Summary:
Approximately 3.5 billion prescriptions are written each year in the U.S., and as many as half of those prescriptions are for psychotropic drugs. Drugs that are not intended for psychotropic use may also impact psychological functioning. In addition, about half of Americans age 12 and older are current users of at least one recreational drug with psychotropic effects (e.g., alcohol, marijuana). With such a high rate of drug use in the U.S., forensic psychologists and attorneys will undoubtedly encounter psychotropic drug effects in their everyday practices. Thus, it is essential for these professionals to remain up-to-date on the latest psychopharmacology research. This presentation will describe some of the latest research on psychopharmacology to help forensic psychologists and attorneys understand how their clients’ psychological functioning may be impacted by drug use.

Learning objectives:
1. At the conclusion of this presentation, attendees will be able to describe the prevalence of psychotropic drug use in the U.S.
2. At the conclusion of this presentation, attendees will be able to recognize some of the effects of non-psychotropic drugs on psychological functioning.
3. At the conclusion of this presentation, attendees will be able to evaluate the latest research on psychopharmacology.

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Presenters’ biographies:
Kristine M. Jacquin earned a B.S. at Northwestern University, and her M.A. and Ph.D. in clinical psychology at the University of Texas at Austin. Dr. Jacquin is a Professor of Psychology and Director of Clinical Training at Fielding Graduate University. She is also a licensed clinical psychologist with a consulting practice focusing on forensic and neuropsychological evaluations.

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Selected References


OVERVIEW
Prevalence of drug use in the U.S.
Forensic relevance of psychopharmacology
Research on psychological consequences of non-psychotropic drug use
Research on psychological consequences of psychotropic drug use

PREVALENCE OF DRUG USE IN THE U.S.
DRUGS
Substances that affect functioning of biological systems
Prescribed – psychological and non-psychological
Recreational – legal and illegal

PSYCHOTROPIC DRUGS
Primary purpose of altering central nervous system functioning
Prescribed and non-prescribed
Legal and illegal

NON-PSYCHOTROPIC DRUGS
Primary purpose of altering a biological system other than the central nervous system
May affect central nervous system

PRESCRIPTION DRUG USE IN THE U.S.
MOST COMMONLY PRESCRIBED DRUGS

- Beta blockers
- Proton pump inhibitors
- Pain relievers
- Antidepressants
- Antihyperlipidemics

ANTIDEPRESSANT USE

Current use

18-44 years
45-64 years
65+ years

ANXIOLYTIC USE

Current benzodiazepine use

18-44 years
45-64 years
65+ years

PSYCHOTROPIC DRUG USE UNDER AGE 18

- Antipsychotic use, ages 12-19
- Psychostimulant use, ages 12-19
- Antidepressant use, ages 12-19
- All use, ages 6-17
RECREATIONAL DRUG USE IN THE U.S.

- Alcohol
- Tobacco
- Marijuana
- Other drugs

Current use

0%  10%  20%  30%  40%  50%  60%

ILLEGAL DRUG USE

- Cocaine
- Hallucinogens
- Methamphetamine
- Inhalants
- Heroin

PRESCRIPTION DRUG MISUSE

- All Rx Drugs
- Pain Killers
- Sedatives
- Psychostimulants

Users (millions)

0  2  4  6  8

RECREATIONAL DRUG USE IN OFFENDERS

- Low Estimate
- High Estimate

Adults  Adolescents
PREVALENCE OF DRUG USE - CITATIONS


FORENSIC RELEVANCE OF PSYCHOPHARMACOLOGY

TOPIC 2

FORENSIC RELEVANCE (WHY YOU SHOULD CARE)

Victims, witnesses, defendants, and plaintiffs with whom you work are highly likely to be using some type of drug.

Drug use may impact criminal matters - defendant’s mental state, mental state of victims and witnesses.

Drug use may impact civil litigation - plaintiff’s or defendant’s psychological functioning.

TOPIC 3

PSYCHOLOGICAL CONSEQUENCES OF NON-PSYCHOTROPIC DRUGS
ANTIMUSCARINIC DRUGS

Antimuscarinic drugs can have several effects, including:

- Impaired divided attention
- Slowed reaction time
- Increased risk of dementia

(Gray et al., 2015; Kay et al., 2006; Lipton, Kolodner, & Wesnes, 2005; Tannenbaum et al., 2012; Wesnes et al., 2009)

ANTIHISTAMINES

First-generation antihistamines may cause:

- Impaired attention
- Decreased vigilance
- Increased risk of dementia

(Conen et al., 2011; Gray et al., 2015; Mansfield et al., 2003; Ridout & Hindmarch, 2003; Tannenbaum et al., 2012; Theunissen et al., 2006; Turner, Handford, & Nicholson, 2006; Wong, 2015; Wu et al., 2017)
NON-CALORIC ARTIFICIAL SWEETENERS

Saccharine

Effects of Non-Caloric Artificial Sweeteners

Disrupt glucose metabolism → weight gain
Activate orexin system → increase reward seeking behaviors
Disrupt circadian sleep-wake cycle → less sleep, poor sleep quality

(Effetto et al., 2016; Gardner et al., 2012; Oishi, Higo-Yamamoto, & Yasumoto, 2016; Shiuchi et al., 2009; Suez et al., 2014)

Effects of Sleep Deprivation

Deficits in memory and attention
Impaired information processing
Increased impulsivity and aggression
Increased risk of dementia

(Fogel, Smith, & Beninger, 2009; Grinberg et al., 2009; Guo et al., 2013; Hayashi et al., 2015; Kamphuis, Dijk, Sprenge, & Lancel, 2013; Karageorgiou, Walsh, Yaffe, Neylan, & Miller, 2017; Krizan & Herlache, 2016; Lim et al., 2014; Nofzinger et al., 2002; Ribeiro et al., 2004; Seeley, Crawford, Zhou, Miller, & Breigius, 2009; Theofilas, Dunlop, Heilise, & Grinberg, 2015; Vogler, Parkison-Blow, Brand, Grob, & Lemola, 2014)

Endocrine Disruptors

Tributyltin
Diethylstilbestrol
Persistent organic pollutants
Bisphenol A
Phthalates
Polybrominated diphenyl ethers
4-Nonylphenol
Parabens
Phytoestrogens
ENDOCRINE DISRUPTORS: BISPHENOL A

EFFECTS OF ENDOCRINE DISRUPTORS

Permanent changes to reproductive ability
Change biological sex characteristics of offspring
Cause obesity
Cause cancer
May cause cognitive deficits

(Berger, 2014; Darbre, 2015, 2017; Darbre & Harvey, 2014; Grun & Blumberg, 2006; Hanahan & Weinberg, 2011; Heindel & Schug, 2014; Heindel et al., 2015; Jamesick & Blumberg, 2010; Nappi et al., 2010; Rochester, 2013; Rubin, 2011)

TOPIC 4

PSYCHOLOGICAL CONSEQUENCES OF PSYCHOTROPIC DRUGS

EFFECTS OF RECREATIONAL CANNABIS USE 1

Impairments in sustained, selective, & divided attention
Increased distractibility
Impairments in episodic and working memory
Impaired learning

(Böcker, Gerritsen et al., 2010; Böcker, Honkela et al., 2010; Curran, Brignell, Fletcher, Redmond, & Henry, 2002; D’Souza et al., 2004; Nicholls et al., 2009; Smith & Genis, 2004; Luce, Cherek, Li, & Schachar, 2005; Morrin et al., 2009; Nicholls, Brien, & Matthews, 2015; O’Leary et al., 2007; Rasmusson, Kaiser, Theunissen, Tononen, & Mueller, 2005; Ranganathan & D’Souza, 2004; Schafer et al., 2015; Soliven & Battisti, 1998)
EFFECTS OF RECREATIONAL CANNABIS USE 2

Impairments after a single use
Deficits may become permanent

(Crean et al., 2011; Enhrrenreich et al., 1999; Fletcher et al., 1996; Medina et al., 2007; Meier et al., 2012; Messinis, Kyprianidou, Malefaki, & Papatheonasopoulos, 2006; Scholes & Martin-Iverson, 2009; Skosnik, Spatz-Glenn, & Park, 2001; Solowij & Battisti, 2008; Solowij, Michie, & Fox, 1991, 1995; Solowij et al., 2008)

EFFECTS OF RECREATIONAL OPIOID USE

Impaired attention
Impaired concentration
Deficits in memory storage

(Cherrier et al., 2009; Tannenbaum et al., 2012)

EFFECTS OF ALCOHOL USE

Adolescent use impairs neuronal signaling in the hippocampus → memory deficits in adulthood

(Centanni et al., 2014; Mulholland, Teppen, Miller, Sexton, Pandey, & Swartzwelder, 2018)

EFFECTS OF COCAINE USE

Higher rate of HIV infection
Increased impulsive sexual behavior
Increased risky sexual behavior

(Edwards, Halpern, & Wechsberg, 2006; Hoffman, Klein, Eber, & Crosby, 2000; Johnson, Johnson, Herrmann, & Sweeney, 2015; Koffarnus et al., 2016)
EFFECTS OF CAFFEINE USE

Increased sleep disruptions
Increased risk of psychotic state in healthy individuals
Increased psychotic symptoms in people with schizophrenia


EFFECTS OF GABAERGIC DRUGS: BENZODIAZEPINES

Decreased memory storage
Decreased strategy use and problem solving
Decreased attention and learning
Reduced reaction time
Reduced psychomotor speed
Increased risk of dementia

(Billioti de Gage et al., 2014; Brett et al., 2015; Lader, 2011; Leckman, Poucet, & Simpson, 2013; Marce, Mercou, Jagiello, Werner, & Karp, 2016; Meehan et al., 2017; Palmaro, Dupuy, & Labrousse-Moise, 2015; Paterniti, Dufovi, & Alperovitch, 2002; Stonnington et al., 2009; Tannenbaum, Paquette, Hilmer, Holroyd-LeDuc, & Carnahan, 2012)

EFFECTS OF GABAERGIC DRUGS: HYPNOTICS

Performance of routine behaviors while sleeping
Possible impairments in attention
Possible impairments in memory recall

(Farber & Burke, 2008; Mets et al., 2011; Otmani et al., 2008; Tannenbaum et al., 2012)
ANTICHOLINGERIC DRUGS: TRICYCLIC ANTIDEPRESSANTS

EFFECTS OF TRICYCLIC ANTIDEPRESSANTS
Impair attention
Reduce reaction time
May impair memory
Increases risk of dementia

(Gray et al., 2015; Iwamoto et al., 2008; Siepmann et al., 2002; Tannenbaum et al., 2012; Van Laar et al., 2002)

OPIOID RECEPTOR AGONISTS

EFFECTS OF OPIOID RECEPTOR AGONISTS
Impaired concentration
Impaired attention
Deficits in memory

(Cherrier et al., 2009; Gutstein & Akil, 2006; Tannenbaum et al., 2012)
PSYCHOSTIMULANTS

EFFECTS OF PSYCHOSTIMULANTS
Hostility
Paranoia
Psychosis

(Hyman, 2011; McCabe & West, 2013; Schelle, Faulmuller, Caviola, & Hewstone, 2014)

CONCLUSIONS

PRESENTATION GOALS
1. Increase your awareness about the prevalence of drug use in the U.S.
2. Increase your knowledge about the psychological effects of non-psychotropic drugs.
3. Increase your knowledge about the latest research on psychopharmacology.
RECOMMENDATIONS

Thorough substance use history
- All currently used substances, prescribed and non-prescribed
- History of all forms of drug use, especially for substances used one month or longer
- Read relevant research

QUESTIONS?

FOR QUESTIONS LATER:
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