pros and cons of marijuana legalization
Quiz 4
Midterm Exam

MODULE 5: Opioid Analgesics: A Modern Epidemic

LEARNING OBJECTIVES

5a. Describe how pain impulses transmitted and modulated within the Central Nervous System.

5b. Describe the opioid receptors, the endogenous ligands for those receptor, define an opioid agonist, antagonist, mixed agonist-antagonist, and partial agonist and give an example of each and how they are therapeutically useful.

5c. Discuss the various options for the pharmacological management of opioid dependence and relapse.

5d. Articulate the public policy issues surrounding opioid dependence, in particular on efforts geared towards harm reduction and treatment.

MODULE ACTIVITIES & ASSESSMENTS

Lecture: Pain & Opioid Analgesics
https://www.youtube.com/watch?v=8EpRBUCe6fs v
Reading: Chapter 10

Film: *Frontline – Chasing Heroin*
http://www.pbs.org/wgbh/frontline/film/chasing-heroin/

Reading:
Straus, M. M., Ghitza, U. E., & Tai, B. (2013). Preventing deaths from rising opioid overdose in the US – the promise of naloxone antidote in community-based naloxone take-home programs. *Substance Abuse and Rehabilitation*, *4*, 65–72.
http://doi.org/10.2147/SAR.S47463

Vlahov, D., & Junge, B. (1998). The role of needle exchange programs in HIV prevention. *Public Health Reports*, *113*(Suppl 1), 75–80.
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1307729/

Rich JD, Adashi EY. Ideological Anachronism Involving Needle and Syringe Exchange Programs: Lessons From the Indiana HIV Outbreak. *JAMA.* 2015;314(1):23-24. doi:10.1001/jama.2015.6303.
http://jama.jamanetwork.com/article.aspx?articleid=2299643#jvp150087r6

Discussion Board on harm reduction policy initiatives to limit HIV and Hepatitis rates in injection drug users and for reducing opiate overdose deaths with naloxone and safe injection sites
Quiz 5

MODULE 6: Clinical Psychopharmacology Part I

LEARNING OBJECTIVES

6a. Describe the positive and negative symptoms of schizophrenia and explain why these symptoms are important in drug therapy.

6b. Compare and contrast the primary clinical differences between traditional and atypical antipsychotic drugs including the mechanisms of action of traditional antipsychotics and atypical antipsychotics and the side effects of first- and second-generation antipsychotics.

6c. Describe the probable mechanism of both acute and ultimate effects of antidepressant drugs, provide explanations for the clinical delay in effects seen in treatment and differentiate the major classes of antidepressants.

6d. Explain the side effects of SSRIs, the risks associated with serotonin syndrome and SSRI withdrawal syndrome and compare and contrast alternative treatments for depression.

MODULE ACTIVITIES & ASSESSMENTS

Lecture: Anti-Psychotic Medications
https://www.youtube.com/watch?v=pVqDC_Hxiss
Reading: Chapter 11

Lecture: Anti-Depressants
https://www.youtube.com/watch?v=ZBjNIGIFNcc
Reading: Chapter 12

Lecture: Alternative Treatments for Depression
Reading:
Bajbouj M & Heuser I. (2009). Stimulating the brain to treat depression. *Experimental Neurology. 219*(1),1. doi:10.1016/j.expneurol.2009.03.033

Padberg, F. & George, M.S. (2009). Repetitive transcranial magnetic stimulation of the prefrontal cortex in depression. *Experimental Neurology. 219*(1), 2-13. doi:10.1016/j.expneurol.2009.04.020

Nitsche, M.A., Boggio, P.S., Fregni, F., & Pascual-Leone, A. (2009). Treatment of depression with transcranial direct current stimulation (tDCS): A Review. *Experimental Neurology. 219*(1), 2-13. doi:10.1016/j.expneurol.2009.03.038

Merkl, A., Heuser, I. & Bajbouj, M. (2009). Antidepressant electroconvulsive therapy: Mechanism of action, recent advances and limitations. *Experimental Neurology. 219*(1), 20-26. doi:10.1016/j.expneurol.2009.04.027

Alderman, B.L., Olson, R.L., Brush, C.J., & Shors, T.J. (2016). MAP training: combining meditation and aerobic exercise reduces depression and rumination while enhancing synchronized brain activity. *Translational Psychiatry. 6.*
http://www.nature.com/tp/journal/v6/n2/full/tp2015225a.html

Discussion Board on alternative treatments for depression
Quiz 6

MODULE 7: Clinical Psychopharmacology Part II – Welcome to the Valley of the Dolls

LEARNING OBJECTIVES

7a. Describe the advantages of benzodiazepines over barbiturates, the mechanism action of benzodiazepines, the clinical uses of benzodiazepines, the processes that might prolong the half-life of a benzodiazepine and why the elderly should avoid using long-acting benzodiazepines.

7b. Describe the clinically significant drug interactions with benzodiazepines, discuss benzodiazepine withdrawal and its treatment and the role of flumazenil.

7c. Describe the symptomatology of bipolar disorder, compare and contrast unipolar versus bipolar depression, describe the major pharmacological drug categories useful in the treatment of bipolar disorder and the neurochemical actions the drugs used to treat bipolar disorder.

7d. Explain which antipsychotics have been found useful for treatment of bipolar disorder, describe the difficulties using mood stabilizers in pregnant women and describe potential alternative treatment strategies.

MODULE ACTIVITIES & ASSESSMENTS

Lecture: Sedative Hypnotics - Barbiturates
https://www.youtube.com/watch?v=9z_eoGjODeE
Reading: Chapter 13

Lecture: Benzodiazepines
https://www.youtube.com/watch?v=KwRYvxfhk6A
Reading: Chapter 13

Lecture: Treatments for Bipolar Disorder
https://www.youtube.com/watch?v=wpYlrJ_ild0
Reading: Chapter 14

Quiz 7

MODULE 8: Special Issues in Psychopharmacology

LEARNING OBJECTIVES

8a. Identify what is meant by an “off-label” use of a drug and why psychotherapeutic drugs are usually used “off-label” in children and adolescents, describe the evidence in favor of and in opposition to, early therapeutic interventions in treating psychological disorders in children.

8b. Explain the symptoms and neural causes of Parkinson’s Disease and Alzheimer’s Disease and describe current pharmacological interventions for both.

8c. Explain the effects of aging on the pharmacokinetics and pharmacodynamics of psychoactive drugs.

8d. Describe the role of pharmacogenetics and pharmacogenomics in our understanding of drug addiction and drug treatment.

8e. Formulate a coherent argument regarding the ethics of using drugs to enhance cognition.

MODULE ACTIVITIES & ASSESSMENTS

Lecture: Pharmacology across the Lifespan
Reading: Chapters 15 & 16

Lecture: Pharmacogenomics & Pharmacogenetics
Reading:
Trescot, A.M. & Faynboym, S. (2014). A review of the role of genetic testing in pain medicine. *Pain Physician, 17,* 425-445.
http://www.painphysicianjournal.com/current/pdf?article=MjE2MQ%3D%3D&journal=84

Brinkely et al (2009). Genetic variations associated with red hair color and fear of dental pain, anxiety regarding dental care and avoidance of dental care. *Journal of the American Dental Association, 140,* 896-9058.
https://www.clinicalkey.com/#!/content/playContent/1-s2.0-S0002817714644755?returnurl=null&referrer=null

Chua, M.V., Tsueda, K., & Doufas, A.G. (2004). Midazolam causes less sedation in volunteers with red hair. *General Anesthesia, 51,* 25-30.
http://link.springer.com/article/10.1007/BF03018542

King et al (2012). Smoking cessation pharmacogenetics: Analysis of varenicline and bupropion in placebo-controlled clinical trials. *Neuropsychopharmacology, 37,* 641-650.
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3260990/

Lecture: Drugs & Ethics – Drugs for Cognitive Enhancement

Reading:

Esposito, R., Cilli, F., Pieramico, V., Ferretti, A., Macchia, A., Tommasi, M., … Sensi, S. L. (2013). Acute Effects of Modafinil on Brain Resting State Networks in Young Healthy Subjects. *PLoS ONE*, *8*(7), e69224. http://doi.org/10.1371/journal.pone.0069224

Harris, J., Kessler, R.C., Gazzaniga, M., Campbell, P. & Farah, M.J. (2008). Towards responsible use of cognitive enhancing drugs by the healthy. *Nature*, *456*(11), 702-705. http://rdcu.be/gmsh

Discussion board on the ethics of drugs for cognitive enhancement

Quiz 8

Cumulative Final Exam