The Nature of Addiction and HIV

Trainer Guide

Pacific Southwest ATTC (HHS Region 9)

CDU Charles Drew University of Medicine and Science

AETC AIDS Education & Training Center Program Pacific

The Nature of Addiction and HIV

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The Nature of Addiction and HIV

Background Information

The purpose of this introductory training is to provide HIV clinicians (including, but not limited to physicians, dentists, nurses, and other allied medical staff, therapists and social workers, and counselors, specialists, and case managers) with a detailed overview of the neurobiology of addiction, the impact of HIV on the brain and central nervous system (CNS), and the detrimental impact of the intersectionality of multiple stigmatized identities. The training includes a 174-slide PowerPoint presentation, Trainer Guide, and a companion 2-page fact sheet. The duration of the training is approximately 2 ½-3 hours, depending on the level of participation and discussion by the training participants.

This training is a companion to, and can be conducted in conjunction with the **"How Change Happens: Substance Use Disorders and HIV/AIDS"** training curriculum.

"Test Your Knowledge" questions have been inserted at the beginning and end of the presentation to assess a change in the audience's level of knowledge after the key content has been presented. An answer key is provided in the Trainer's notes for slides 4-13 and slides 164-173.

What Does the Training Package Contain?

- PowerPoint Training Slides (with notes)
- Trainer's Guide with detailed instructions for how to convey the information and conduct the interactive exercises
- Two-page fact sheet entitled, "*Tips for HIV Clinicians Working with Patients with Substance Use Disorders*"

What Does This Trainer's Guide Contain?

- Slide-by-slide notes designed to help the trainer effectively convey the content of the slides themselves
- Supplemental information for select content to enhance the quality of instruction
- Suggestions for facilitating the "Test Your Knowledge" questions and group discussions/case studies

How is This Trainer's Guide Organized?

For this guide, text that is shown in bold italics is a "***Note to the Trainer.***" Text that is shown in normal font relates to the "Trainer's Script" for the slide.

It is important to note that several slides throughout the PowerPoint presentation contain animation, some of which is complicated to navigate. Animations are used to call attention to particular aspects of the information or to present the information in a stepwise fashion to facilitate both the presentation of information and participant understanding. Becoming acquainted with the slides, and practicing delivering the content of the presentation are essential steps for ensuring a successful, live training experience.

General Information about Conducting the Training

The training is designed to be conducted in medium-sized groups (30-50 people). It is possible to use these materials with larger groups, but the trainer may have to adapt the small group exercises/case studies and discussions to ensure that there is adequate time to cover all of the content.

Materials Needed to Conduct the Training

- Computer with PowerPoint software installed (2010 or higher version recommended) and LCD projector to show the PowerPoint training slides.
- When making photocopies of the PowerPoint presentation to provide as a handout to training participants, it is recommended that you print the slides three slides per page with lines for notes. Select "pure black and white" as the color option. This will ensure that all text, graphs, tables, and images print clearly.
- Flip chart paper and easel/white board, and markers/pens to write down relevant information, including key case study discussion points.

Overall Trainer Notes

It is critical that, prior to conducting the actual training, the trainer practice using this guide while showing the slide presentation in Slideshow Mode in order to be prepared to use the slides in the most effective manner.

Icon Key

	Note to Trainer		Activity
	References		Audience Response System (ARS)-Compatible Slide
	Image Credit		Video Source

The Nature of Addiction and HIV

Slide-By-Slide Trainer Notes

The notes below contain information that can be presented with each slide. This information is designed as a guidepost and can be adapted to meet the needs of the local training situation. Information can be added or deleted at the discretion of the trainer(s).

Slide 1: Title Slide

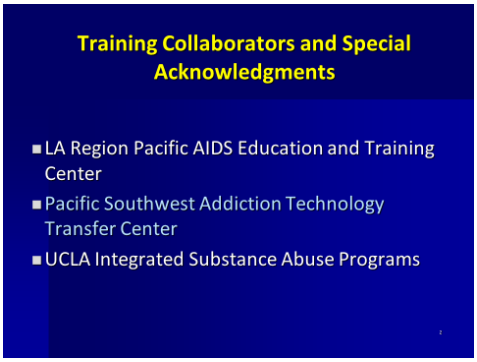
The purpose of this introductory training is to provide HIV clinicians (including, but not limited to physicians, dentists, nurses, and other allied medical staff, therapists and social workers, and counselors, specialists, and case managers) with a detailed overview of the neurobiology of addiction, the impact of HIV on the brain and central nervous system (CNS), and the detrimental impact of the intersectionality of multiple stigmatized identities. The training includes a 174-slide PowerPoint presentation, Trainer Guide, and a companion 2-page fact sheet. The duration of the training is approximately 2 ½-3 hours, depending on the level of participation and discussion by the training participants.

(Notes for Slide 1, continued)

Slide 1: Title Slide

This title slide should be customized to each training with the name of the trainer(s), training date, and training location.

"Test Your Knowledge" questions have been inserted at the beginning and end of the presentation to assess a change in the audience's level of knowledge after the key content has been presented. An answer key is provided in the Trainer's notes for slides 4-13 and slides 164-173.

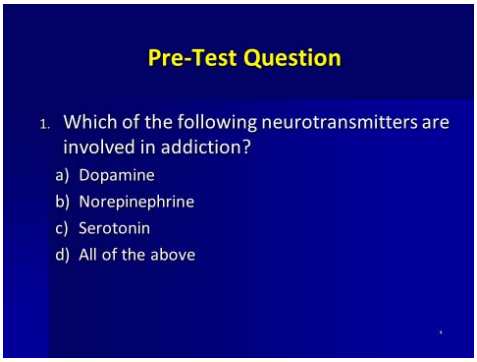


Slide 2: Training Collaborators and Special Acknowledgments

This PowerPoint presentation, Trainer Guide, and companion fact sheet were developed by James Peck, Psy.D., Beth Rutkowski, MPH (Associate Director of Training of UCLA ISAP) and Thomas E. Freese, PhD (Director of Training of UCLA ISAP and Director of the Pacific Southwest ATTC) through supplemental funding provided by the Pacific AIDS Education and Training Center, based at Charles R. Drew University of Medicine and Science. We wish to acknowledge Phil Meyer, LCSW, Kevin-Paul Johnson, Maya Gil Cantu, MPH, and Thomas Donohoe, MBA, from the LA Region PAETC.

Slide 3: Test Your Knowledge

The purpose of the following 10 questions is to test the pre-training level of addiction and HIV knowledge amongst the training participants. The questions are formatted as either multiple choice or true/false questions. Read each question and the possible responses aloud, and give training participants time to jot down their response before moving on to the next question. <u>Do not</u> reveal the answers to the questions until the end of the training session (when you re-administer the questions that appear on slides 164-173).

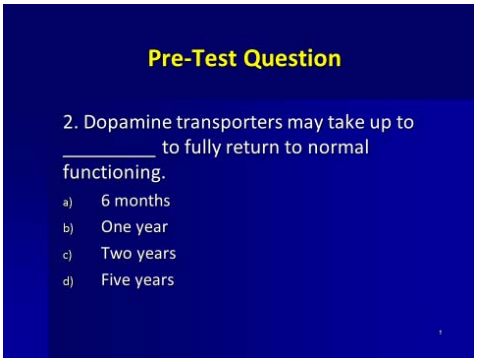


Slide 4: Pre-Test Question

Read the question and choices, and review audience responses out loud.

**Audience Response System (ARS)-compatible slide

Answer: d) all of the above

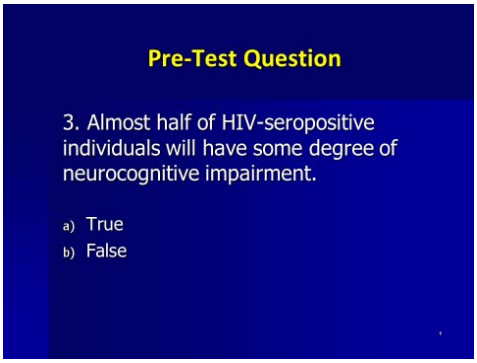


Slide 5: Pre-Test Question

Read the question and choices, and review audience responses out loud.

**Audience Response System (ARS)-compatible slide

Answer: c) two years

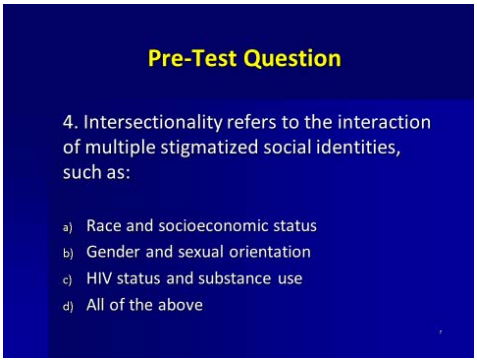


Slide 6: Pre-Test Question

Read the question and choices, and review audience responses out loud.

**Audience Response System (ARS)-compatible slide

Answer: a) True

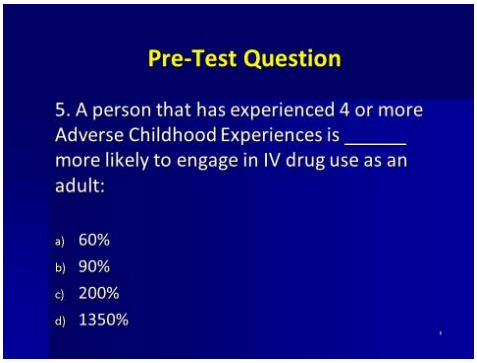


Slide 7: Pre-Test Question

Read the question and choices, and review audience responses out loud.

**Audience Response System (ARS)-compatible slide

Answer: d) all of the above

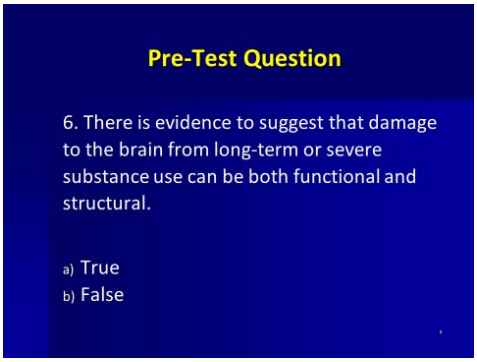


Slide 8: Pre-Test Question

Read the question and choices, and review audience responses out loud.

**Audience Response System (ARS)-compatible slide

Answer: d) 1350%

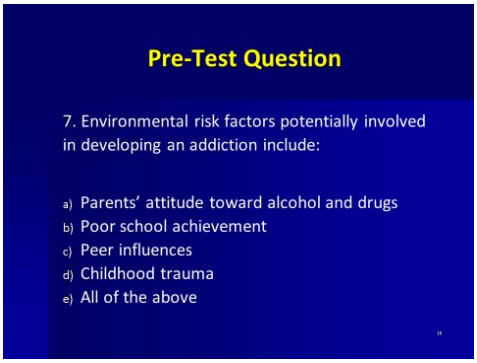


Slide 9: Pre-Test Question

Read the question and choices, and review audience responses out loud.

**Audience Response System (ARS)-compatible slide

Answer: a) True

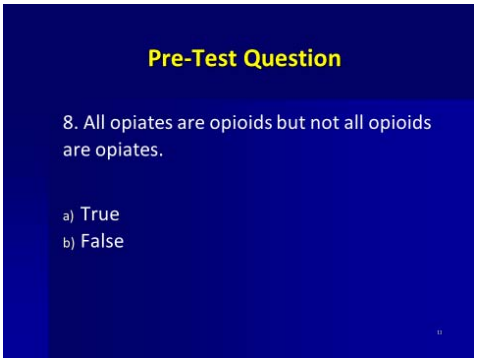


Slide 10: Pre-Test Question

Read the question and choices, and review audience responses out loud.

**Audience Response System (ARS)-compatible slide

Answer: e) All of the above

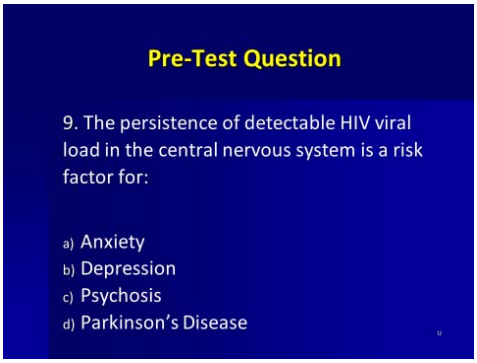


Slide 11: Pre-Test Question

Read the question and choices, and review audience responses out loud.

**Audience Response System (ARS)-compatible slide

Answer: a) True

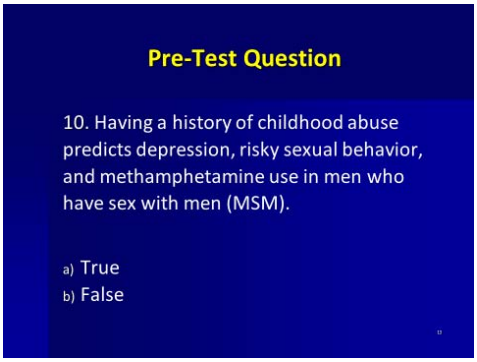


Slide 12: Pre-Test Question

Read the question and choices, and review audience responses out loud.

**Audience Response System (ARS)-compatible slide

Answer: b) Depression

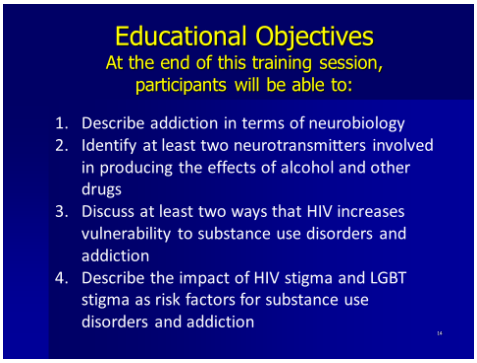


Slide 13: Pre-Test Question

Read the question and choices, and review audience responses out loud.

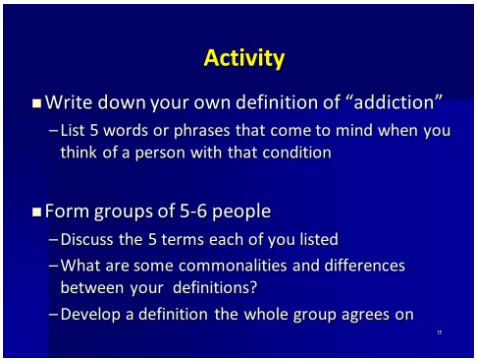
**Audience Response System (ARS)-compatible slide

Answer: a) True



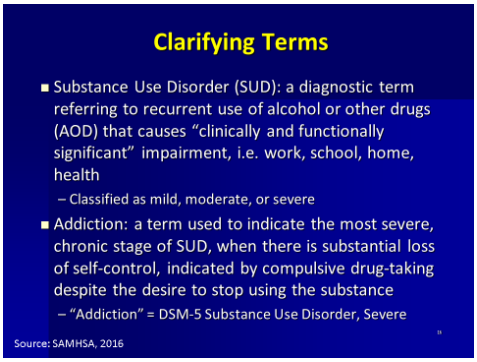
Slide 14: Educational Objectives

Briefly review each of the educational objectives with the audience.



Slide 15: Activity

Have the audience follow the instructions on the slide. Give them 10-15 minutes to work in groups. Have several groups read out the definition they settled on. Ask how they arrived at that definition. Reflect the important aspects of addiction that they identify back to the entire room.

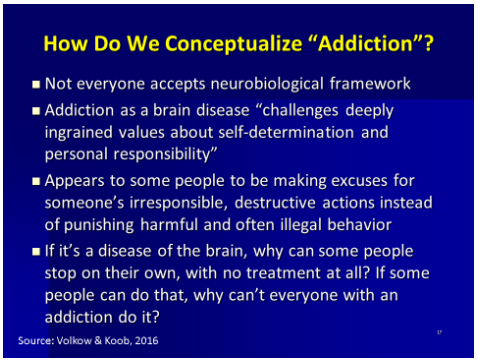


Slide 16: Clarifying Terms

DSM-5 eliminates the term "addiction" as a diagnostic term because of its uncertain definition and its potentially negative connotation. We generally now refer diagnostically to "Substance Use Disorder", reserving "Addiction" for the most severe substance use disorders.

REFERENCE:

Substance Abuse and Mental Health Services Administration (US); Office of the Surgeon General (US). (2016). *Facing Addiction in America: The Surgeon General's Report on Alcohol, Drugs, and Health.* Washington (DC): U.S. Department of Health and Human Services.



Slide 17: How Do We Conceptualize "Addiction"

Make the point that we are going to discuss addiction from a neurobiology perspective, but that not everyone accepts that framework. Pose the questions on the last bullet point as rhetorical questions that we are going to try to answer today.

REFERENCE:

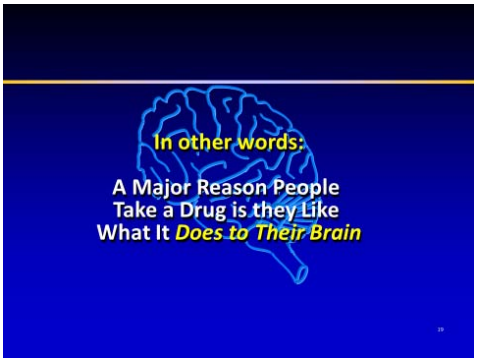
Koob, C.F., & Volkow, N.D. (2016). Neurobiology of addiction: A neurocircuitry analysis. *JAMA Psychiatry, 3(8),* 760-773.

Slide 18: Why do People Take Drugs?

Pose the question to the audience. After they have given you a few answers, advance the slide once and the "To feel good" column appears. Advance the slide again and the "To feel better" column appears. Make the point that substances are both positively (the "to feel good" column) and negatively (the "to feel better" column) reinforcing.

REFERENCE:

National Institute on Drug Abuse. *Bringing the full power of science to bear on drug abuse and addiction.* Retrieved from: https://www.drugabuse.gov/sites/default/files/addictionscience.ppt.

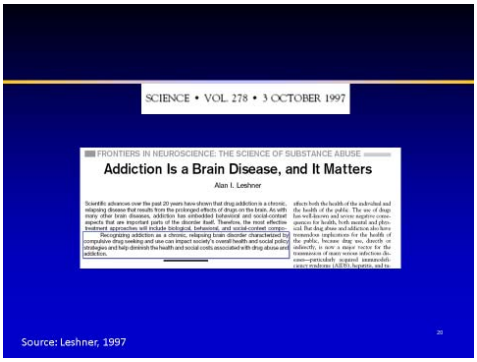


Slide 19: In Other Words

Make the point that a major reason people take drugs is because they like the impact of them on their brain (in terms of the effects on the previous slide).

IMAGE CREDIT:

NIDA website, https://www.drugabuse.gov/.

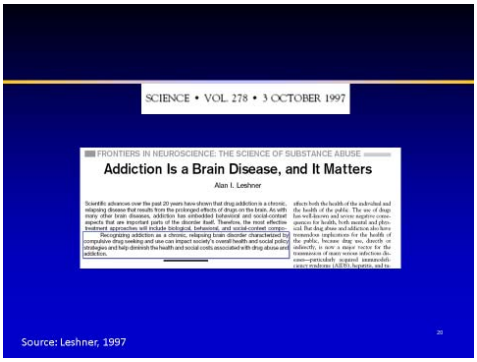


Slide 20: No Title

Introduce the slide by saying "in 1997 Dr. Alan Leshner, then-Director of the National Institute on Drug Abuse, published what became a seminal article in how we conceptualize substance use and addiction. Until then it had largely been considered to be a problem of self-discipline or a moral failing. Part of what he says in the article is this (advance the slide, and the sentence in the box will pull out). (Read the sentence) then ask "what parts of this statement strike you as being important, and why?" (typically people will point out "chronic, relapsing brain disorder", "compulsive drug seeking and use", "society's overall health and social policy strategies", and "diminish health and social costs".) Engage in a discussion of why each of those is important in how we define addiction.

REFERENCE:

Leshner, A. (1997). Addiction is a brain disease, and it matters. *Science. 278*.

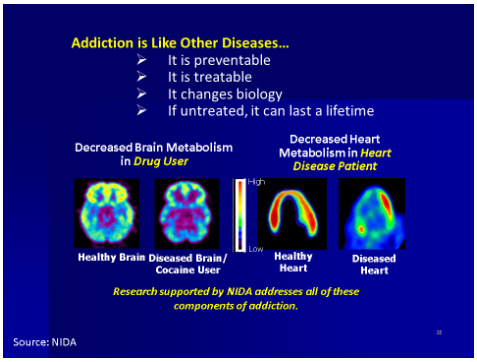


Slide 21: What is Addiction?

Decades of research have revealed addiction to be a disease that alters the brain. We now know that while the initial decision to use drugs is voluntary, drug addiction is a disease of the brain that compels a person to become singularly obsessed with obtaining and abusing drugs despite their many adverse health and life consequences.

REFERENCE:

National Institute on Drug Abuse. *Bringing the full power of science to bear on drug abuse and addiction*. Retrieved from: https://www.drugabuse.gov/sites/default/files/addictionscience.ppt.



Slide 22: Addiction is Like Other Diseases

Addiction is similar to other chronic diseases. Using imaging technology to measure metabolism (in this case, glucose uptake) in the brain and heart, one can see that both addiction and heart disease produce observable changes in organ function. In each pair of images shown above, the healthy organ shows greater activity (reds and yellows) than the diseased organ. In drug addiction, the frontal cortex, which is a part of the brain associated with judgment and decision-making, is significantly affected. Like heart disease, drug addiction can be prevented and treated successfully. If left untreated, however, its effects can last a lifetime.

REFERENCE:

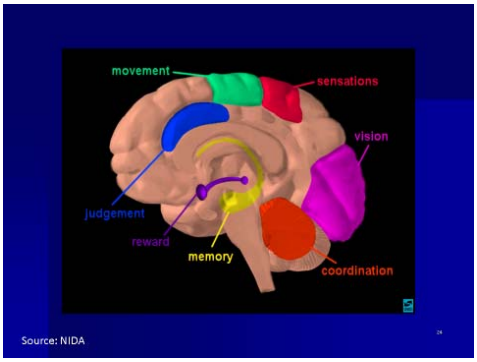
National Institute on Drug Abuse. *Bringing the full power of science to bear on drug abuse and addiction.* Retrieved from: https://www.drugabuse.gov/sites/default/files/addictionscience.ppt.

Slide 23: Science of Addiction

Over the past 20 years, imaging studies and advanced genetic research have given us a much clearer idea of what addiction is, and how it manifests in the brain.

IMAGE CREDIT:

Fotolia, purchased image, 2018.



Slide 24: No Title

This slide depicts a cartoon image of the human brain. Say "alcohol and drugs impact many different parts of the brain, including":

Prefrontal Cortex = judgement/executive level decision making

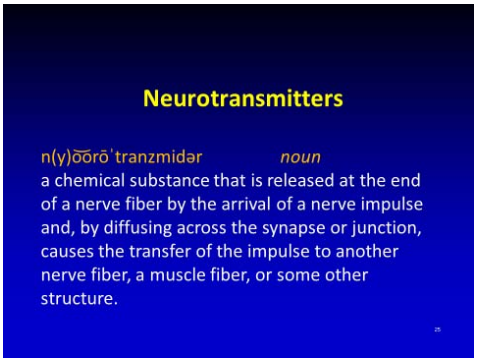
Nucleus accumbens = cognitive processing of aversion, motivation, ***pleasure, reward***, and reinforcement

Limbic system = center of emotions, learning, and memory; cingulate gyri, hypothalamus, **amygdala *(emotional reactions)***, and **hippocampus *(learning & memory)***.

Cerebellum – coordination

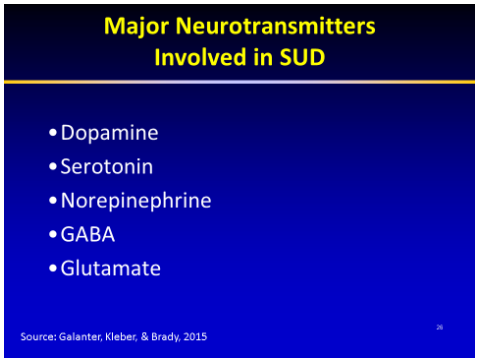
REFERENCE:

National Institute on Drug Abuse. *Bringing the full power of science to bear on drug abuse and addiction.* Retrieved from: https://www.drugabuse.gov/sites/default/files/addictionscience.ppt.



Slide 25: Neurotransmitters

In order to talk about effects that substances have in the brain, we need to define neurotransmitters.



Slide 26: Major Neurotransmitters Involved in SUD

Explain the listed neurotransmitters as follows:

Dopamine: the brain's central pleasure chemical

Serotonin: involved in mood regulation

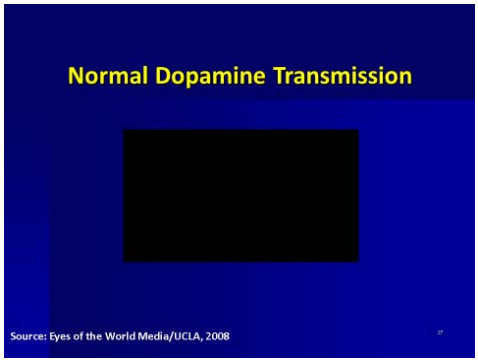
Norepinephrine: energy and mood

GABA: the brain's central inhibitory neurotransmitter – it slows us down

Glutamate: the brain's central excitatory neurotransmitter – it speeds us up

REFERENCE:

Galanter, M., Kleber, H.D., & Brady, K.T. (2015). *Textbook of Substance Abuse Treatment, 5th Ed.* Arlington, VA: American Psychiatric Publishing.

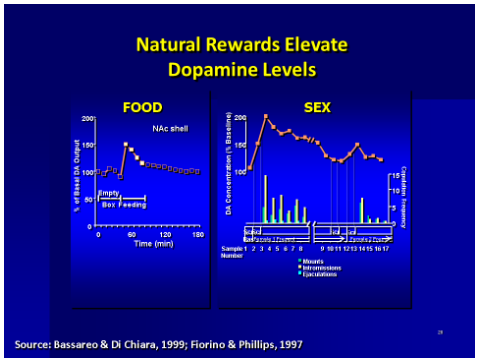


Slide 27: Normal Dopamine Transmission

This slide shows how neurotransmission works specifically for dopamine. What is schematically illustrated in this slide is a nerve terminal (top), the synaptic cleft or space between the neurons, and the post-synaptic or receiving portion of a dendrite on a neighboring neuron. Dopamine is contained in vesicles (round storage sites) in the nerve terminal; dopamine receptors are present on the receiving (bottom) neuron. When a signal comes down the axon, dopamine (shown in orange) is released into the synapse. It then crosses the synaptic cleft to the second neuron, where it binds to and stimulates dopamine receptors (shown in blue), generating a signal in the second neuron. The dopamine is then released from the receptor and crosses back to the first neuron where it is picked up by dopamine transporters (reuptake molecules; shown in purple) for re-use**.**

VIDEO SOURCE:

Eyes of the World Media Group/UCLA. *Meth Inside Out: Brain & Behavior.* (2008). Retrieved from: https://www.youtube.com/watch?v=MGEJ_GQVOqg.



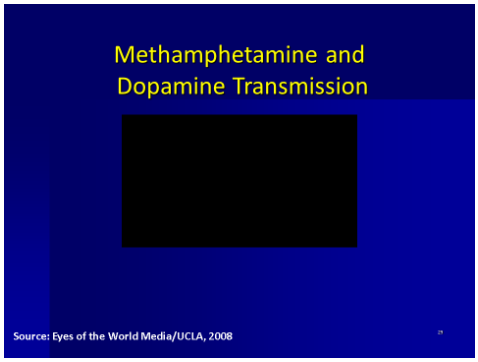
Slide 28: Natural Rewards Elevate Dopamine Levels

Natural rewards stimulate dopamine neurotransmission. Eating something that you enjoy or being stimulated sexually can cause dopamine levels to increase. In these graphs, dopamine is being measured inside the brains of animals. Its increase is shown in response to food or sex cues. This basic mechanism of controlled dopamine release and reuptake has been carefully shaped and calibrated by evolution to reward normal activities critical for our survival.

REFERENCES:

Bassareo, V., & Di Chiara, G. (1999). Differential responsiveness of dopamine transmission to food-stimuli in nucleus accumbens shell/core compartments. *Neuroscience, 89*(3), 637-641.

Fiorino, D.F., & Phillips, A.G. (1997). Dynamic changes in nucleus accumbens dopamine efflux during the Coolidge effect in male rats. *Journal of Neuroscience, 17*(12), 4849-4855.

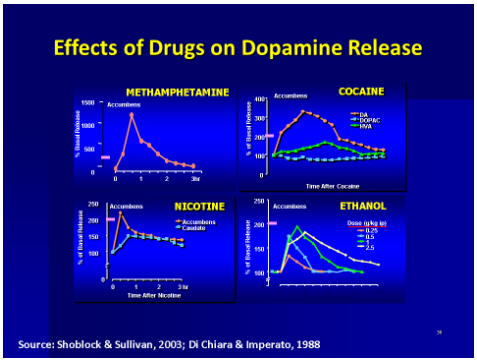


Slide 29: Methamphetamine and Dopamine Transmission

This next video explains what happens to dopamine transmission when a drug like methamphetamine is introduced into the brain. Explain that the process is similar for all the neurotransmitters we'll discuss.

VIDEO SOURCE:

Eyes of the World Media Group/UCLA. *Meth Inside Out: Brain & Behavior.* (2008). Retrieved from: https://www.youtube.com/watch?v=dsFpe4IiF8w.



Slide 30: Effects of Drugs on Dopamine Release

Nearly all drugs of abuse increase dopamine neurotransmission, either directly or indirectly. This slide shows the increase in brain dopamine (DA) levels (measured in animals) following exposure to various drugs of abuse. All of the drugs depicted in this slide have different mechanisms of action, however they all increase activity in the brain reward pathway by increasing dopamine neurotransmission. It is because drugs activate these brain regions—usually more effectively and for longer periods of time than natural rewards—that they have an inherent risk of being abused.

The dopamine release profile for opioids is similar to that of alcohol.

REFERENCES:

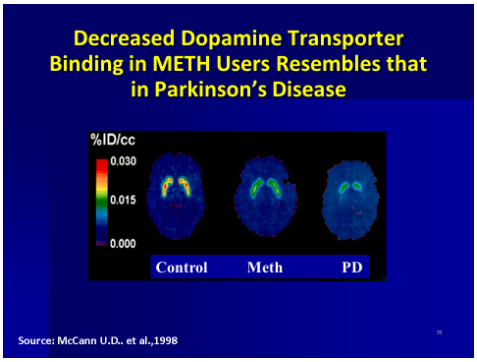
Di Chiara, G., & Imperato, A. (1988). Drugs abused by humans preferentially increase synaptic dopamine concentrations in the mesolimbic system of freely moving rats. *Proceedings of the National Academy of Science U.S.A., 85*(14), 5274-5278.

(Notes for Slide 30, continued)

Slide 30: Effects of Drugs on Dopamine Release

REFERENCES:

Shoblock, J.R., Sullivan, E.B., Maisonneuve, I.M., & Glick, S.D. (2003). Neurochemical and behavioral differences between d-methamphetamine and d-amphetamine in rats. *Psychopharmacology (Berl), 165*(4), 359-369.



Slide 31: Decreased Dopamine Transporter Binding in METH Users Resembles that in Parkinson's Disease

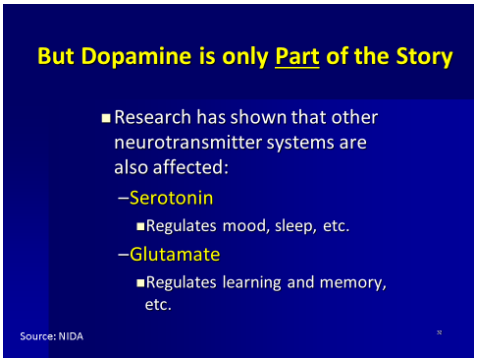
The scan on the far left of the screen depicts the brain of a non-methamphetamine using control. Notice the bright colors in the reward center. Brighter colors mean higher glucose metabolism, so more activity in the reward pathways. The center scan is the brain of a methamphetamine user who has been matched to the control in terms of age, race, etc. Notice that there are no bright red and orange colors in the reward center. Symptomatically, this might show up as depression. The scan on the far right depicts the brain of a Parkinson's Disease patient. Notice that like the center scan, this scan lacks the bright red and orange colors in the reward center. Parkinson's Disease is a movement disorder that impacts similar areas of the brain as does meth. A meth user ends up looking more like a Parkinson's patient than a non using control.This is not to say that methamphetamine users will eventually become Parkinson's patients, but it does help to explain why some methamphetamine users exhibit muscle twitching (known as "tweaking") and other strange movements.

(Notes for Slide 31, continued)

Slide 31: Decreased Dopamine Transporter Binding in METH Users Resembles that in Parkinson's Disease

REFERENCE:

McCann U.D., Wong, D.F., Yokoi, F., Villemagne, V., Dannals, R.F., & Ricaurte, G.A. (1998). Reduced Striatal Dopamine Transporter Density in Abstinent Methamphetamine and Methcathinone Users: Evidence from Positron Emission Tomography Studies with [^{11}C]WIN-35,428. *Journal of Neuroscience 18*(20), 8417-8422.



Slide 32: But Dopamine is only Part of the Story

Dopamine is an important brain chemical in drug abuse and addiction, but other brain systems and brain chemicals are also involved. Serotonin and glutamate neurotransmitter systems, for example, are among those affected. These neurotransmitters are important regulators of mood, sleep, learning and memory, and more.

REFERENCE:

National Institute on Drug Abuse. *Bringing the Full Power of Science to Bear on Drug Abuse and Addiction.* Downloaded from: https://www.drugabuse.gov/sites/default/files/addictionscience.ppt.

Slide 33: No Title

Make the point that sustained drug use changes the brain in profound and long-lasting ways, which we will look at next.

REFERENCE:

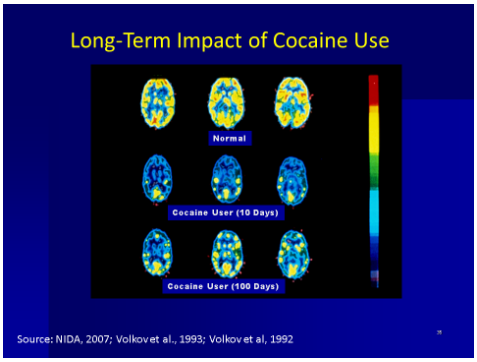
National Institute on Drug Abuse. *Bringing the Full Power of Science to Bear on Drug Abuse and Addiction.* Retrieved from: https://www.drugabuse.gov/sites/default/files/addictionscience.ppt.

Slide 34: No Title

These long-term changes can be both structural and functional, and affect many aspects of our ability to function in our daily lives.

REFERENCE:

National Institute on Drug Abuse. *Bringing the Full Power of Science to Bear on Drug Abuse and Addiction.* Retrieved from: https://www.drugabuse.gov/sites/default/files/addictionscience.ppt.



Slide 35: Long-Term Impact of Cocaine Use

Brain glucose metabolism with PET – chronic cocaine users vs. normal controls; chronic cocaine users were tested 1-6 weeks after last use of cocaine and again after 3-month drug-free period

Cocaine users had significantly lower metabolic activity in 16 of the 21 left frontal regions and 8 of the 21 right frontal regions. These decreases persisted after 3-4 months of detoxification and were correlated with dose and years of use. Conclusion – reduced frontal metabolism in neurologically intact cocaine users that persist even after 3-4 months of detoxification.

REFERENCES:

National Institute on Drug Abuse. (2007). *Bringing the Power of Science to Bear on Drug Abuse and Addiction, Long Term Effects of Drug Abuse*. Retrieved from: https://www.drugabuse.gov/publications/teaching-packets/power-science/section-ii/4-long-term-effects-drug-abuse.

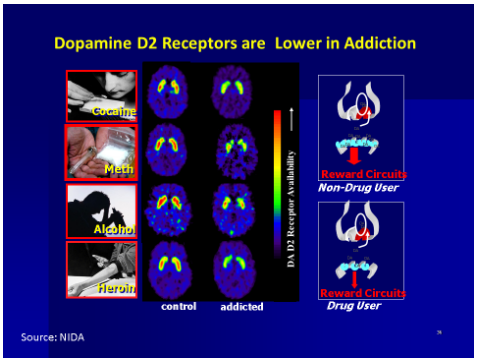
(Notes for Slide 35, continued)

Slide 35: Long-Term Impact of Cocaine Use

REFERENCES:

Volkow, N.D., Fowler, J.S., Wang, G.-J., Hitzemann, R., Logan, J., Schlyer, D., Dewey, S., & Wolf, A.P. (1993). Decreased dopamine D2 receptor availability is associated with reduced frontal metabolism in cocaine abusers. *Synapse, 14*, 169-177.

Volkow, N.D., Hitzemann, R., Wang, G.-J., Fowler, J.S., Wolf, A.P., & Dewey, S.L. (1992). Long-term frontal brain metabolic changes in cocaine abusers. *Synapse 11*, 184-190.



Slide 36: Dopamine D2 Receptors are Lower in Addiction

Repeated drug exposure also changes brain function. Positron emission tomography (PET) images show similar changes in brain dopamine receptors resulting from addiction to different substances. Dopamine D2 receptors are one of five types of receptors that bind dopamine in the brain. The brain images on the left are those of controls, while those on the right are from individuals addicted to cocaine, methamphetamine, alcohol, or heroin. The striatum (which contains the reward and motor circuitry) shows up as bright red and yellow in the controls (in the left column), indicating numerous D2 receptors. Conversely, the brains of addicted individuals (in the right column) show a less intense signal, indicating lower levels of D2 receptors. This reduction likely stems from repeated over-stimulation of the dopamine receptors. Brain adaptations such as this contribute to the compulsion to abuse drugs, because it is much more difficult to experience pleasure.

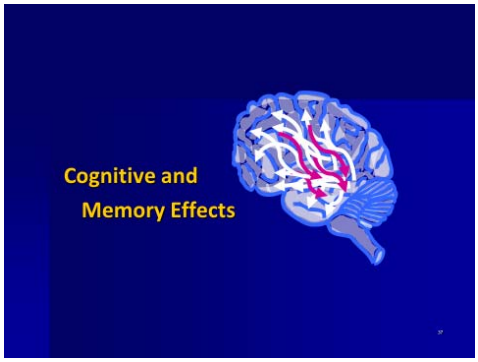
(Notes for Slide 36, continued)

Slide 36: Dopamine D2 Receptors are Lower in Addiction

REFERENCE:

National Institute on Drug Abuse. *Bringing the Full Power of Science to Bear on Drug Abuse and Addiction.* Retrieved from: https://www.drugabuse.gov/sites/default/files/addictionscience.ppt.

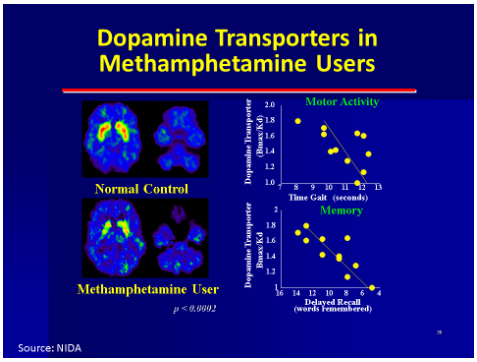
Slide 37: Cognitive and Memory Effects



This slide introduces a section on cognitive and memory effects of drugs.

IMAGE CREDIT:

NIDA Website, https://www.drugabuse.gov/.



Slide 38: Dopamine Transporters in Methamphetamine Users

Another example: Methamphetamine abuse decreases dopamine transporter activity and compromises mental function. The brain image at the top left is a PET image from a normal control subject. The striatum is brightly lit in red and yellow, indicating the presence of many dopamine transporters, which contrasts with the brain of a methamphetamine abuser (bottom left). What does this mean functionally? The graphs on the right show the relationship between performance on a motor (upper right) and a memory task (lower right) and methamphetamine-driven decreases in dopamine transporters. The magnitude of the decline in the dopamine transporter binding is positively correlated with the extent of motor and memory impairment; thus the greater the decline, the greater the impairment in memory and motor reaction time.

REFERENCE:

National Institute on Drug Abuse. *Bringing the Full Power of Science to Bear on Drug Abuse and Addiction.* Retrieved from: https://www.drugabuse.gov/sites/default/files/addictionscience.ppt.

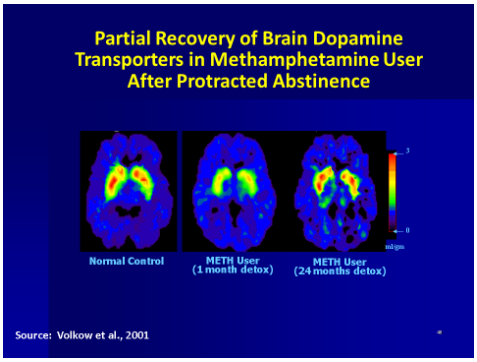
Slide 39: How Much Does the Brain Heal?

Drug use can kill brain cells. Many drugs, including alcohol, are neurotoxic, meaning they are poisonous to portions of the brain. Long-term, high-dose methamphetamine use, for instance, can produce neurotoxicity, thereby destroying neurons and permanently eliminating certain types of brain function. The good news is that many of the changes that methamphetamine causes to neurons in specific parts of the brain appear to recover over time. In effect, the brain "heals."

What happens when neurons are destroyed? Depends on which part of the brain. If in the limbic system, anything from how people experience pleasure to learning and memory may be impaired. If in the prefrontal cortex, reasoning and decision-making will be impaired.

This information can be one of the most important and motivating facts that a substance user can learn – that it appears that the brain does heal over time.

IMAGE CREDIT:
NIDA Website,
https://www.drugabuse.gov/.



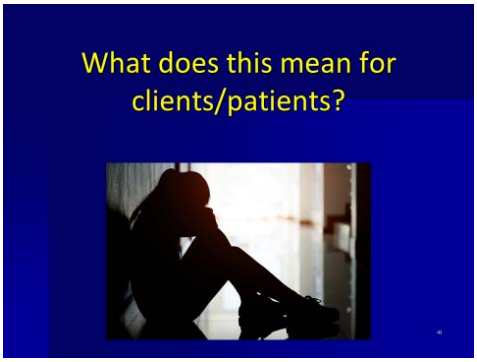
Slide 40: Partial Recovery of Brain Dopamine Transporters in Methamphetamine User After Protracted Abstinence

In this study, researchers examined the PET scans of chronic methamphetamine users who had achieved two years of abstinence from methamphetamine. The scans showed a return to virtually normal dopamine levels. While this is good news, and suggests that the brain has an amazing ability to repair itself, the subjects in the study did not regain all of the lost cognitive function associated with the damage, which could suggest an incomplete recovery.

While the fact that the brain recovers is good news, the not-so-good news is that the recovery takes months, not days. Treatment and recovery are long-term processes.

REFERENCE:

Volkow, N.D., Chang, L., Wang, G.-L., Fowler, J.S., Franceschi, D., Sedler, M., Gatley, S.J., Miller, E., Hitzemann, R., Ding, Y.-S., & Logan, J. (2001). Loss of dopamine transporters in methamphetamine abusers recovers with protracted abstinence. *The Journal of Neuroscience, 21*(23), 9414-9418.

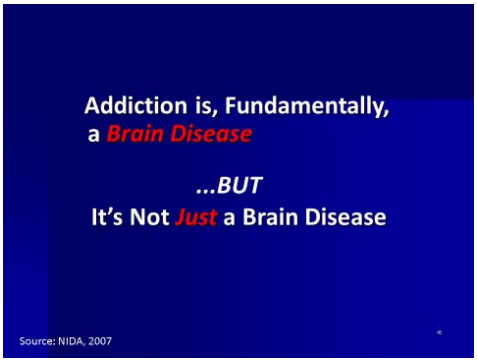


Slide 41: What Does This Mean for Clients/Patients?

Pose the question to the audience: "what does the fact that brain mechanism recovery may take a long time mean for our clients/patients?" Answer: that we need to be mindful that people aren't necessarily going to change and get better overnight, and that treatment episodes may need to be longer than previously thought.

IMAGE CREDIT:

Fotolia, purchased image, 2018.

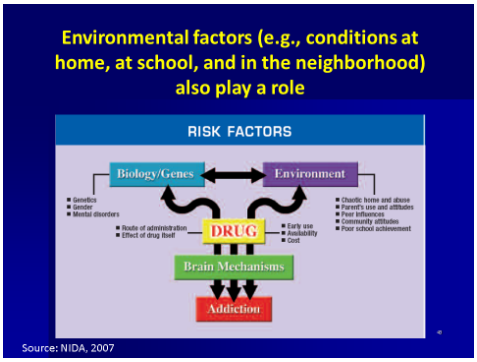


Slide 42: No Title

Addiction is, on a fundamental level, a brain disease, but it's not just a brain disease. This slide transitions to a section on environmental and biological influences.

REFERENCE:

National Institute on Drug Abuse. (2007). *Drugs, Brains, and Behavior: The Science of Addiction. NIH Pub No. 07-5605*, February 2007.



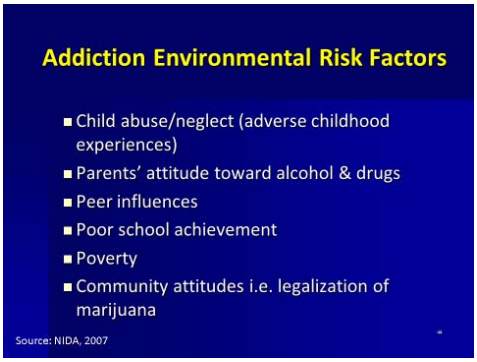
Slide 43: Environmental factors (e.g., conditions at home, and in the neighborhood) also play a role

Explain the diagram. In particular, stress the interaction between biological factors and environmental factors along with aspects of the substance itself as determinants of developing an addiction. Each of these factors is explained in more detail on the next 3 slides.

"No single factor determines whether a person will become addicted to drugs. The overall risk for addiction is impacted by the biological makeup of the individual – it can even be influenced by gender or ethnicity, his or her developmental stage, and the surrounding social environment (e.g., conditions at home, at school, and in the neighborhood (NIDA, 2007)."

REFERENCE:

National Institute on Drug Abuse. (2007). *Drugs, Brains, and Behavior: The Science of Addiction. NIH Pub No. 07-5605*, February 2007.

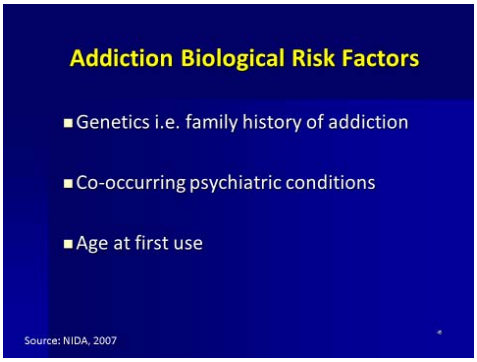


Slide 44: Addiction Environmental Risk Factors

In addressing the question of "who becomes addicted to alcohol and/or drugs, and who doesn't?" there is no simple answer. Many environmental factors play a role, including experiencing childhood abuse and/or neglect, parents' attitudes toward alcohol and drugs, peer influences, poor school achievement, poverty, and community attitudes including phenomena like the growing legalization of marijuana for recreational purposes.

REFERENCE:

National Institute on Drug Abuse. (2007). *Drugs, Brains, and Behavior: The Science of Addiction. NIH Pub No. 07-5605*, February 2007.

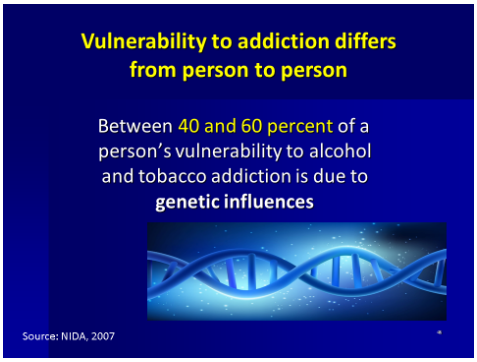


Slide 45: Addiction Biological Risk Factors

Continuing from the previous slide on why do some people become addicted and some don't…there are also biological risk factors, including genetics (for instance, is there a family history of addiction?), does the individual have a psychiatric condition (which increases vulnerability to addictions), and how old were they when they first used alcohol and/or drugs? The younger they were, the more likely they are to develop an addiction.

REFERENCE:

National Institute on Drug Abuse. (2007). *Drugs, Brains, and Behavior: The Science of Addiction. NIH Pub No. 07-5605*, February 2007.



Slide 46: Vulnerability to Addiction Differs From Person to Person

Addiction also has a strong genetic component. It is estimated that between 40 and 60% of an individual's vulnerability to addiction is due to genetic factors. For instance, there may be a gene or genes that are "turned on" by environmental factors in childhood.

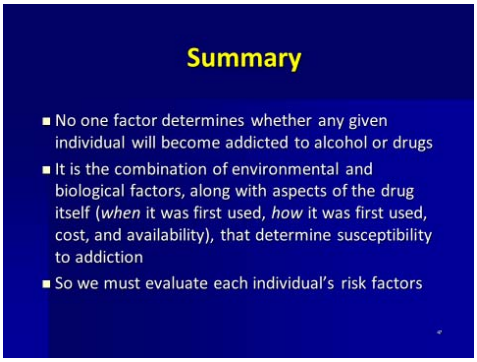
"As with any other disease, vulnerability to addiction differs from person to person. In general, the more risk factors an individual has, the greater the chance that taking drugs will lead to abuse and addiction. Scientists estimate that genetic factors account for between 40 and 60 percent of a person's vulnerability to addiction, including the effects of environment on gene expression and function."

REFERENCE:

National Institute on Drug Abuse. (2007). *Drugs, Brains, and Behavior: The Science of Addiction. NIH Pub No. 07-5605,* February 2007.

IMAGE CREDIT:

Fotolia, purchased image, 2018.



Slide 47: Summary

Summarize the previous 3 slides and make the point that we must evaluate risk factors of each individual in order to determine who is most likely to develop a substance use disorder. It is therefore vital to complete a comprehensive history on intake.

Slide 48: No Title

The brain changes that occur as a result of ongoing drug use can be long lasting, and can persist long after the user has stopped using drugs. Studies show the brain can recover and return towards normal, but this recovery process takes time (exact time depends upon a number of factors, including how long and how heavily they have used the substance). What happens when neurons are destroyed? Depends on which part of the brain. If in the limbic system, clients may have difficulty experiencing pleasure, may appear depressed, may have problems with learning and memory. If in the prefrontal cortex, reasoning and decision-making will be impaired. This is why so many people with substance use disorders seem to make bad decisions.

REFERENCE:

National Institute on Drug Abuse. (2007). *Drugs, Brains, and Behavior: The Science of Addiction. NIH Pub No. 07-5605*, February 2007.

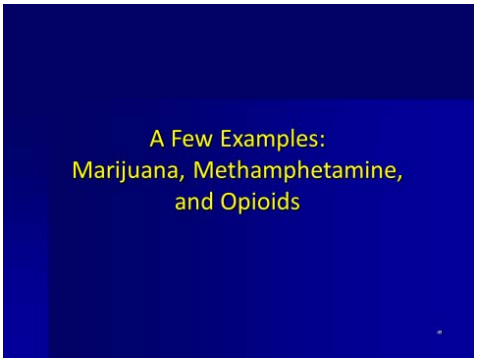
(Notes for Slide 48, continued)

Slide 48: No Title

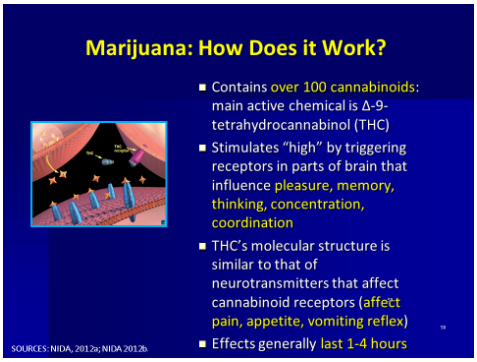
IMAGE CREDIT:

NIDA Website, https://www.drugabuse.gov.

Slide 49: A Few Examples



Now we will look at the effects of a few drugs: marijuana, methamphetamine, and opioids, and see what happens both acutely and long-term.



Slide 50: Marijuana: How Does it Work?

THC (tetrahydrocannabinol – one of the main psychoactive ingredients in marijuana) works by acting on specialized cells called neurons in the brain (refer to illustration). Neurons do not touch each other, and the gap between them—called the synaptic space—needs to be bridged for messages to get from one neuron to the next. To get messages across the space, neurons release chemicals, or neurotransmitters. The receiving neuron contains special proteins called receptors that neurotransmitters will bind to, similar to the way a key fits into a lock. After a neurotransmitter has bound to a receptor, proteins called transporters or reuptake pumps will carry neurotransmitters back to the neurons that released them. The reason this process is important is that certain neurotransmitters and receptors are associated with specific emotional and functions. Any changes to these steps—the way neurotransmitters are released, the way receptors work, or the way transporters or reuptake pumps work—can have profound effects on sensation, perception, thought, mood, and behavior. When people take drugs, these processes are altered, leading to changes in the way they feel and behave. Marijuana gets its effects because it contains over 60 chemicals called cannabinoids.

(Notes for Slide 50, continued)

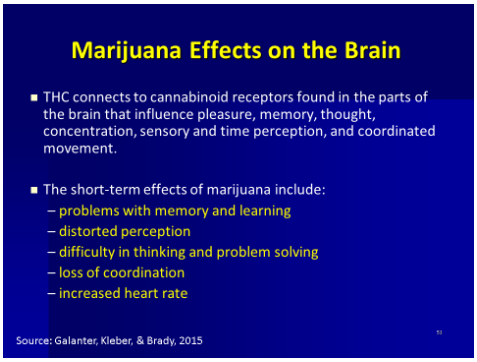
Slide 50: Marijuana: How Does it Work?

The main active chemical is a cannabinoid called delta-9-tetrahydorocannabinol, often referred to as THC. Cannabinoids trigger cannabinoid receptors, which are particularly dense in parts of the brain that affect pleasure, memory, thinking, concentration, and coordination. The effects of marijuana generally last 1-4 hours.

REFERENCES:

NIDA 2012(a). *Drug Facts: Marijuana.* Retrieved from: http://www.drugabuse.gov/sites/default/files/marijuana_0.pdf.

NIDA 2012(b). *Research Report Series: Marijuana Abuse*. Retrieved from: http://www.drugabuse.gov/sites/default/files/rrmarijuana.pdf.

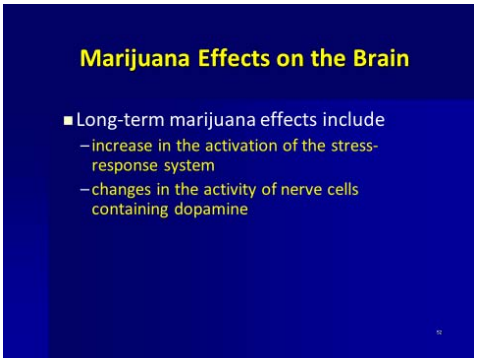


Slide 51: Marijuana Effects on the Brain

Make the point that cannabinoid receptors are found in numerous parts of the brain and body, resulting in the phenomena listed in the bullet points.

REFERENCE:

Galanter, M., Kleber, H.D., & Brady, K.T. (2015). *Textbook of Substance Abuse Treatment, 5th Ed.* Arlington, VA: American Psychiatric Publishing.

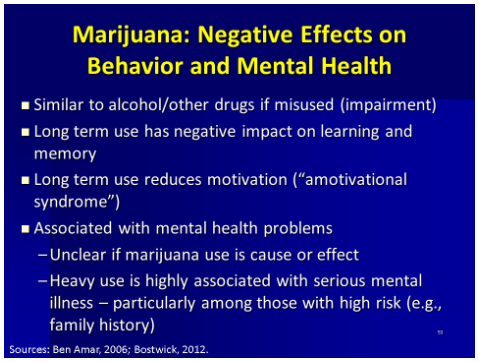


Slide 52: Marijuana Effects on the Brain

Make the point that cannabinoid receptors are found in numerous parts of the brain and body, resulting in the phenomena listed in the bullet points.

REFERENCE:

Galanter, M., Kleber, H.D., & Brady, K.T. (2015). *Textbook of Substance Abuse Treatment, 5th Ed.* Arlington, VA: American Psychiatric Publishing.



Slide 53: Marijuana: Negative Effects on Behavioral and Mental Health

Marijuana use can have very negative effects on behavior and mental health. Since marijuana is a psychoactive drug, it causes significant **impairment**, just like alcohol and other drugs. This means that when experiencing a marijuana "high" people are impaired, both physically and mentally. It is unsafe to drive, operate heavy machinery, or do other things that require concentration and physical coordination when under the influence of marijuana. Long-term marijuana use has a negative impact on learning and memory. Long-term marijuana use also causes **amotivational syndrome**, as it makes regular users less motivated to do things. Marijuana use is also associated with mental health problems and mental illness, particularly mood disorders. It is unclear if marijuana is what causes these problems, or if people who have mood disorders are more likely to use marijuana to self-medicate. Research also shows that heavy marijuana use is associated with serious mental illness, particularly among people who are at risk for serious mental illness because of family history.

(Notes for slide 53, continued)

Slide 53: Marijuana: Negative Effects on Behavioral and Mental Health

Additional Information for the Trainer(s)

Serious mental illness differs from "mental illness" in general in that it lasts longer and is more disabling, often preventing people from working or functioning in their day to day lives. Among individuals who meet diagnostic criteria for marijuana abuse, 36% have had a mood disorder in their life, and 25% have had an anxiety disorder in their life. Among individuals who meet diagnostic criteria for marijuana dependence, 60.5% have had a mood disorder in their life, and 48.5% have had an anxiety disorder in their lifetime. Overall, marijuana dependence increases the odds of a co-occurring mood disorder by 6.5 times, and of an anxiety disorder by 4.6 times. Further, there is a significant gender difference with regard to major depression, with marijuana dependence increasing the odds for men by 4.6 times and 7.2 times for women.

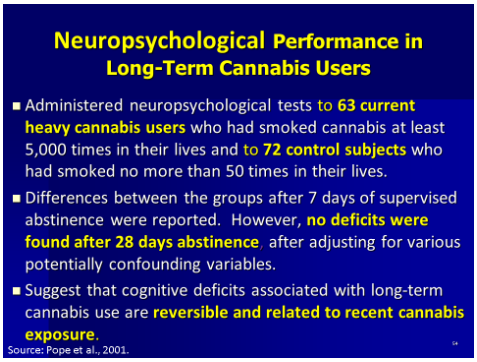
(Notes for slide 53, continued)

Slide 53: Marijuana and the Adolescent Brain

REFERENCES:

Ben Amar M. (2006). Cannabinoids in medicine: a review of their therapeutic potential. *J Ethnopharmacology, 105,* 1-25.

Bostwick, J.M. (2012). Blurred boundaries: the therapeutics and politics of medical marijuana. *Mayo Clinic Proceedings, 87,* 172-186.



Slide 54: Neuropsychological Performance in Long-Term Cannabis Users

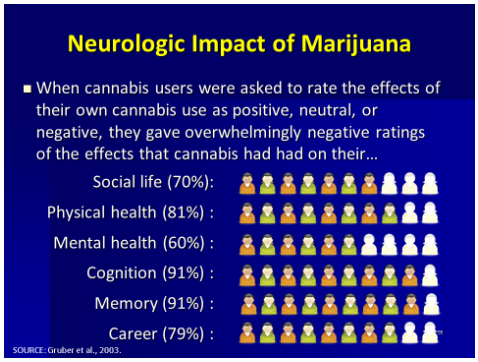
Pope and colleagues examined the long-term cognitive effects of cannabis use. The recruited three groups of users – (1) current heavy users who smoked cannabis at least 5,000 times in their lives and were daily smokers at the start of the study; (2) former heavy users who had also smoked at least 5,000 times but fewer than 12 times in the last three months; and (3) controls who smoked no more than 50 times in their lives. In the study, the participants went through a 28-day "washout" from cannabis use, and on days 0, 1, 7, and 28, participated in a neuropsychological test battery to assess cognitive functioning. They found that at days 0, 1, and 7, the current heavy users scored significantly lower than control subjects. But by day 28, there were virtually no significant differences among the groups. This suggests that cognitive deficits may be reversible and related to recent cannabis exposure, instead of irreversible and related to cumulative lifetime use of cannabis.

(Notes for slide 54, continued)

Slide 54: Marijuana and the Adolescent Brain

REFERENCE:

Pope, H.G., Gruber, A.J., Hudson, J.I., Huestis, M.A., & Yurgelun-Todd, D. (2001). Neuropsychological performance in long-term cannabis users. *Archives of General Psychiatry, 58*(10), 909-915.



Slide 55: Neurologic Impact of Marijuana

ANIMATIONS

This slide has animations. Introduce the content in the first bullet first. Then, one by one, click the mouse one time for the domain name and images of people to animate in. A total of six domains and associated data are included. Be sure to practice ahead of time.

This is the same group of study participants described on the previous slide. Gruber and colleagues to assess the neurologic impact of long-term heavy cannabis use in a variety of life domains. This slide details the results of the study. In several domains, the majority of individuals (or on some cases, vast majority) of individuals felt that cannabis negatively impacted their lives. Additional details are included below:

RESULTS:

Gruber and colleagues found no significant differences between the two groups on reported levels of income and education in their families of origin.

(Notes for slide 55, continued)

Slide 55: Impact on Cognition – Significant IQ Drop between Childhood and Mid-Life

However, the heavy users themselves reported significantly lower educational attainment ($P < 0.001$) and income ($P = 0.003$) than the controls, even after adjustment for a large number of potentially confounding variables. When asked to rate the subjective effects of cannabis on their cognition, memory, career, social life, physical health and mental health, large majorities of heavy users (66-90%) reported a 'negative effect'. On several measures of quality of life, heavy users also reported significantly lower levels of satisfaction than controls.

CONCLUSION:

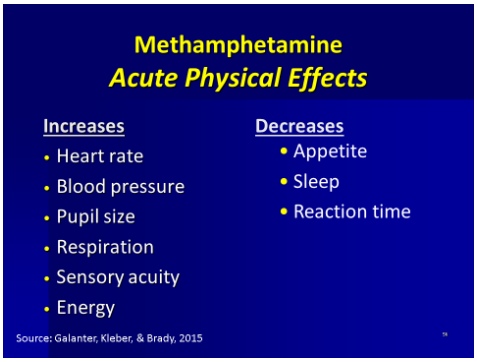
Both objective and self-report measures suggest numerous negative features associated with long-term heavy cannabis use. Thus, it seems important to understand why heavy users continue to smoke regularly for years, despite acknowledging these negative effects. Such an understanding may guide the development of strategies to treat cannabis dependence.

(Notes for slide 55, continued)

Slide 55: Impact on Cognition – Significant IQ Drop between Childhood and Mid-Life

REFERENCE:

Gruber, A.J., Pope, H.G., & Yurgelun-Todd, D. Attributes of long-term heavy cannabis users: A case-control study. *Psychological Medicine, 33*(8), 1415-1422.

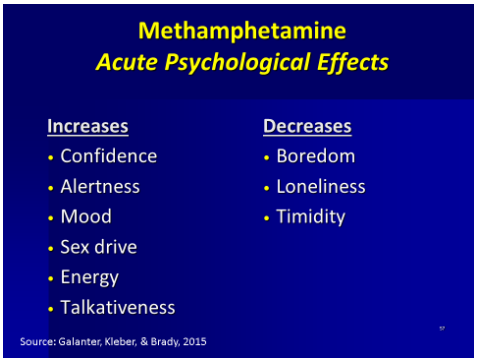


Slide 56: Methamphetamine – Acute Physical Effects

At the outset, methamphetamine is a seductive drug because its effects during the early stages of use are very pleasurable and reduce appetite and fatigue. People take the drug to help them work longer hours, lose weight, study longer, become more athletic, and have more and better sex. When a person uses methamphetamine, heart rate and blood pressure increase, as do pupil size, sensory acuity, and energy. Concomitantly, it decreases appetite, sleep, and reaction time. People find these effects useful.

REFERENCE:

Galanter, M., Kleber, H.D., & Brady, K.T. (2015). *Textbook of Substance Abuse Treatment, 5th Ed.* Arlington, VA: American Psychiatric Publishing.

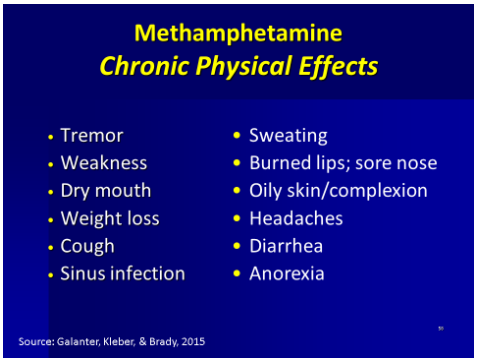


Slide 57: Methamphetamine – Acute Psychological Effects

Like the initial medical effects of methamphetamine, the initial psychological effects are also generally pleasant: methamphetamine increases confidence, alertness, positive mood, sex drive, energy, and talkativeness. It also decreases boredom, loneliness, and timidity.

REFERENCE:

Galanter, M., Kleber, H.D., & Brady, K.T. (2015). *Textbook of Substance Abuse Treatment, 5th Ed.* Arlington, VA: American Psychiatric Publishing.



Slide 58: Methamphetamine – Chronic Physical Effects

Over time, the effects of methamphetamine change. As methamphetamine is repeatedly applied to the brain, it changes brain chemistry, structure, and function. Some structures of the brain develop tolerance to the drug's effects and require an increased dosage to produce the desired effects. However, other areas of the brain become sensitized to the effects of methamphetamine, causing even small doses to produce very powerful reactions. Simply put, over time, part of the brain reacts to the drug by needing more of it, while other parts of the brain respond in exactly the opposite manner. Methamphetamine is a powerful stimulant that causes the heart to work harder and strains the vascular system. Chronic use can cause heart attacks and strokes. It increases blood pressure and thickens heart valves. Methamphetamine constricts blood vessels on the skin surface, causing the skin to feel tingly. Users will frequently vigorously scratch their skin in response to this sensation (meth bugs, speed bumps). Some of the effects to the left are due to the method the user uses to get the drug into his/her body. And what started as a weight loss of a few pounds ends up being an uncontrollable level of weight loss.

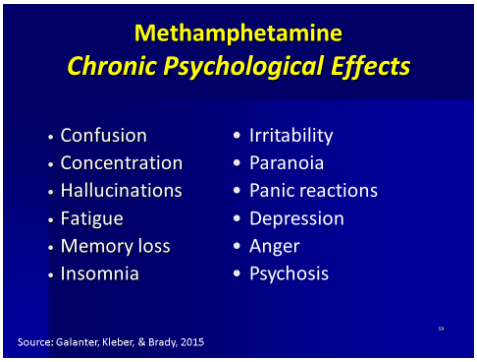
(Notes for Slide 58, continued)

Slide 58: Methamphetamine – Chronic Physical Effects

Infective Endocarditis (i.e., staphylococcus aureus) is frequent among people who inject drugs (PWID). About 8-16% of hospital admissions for PWIDs are accounted for by infective endocarditis. Essentially, an organism colonizes the heart (mostly the right side). Most common symptoms of endocarditis are chest pain, cough, fever, chills, and arthralgia. The condition can be treated with antibiotics or surgery.

REFERENCE:

Galanter, M., Kleber, H.D., & Brady, K.T. (2015). *Textbook of Substance Abuse Treatment, 5th Ed.* Arlington, VA: American Psychiatric Publishing.



Slide 59: Methamphetamine – Chronic Psychological Effects

As dramatic as the chronic physical effects of methamphetamine are, the chronic psychological effects are even more profound. During initial stages of use, methamphetamine produces feelings of optimism, enthusiasm, and sociability. Over time, however, these positive effects are replaced with much more troublesome and pathological symptoms. In fact, the major presenting problems for methamphetamine users are psychological symptoms such as confusion, depression, anxiety, delusions, paranoid reactions, hallucinations, and suicidal ideation.

REFERENCE:

Galanter, M., Kleber, H.D., & Brady, K.T. (2015). *Textbook of Substance Abuse Treatment, 5th Ed.* Arlington, VA: American Psychiatric Publishing.

Slide 60: What are Opioids?

Opiates are direct derivatives of the opium poppy plant. They are opium itself, morphine, and codeine. **Opioids** are any compound that binds to opioid receptors in the brain and body. They include the opiates but also include synthetic and semi-synthetic compounds. The term "narcotic" is more of a legal designation for drugs that is used less and less in drug treatment settings because of its negative connotation.

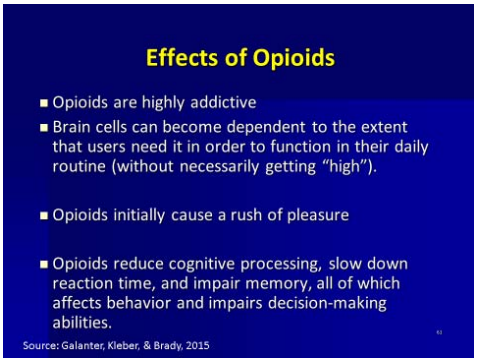
REFERENCE:

Galanter, M., Kleber, H.D., & Brady, K.T. (2015). *Textbook of Substance Abuse Treatment, 5th Ed.* Arlington, VA: American Psychiatric Publishing.

IMAGE CREDITS:

Top right: Wikimedia Commons.

Top left: Pixabay.com Free Photo.

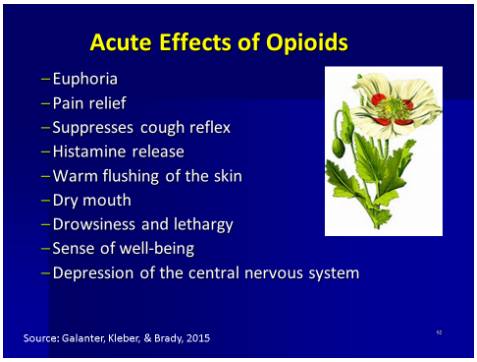


Slide 61: Effects of Opioids

Make the point that opioids are highly addictive and people can become physiologically dependent on them very quickly. It is important for training participants to understand that individuals who are physiologically dependent on opioids can need drugs just to be able to function normally, without even necessarily getting high.

REFERENCE:

Galanter, M., Kleber, H.D., & Brady, K.T. (2015). *Textbook of Substance Abuse Treatment, 5th Ed.* Arlington, VA: American Psychiatric Publishing.



Slide 62: Acute Effects of Opioids

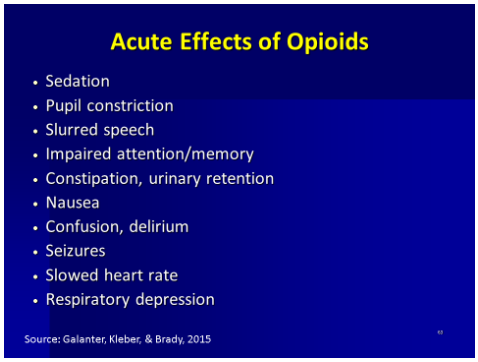
Read the bullet points on the slide detailing the acute effects of opioids.

REFERENCE:

Galanter, M., Kleber, H.D., & Brady, K.T. (2015). *Textbook of Substance Abuse Treatment, 5th Ed.* Arlington, VA: American Psychiatric Publishing.

IMAGE CREDIT:

Wikimedia Commons.

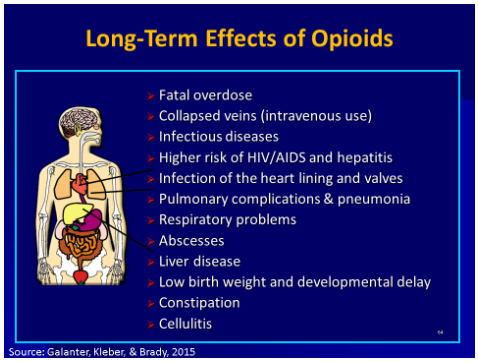


Slide 63: Acute Effects of Opioids

Read the bullet points on the slide detailing the additional acute effects of opioids.

REFERENCE:

Galanter, M., Kleber, H.D., & Brady, K.T. (2015). *Textbook of Substance Abuse Treatment, 5th Ed.* Arlington, VA: American Psychiatric Publishing.

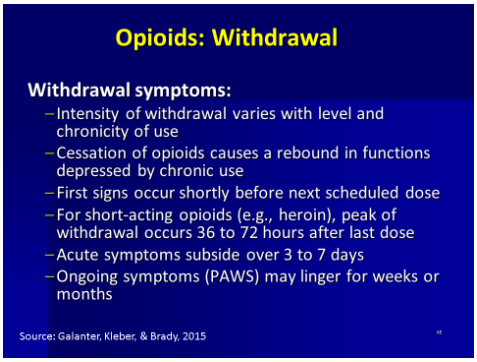


Slide 64: Long Term Effects of Opioids

Read the bullet points on the slide detailing the longer-term effects of opioids.

REFERENCE:

Galanter, M., Kleber, H.D., & Brady, K.T. (2015). *Textbook of Substance Abuse Treatment, 5th Ed.* Arlington, VA: American Psychiatric Publishing.

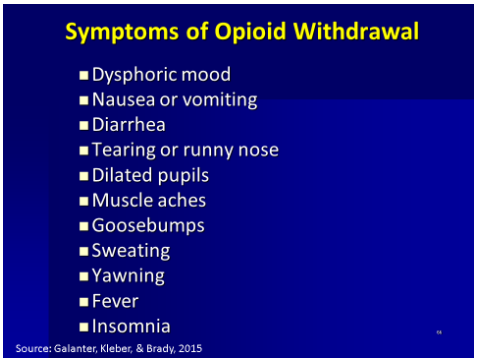


Slide 65: Opioids: Withdrawal

Read the bullet points on the slide detailing the withdrawal effects of opioids. Make the point that the severity of withdrawal symptoms depends on how often and how heavily someone has been using opioids. On the final bullet point, PAWS stands for "post-acute withdrawal syndrome", which can include cravings, exhaustion, and cognitive impairment that does not go away for week or even months.

REFERENCE:

Galanter, M., Kleber, H.D., & Brady, K.T. (2015). *Textbook of Substance Abuse Treatment, 5th Ed.* Arlington, VA: American Psychiatric Publishing.

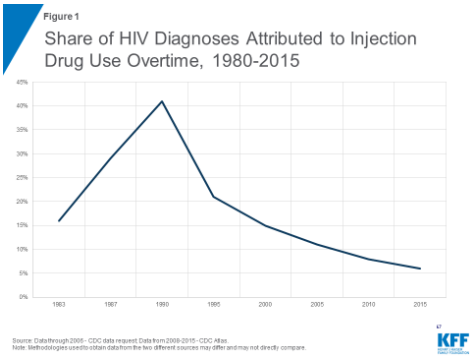


Slide 66: Symptoms of Opioid Withdrawal

Read the bullet list of additional opioid withdrawal symptoms.

REFERENCE:

Galanter, M., Kleber, H.D., & Brady, K.T. (2015). *Textbook of Substance Abuse Treatment, 5th Ed.* Arlington, VA: American Psychiatric Publishing.

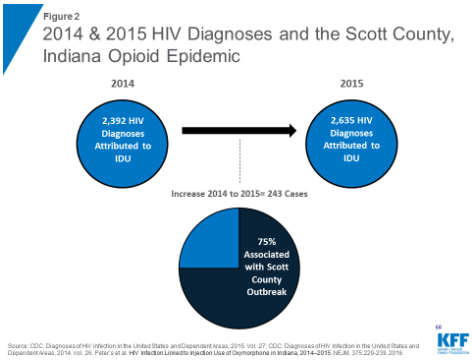


Slide 67: Share of HIV Diagnoses Attributed to Injection Drug Use Over Time, 1980-2015

The overall number of HIV diagnoses attributed to injection drug use has dropped from a high of about 40% in 1990 to about 6% in 2015.

REFERENCE:

Kaiser Family Foundation (2018). *Share of HIV diagnoses attributed to injection drug use over time, 1980-2015.* Retrieved from: https://www.kff.org/hivaids/issue-brief/hiv-and-the-opioid-epidemic-5-key-points.

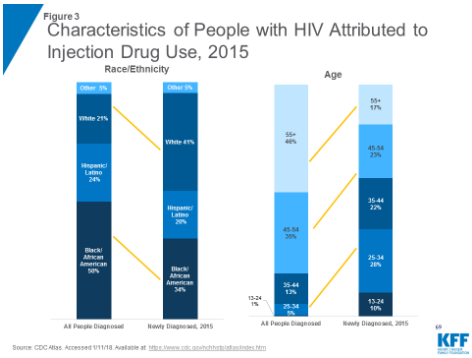


Slide 68: 2014 & 2015 HIV Diagnoses and the Scott County, Indiana Opioid Epidemic

An increase of 243 cases of HIV diagnoses attributed to injection drug use (an approximately 10% increase) was seen between 2014 and 2015. Seventy-five percent (75%) of these were attributed to one county in Indiana, which has been one of the epicenters of the opioid crisis.

REFERENCE:

Kaiser Family Foundation (2018). *2014 & 2015 HIV diagnoses and the Scott County, Indiana opioid epidemic.* Retrieved from: https://www.kff.org/hivaids/issue-brief/hiv-and-the-opioid-epidemic-5-key-points/.

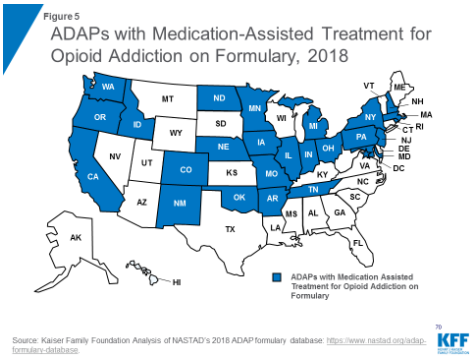


Slide 69: Characteristics of People with HIV Attributed to Injection Drug Use, 2015

Fewer of the new IDU-related HIV diagnoses in 2015 were African-American and more were Caucasian-American. This likely reflects the movement of the opioid epidemic into largely White, poor, rural areas. Additionally, new diagnoses in 2015 tended to be much younger than the overall population of IDU-related HIV cases (60% were under the age of 45 vs. 80% 45 and older in the broader population). The increase was especially large among ages 13-24 and ages 25-34.

REFERENCE:

Kaiser Family Foundation (2018). *Characteristics of people with HIV attributed to injection drug use, 2015*. Retrieved from: https://www.kff.org/hivaids/issue-brief/hiv-and-the-opioid-epidemic-5-key-points/.

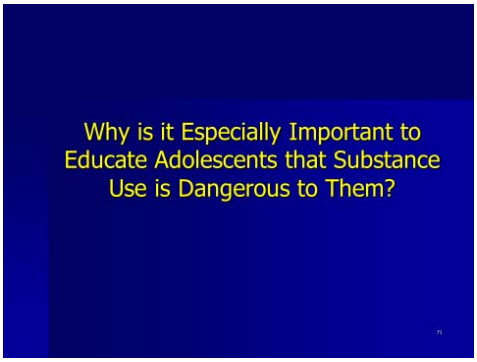


Slide 70: ADAPs with Medication-Assisted Treatment for Opioid Addiction on Formulary, 2018

This is a map showing ADAP (AIDS Drug Assistance Program) programs in states that include medication-assisted treatment (MAT) for opioid addiction on their formulary. California is one of these states. Therefore HIV care recipients on ADAP who have an opioid addiction in CA do have access to MAT.

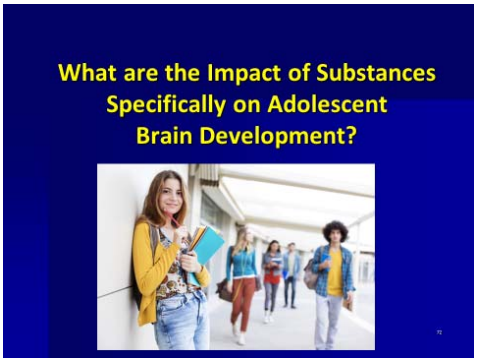
REFERENCE:

Kaiser Family Foundation (2018). *Analysis of NASTAD's 2018 ADAP formulary database.* Retrieved from: https://www.kff.org/hivaids/issue-brief/hiv-and-the-opioid-epidemic-5-key-points/.



Slide 71: Why is it Especially Important to Educate Adolescents that Substance Use is Dangerous to Them?

This slide and the following slide are transition slides to a small section on the impact of substances on adolescent brain development. The key point is that adolescent brains are still under development and therefore alcohol and other drugs have a greater impact on them than they do on adult brains.

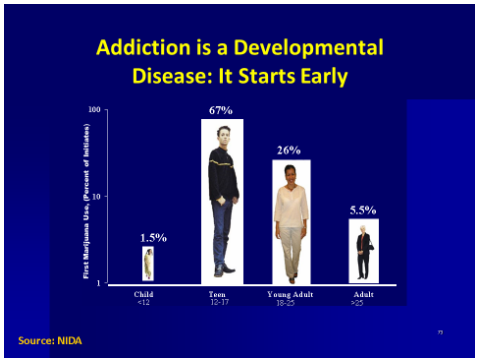


Slide 72: What are the Impact of Substances Specifically on Adolescent Brain Development?

Ask the audience if they have any idea how adolescent brains in particular might be affected by alcohol and other drugs.

IMAGE CREDIT:

Fotolia, purchased image, 2018.

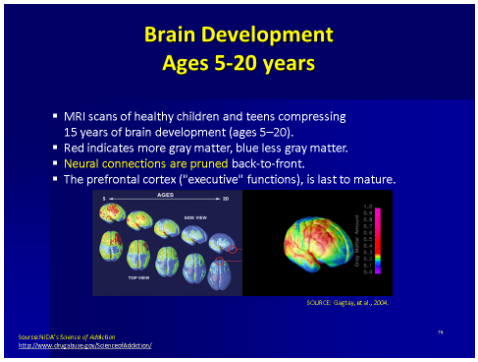


Slide 73: Addiction is a Developmental Disease: It Starts Early

Addiction is a developmental disease that usually begins in adolescence. For example, 67% of those who try marijuana for the first time are between the ages of 12 and 17. Prevention efforts are therefore of primary importance—to stop drug abuse before it ever starts.

REFERENCE:

National Institute on Drug Abuse. *Bringing the Full Power of Science to Bear on Drug Abuse and Addiction.* Retrieved from: https://www.drugabuse.gov/sites/default/files/addictionscience.ppt.



Slide 74: Brain Development Ages 5-20 Years

Constructed from MRI scans of healthy children and teens, the time-lapse movie, from which the above images were extracted, compresses 15 years of brain development (ages 5–20) into just a few seconds. Red indicates more gray matter, blue less gray matter. Gray matter wanes in a back-to-front wave as the brain matures and neural connections are pruned. Areas performing more basic functions mature earlier; areas for higher order functions mature later. The prefrontal cortex, which handles reasoning and other "executive" functions, emerged late in evolution and is among the last to mature. Studies in twins are showing that development of such late-maturing areas is less influenced by heredity than areas that mature earlier.

*****ANIMATION*****

This slide has complex animations and the trainer should practice prior to training. A step-by-step guide is provided below.

(Notes for slide 74, continued)

Slide 74: Brain Development Ages 5-20 Years

The first bullet comes in automatically at the beginning of the slide. Provide the following description:

This slide demonstrates the neural pruning through animations. This is a series of MRI scans from healthy children showing brain development as they age from 5 to 20 years.

Move forward to reveal the next bullet, and present the information:

Red indicates more gray matter and blue indicates less gray matter.

Move forward and a small brain image will briefly appear on the lower right and then a short movie will automatically play full screen showing brain maturation. Once it stops, the small image of the brain will appear again on the lower right of the slide. Move forward to reveal the next bullet:

As you can see, the pruning occurs from the back of the brain toward the front.

Move forward to reveal the last bullet:

This means that the prefrontal cortex (responsible for executive functioning, like decision-making) is the last to mature.

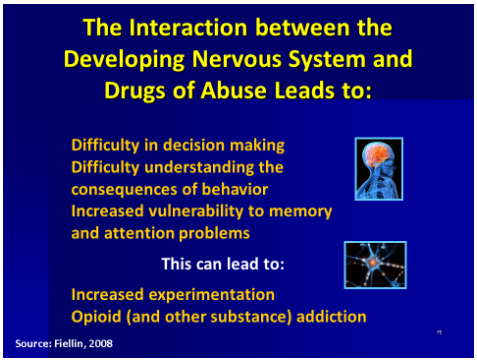
(Notes for slide 74, continued)

Slide 74: Brain Development Ages 5-20 Years

REFERENCES:

National Institute on Drug Abuse. (2007). *Drugs Brains, and Behavior: The Science of Addiction* (NIH Pub No. 07-5605). Retrieved from: http://www.drugabuse.gov/ScienceofAddiction.

Gogtay, N., Giedd, J.N., Lusk, L., Hayashi, K.M., Greenstein, D., Vaituzis A.C. …. Thompson, P.M. (2004). Dynamic mapping of human cortical development during childhood through early adulthood. *Proceedings of the National Academy of Sciences, 101*, 8174-8179.



Slide 75: The Interaction Between the Developing Nervous System and Drugs of Abuse Leads to:

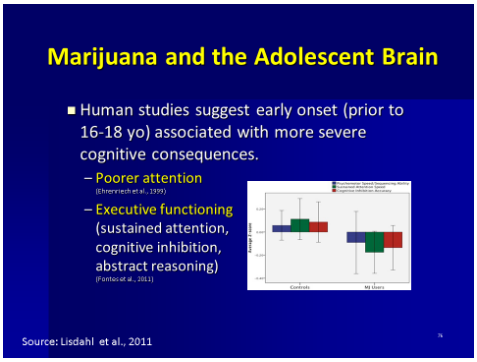
In reality, the exact impact of substance use on the developing brain is not known. However, when we look at the impact on the adult brain and understand normal development, several things seems true about this interaction, including that it may lead to difficulties in decision making and understanding the consequences of behavior (Fiellin, 2008). Additionally, it may increase the risk of memory and attention problems. These impairments, in turn, may lead to increased experimentation across a variety of behaviors; and increase the risk of addiction to a variety of substances (Fiellin, 2008).

REFERENCE:

Fiellin, D.A. (2008). Treatment of adolescent opioid dependence: No quick fix. *Journal of the American Medical Association, 300(*17), 2057-2059.

IMAGE CREDIT:

NIDA Website, https://www.drugabuse.gov/.

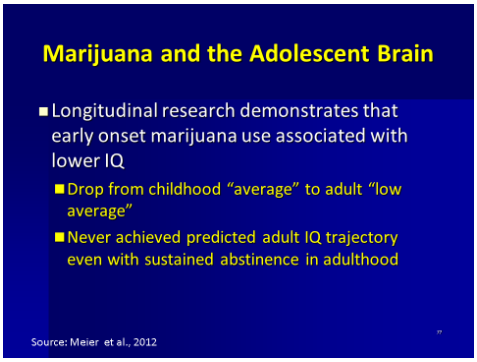


Slide 76: Marijuana and the Adolescent Brain

Details of several studies are provided on the next two slides. Make the point that beginning marijuana use prior to age 16 seems to result in poorer attention and concentration, and more impaired executive functioning (sustained attention, ability to cognitively inhibit impulses, and abstract reasoning).

REFERENCE:

Lisdahl, K.M., Gilbart, E.R., Wright, N.E., & Shollenbarger, S. (2013). Dare to delay? The impacts of adolescent alcohol and marijuana use onset on cognition, brain structure, and function. *Frontiers in Psychiatry, 1*(4), 53.

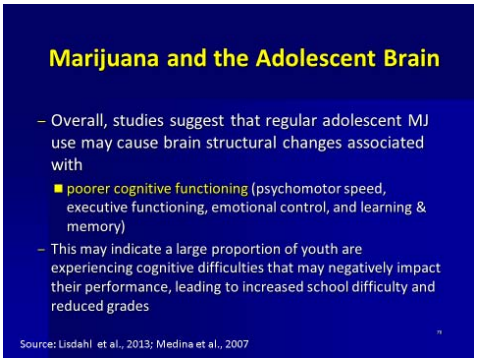


Slide 77: Marijuana and the Adolescent Brain

People who began using marijuana in their teenage years and then continued to use marijuana for many years lost about 8 IQ points from childhood to adulthood, whereas those who never used marijuana did not lose any IQ points. The amount people smoked also made a difference. Those who smoked the most – at least every day – saw the greatest drop in IQ, the full 8 points. And the younger they were when they started using cannabis, the greater the IQ decline. It wasn't just IQ. Adults who smoked marijuana as teenagers did worse in tests of memory and decision-making than adults who hadn't smoked marijuana.

REFERENCE:

Meier, M.H., Caspi, A., Ambler, A., Harrington, H., Houts, R., Keefe, R.S., et al. (2012). Persistent cannabis users show neuropsychological decline from childhood to midlife. *Proceedings of the National Academy of Sciences, 109*(40), E2657-E2664.



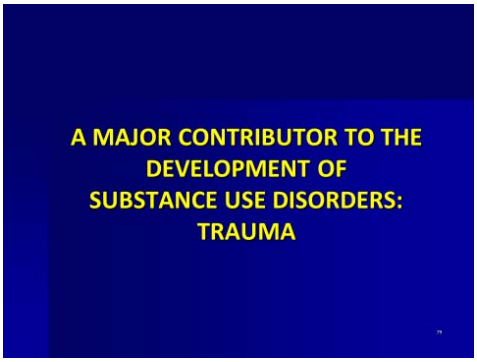
Slide 78: Marijuana and the Adolescent Brain

Additional studies indicate neuropsychological impairment in adolescent marijuana users that may negatively impact school performance, leading to increased school difficulties and reduced grades.

REFERENCES:

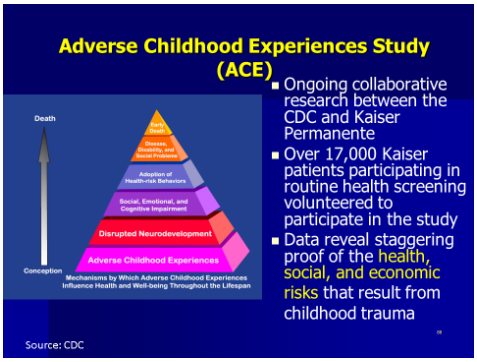
Lisdahl, K.M., Gilbart, E.R., Wright, N.E., & Shollenbarger, S. (2013). Dare to delay? The impacts of adolescent alcohol and marijuana use onset on cognition, brain structure, and function. *Frontiers in Psychiatry, 1*(4), 53.

Medina, K.L., Hanson, K.L., Schweinsburg, A.D., Cohen-Zion, M., Nagel, B.J., & Tapert, S.F. (2007). Neuropsychological functioning in adolescent marijuana users: Subtle deficits detectable after a month of abstinence. *Journal of the International Neuropsychological Society, 13*(5), 807-820.



Slide 79: A Major Contributor to the Development of Substance Use Disorders: Trauma

This is a transition slide to a section on childhood trauma and its relationship with substance use disorders.



Slide 80: Adverse Childhood Experiences Study (ACE)

The ACE Study is ongoing collaborative research between the Centers for Disease Control and Prevention in Atlanta, GA, and Kaiser Permanente in San Diego, CA and represents one of the largest investigations ever conducted to assess associations between childhood maltreatment and later-life health and well-being. The Co-Principal Investigators of the study are Robert F. Anda, MD, MS, with the CDC; and Vincent J. Felitti, MD, with Kaiser Permanente. Over 17,000 Kaiser patients participating in routine health screening volunteered to participate in the study. Data resulting from their participation continues to be analyzed; it reveals staggering proof of the health, social, and economic risks that result from childhood trauma. The CDC provides access to the peer-reviewed publications resulting from The ACE Study (http://www.cdc.gov/violenceprevention/acestudy/). To date, more than 50 scientific articles have been published and more than100 conference and workshop presentations have been made.

The ACE Study findings suggest that certain experiences are major risk factors for the leading causes of illness and death as well as poor quality of life in the United States.

(Notes for slide 80, continued)

Slide 80: Adverse Childhood Experiences Study (ACE)

It is critical to understand how some of the worst health and social problems in our nation can arise as a consequence of adverse childhood experiences. Realizing these connections is likely to improve efforts towards prevention and recovery.

Additional Information for the Trainer(s)

The ACE Pyramid represents the conceptual framework for the study. During the time period of the 1980s and early 1990s, information about risk factors for disease had been widely researched and merged into public education and prevention programs. It was also clear, however, that risk factors, such as smoking, alcohol abuse, and sexual behaviors for many common diseases were not randomly distributed in the population. In fact, it was known that risk factors for many chronic diseases tended to cluster, that is, persons who had one risk factor tended to have one or more other risk factors too. Because of this knowledge, the ACE Study was designed to assess what we considered to be "scientific gaps" about the origins of risk factors. These gaps are depicted as the two arrows linking Adverse Childhood Experiences to risk factors that lead to the health and social consequences higher up the pyramid.

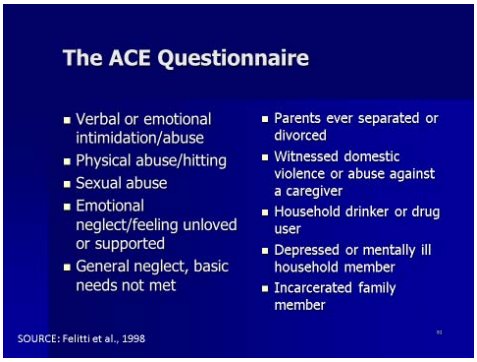
(Notes for slide 80, continued)

Slide 80: Adverse Childhood Experiences Study (ACE)

Specifically, the study was designed to provide data that would help answer the question: "If risk factors for disease, disability, and early mortality are not randomly distributed, what influences precede the adoption or development of them?" By providing information to answer this question, we hoped to provide scientific information that would be useful for developing new and more effective prevention programs. The ACE Study takes a whole life perspective, as indicated on the orange arrow leading from conception to death. By working within this framework, the ACE Study began to progressively uncover how adverse childhood experiences (ACE) are strongly related to development and prevalence of risk factors for disease and health and social well-being throughout the lifespan.

REFERENCE:

Centers for Disease Control and Prevention, National Center for Injury Prevention and Control, Division of Violence Prevention. *The ACE Pyramid.* Retrieved from: https://www.cdc.gov/violenceprevention/acestudy/ACE_graphics.html.

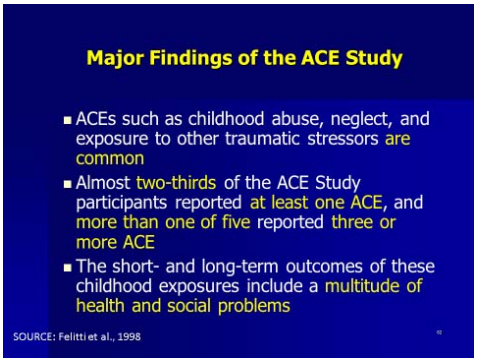


Slide 81: The ACE Questionnaire

Read the bullet points, which represent the items on the ACE (Adverse Childhood Experiences) questionnaire.

REFERENCE:

Felitti, V.J., Anda, R.F., Nordenberg, D., et al. (1998). Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults. The Adverse Childhood Experiences (ACE) Study. *American Journal of Preventive Medicine, 14*(4), 245-258.

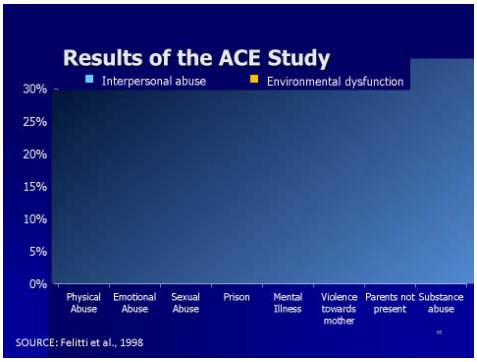


Slide 82: Major Findings of the ACE Study

Childhood abuse, neglect, and exposure to other traumatic stressors which are termed adverse childhood experiences (ACE) are common. Almost two-thirds of ACE study participants reported at least one ACE, and more than one in five reported three or more ACE's. The short- and long-term outcomes of these childhood exposures include a multitude of health and social problems.

REFERENCE:

Felitti, V.J., Anda, R.F., Nordenberg, D., et al. (1998). Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults. The Adverse Childhood Experiences (ACE) Study. *American Journal of Preventive Medicine, 14*(4), 245-258.

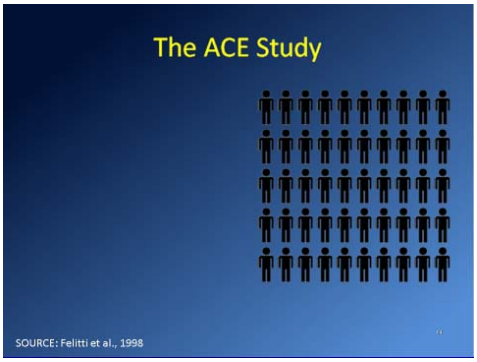


Slide 83: Results of the ACE Study

Reveal the categories by advancing the slide. On the "interpersonal abuse" side of the chart, make the point that high rates of physical and emotional abuse, and especially sexual abuse, were found in the childhoods of the study participants. Advance the slide. On the "environmental dysfunction" side of the chart, especially high were histories of parents not being present (i.e. child neglect), mental illness, and highest of all (advance the slide a final time) was a history of substance abuse.

REFERENCE:

Felitti, V.J., Anda, R.F., Nordenberg, D., et al. (1998). Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults. The Adverse Childhood Experiences (ACE) Study. *American Journal of Preventive Medicine, 14*(4), 245-258.

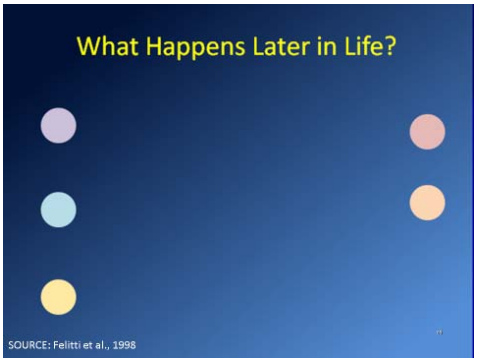


Slide 84: The ACE Study

Advance the slide once, and the first statistic appears (14% of women and 28% of men reported a history of childhood sexual abuse. Advance the slide again, and the 2nd statistic appears: 66% of people in substance abuse treatment report a history of childhood abuse or neglect. Advance the slide again, and the 3rd statistic appears: 90% of women with alcohol dependence report childhood sexual abuse or severe physical abuse.

REFERENCE:

Felitti, V.J., Anda, R.F., Nordenberg, D., et al. (1998). Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults. The Adverse Childhood Experiences (ACE) Study. *American Journal of Preventive Medicine, 14*(4), 245-258.



Slide 85: What Happens Later in Life?

This slide presents information that resulted from Felitti and Anda's initial work on Adverse Childhood Experiences and the connection to later life health impairments/risk behaviors. Click to advance the slide. The circle with title "Smoking by Age 14" will animate into the center. Set up the slide by saying that you will be discussing different health impacts and the risk of developing those health impacts as a result of early childhood adversities. The first circle that show represents the general risk for someone with zero ACEs. On the next click, the circle that appears represents the increased risk for someone with one Adverse Childhood Experience, click again for two, click again for three, and click again for four. The intent is to show the compounding impact of Adverse Childhood Experiences.

Once you get to the "Four or More" circle, note the increased risk for Smoking by the Age of 14: someone with four or more ACEs is 315% more likely to smoke regularly by the age of fourteen versus someone with zero ACEs.

(Notes for slide 85, continued)

Slide 85: What Happens Later in Life?

Click again and the circle will disappear and the next health impact ("COPD") will animate to the center.

Continue through for the remaining four health impacts:

- **COPD**: 250% greater risk of COPD with four or more ACEs
- **Alcoholism**: 700% more likely with four or more ACEs
- **Suicide**: 1200% more likely to attempt suicide with four or more ACEs
- **IV drug use**: 1350% more likely to use IV drugs with four or more ACEs

Once you've gone through the "four or more" for IV drug use, click again for the scale to change. The next overlay adds the risk of IV drug use with 6 or more ACEs: 4600% more likely!

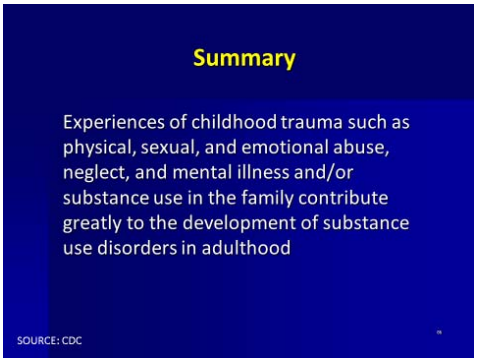
(Notes for slide 85, continued)

Slide 85: What Happens Later in Life?

REFERENCE:

Felitti, V.J., Anda, R.F., Nordenberg, D., et al. (1998). Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults. The Adverse Childhood Experiences (ACE) Study. *American Journal of Preventive Medicine, 14*(4), 245-258.

Slide 86: Summary



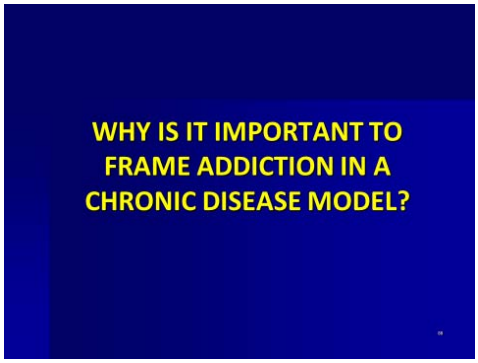
Summarize the previous five slides by emphasizing that childhood trauma plays a major role in the development of substance use disorders and therefore trauma needs to be addressed in mental health or substance use treatment.

REFERENCE:

Centers for Disease Control & Prevention. *Adverse Childhood Experiences.* Retrieved from: https://www.cdc.gov/violenceprevention/acestudy/index.html.

Slide 87: Break

Take a 10-15 minute break at this point.



Slide 88: Why is it Important to Frame Addiction in a Chronic Disease Model?

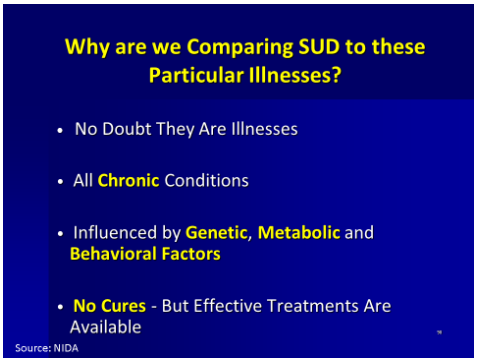
Pose this question to the audience. "Switching gears a bit, why is it important to frame addiction in a chronic disease model?"

Slide 89: Chronic Nature of Addiction

Make the point that addiction, or severe substance use disorders, are a "chronic relapsing condition", similar to the other listed diseases.

REFERENCE:

National Institute on Drug Abuse. *Bringing the Full Power of Science to Bear on Drug Abuse and Addiction.* Retrieved from: https://www.drugabuse.gov/sites/default/files/addictionscience.ppt.

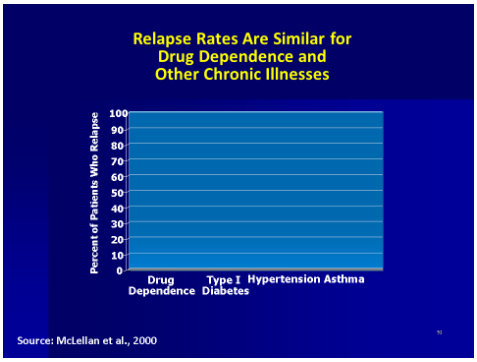


Slide 90: Why are we comparing SUD to these particular illnesses?

Make the points listed in the bullet points about the chronic diseases listed on the previous slide.

REFERENCE:

National Institute on Drug Abuse. *Bringing the Full Power of Science to Bear on Drug Abuse and Addiction.* Retrieved from: https://www.drugabuse.gov/sites/default/files/addictionscience.ppt.

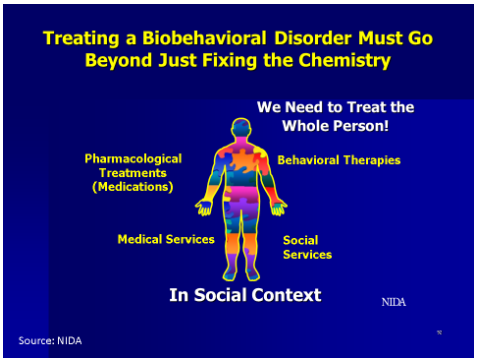


Slide 91: Relapse Rates Are Similar for Drug Dependence and Other Chronic Illnesses

Make the point that Type I diabetes, hypertension, and asthma all have "relapse rates" i.e. a lapse in medications, a recurrence of symptoms, in the 30-70% range. This is very similar to the approximately 40-60% relapse rates in substance use disorder treatment. This contradicts what has often been said disparagingly about substance abuse treatment, i.e., that only about half of individuals succeed in treatment, unlike with other diseases.

REFERENCE:

McClellan, A.T., Lewis, D.C., O'Brien, C.P., & Kleber, H.D. (2000). Drug dependence, a chronic medical illness: Implications for treatment, insurance, and outcomes evaluation. *Journal of the American Medical Association, 284*(13), 1689-1695.



Slide 92: Treating a Biobehavioral Disorder Must Go Beyond Just Fixing the Chemistry

Make the point that addiction requires treatment that addresses its complexity. Addiction brain chemistry needs to address the whole person. "Fixing it" can include medications, behavioral therapies, and ancillary support services.

REFERENCE:

National Institute on Drug Abuse. *Bringing the Full Power of Science to Bear on Drug Abuse and Addiction*. Retrieved from: https://www.drugabuse.gov/sites/default/files/addictionscience.ppt.

Slide 93: Four Legs of Addiction

Alcohol and drug addiction is affected by many factors, including development, physiology, genetics, social influence, personality, coping discrepancies, spiritual values, reinforcement, conditioning, abuse, self-regulated use, and dependence. All of these factors point to initial use, and can be linked to one or more other factors. A person's treatment plan should be holistic in nature and address the multiple needs and aspects of the individual, such as sexual orientation, gender differences, homelessness, family dynamics, children/prenatal care, legal issues, disabilities, employment issues, developmental needs, co-occurring disorders, and cultural, racial/ethnic, and religious norms.

REFERENCE:

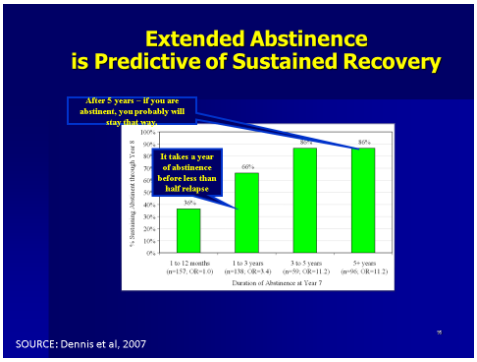
National Institute on Drug Abuse. *Bringing theFull Power of Science to Bear on Drug Abuse and Addiction.* Retrieved from: https://www.drugabuse.gov/sites/default/files/addictionscience.ppt.

Slide 94: Full recovery is a challenge but it is possible…

The point to make here is that people <u>do</u> recover from substance abuse and addiction. Research bears this out.

REFERENCE:

National Institute on Drug Abuse. *Bringing the Full Power of Science to Bear on Drug Abuse and Addiction.* Retrieved from: https://www.drugabuse.gov/sites/default/files/addictionscience.ppt.



Slide 95: Extended Abstinence is Predictive of Sustained Recovery

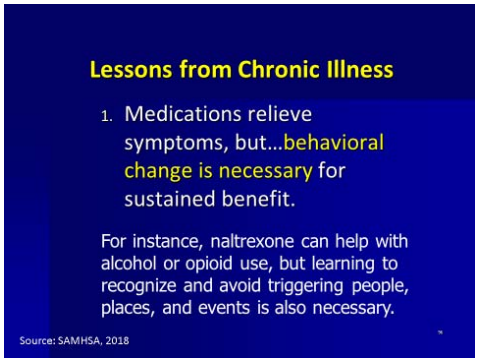
Extended abstinence is predictive of sustained recovery. The odds of remaining abstinent rise if patients have been abstinent for 1 to 3 years. After 3 years, the recovery odds remain high and stable. Therefore, as with other chronic diseases, addiction requires an ongoing and active disease management strategy.

****ANIMATION****

Click to advance the slide once and the graphic appears "It takes a year of abstinence before less than half relapse." Click again and the graphic "After 5 years – if you are abstinent, you probably will stay that way." Make the point that by 3-5 years of abstinence, only 14% relapse.

REFERENCE:

Dennis, M.L., Foss, M.A., & Scott, C.K. (2007). An eight-year perspective on the relationship between the duration of abstinence and other aspects of recovery. *Evaluation Review, 31*(6), 585-612.

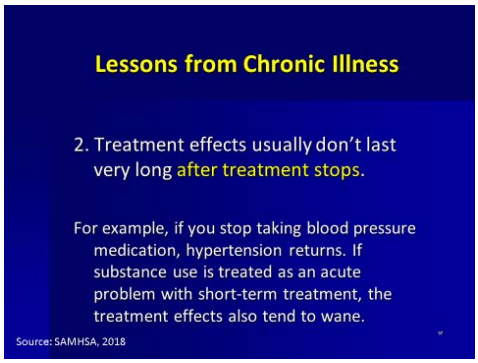


Slide 96: Lessons from Chronic Illness

Just like with chronic diseases, addiction medications can relieve symptoms (ex: high blood pressure medications) but people need to make behavioral changes (i.e. diet, exercise) for sustained benefit.

REFERENCE:

Substance Abuse and Mental Health Services Administration. (2018). *Treatment Improvement Protocol 63: Medications for Opioid Use Disorder*.

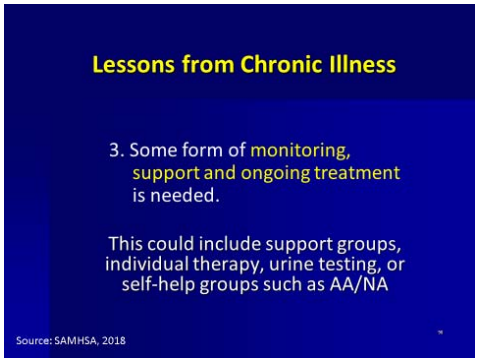


Slide 97: Lessons from Chronic Illness

Again, just like with medications for other chronic diseases, the effects of treatment don't usually last long after treatment stops (i.e. high blood pressure, high cholesterol, diabetes).

REFERENCE:

Substance Abuse and Mental Health Services Administration. (2018). *Treatment Improvement Protocol 63: Medications for Opioid Use Disorder*.

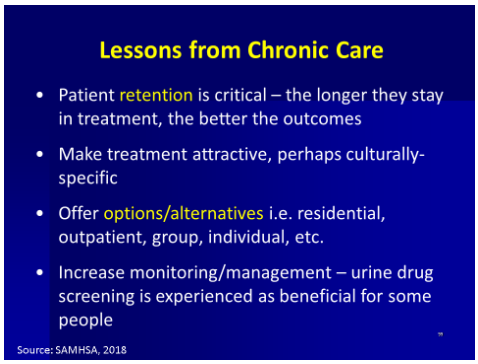


Slide 98: Lessons from Chronic Illness

Again, just like with hypertension, diabetes, and asthma, you don't just treat it once and then forget about it. You need ongoing monitoring and treatment.

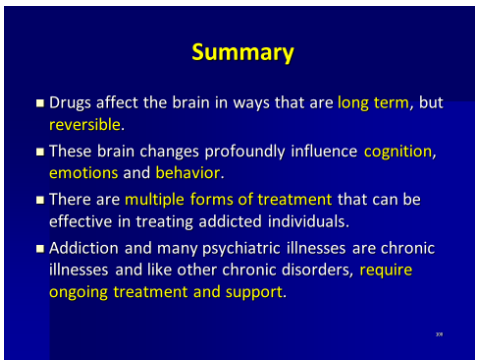
REFERENCE:

Substance Abuse and Mental Health Services Administration. (2018). *Treatment Improvement Protocol 63: Medications for Opioid Use Disorder*.



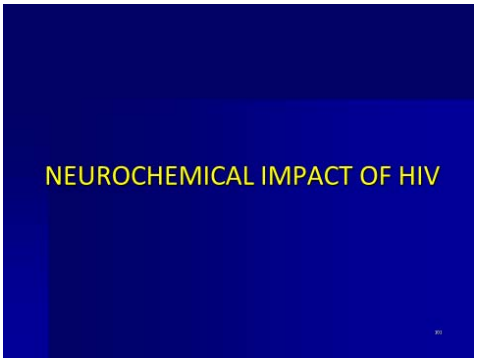
Slide 99: Lessons from Chronic Care

Make the points listed in the bullet points.



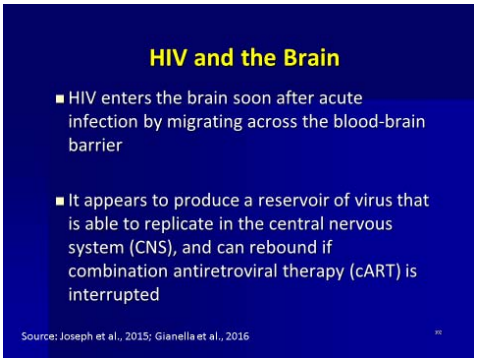
Slide 100: Summary

This slide summarizes the points that have been made on the previous 11 slides.



Slide 101: Neurochemical Impact of HIV

This begins a new section on some of the impacts of HIV on the brain and central nervous system.



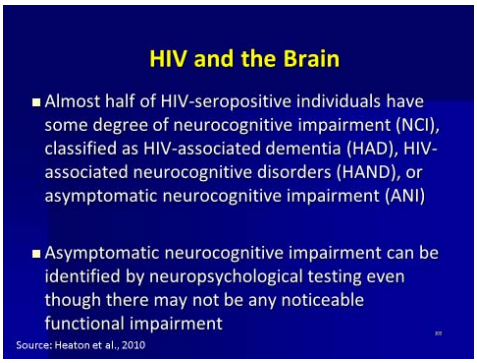
Slide 102: HIV and the Brain

Make the points that: HIV crosses the blood-brain barrier soon after acute infection; it appears to produce a reservoir in the central nervous system that can replicate and that can rebound if antiretroviral treatment is interrupted.

REFERENCES:

Joseph, S., Arrildt K., Sturdevant C., & Swanstrom., R. (2015). HIV-1 target cells in the CNS. *Journal of Neurovirology, 21,* 276-289.

Gianella, S., Kosakovsky-Pond, S., Oliveira, M., Scheffler, K., Strain, M.C.,…Ellis, R.J. (2016). Compartmentalized HIV rebound in the central nervous system after interruption of antiretroviral therapy. *Virus Evolution, 2*(2), vew020.

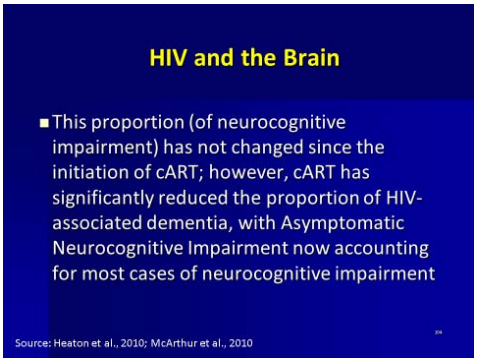


Slide 103: HIV and the Brain

Almost half of HIV-positive individuals will have some degree of neurocognitive impairment. These are classified as HIV-Associated Dementia (HAD), HIV-Associated Neurocognitive Disorders (HAND), or Asymptomatic Neurocognitive Impairment (ANI). Explain that asymptomatic neurocognitive impairment can be detected by neuropsychological testing even if there is no noticeable daily functional impairment, and tends to progress to HAND.

REFERENCE:

Heaton, R., Clifford, D., Franklin, D., Woods, S., Ake, C., Vaida, F.,…CHARTER Group. (2010). HIV-associated neurocognitive disorders persist in the era of potent antiretroviral therapy: CHARTER Study. *Neurology, 75,* 2087-2096.



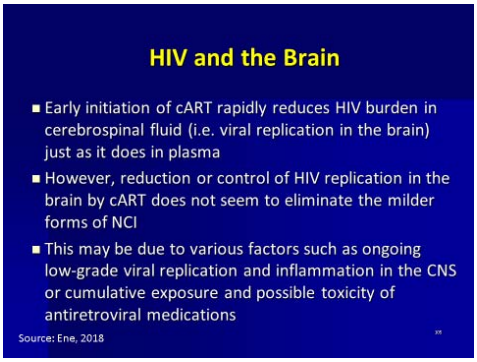
Slide 104: HIV and the Brain

Make the point that while the proportion of PLWH experiencing some degree of cognitive impairment has not changed since the initiation of combination antiretroviral treatment, the proportion of HIV-associated dementia has decreased significantly, and asymptomatic neurocognitive impairment now accounts for most of the total neurocognitive impairment (in other words, this is a significant improvement).

REFERENCES:

Heaton, R., Clifford, D., Franklin, D., Woods, S., Ake, C., Vaida, F.,…CHARTER Group. (2010). HIV-associated neurocognitive disorders persist in the era of potent antiretroviral therapy: CHARTER Study. *Neurology, 75,* 2087-2096.

McArthur, J., Steiner, J., Sacktor, N., & Nath, A. (2010). Human immunodeficiency virus-associated neurocognitive disorders: mind the gap. *Annals of Neurology, 67,* 699-714.

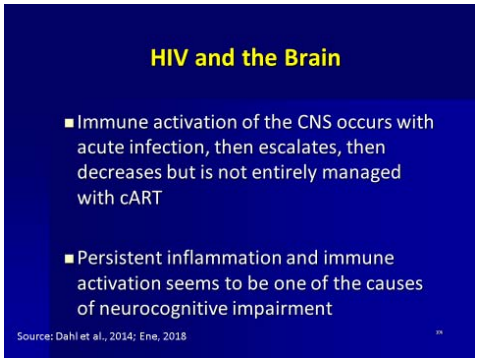


Slide 105: HIV and the Brain

A very recent study has shown that beginning antiretroviral treatment soon after infection reduces virus in cerebrospinal fluid (and therefore in the brain) just as it does in blood plasma, but that doesn't seem to eliminate milder forms of neurocognitive impairment. This may be due to ongoing low-grade viral replication and/or inflammation in the central nervous system. It may also be due to the cumulative exposure to and possible long-term toxicity of antiretroviral medications themselves.

REFERENCE:

Ene, L. (2018). Human immunodeficiency virus in the brain – culprit or facilitator? *Infectious Diseases: Research and Treatment, 11,* 1-9.



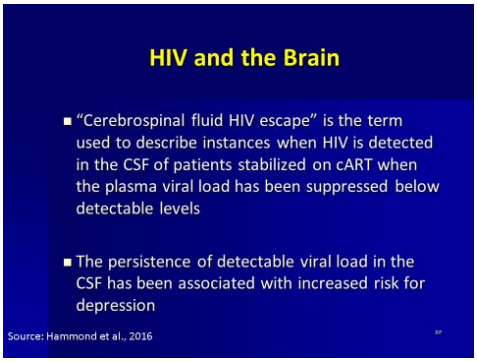
Slide 106: HIV and the Brain

Activation of the central nervous system part of the immune system escalates after acute infection, then decreases with antiretroviral treatment. However, it is not completely suppressed. That persistent immune activation and inflammation appears to be one of the causes of neurocognitive impairment.

REFERENCES:

Dahl. V., Peterson, J., Fuchs, D., Gisslen, M., Palmer, S., & Price, R. (2014). Low levels of HIV-1 RNA detected in the cerebrospinal fluid after up to 10 years of suppressive therapy are associated with local immune activation. *AIDS, 28,* 2251-2258.

Ene, L. (2018). Human immunodeficiency virus in the brain – culprit or facilitator? *Infectious Diseases: Research and Treatment, 11,* 1-9.

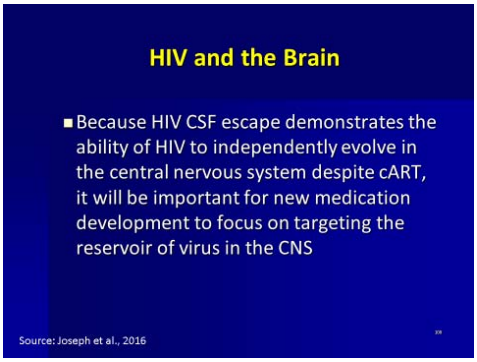


Slide 107: HIV and the Brain

HIV virus is sometimes detected in the cerebrospinal fluid (and thus the brain) even when patients are stabilized on antiretroviral treatment and have an undetectable plasma viral load. This persistence of virus in the brain is associated with increased risk for depression.

REFERENCE:

Hammond, E., Crum, R., Treisman, G., Mehta S., Clifford D., Ellis R.,...CHARTER Group. (2016). Persistent CSF but not plasma HIV RNA is associated with increased risk of new-onset moderate-to-severe depressive symptoms; a prospective cohort study. *Journal of Neurovirology, 22,* 479-487.

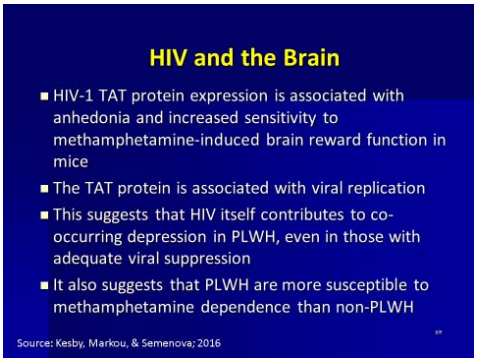


Slide 108: HIV and the Brain

"HIV cerebrospinal fluid escape" demonstrates the ability of the virus to independently exist in the central nervous system despite antiretroviral treatment. It will thus be important for new medication development to target that reservoir of virus in the CNS.

REFERENCE:

Joseph, J., Cinque, P., Colosi, D., Dravid, A., Ene, L., Fox, H., …Spudich, S. (2016) Highlights of the Global HIV-1 CSF Escape Consortium Meeting. *Journal of Virus Eradication, 2(4),* 243-250.

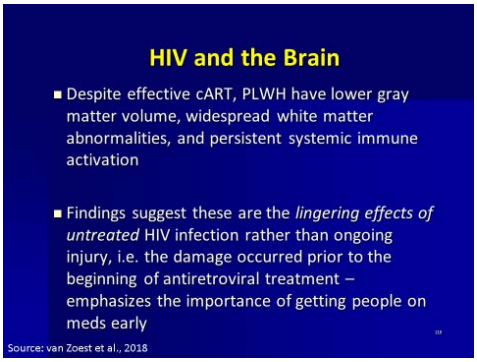


Slide 109: HIV and the Brain

The HIV-1 TAT protein is one of the primary proteins involved in viral replication. From studies in mice, it appears that expression of that protein is associated with depression symptoms (anhedonia) and increased sensitivity to methamphetamine effects in the brain. This suggests that even individuals with an undetectable viral load may be vulnerable to depression. It also suggests that PLWH are more vulnerable to developing dependence on methamphetamine than non-PLWH.

REFERENCE:

Kesby, J., Markou, A., & Semenova, S. (2016). The effects of HIV-1 regulatory TAT protein expression on brain reward function, response to psychostimulants, and delay-dependent memory in mice. *Neuropharmacology, 109,* 205-215.

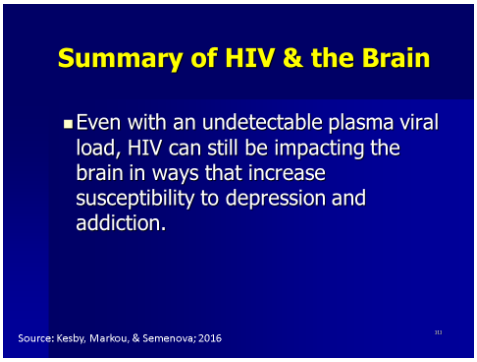


Slide 110: HIV and the Brain

Despite being on antiretroviral medications, PLWH still show various kinds of brain damage and systemic immune activation. However, the findings suggest that these are the lingering effects of HIV before it was treated, rather than while on antiretroviral treatment. This damage to brain tissue may not manifest in any sort of observable way to the individual. It also emphasizes the importance of starting medications as soon as possible after infection.

REFERENCE:

Van Zoest, R., Underwood, J., De Francesco, D., Sabin, C., Cole, J., Wit, F.,…COBRA Collaboration. (2018). Structural brain abnormalities in successfully treated HIV infection: associations with disease and cerebrospinal fluid biomarkers. *Journal of Infectious Diseases, 217,* 69-81.

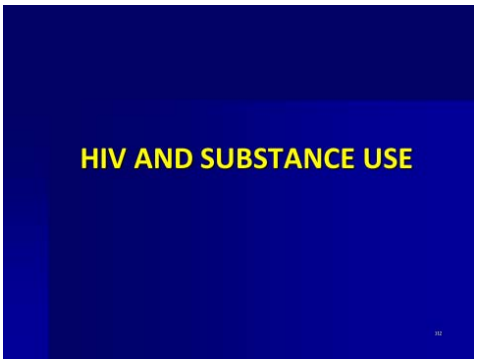


Slide 111: Summary of HIV & the Brain

Summarize this section by emphasizing that even with an undetectable viral load, HIV can still be impacting the brain in ways that increase susceptibility to depression and substance dependence.

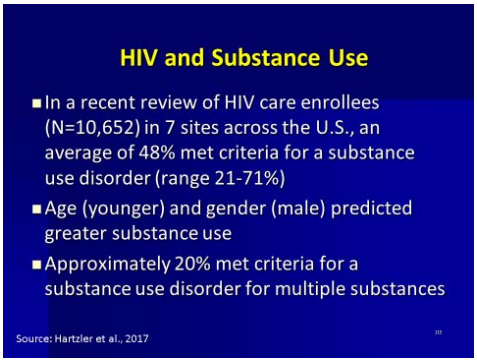
REFERENCE:

Kesby, J., Markou, A., & Semenova, S. (2016). The effects of HIV-1 regulatory TAT protein expression on brain reward function, response to psychostimulants, and delay-dependent memory in mice. *Neuropharmacology, 109,* 205-215.



Slide 112: HIV and Substance Use

Having discussed HIV and the brain, this slide is a transition to a section on HIV and substance use, particularly methamphetamine. Methamphetamine is the drug on which most of the research with HIV has been conducted.

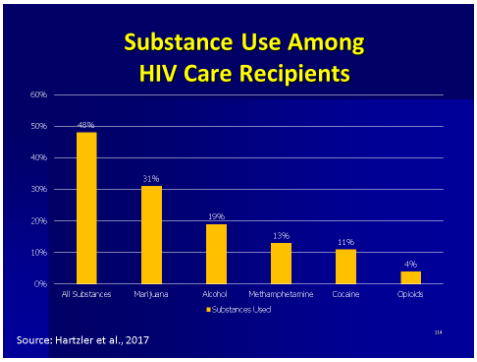


Slide 113: HIV and Substance Use

Make the point that in a recent study looking at over 10,000 people in HIV care nationally, almost half of them met criteria for a substance use disorder. Younger age and male gender predicted having a substance use disorder. Approximately 20% met criteria for a SUD for multiple substances.

REFERENCE:

Hartzler, B., Dombrowski, J.C., Crane, H.M., Eron, J.J., Geng, E.H., Mathews, W.C.,…Donovan, D.M. (2017). Prevalence and predictors of substance use disorders among HIV care enrollees in the United States. *AIDS & Behavior, 21*(4), 1138-1148.

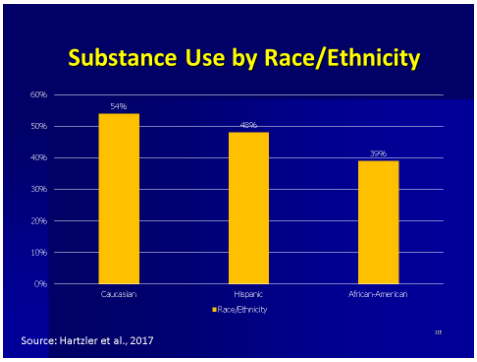


Slide 114: Substance Use Among HIV Care Recipients

In the study mentioned on the previous slide, marijuana was the most frequently used substance, followed by alcohol, methamphetamine, cocaine, and non-prescription opioids. Make the point that if prescription opioids had been included, the opioids number might well have been higher.

REFERENCE:

Hartzler, B., Dombrowski, J.C., Crane, H.M., Eron, J.J., Geng, E.H., Mathews, W.C.,…Donovan, D.M. (2017). Prevalence and predictors of substance use disorders among HIV care enrollees in the United States. *AIDS & Behavior, 21*(4), 1138-1148.

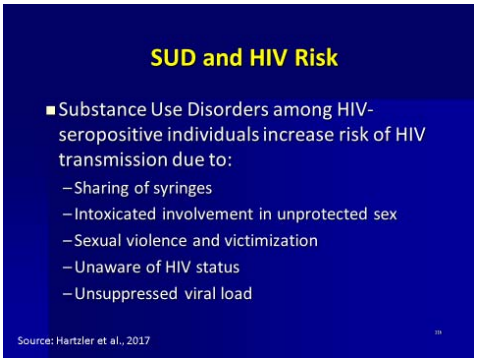


Slide 115: Substance Use by Race/Ethnicity

In this same study, significantly fewer African-Americans met criteria for a substance use disorder than Caucasians or Hispanics.

REFERENCE:

Hartzler, B., Dombrowski, J.C., Crane, H.M., Eron, J.J., Geng, E.H., Mathews, W.C.,…Donovan, D.M. (2017). Prevalence and predictors of substance use disorders among HIV care enrollees in the United States. *AIDS & Behavior, 21*(4), 1138-1148.

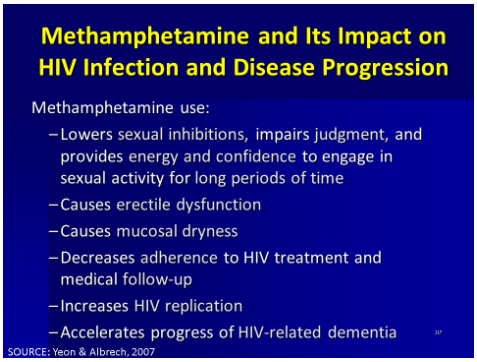


Slide 116: SUD and HIV Risk

Make the point that substance use disorders among PLWH increase risk of HIV transmission due to the listed factors. So not only is HIV a risk factor for substance use, substance use is a risk factor for HIV transmission.

REFERENCE:

Hartzler, B., Dombrowski, J.C., Crane, H.M., Eron, J.J., Geng, E.H., Mathews, W.C.,…Donovan, D.M. (2017). Prevalence and predictors of substance use disorders among HIV care enrollees in the United States. *AIDS & Behavior, 21*(4), 1138-1148.

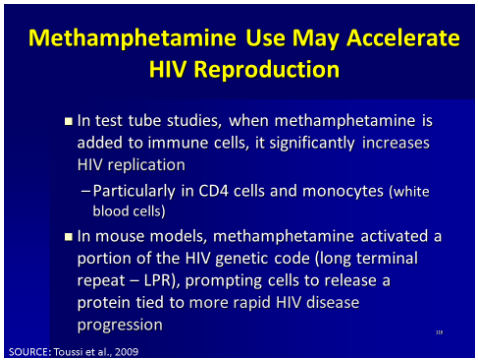


Slide 117: Methamphetamine and Its Impact on HIV Infection and Disease Progression

The connection between crystal meth use and HIV transmission has been well established by researchers. Individuals who use methamphetamine are more likely to become infected with HIV and transmit the virus to others. Studies have also documented more substantial brain damage and cognitive impairment in people who use meth and are infected with HIV, as compared to people living with HIV who do not use meth.

REFERENCE:

Yeon, P.A., & Albrecht, H. (2007). Crystal meth and HIV/AIDS: The perfect storm? *NEJM Journal Watch*, December 3, 2007.

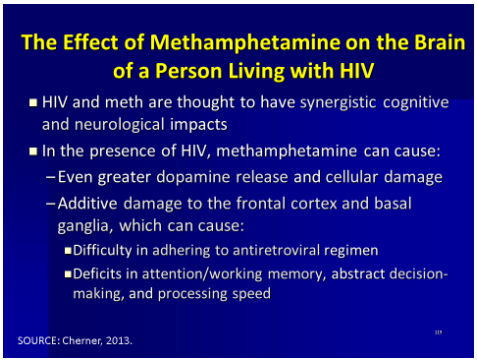


Slide 118: Methamphetamine Use May Accelerate HIV Reproduction

According to a paper published by Toussi and colleagues in 2009, methamphetamine speeds up HIV replication in both test tube and animal studies. This slide details the key findings from the test tube studies and mouse model studies.

REFERENCE:

Toussi, S.S., Joseph, A., Zheng, J.H., Dutta, M., Santambrogio, L., & Goldstein, H. (2009). Short communication: Methamphetamine treatment increases in vitro and in vivo HIV replication. *AIDS Research and Human Retroviruses, 25*(17), 1117-1121.

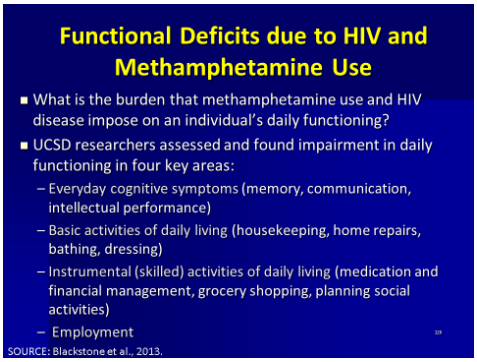


Slide 119: The Effect of Methamphetamine on the Brain of a Person Living with HIV

Cherner published an article in the *APA Psychology and AIDS Exchange Newsletter* in 2013 about the effects of methamphetamine on the brain of a person infected with HIV. This slide details the key findings.

REFERENCE:

Cherner, M. (2013). The HIV+ brain on drugs: Focus on methamphetamine. *American Psychological Association, Psychology and AIDS Exchange Newsletter.*

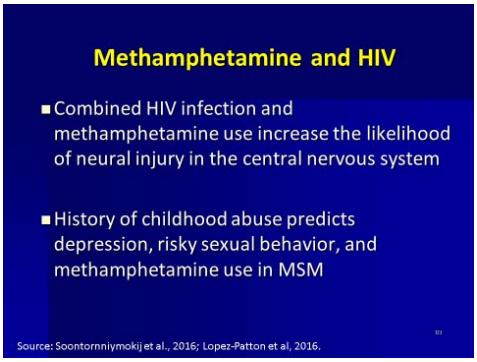


Slide 120: Functional Deficits due to HIV and Methamphetamine Use

Blackstone and colleagues from the University of California, San Diego Translational Methamphetamine AIDS Research Center conducted a study to assess daily functioning among nearly 800 individuals who are HIV positive and use methamphetamine. They found impairment in daily functioning in four key areas – everyday cognitive symptoms, instrumental (skilled) activities of daily living, basic activities of daily living, and employment.

REFERENCE:

Blackstone, K., Iudicello, J.E., Morgan, E.E., Weber, E., Moore, D.J., Franklin, D.R.,…TMARC Group. (2013). HIV infection heightens concurrent risk of functional dependence in persons with chronic methamphetamine use. *Journal of Addiction Medicine, 7*(4), 255-263.



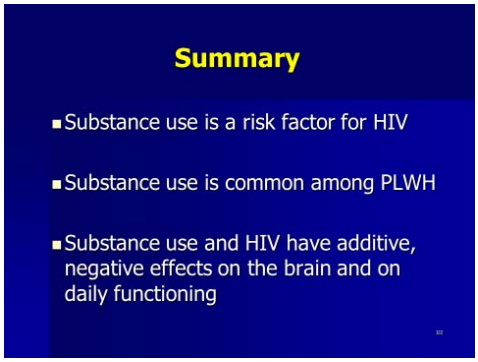
Slide 121: Methamphetamine and HIV

More recent findings indicate that the combination of HIV and methamphetamine increases the likelihood of damage to the central nervous system. Among men who have sex with men (MSM), a history of childhood abuse predicts depression, risky sexual behavior, and methamphetamine use.

REFERENCES:

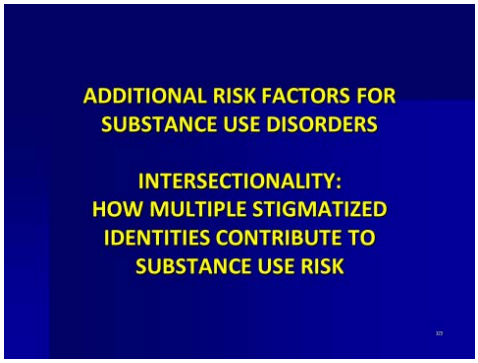
Soontornniyomkij, V., Kesby, J.P., Morgan, E.E., Bischoff-Grethe, A., Minassian, A., Brown, G.G., Grant, I., & Translational Methamphetamine AIDS Research Group. (2016). Effects of HIV and Methamphetamine on Brain and Behavior: Evidence from Human Studies and Animal Models. *Journal of Neuroimmune Pharmacology, 11*(3), 495-510.

Lopez-Patton, M., Kumar, M., Jones, D., Fonseca, M., Kumar, A.M., & Nemeroff, C.B. (2016). Childhood trauma and meth abuse among men who have sex with men: Implications for intervention. *Journal of Psychiatry Research, 72,* 1-5.



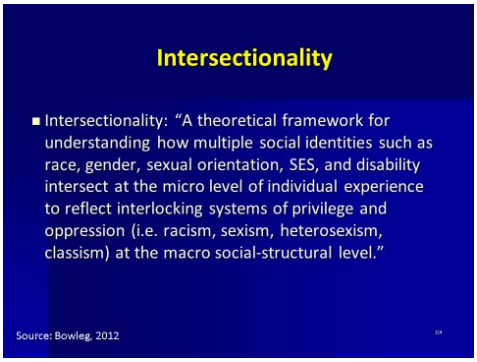
Slide 122: Summary

This is a summary slide for the past nine slides.



Slide 123: Additional Risk Factors for Substance Use Disorders

This is a transition slide to the intersectionality section of the training.



Slide 124: Intersectionality

Explain the concept of intersectionality as defined in the quote.

REFERENCE:

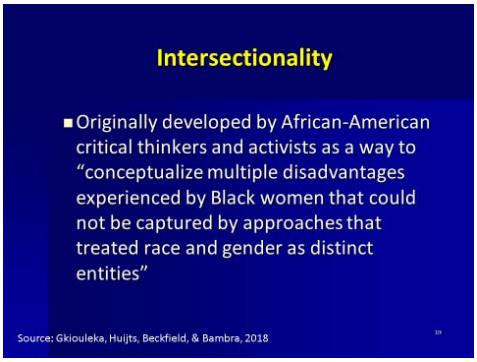
Bowleg, L. (2012). The problem with the phrase *Women and Minorities*: Intersectionality – an important theoretical framework for public health. *American Journal of Public Health, 102(7),* 1267-1273.

Slide 125: Intersectionality

Explain the concept of intersectionality. Make the point that we're talking about health disparities among historically oppressed groups and some of the factors that drive them.

REFERENCE:

Bowleg, L. (2012). The problem with the phrase *Women and Minorities*: Intersectionality – an important theoretical framework for public health. *American Journal of Public Health, 102(7),* 1267-1273.

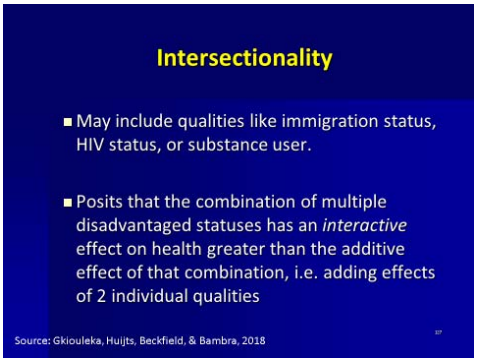


Slide 126: Intersectionality

This slide explains the historical origin of intersectionality. Make the point that treating race and gender as two distinct entities isn't adequate enough to explain the health disparities experienced by Black women.

REFERENCE:

Gkiouleka, A., Huijts, T., Beckfield, J., & Bambra, C. (2018). Understanding the micro and macro politics of health: inequalities, intersectionality, and institutions – a research agenda. *Social Science & Medicine, 200,* 92-98.

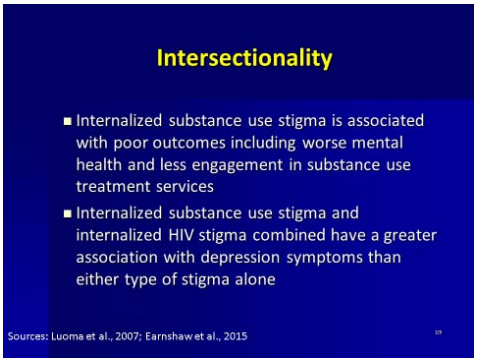


Slide 127: Intersectionality

Make the point that intersectionality includes more than race or gender, like immigration status, HIV status, or substance user, and the point that the combination of multiple disadvantaged statuses has an interactive effect on health that is greater than the additive effect of that combination.

REFERENCE:

Gkiouleka, A., Huijts, T., Beckfield, J., & Bambra, C. (2018). Understanding the micro and macro politics of health: Inequalities, intersectionality, and institutions – a research agenda. *Social Science & Medicine, 200,* 92-98.



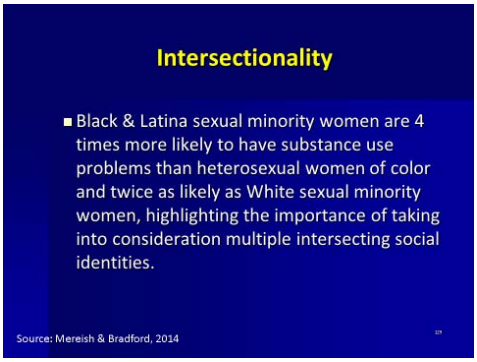
Slide 128: Intersectionality

Individuals with internalized substance use stigma have worse mental health and less engagement in substance abuse treatment. In addition, internalized substance use stigma and internalized HIV stigma have an additive effect on depression symptoms, i.e. those with both types of internalized stigma have a greater likelihood of depression than those with one type of stigma.

REFERENCES:

Luoma, J.B., Twohig, M.P., Waltz, T., Hayes, S.C., Roget, N., Padilla, M., & Fisher, G. (2007). An investigation of stigma in individuals receiving treatment for substance abuse. *Addictive Behavior, 32(7*), 1331-1346.

Earnshaw, V.A., Smith, L.R., Cunningham, C.O., & Copenhaver, M.M. (2015). Intersectionality of internalized HIV stigma and internalized substance use stigma: Implications for depressive symptoms. *Journal of Health Psychology, 20(8),* 1083-1089.

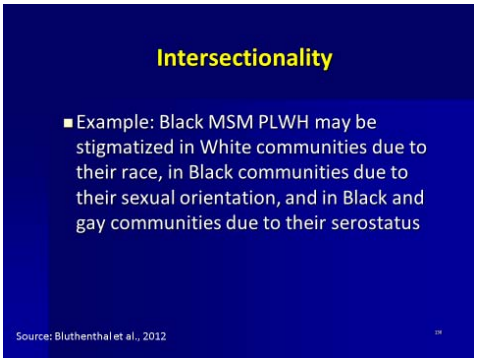


Slide 129: Intersectionality

It is important when working with clients/patients to take into consideration the effects of multiple intersecting stigmatized identities, such as Black and Latina sexual minority women.

REFERENCE:

Mereish, E. & Bradford, J. (2014). Intersecting identities and substance use problems: sexual orientation, gender, race, and lifetime substance use problems. *Journal of Studies on Alcohol and Drugs, 75,* 179-188.

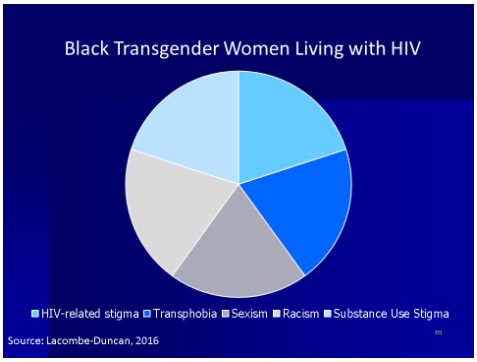


Slide 130: Intersectionality

A good example of how multiple stigmatized identities interact is with African-American men who have sex with men living with HIV. They may be stigmatized in White communities due to their race, in Black communities due to their sexual orientation, and in both Black and gay communities due to their HIV serostatus**.**

REFERENCE:

Bluthenthal, R.N., Palar, K., Mendel, P., Kanouse, D.E., Corbin, D.E., & Derose, K.P. (2012). Attitudes and beliefs related to HIV/AIDS in urban religious congregations: Barriers and opportunities for HIV-related interventions. *Social Science & Medicine, 74(10),* 1520-1527.

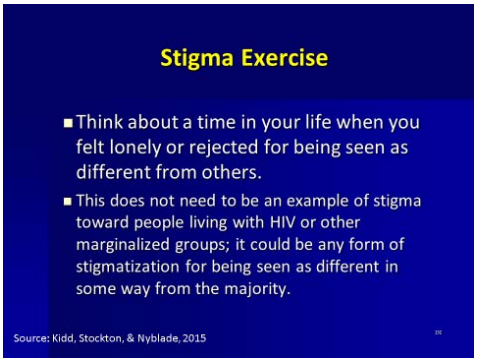


Slide 131: Black transgender Women Living with HIV

Make the point that the chart shows the intersecting systems of oppression of Black transgender women living with HIV that reduce access to healthcare, including HIV-related stigma, transphobia, sexism, racism, and substance use stigma.

REFERENCE:

Lacombe-Duncan, A. (2016). An intersectional perspective on access to HIV-related healthcare for transgender women. *Transgender Health, 1*(1), 137-141.

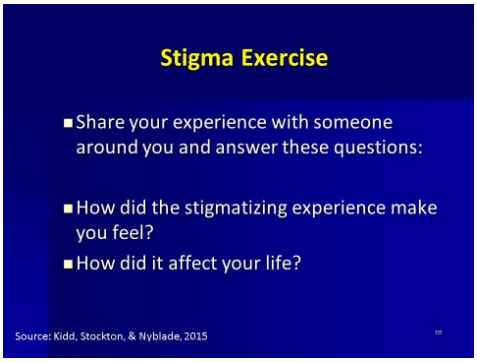


Slide 132: Stigma Exercise

Read the instructions on the slide, then give the participants a minute or two to think of an experience.

REFERENCE:

Kidd R., S. Clay, M. Stockton, L. Nyblade. (2015). *Facilitator's Training Guide For A Stigma-Free Health Facility*. Washington, DC: Futures Group, Health Policy Project.



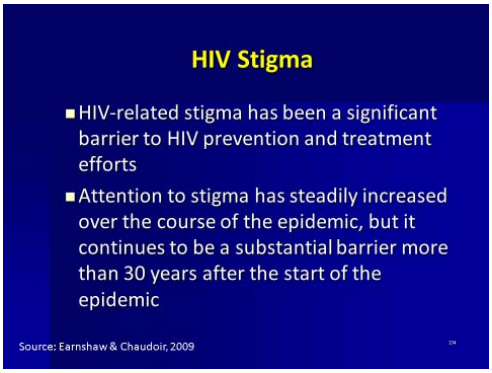
Slide 133: Stigma Exercise

Debrief with the whole group, ask for volunteers to share their experience.

At the end, summarize what the volunteers have shared and add: "this experience helps us get an inside understanding of how it feels to be stigmatized, i.e. shamed and/or rejected. It helps put us in the shoes of PLWH or other marginalized groups.

REFERENCE:

Kidd R., S. Clay, M. Stockton, L. Nyblade. (2015). *Facilitator's Training Guide For A Stigma-Free Health Facility*. Washington, DC: Futures Group, Health Policy Project.

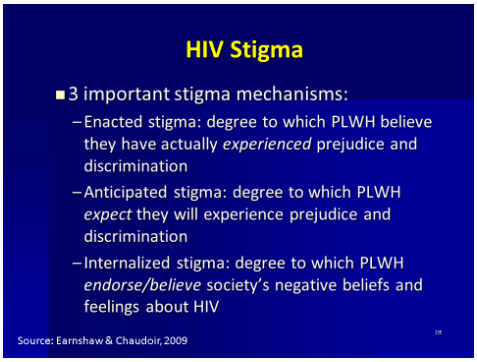


Slide 134: HIV Stigma

Make the point that HIV-related stigma has been a significant barrier to HIV prevention and treatment efforts since the beginning of the epidemic. Even though progress has been made over the last 30 years, it continues to be a significant barrier.

REFERENCE:

Earnshaw, V.A. & Chaudoir, S.R. (2009). From conceptualizing to measuring HIV stigma: a review of HIV stigma mechanism measures. *AIDS & Behavior, 13*(6), 1160-1177.

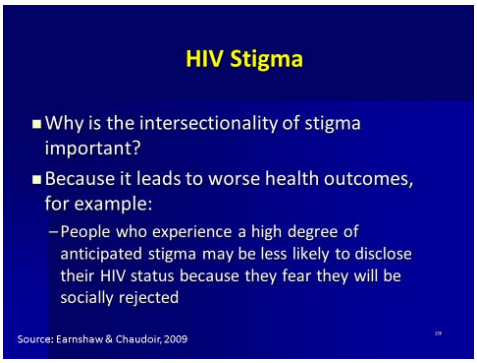


Slide 135: HIV Stigma

Explain the 3 stigma mechanisms: enacted stigma, anticipated stigma, and internalized stigma.

REFERENCE:

Earnshaw, V.A. & Chaudoir, S.R. (2009). From conceptualizing to measuring HIV stigma: a review of HIV stigma mechanism measures. *AIDS & Behavior, 13*(6), 1160-1177.

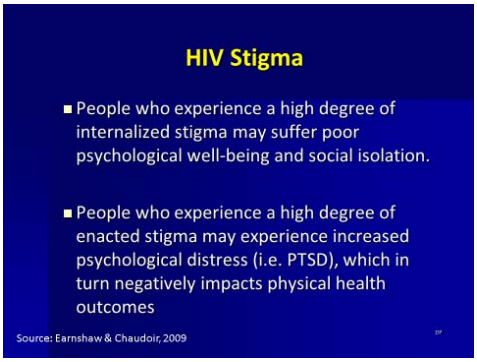


Slide 136: HIV Stigma

Pose the question to the audience and then read the 2nd bullet point.

REFERENCE:

Earnshaw, V.A. & Chaudoir, S.R. (2009). From conceptualizing to measuring HIV stigma: a review of HIV stigma mechanism measures. *AIDS & Behavior, 13*(6), 1160-1177.

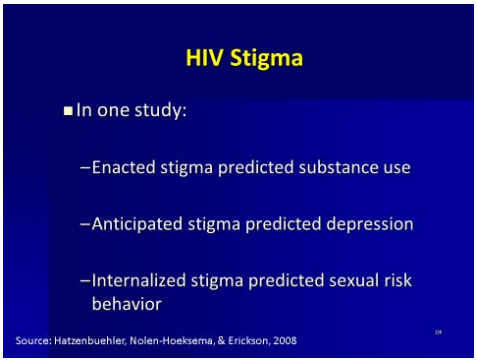


Slide 137: HIV Stigma

Explain the listed potential effects of internalized and enacted stigma.

REFERENCE:

Earnshaw, V.A. & Chaudoir, S.R. (2009). From conceptualizing to measuring HIV stigma: a review of HIV stigma mechanism measures. *AIDS & Behavior, 13(6),* 1160-1177.



Slide 138: HIV Stigma

Read the bullet points about effects of stigma.

REFERENCE:

Hatzenbuehler, M.L., Nolen-Hoeksema, S., & Erickson, J. (2008). Minority stress predictors of HIV risk behavior, substance use, and depressive symptoms: results from a prospective study of bereaved gay men. *Health Psychology, 27,* 455-462.

Slide 139: LGBT Stigma and Stress

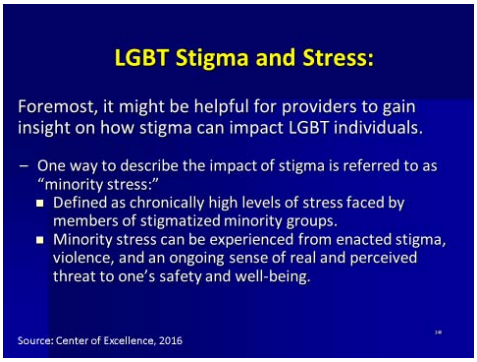
The purpose of this section is to provide an overview of LGBT stigma and stress, and the negative effects both have on LGBT individuals, which can lead to unhealthy coping behaviors like substance use.

REFERENCE:

Center of Excellence for Racial/ethnic Minority Young Men Who Have Sex with Men and other Lesbian, Gay, Bisexual, and Transgender populations (YMSM+LGBT COE). (2016). *A Provider's Introduction to Substance Abuse Treatment for Lesbian, Gay, Bisexual, and Transgender Individuals, Second Edition*. Rockville, MD: Substance Abuse and Mental Health Services Administration.

IMAGE CREDIT:

Center of Excellence for Racial/ethnic Minority Young Men Who Have Sex with Men and other Lesbian, Gay, Bisexual, and Transgender populations (YMSM+LGBT COE), 2016.



Slide 140: LGBT Stigma and Stress

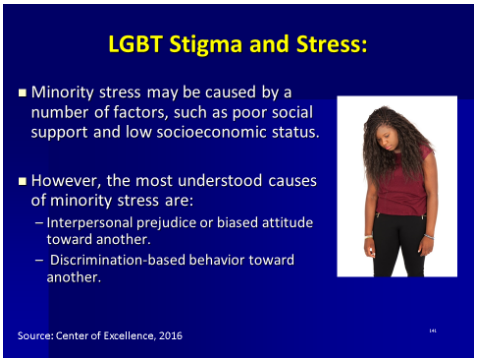
Minority stress results from daily and on-going negative social conditions experienced by LGBT individuals. This stress is perpetuated by general social prejudices against LGBT individuals and communities, as well as discriminatory systems and laws.

REFERENCE:

Center of Excellence for Racial/ethnic Minority Young Men Who Have Sex with Men and other Lesbian, Gay, Bisexual, and Transgender populations (YMSM+LGBT COE). (2016). *A Provider's Introduction to Substance Abuse Treatment for Lesbian, Gay, Bisexual, and Transgender Individuals, Second Edition*. Rockville, MD: Substance Abuse and Mental Health Services Administration.

Additional Resource:

https://www.americanprogress.org/issues/lgbt/report/2012/03/09/11228/why-the-gay-and-transgender-population-experiences-higher-rates-of-substance-use/.



Slide 141: LGBT Stigma and Stress

Homophobic, biphobic, and transphobic prejudices often stem from the belief that being LGBT is bad or wrong.

Examples of how these beliefs are expressed include:

1) A person asking a gay male couple with a child which man is the "real" parent.
2) Two women embracing in public getting taunted with homophobic remarks.
3) Transgender person being asked about their anatomy and other invasive questions.

REFERENCE:

A Provider's Introduction to Substance Abuse Treatment for Lesbian, Gay, Bisexual, and Transgender Individuals, Second Edition. (2016). *Center of Excellence for Racial/ethnic Minority Young Men Who Have Sex with Men and other Lesbian, Gay, Bisexual, and Transgender populations (YMSM+LGBT COE).*

(Notes for slide 141, continued)

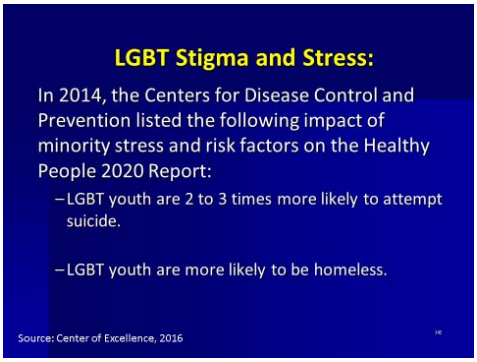
Slide 141: LGBT Stigma and Stress

Additional Resource:

https://www.americanprogress.org/issues/lgbt/report/2012/03/09/11228/why-the-gay-and-transgender-population-experiences-higher-rates-of-substance-use/.

IMAGE CREDIT:

A Provider's Introduction to Substance Abuse Treatment for Lesbian, Gay, Bisexual, and Transgender Individuals, Second Edition. (2016). *Center of Excellence for Racial/ethnic Minority Young Men Who Have Sex with Men and other Lesbian, Gay, Bisexual, and Transgender populations (YMSM+LGBT COE)*.



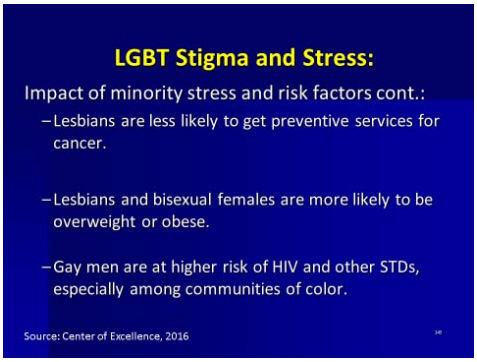
Slide 142: LGBT Stigma and Stress

Additional examples of minority stress in literature and research:

Same-sex individuals are twice as likely as heterosexuals to have experienced discrimination in their lifetime. They are five times more likely to indicate that discrimination has interfered with having a full and productive life. And perceived discrimination correlated with mental disorders including substance use disorders.

REFERENCE:

Center of Excellence for Racial/ethnic Minority Young Men Who Have Sex with Men and other Lesbian, Gay, Bisexual, and Transgender populations (YMSM+LGBT COE). (2016). *A Provider's Introduction to Substance Abuse Treatment for Lesbian, Gay, Bisexual, and Transgender Individuals, Second Edition*. Rockville, MD: Substance Abuse and Mental Health Services Administration.



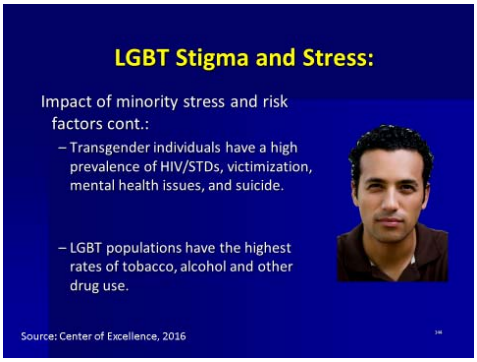
Slide 143: LGBT Stigma and Stress

Perceived or actual discrimination, shame and stigma from behavioral health providers directed towards LGBT people can cause an avoidance or delay in screening and care, which can exacerbate problems and create more harm.

For example, the connections between minority stress, depression, weight gain and obesity, diabetes, smoking, cortisol levels and inflammation among a lesbian individual – who avoids healthcare services because she perceives "all healthcare providers to be homophobic" exacerbates her health problems and her symptoms become worse.

REFERENCE:

Center of Excellence for Racial/ethnic Minority Young Men Who Have Sex with Men and other Lesbian, Gay, Bisexual, and Transgender populations (YMSM+LGBT COE). (2016). *A Provider's Introduction to Substance Abuse Treatment for Lesbian, Gay, Bisexual, and Transgender Individuals, Second Edition*. Rockville, MD: Substance Abuse and Mental Health Services Administration.



Slide 144: LGBT Stigma and Stress

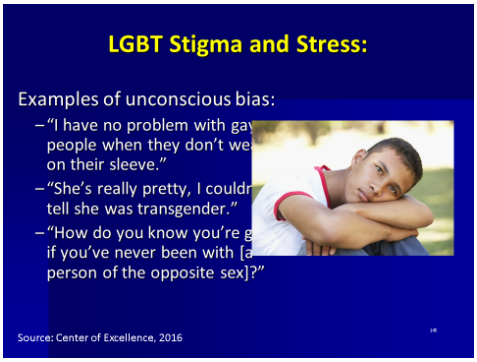
A theme throughout this section is the need for improved behavioral health care systems to meet the needs of LGBT people.

REFERENCE:

Center of Excellence for Racial/ethnic Minority Young Men Who Have Sex with Men and other Lesbian, Gay, Bisexual, and Transgender populations (YMSM+LGBT COE). (2016). *A Provider's Introduction to Substance Abuse Treatment for Lesbian, Gay, Bisexual, and Transgender Individuals, Second Edition*. Rockville, MD: Substance Abuse and Mental Health Services Administration.

IMAGE CREDIT:

Center of Excellence for Racial/ethnic Minority Young Men Who Have Sex with Men and other Lesbian, Gay, Bisexual, and Transgender populations (YMSM+LGBT COE), 2016.



Slide 145: LGBT Stigma and Stress

Examples of unconscious bias about sexual orientation and gender identity:

1) When asking a man if married, responding "What does your wife do ?" To a woman: What does your husband do?
2) Asking a man if he has a girlfriend ? Asking a woman if she has a boyfriend?
3) Asking an openly identified transgender person upon meeting them personal questions about surgeries or when they changed their sex, questions that within most social conventions are deemed too personal to ask when first meeting.

REFERENCE:

Center of Excellence for Racial/ethnic Minority Young Men Who Have Sex with Men and other Lesbian, Gay, Bisexual, and Transgender populations (YMSM+LGBT COE). (2016). *A Provider's Introduction to Substance Abuse Treatment for Lesbian, Gay, Bisexual, and Transgender Individuals, Second Edition*. Rockville, MD: Substance Abuse and Mental Health Services Administration.

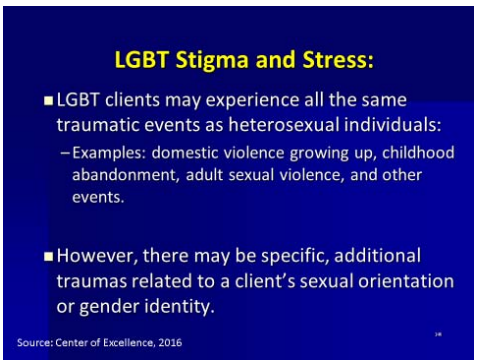
(Notes for slide 145, continued)

Slide 145: LGBT Stigma and Stress

IMAGE CREDIT:

Center of Excellence for Racial/ethnic Minority Young Men Who Have Sex with Men and other Lesbian, Gay, Bisexual, and Transgender populations (YMSM+LGBT COE), 2016.

Slide 146: LGBT Stigma and Stress



Here is an example of how LGBT clients might experience additional trauma:

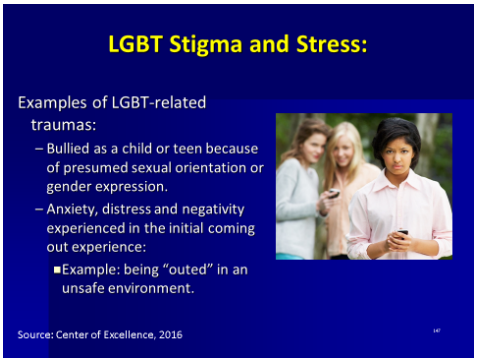
A bisexual woman is currently in an abusive, same-sex romantic relationship. The woman does not access supportive services for the domestic violence because she feels counseling programs would not understand her relationship with another woman. This perception is based on her experiences with her family and friends, who have a hard time understanding and accepting it. There were a few times she sought support from her family after she was badly beaten. The family blamed her for being in a same-gender relationship and cited her same-sex relationship as the root cause of the abuse. They continuously pressure her to get back together with her ex-boyfriend, because she would be much happier, safer, and sexually satisfied.

(Notes for slide 146, continued)

Slide 146: LGBT Stigma and Stress

REFERENCE:

Center of Excellence for Racial/ethnic Minority Young Men Who Have Sex with Men and other Lesbian, Gay, Bisexual, and Transgender populations (YMSM+LGBT COE). (2016). *A Provider's Introduction to Substance Abuse Treatment for Lesbian, Gay, Bisexual, and Transgender Individuals, Second Edition*. Rockville, MD: Substance Abuse and Mental Health Services Administration.



Slide 147: LGBT Stigma and Stress

"Coming out" can be good for one's health. Measures of psychiatric symptoms, hormone levels throughout the day, and a battery of over twenty biological markers found lesbians, gay men, and bisexuals who were out to family and friends had lower levels of psychiatric symptoms including anxiety, depression and burnout. However, it is important to note the opposite may be true if people come out in a hostile or dangerous environment.

REFERENCE:

Center of Excellence for Racial/ethnic Minority Young Men Who Have Sex with Men and other Lesbian, Gay, Bisexual, and Transgender populations (YMSM+LGBT COE). (2016). *A Provider's Introduction to Substance Abuse Treatment for Lesbian, Gay, Bisexual, and Transgender Individuals, Second Edition*. Rockville, MD: Substance Abuse and Mental Health Services Administration.

(Notes for slide 147, continued)

Slide 147: LGBT Stigma and Stress

IMAGE CREDIT:

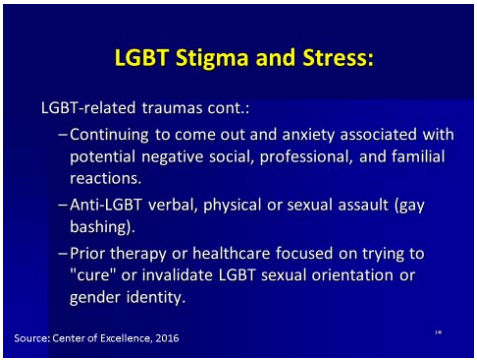
Center of Excellence for Racial/ethnic Minority Young Men Who Have Sex with Men and other Lesbian, Gay, Bisexual, and Transgender populations (YMSM+LGBT COE), 2016.

Additional Resources:

www.glaad.org/news/gay-good-coming-out-improves-mental-health-say-researchers

www.psychosomaticmedicine.org/content/early/2013/01/18/PSY.0b013e3182826881.abstract

www.humanstress.ca/study-demonstrates-health-benefits-of-coming-out-of-the-closet.html



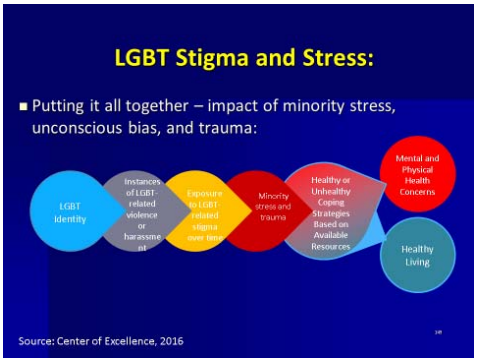
Slide 148: LGBT Stigma and Stress

Additional examples of LGBT-related traumas, include the following:

- Institutions that stigmatize LGBT individuals and identities such as some religious or faith-based communities, military, and/or educational settings.
- Dealing with misconceptions and invalidation from a wide range of service providers including social service, behavioral health and medical providers.

REFERENCE:

Center of Excellence for Racial/ethnic Minority Young Men Who Have Sex with Men and other Lesbian, Gay, Bisexual, and Transgender populations (YMSM+LGBT COE). (2016). *A Provider's Introduction to Substance Abuse Treatment for Lesbian, Gay, Bisexual, and Transgender Individuals, Second Edition*. Rockville, MD: Substance Abuse and Mental Health Services Administration.

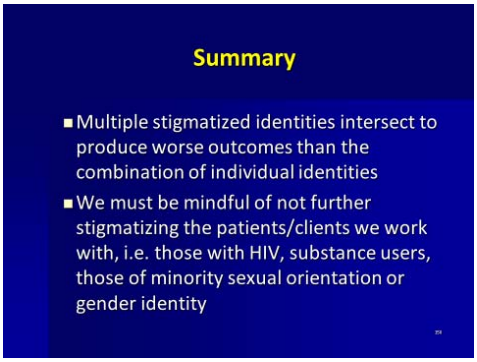


Slide 149: LGBT Stigma and Stress

The purpose of this graphic is to illustrate the impact of minority stress, unconscious bias and trauma for an LGBT individual. Make the point that healthy or unhealthy coping strategies and available resources can determine whether an LGBT individual develops mental health, substance use, or medical problems.

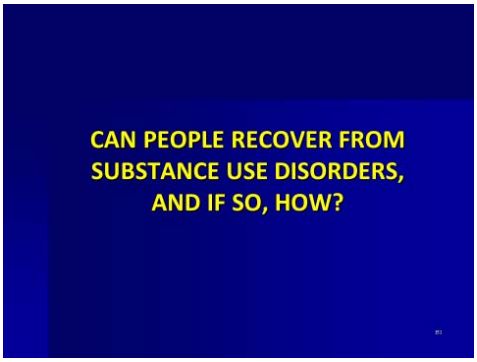
REFERENCE:

Center of Excellence for Racial/ethnic Minority Young Men Who Have Sex with Men and other Lesbian, Gay, Bisexual, and Transgender populations (YMSM+LGBT COE). (2016). *A Provider's Introduction to Substance Abuse Treatment for Lesbian, Gay, Bisexual, and Transgender Individuals, Second Edition*. Rockville, MD: Substance Abuse and Mental Health Services Administration.



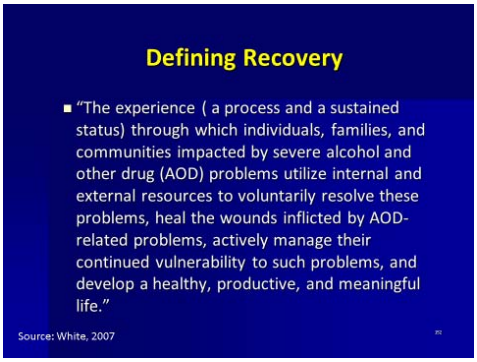
Slide 150: Summary

This is a summary of the stigma section of the training. Make the points that multiple stigmatized identities intersect to produce greater health disparities than individual identities, and that as providers we need to be mindful of not further stigmatizing our patients/clients by how we treat them.



Slide 151: Can People Recover from Substance Use Disorders, and if so How?

This is a transition slide to the final section of the training, which is a brief introduction to the concept of recovery.



Slide 152: Defining Recovery

Read the definition, then ask the question "what aspects of this definition strike you as being important?" Reflect their responses and use them to discuss what those terms mean.

REFERENCE:

White, W.L. (2007). Addiction recovery: Its definition and conceptual boundaries. *Journal of Substance Abuse Treatment, 33*(3), 229-241.

Slide 153: 10 Guiding Principles of Recovery

Use this graphic to introduce SAMHSA's 10 guiding principles of recovery.

REFERENCE:

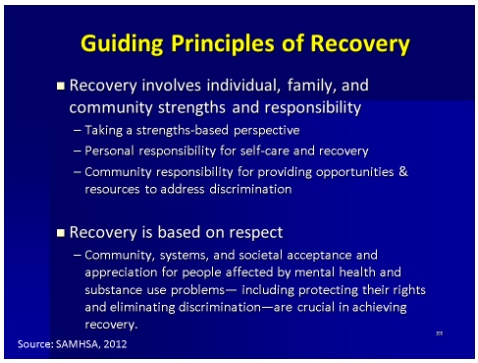
Substance Abuse and Mental Health Services Administration (SAMHSA). (2012). *SAMHSA's Working Definition of Recovery: 10 Guiding Principles of Recovery.* Retrieved from: https://store.samhsa.gov/shin/content/PEP12-RECDEF/PEP12-RECDEF.pdf.

Slide 154: Guiding Principles of Recovery

Discuss each bullet point. See the SAMHSA reference below for more detailed descriptions of each principle.

REFERENCE:

SAMHSA. (2012). *SAMHSA's Working Definition of Recovery: 10 Guiding Principles of Recovery*. Retrieved from: https://store.samhsa.gov/shin/content/PEP12-RECDEF/PEP12-RECDEF.pdf.

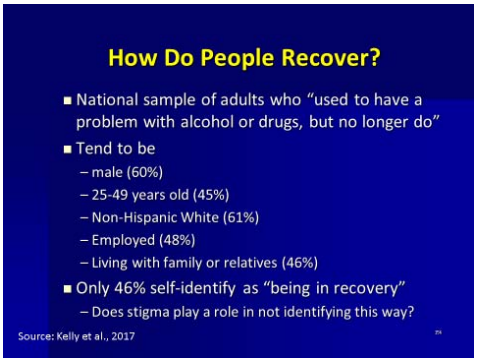


Slide 155: Guiding Principles of Recovery

Read the bullet points.

REFERENCE:

SAMHSA. (2012). *SAMHSA's Working Definition of Recovery: 10 Guiding Principles of Recovery*. Retrieved from: https://store.samhsa.gov/shin/content/PEP12-RECDEF/PEP12-RECDEF.pdf.



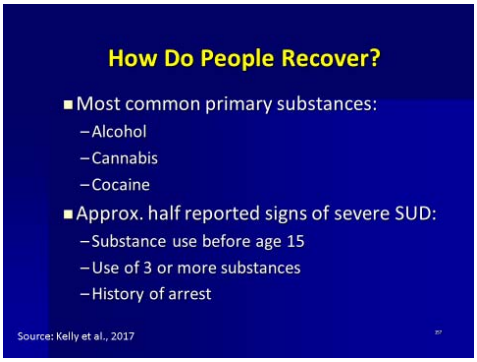
Slide 156: How Do People Recover?

These data are from a nationally representative sample of people who endorsed having had a problem with alcohol or drugs but don't currently, i.e. they have "recovered."

Read the bullet points on the demographics of this group, and then make the point that only 46% self-identify as being in recovery. The authors speculate that one of the reasons for this may be the stigma attached to the term "in recovery."

REFERENCE:

Kelly, J.F., Bergman, B., Hoeppner, B.B., Vilsaint, C., & White, W.L. (2017). Prevalence and pathways of recovery from drug and alcohol problems in the United States population: Implications for practice, research, and policy. *Drug and Alcohol Dependence, 181,* 162-169.

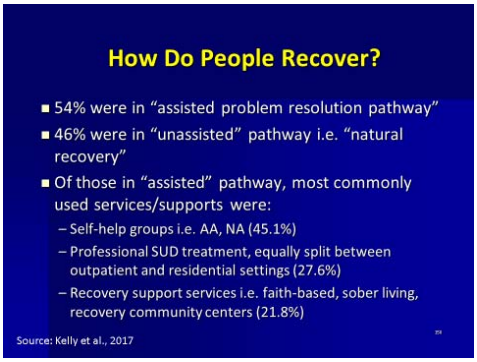


Slide 157: How Do People Recover?

Among those who have "recovered", the most common substances were alcohol, cannabis, and cocaine. About half the sample reported signs of severe substance use disorders, such as beginning substance use prior to age 15, using at least 3 different substances, and having a history of arrest.

REFERENCE:

Kelly, J.F., Bergman, B., Hoeppner, B.B., Vilsaint, C., & White, W.L. (2017). Prevalence and pathways of recovery from drug and alcohol problems in the United States population: Implications for practice, research, and policy. *Drug and Alcohol Dependence, 181,* 162-169.



Slide 158: How Do People Recover?

Approximately half the sample recovered on their own, and the other half had some type of assistance. Of those who had some type of assistance, the most common was 12-Step groups, followed by professional treatment of some kind, and recovery support services.

REFERENCE:

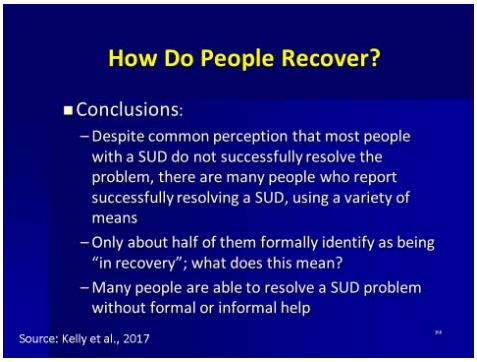
Kelly, J.F., Bergman, B., Hoeppner, B.B., Vilsaint, C., & White, W.L. (2017). Prevalence and pathways of recovery from drug and alcohol problems in the United States population: Implications for practice, research, and policy. *Drug and Alcohol Dependence, 181,* 162-169.

Slide 159: How Do People Recover?

People who used some type of assistance to recover tended to have more severe substance use disorders, be addicted to opioids and/or stimulants, have a mental health diagnosis, and have a history of being arrested. The use of opioids and/or stimulants is not surprising, as they are the most physiologically addicting substances and are very difficult to abstain from without some type of medication or behavioral therapy.

REFERENCE:

Kelly, J.F., Bergman, B., Hoeppner, B.B., Vilsaint, C., & White, W.L. (2017). Prevalence and pathways of recovery from drug and alcohol problems in the United States population: Implications for practice, research, and policy. *Drug and Alcohol Dependence, 181,* 162-169.

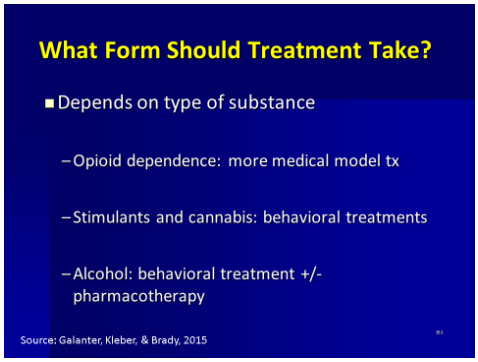


Slide 160: How Do People Recover?

The conclusions of this study are that despite the common misperception that "addicts are hopeless" and don't recover, there are many people who do successfully resolve a substance use disorder, either on their own or with some type of formal or informal assistance.

REFERENCE:

Kelly, J.F., Bergman, B., Hoeppner, B.B., Vilsaint, C., & White, W.L. (2017). Prevalence and pathways of recovery from drug and alcohol problems in the United States population: Implications for practice, research, and policy. *Drug and Alcohol Dependence, 181,* 162-169.

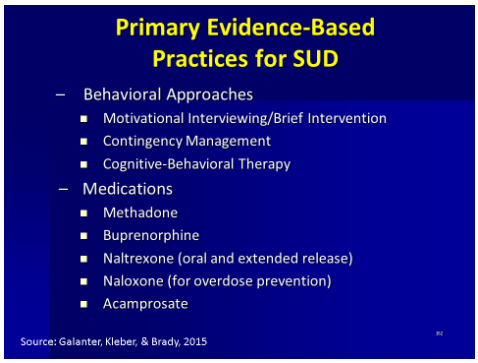


Slide 161: What Form Should Treatment Take?

Read the bullet points. These are the generally accepted best treatment approaches for each type of substance.

REFERENCE:

Galanter, M., Kleber, H.D., & Brady, K.T. (2015). *Textbook of Substance Abuse Treatment, 5th Ed.* Arlington, VA: American Psychiatric Publishing.



Slide 162: Primary Evidence-Based Practices for SUD

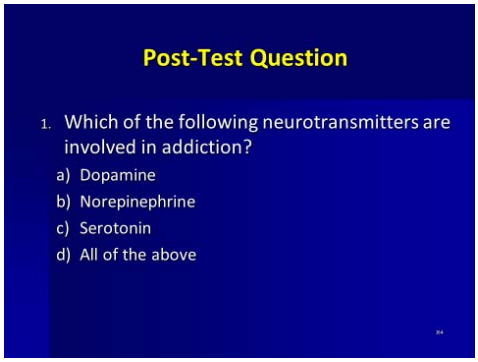
These are the primary evidence-based treatment approaches for substance use disorders, divided into two major categories; medications and behavioral approaches.

REFERENCE:

Galanter, M., Kleber, H.D., & Brady, K.T. (2015). *Textbook of Substance Abuse Treatment, 5th Ed.* Arlington, VA: American Psychiatric Publishing.

Slide 163: What Did You Learn?

The purpose of the following 10 post-test questions is to test the change in addiction and HIV knowledge among training participants. The questions are identical to the pre-test questions. Read each question and possible responses aloud, and give training participants adequate time to jot down each response before moving onto the next question. Reveal the answer before moving on to the next question.

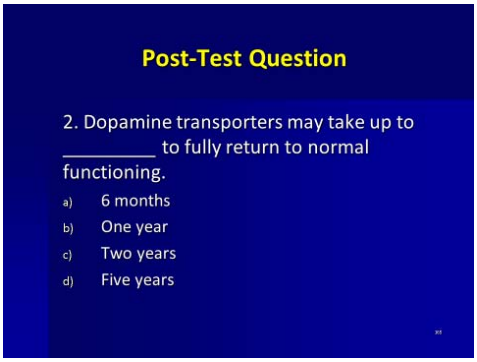


Slide 164: Post-Test Question

Read the question and choices, and review audience responses out loud.

**Audience Response System (ARS)-compatible slide

Answer: d) all of the above

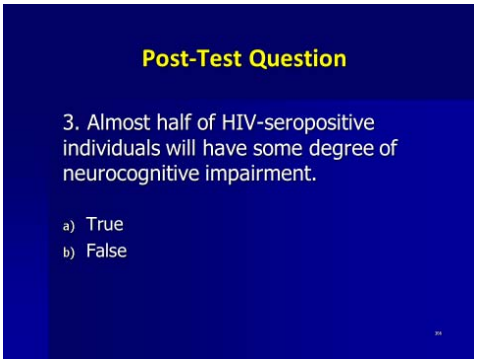


Slide 165: Post-Test Question

Read the question and choices, and review audience responses out loud.

**Audience Response System (ARS)-compatible slide

Answer: c) two years

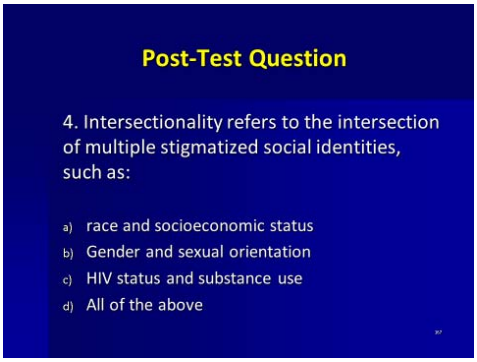


Slide 166: Post-Test Question

Read the question and choices, and review audience responses out loud.

**Audience Response System (ARS)-compatible slide

Answer: a) True

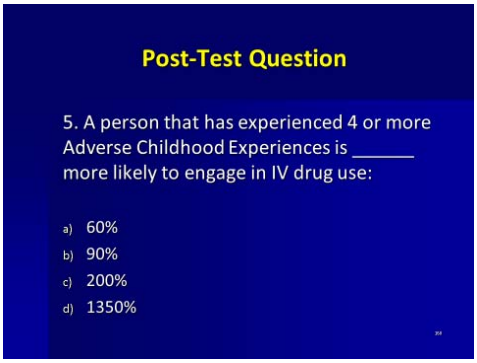


Slide 167: Post-Test Question

Read the question and choices, and review audience responses out loud.

**Audience Response System (ARS)-compatible slide

Answer: d) all of the above

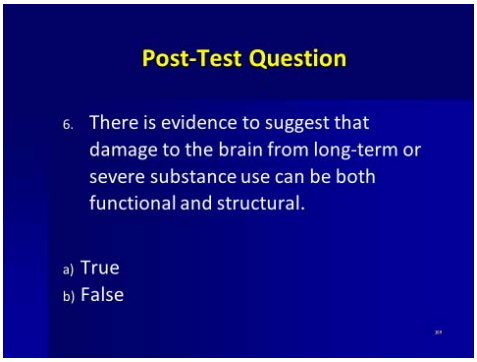


Slide 168: Post-Test Question

Read the question and choices, and review audience responses out loud.

**Audience Response System (ARS)-compatible slide

Answer: d) 1350%

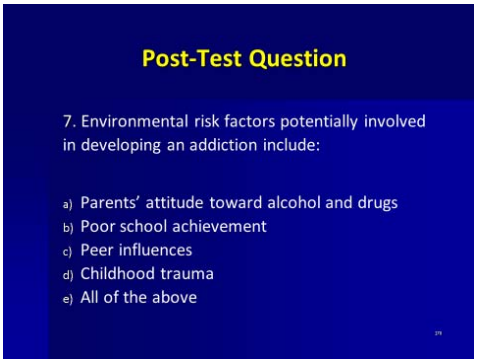


Slide 169: Post-Test Question

Read the question and choices, and review audience responses out loud.

**Audience Response System (ARS)-compatible slide

Answer: a) True

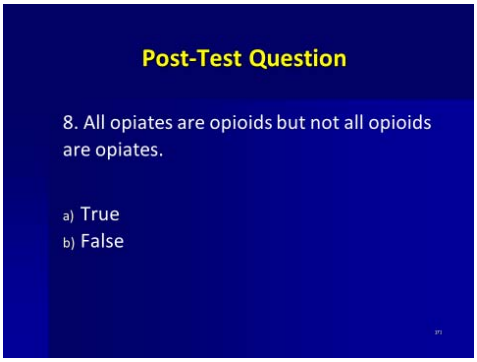


Slide 170: Post-Test Question

Read the question and choices, and review audience responses out loud.

**Audience Response System (ARS)-compatible slide

Answer: e) All of the above

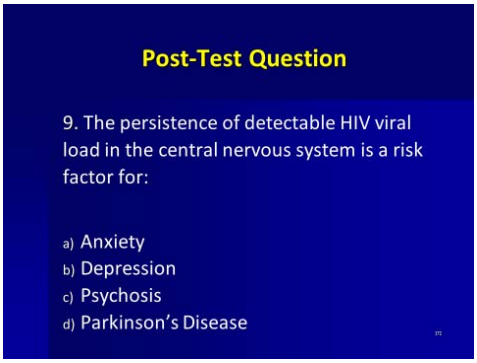


Slide 171: Post-Test Question

Read the question and choices, and review audience responses out loud.

**Audience Response System (ARS)-compatible slide

Answer: a) True

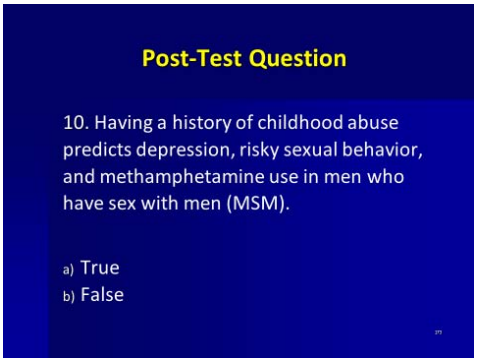


Slide 172: Post-Test Question

Read the question and choices, and review audience responses out loud.

**Audience Response System (ARS)-compatible slide

Answer: b) Depression

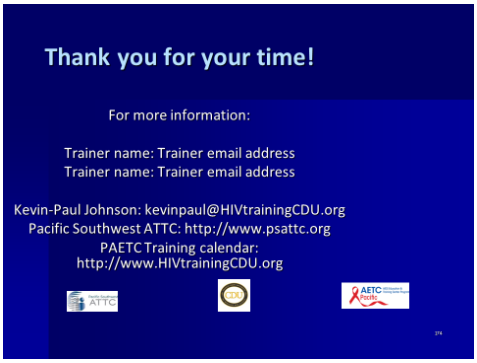


Slide 173: Post-Test Question

Read the question and choices, and review audience responses out loud.

**Audience Response System (ARS)-compatible slide

Answer: a) True



Slide 174: Final Slide

ADD TRAINER(S) NAMES AND CONTACT INFORMATION AND REPLACE IMAGES FOR TRAINER'S ORGANIZATION

This concludes the presentation. Thank the participants for their time and address any last-minute questions about the content. Encourage participants to reach out to the Pacific Southwest ATTC or the LA Region PAETC, should they have questions or concerns following the training session.

Acknowledgments

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