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Presentation Outline


- History
- Impulsivity/Compulsivity Spectrum
- Gambling Disorder
- Internet Gaming Disorder



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History


- Classified as:
 - Obsessive-compulsive spectrum disorders
 - Impulse-control disorders
 - By-products of mood disorders
- Now: substance-related and addictive disorder



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DSM-5

- Substance-related and Addictive Disorders
 - Gambling disorder
- Conditions for Further Study
 - Internet gaming disorder
- Not included at all ("insufficient evidence")
 - Other internet or technology-related behaviors (social media, TV, etc.)
 - Sex, exercise, shopping, food, etc.



Potenza, M: Non-substance addictive behaviors in the context of DSM-5. Addict Behav 2014.

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Essential Features

- Failure to resist an . . .
 - impulse
 - drive
 - temptation

. . . to perform an act that is harmful to oneself or others.

Potenza, M. Non-substance addictive behaviors in the context of DSM-5. Addict Behav 2014.

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Impulsivity vs. Compulsivity

- Both show inability to refrain from repetitive behaviors.
- Impulsivity is driven by an effort to obtain arousal and gratification.
- Compulsivity is driven by an effort to reduce anxiety.

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Dimensional Approach

Risk aversiveness/impulsivity

Compulsive | Impulsive

OCD BDD AN DEP HYP TS TTM Autism Binge eating Compulsive buying KLEP PG SIB SC BPD ASPD

Overexaggerated harm | Underestimated harm

Adapted from: Hollander E. Clinical Manual of Impulse-Control Disorders, 2006.

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Gender Differences

Women	Men
<ul style="list-style-type: none">• Anorexia• Binge Eating• Kleptomania• Compulsive Buying• Trichotillomania	<ul style="list-style-type: none">• Body Dysmorphic• Sexual Compulsion• Pyromania• Gambling• Problematic gaming

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Gambling Disorder

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Gambling Disorder

Risk aversiveness/impulsivity

Compulsive Impulsive

OCD BDD AN DEP HYP TS TTM Autism Binge eating Compulsive buying KLEP PG SB SC BPD ASPD

Overexaggerated harm Underestimated harm

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Gambling Disorder

DSM-IV-TR

Pathological Gambling

as

Impulse-Control Disorder

➔

DSM-5

Gambling Disorder

as


Substance-Related and Addictive Disorder

American Psychiatric Association: Diagnostic and Statistical Manual of Mental Disorders, 5th Edition. Washington, DC: American Psychiatric Association, 2013.

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Substance-Related and Addictive Disorder

Alcohol	Caffeine	Cannabis
Hallucinogen	Inhalant	Opioid
Sedative	Stimulant	Tobacco
Gambling Disorder		



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Clinical Presentation for GD

Five DSM-5 Addiction Criteria

Plus

- "Chases" one's losses
- Lies to conceal the extent of their gambling
- Relies on others for money
- Gambles when feeling distressed (Specifiers: episodic or persistent)

Phases

- Winning Phase
- Loss Phase
- Desperation Phase
- Hopelessness Phase

Blanco C, Cohen O, Lujan JJ, et al: Pathological gambling and substance use disorders, in Substance Dependence and Co-Occurring Psychiatric Disorders: Best Practices for Diagnosis and Treatment. Edited by Nunes EV, Selzer J, Levaonis P. Davies CA, New York, Civic Research Institute, 2010.

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Neurobiology of GD

- Gambling affects:
 - DA
 - NE
 - Cortisol
 - 5HT
- Neurobiological similarities with substance use disorders

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Epidemiology

- **US Gambling Statistics:**
 - \$110 billion commercial gaming revenue in 2023
 - \$14.4 billion in revenue from gambling taxes
 - 49% of residents have gambled in the past year
 - ~0.5% of the adult population meets criteria for GD

State forecasts dip, stagnation of casino tax aid
Projections show state will no longer be able to count on more money from slots, table game for schools
By Lauren Starbuck | Published 12:32 pm EDT, Wednesday, March 13, 2019
www.americangaming.org
Stefanovics E, Potenza M: Update on Gambling Disorder. Psych Clin of N Am 45(3): 483-502, 2022.

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Epidemiology

- High rate of co-occurrence with other psychiatric disorders
 - 96% of individuals with GD have one or more co-occurring psychiatric disorders
 - 64% have 3 or more
- Substance use disorders, mood disorders, anxiety disorders, and impulse control disorders are most common
- Co-occurring disorders may help guide treatment

Kessler RC, et al: DSM-IV pathological gambling in the National Comorbidity Survey Replication. Psych Med 38(9): 1351-1360, 2008.

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What's Available in Your State?




- Opportunities in US:
 - Land-based casinos
 - Internet gambling
 - Nonregulated gambling
 - Online fantasy sports
- More available and accessible now than ever before

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Screening Tools

- The Lie/Bet Test
 - Have you ever felt the need to bet more and more money?
 - Have you ever had to lie to people important to you about how much you gambled?
 - 99% sensitivity, 91% specificity



Johnson EE, Hamer R, Nora RM, et al: The lie/bet questionnaire for screening pathological gamblers. Psychological Reports 80:83-88, 1997.

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Gambling Cognitive Distortions

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The Odds are Never in Your Favor

- "The house always wins"
- House edge is the ratio of the average loss to the initial bet, essentially the average gross profit the casino expects to make from each game
 - Keno - house edge 25-29%
 - Any craps - 11.11%
 - Ultimate Texas Hold 'Em - 2.19%
 - Blackjack (liberal Vegas rules) - 0.28%
- The longer you play, the greater the odds are that the result of your play will match up with the house edge



www.wizardofodds.com/gambling/house-edge

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Interpretative Biases



- Attributing wins to skill, losses to flukes
- Wrongly believing that a series of losses increases the chance of subsequent win
- Near misses ("I was only one number away!")

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The "Sunk-Cost" Effect



BE FOR DOGS: **SUNK-COST EFFECT** Duke CENTER FOR ANIMAL HUMANITIES

Panel 1: Duke is digging. "I hope I kept all my bones here."

Panel 2: Duke has dug a hole. "I hope I found them bones in here."

Panel 3: Duke has dug deeper. "HEY! I'M SO CLOSE TO FINDING THEM BONES!"


Panel 4: Duke has dug a deep hole. "LATER..."

BEHAR, FOLK, THUNDER BOLT

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Superstitious Beliefs


- Believing in:
 - Good luck objects (like animal parts)
 - Behaviors
 - Routines



Gaboury A, Ladouceur R. Erroneous perceptions and gambling. Journal of Social Behaviors and Personality 4:411-420, 1989.

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Selective Memory




- Remembering wins while ignoring losses
- Totaling wins without correcting for amounts lost

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Treatment


- Evidence-based therapies
 - CBT, Motivational Interviewing, Imaginal Desensitization all appear efficacious
- NO FDA-approved medication for GD
 - opioid antagonists, SSRIs, and lithium show some positive effect
- Mutual-help groups (Gamblers Anonymous)



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Treatment: Opioid Antagonists

- Naltrexone and Nalmefene
- GD conceptualized as an impulsive disorder
- Block opioid receptors, decrease dopamine function, and reduce "reward cravings"



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Treatment: Opioid Antagonists


- Reductions in gambling outcomes and urges to gamble with daily naltrexone
- Results for "as-needed" use of naltrexone more mixed
- Naltrexone 50 mg PO daily seems to be as effective as higher doses though some studies dose up to 250 mg PO daily
- Appears to work best in patients with either a personal or family history of alcohol use disorder

Grant JE, Kim SW, Hollander E, et al: Predicting treatment response to opioid antagonists and placebo in the treatment of pathological gambling. Psychopharmacol. 2005;212:527-537, 2005.
Grant JE, Potenza MN: Pathological Gambling: A Clinical Guide to Treatment. Washington, DC, American Psychiatric Publishing, 2004.
Ward S, Smith N, Bowden-Jones H: The use of naltrexone in pathological and problem gambling: A UK case series. J of Behav Addictions 7(10): 827-833, 2013

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Treatment: Lithium


- Mood stabilizer
- GD conceptualized as an impulsive disorder
- Shown to decrease both urges to gamble and gambling behavior in people with co-morbid bipolar-spectrum illness
- May also have some efficacy for those with GD but no bipolar illness



Pallanti S, Quercioni L, Sood E, Hollander E: Lithium and velpate treatment of pathological gambling: A randomized single-blind study. J Clin Psych 63: 559-564, 2002.
Hollander E, et al: Does sustained-release lithium reduce impulsive gambling and affective instability versus placebo in pathological gamblers with comorbid alcohol dependence? Am J Psychiatry 166(11): 1427-1435, 2009.

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Treatment: SSRIs



- Frequently investigated for compulsive disorders (e.g. OCD, hoarding, trichotillomania)
- Gambling conceptualized as a compulsive disorder
- Block serotonin reuptake, increase serotonin function, used for treatment of mood and anxiety disorders

Hollander E, Sood E, Pallanti S, et al: Pharmacological treatments of pathological gambling. Journal of Gambling Studies 21:101-110, 2005.


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Treatment: SSRIs

- Fluvoxamine, paroxetine, escitalopram most studied
- Unclear if they help decrease urges but may reduce “self-medication” behavior
- May require higher-than-usual doses
- Work best with co-occurring depression or anxiety

Grant JE, Kim SW. Medication management of pathological gambling. Minn Med. 2006 Sep;89(9):44-8.

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Internet Gaming Disorder

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The Evolution of IGD

DSM-IV-TR DSM-5

Not Found → Conditions for Further Study

American Psychiatric Association: Diagnostic and Statistical Manual of Mental Disorders, 5th Edition. Washington, DC: American Psychiatric Association, 2013.

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Proposed Criteria

- Seven DSM-5 Addiction Criteria, plus
- Has deceived family, therapists or others about the amount of gaming
- Uses games to escape/relieve negative mood
 - (Excludes Internet gambling, recreational/social Internet use, sexual websites)

American Psychiatric Association: Diagnostic and Statistical Manual of Mental Disorders, 5th Edition. Washington, DC: American Psychiatric Association, 2013.

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ICD-11 Criteria


- A pattern of persistent or recurrent gaming behavior ('digital gaming' or 'video-gaming'), which may be online (i.e., over the internet) or offline, manifested by:
 - 1) impaired control over gaming (e.g., onset, frequency, intensity, duration, termination, context)
 - 2) increasing priority given to gaming to the extent that gaming takes precedence over other life interests and daily activities
 - 3) continuation or escalation of gaming despite the occurrence of negative consequences.
- The behavior pattern is of sufficient severity to result in significant impairment in personal, family, social, educational, occupational or other important areas of functioning.
- Modifiers are "predominantly online" and "predominantly offline."
- "Hazardous gaming" also exists as a diagnosis

World Health Organization: International Statistical Classification of Diseases and Related Health Problems, 11th Edition. Retrieved from <https://icd.who.int/>, 2019.

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Who's Playing?

- ESA (Entertainment Software Association) 2022 survey
 - 215.5 million Americans play video games
 - 83% of gamers play with others on-line or in person at least weekly (up from 77% in 2021 and 65% in 2020)
 - Players spend an average of 13 hours a week playing video games and 41% of that time is spent playing with others




2022 Essential Facts about the Computer and Video Game Industry. Entertainment Software Association. <https://www.thesa.com/>. Published June 2022. Accessed April 2023.

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The Average Player

- Is white (71%)
- May be of either gender
 - Gender breakdown: 52% identify as male, 48% identify as female (nearly 1% identify as "other")
- Is age 33
 - 76% of players are over 18 years old
 - 27% of those who play video games are over the age of 45.



2022 Essential Facts about the Computer and Video Game Industry. Entertainment Software Association. <https://www.thesa.com/>. Published June 2022. Accessed April 2023.

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Clinical Presentation of IGD

- Has more to do with life impact than amount of time played (though this is controversial)
- Often, but not always, occurs in patients with other co-morbidities (especially SUDs and mood disorders)
- Prevalence: Global prevalence appears to be ~2-3% and males 2.5 times as likely to be diagnosed
 - More common in Asian countries esp. China, Taiwan, South Korea




2022 Essential Facts about the Computer and Video Game Industry. Entertainment Software Association. <https://www.thesa.com/>. Published June 2022. Accessed April 2023.

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Problematic Play

- Risk factors include:
 - Personality traits (neuroticism, aggression and hostility, and sensation seeking)
 - Motivations for play (escapism, control, avoiding dissatisfaction)
 - Structural game characteristics (online games, ability to customize virtual game persona, game reinforcement structure).
 - MMORPGs a particular area of interest



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Imaging studies

- Executive control networks are altered
 - Internet gaming addicts showed lower resting-state functional connectivity between VTA and mOFC (Han 2018)
 - Impaired task performance in Stroop test (Dong 2015)
- Decreased gray matter volume in brain regions involved in self-control and motivation in patients with gaming disorder (Yao 2017)

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Imaging studies

- Several studies show increased activity in the ACC and mOFC in response to gaming cues in subjects with gaming disorder (Han 2010, Ko 2009)

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Bottom Line

- Imaging studies suggest that the brains of people with problematic play are similar to those of people with substance use disorders
 - Gaming and gaming-related cues trigger activation of reward pathway
 - Gaming cues acquire increased salience over other activities
- Clinically this may manifest in other impulse control problems
- Problematic play is frequently co-morbid with other psychiatric disorders including mood disorders and substance use disorders

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Treatment

- Therapy modalities consist mainly of CBT, behavior therapy, and 12-Step approaches
- Psychopharmacologic management is off-label and has poor to middling evidence base for efficacy
 - Potential agents mainly selected from the same medications that are researched for SUDs
- Treatment centers initially arose in Asia and then Europe but now exist in North America as well

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In Summary

- Behavioral addictions fall within an impulsivity-compulsivity spectrum of illness.
- DSM-5 only recognizes one disorder officially though one other is included as a condition for further study.
- Psychosocial treatments work.
- Medications have fallen short so far.

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Which of the following behavioral addictions is included in the DSM-5 under "Substance-Related and Addictive Disorders"?


- A. Internet Use Disorder
- B. Gambling Disorder
- C. Internet Gaming Disorder
- D. Hypersexual Disorder



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Research shows that gambling disorder involves the strongest effect on which of the following neurotransmitters?


- A. Dopamine
- B. GABA
- C. Acetylcholine
- D. Serotonin



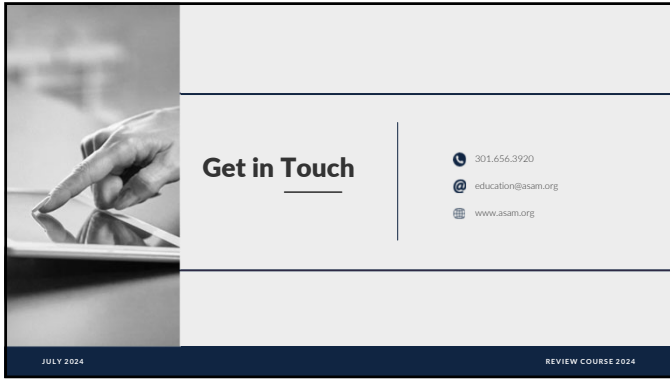
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Which of the following medications has some evidence for the treatment of gambling disorder?

- A. Memantine
- B. Naltrexone
- C. Aripiprazole
- D. Clonidine



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