MASSACHUSETTS GENERAL HOSPITAL
PSYCHIATRY ACADEMY

Athletics and SUD

Timothy E. Wilens, MD

Center for Addiction Medicine and
Child Psychiatry Service

Massachusetts General Hospital

Faculty Disclosure

MASSACHUSETTS GENERAL HOSPITAL
PSYCHIATRY ACADEMY

Timothy Wilens, MD has served as a consultant, or has received grant support from the following:

- NIH (NIDA), FDA
- Licensing agreement with 3D Therapeutics
- Clinical care: MGH, Bay Cove Human Services, Gavin, Major/Minor League Baseball
- (Co)Edited Straight Talk About Psychiatric Medications for Kids (Guilford); ADHD Across the Lifespan (Cambridge), MGH Comprehensive Clinical Psychiatry (Elsevier), MGH Psychopharmacology and Neurotherapeutics (Elsevier), ADHD Pharmacotherapy, Child Adolesc Psych Clin N Am (Elsevier)

Some of the medications discussed may not be FDA approved in the manner in which they are discussed including diagnosis(es), combinations, age groups, dosing, or in context to other disorders (e.g., substance use disorders)

Athletic Identity

MASSACHUSETTS GENERAL HOSPITAL
PSYCHIATRY ACADEMY

- Athletic identity (the degree to which one's sense of self is based on their role as an athlete)
  - Pro: Improved performance, commitment to learning, and enjoyment of sports
  - Con: Overtraining, playing with injuries, difficulty coping with changes like injury or discontinuation, and high-risk behaviors (disordered eating, performance-enhancing substance use).
- Younger athletes demonstrate depression and may be trained to exhibit mental toughness which could deter them from seeking help.
- Higher rates of depression are noted among HS senior female athletes, team sport athletes, and athletes from lower socioeconomic backgrounds after school closures during COVID in the US.

Daley MM, Reardon CL. Mental health in the youth athlete. *Clin Sports Med*. 2024;43:107-126

Anxiety in Athletes

MASSACHUSETTS GENERAL HOSPITAL
PSYCHIATRY ACADEMY

- Anxiety in athletes
  - More frequently seen in female athletes
  - Younger/less experienced athletes
  - Individual athletes over team-sport athletes
  - Etiology uncertainty of outcome, self-critical comparisons, vulnerability to judgment, and competition
- Variable clinical presentation of anxiety and depression
  - Younger athletes more likely to exhibit externalizing symptoms, behavior changes, and somatic complaints
  - Young adults more likely to present withdrawal, lack of motivation, and avoidance

Daley MM, Reardon CL. Mental health in the youth athlete. *Clin Sports Med*. 2024;43:107-126.

Overtraining

MASSACHUSETTS GENERAL HOSPITAL
PSYCHIATRY ACADEMY

- **Overtraining and burnout : limited data**
- **29% of 300 young English athletes (11-18 y/o) self reported nonfunctional or overtraining syndrome at some point in their career.**
- **Overtraining can lead to depression, fatigue, psychological/hormonal changes, performance decline, and eventual withdrawal from sports**
- **Overtraining syndrome may improve after rest; although in athletes with depression may lead to worsening of symptoms if sports are protective factor**
- **Externally motivated (ex. Parental pressure, comparison to peers) athletes experience greater self-criticism, depressive and anxiety symptoms, and lower self esteem which could lead to perfectionist tendencies.**

Daley MM, Reardon CL. Mental health in the youth athlete. *Clin Sports Med*. 2024;43:107-126.

Injuries

MASSACHUSETTS GENERAL HOSPITAL
PSYCHIATRY ACADEMY

- Musculoskeletal injuries → depression in young adults – especially those with higher levels of athletic identity
- Injuries → anxiety due to fear of reinjury, decreased likelihood of returning to pre-injury level
- Risk for substance use, opioid use after Rx use
- Concussions may:
  - Disrupt sleep, attention/focus, school performance
  - Heighten anxiety, frustration, emotional regulation, and depression
  - Enhance effects of substances of misuse

Daley MM, Reardon CL. Mental health in the youth athlete. *Clin Sports Med*. 2024;43:107-126

Springer

Sports Med. 2017; 47(12): 2497–2506.
Published online 2017 Aug 8. doi: 10.1007/s40279-017-0764-5

PMCID: PMC5684328
PMID: 28791650

Nicotine: Sporting Friend or Foe? A Review of Athlete Use, Performance Consequences and Other Considerations

Toby Mündel

▸ Author information ▸ Copyright and License information PMC Disclaimer

Abstract

Go to: ▸

Nicotine use amongst athletes is high and increasing, especially in team sports. This narrative review examines the rationale behind its use and evidence of its effect on physical performance, and considers important factors that should determine future research efforts. To date, ten studies have assessed muscular strength and power, sub- or maximal endurance and high-intensity exercise when nicotine (medication) or smokeless tobacco was used as an intervention. Two studies observed an ergogenic effect, one an ergolytic with the remaining seven reporting no change. These studies have notable limitations and confounding factors that include participant tolerance to nicotine, interindividual responses, the nicotine delivery system used and failure to adhere to rigorous experimental/scientific design. Further research is encouraged to address these limitations and determine the extent to which anti-doping and governing bodies should consider promoting, coordinating and monitoring any effort against nicotine and nicotine-containing substances in sports.

MGH 1811 MASSACHUSETTS GENERAL HOSPITAL
PSYCHIATRY ACADEMY

- **Nicotine not banned by WADA**
- **Nicotine use in 25-50% of active athletes**
- **Psychostimulant and sympathomimetic**
- **Only 4/16 studies show enhancement**
- **Study: improved cognition, reaction rates, batting (baseball) Fang et al, Int J Environ Res Public Health. 2022 Jan; 19(1): 515)**

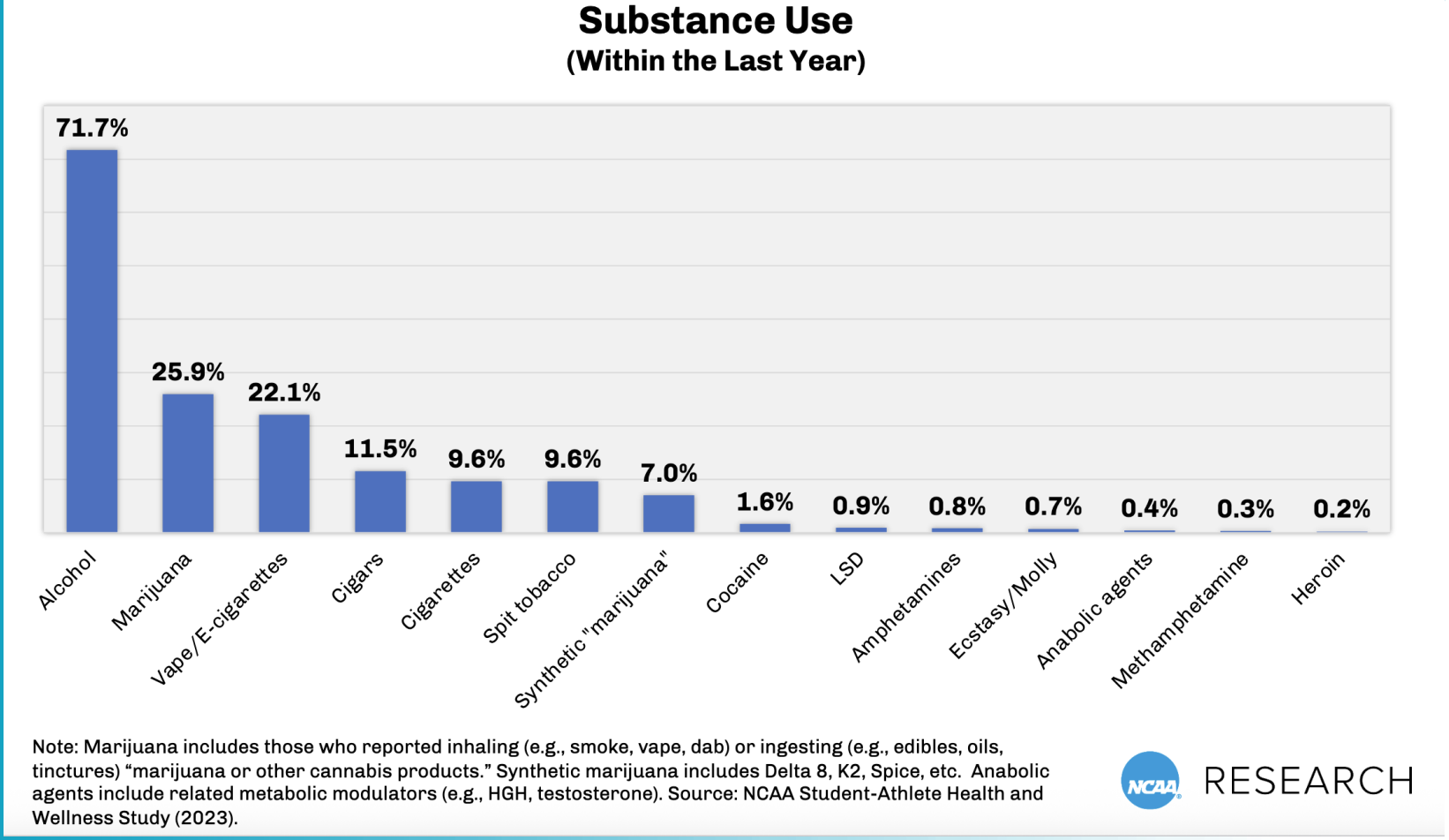
WADA= World Anti Doping Agency

Substance Use in Athletes

Use of substances to objectively or subjectively assist performance (performance enhancement; greater with elite athletes)

Continued substance use may be related to stress relief, psychological dependence, negative emotions reduction, and tolerance/withdrawal

Clinical Sports Psychiatry: An International Perspective Substance Use in Athletes Eric D. Morse Book Editor(s):David A. Baron, Claudia L. Reardon, Steven H. Baron First published: 11 April 2013 https://doi.org/10.1002/9781118404904.ch1



https://www.ncaa.org/news/2024/1/9/media-center-student-athletes-report-drop-in-binge-drinking-use-of-narcotic-pain-medication-and-spit-tobacco.aspx

Comparative Data, Student-Athletes vs. Nonathletes

(Use within the Last Year)

	NCAA[1] [2022-23]	ACHA-NCHA[2] [2023]	MTF[3] [2022]
Alcohol	71.7%	72.2%	80.5%
Marijuana	25.9%	38.4%	40.9%
Vaping nicotine/e-cigarettes	22.1%	-	26.4%
Cigarettes	9.6%	-	15.6%
Amphetamines	0.8%	-	4.8%
Cocaine	1.6%	-	3.3%
Ecstasy/Molly	0.7%	-	1.7%
LSD	0.9%	-	1.4%

[1]Representative sample of 23,272 NCAA student-athletes. Source: NCAA Student-Athlete Health and Wellness Study (2023).

[2]55,292 undergraduate students from 125 US Postsecondary Institutions. Source: American College Health Association. American College Health Association-National College Health Assessment III: Undergraduate Student Reference Group Data Report Spring 2023. Silver Spring, MD: American College Health Association; 2023. Retrieved from: Spring 2023 UG Reference Group Data Report (acha.org)

[3]Representative sample of 800-1,500 full-time college students (ages 19 to 22) at a 2-year or 4-year college or university annually. Source: Patrick, M. E., Miech, R. A., Johnston, L. D., & O'Malley, P. M. (2023). Monitoring the Future Panel Study annual report: National data on substance use among adults ages 19 to 60, 1976-2022. Monitoring the Future Monograph Series. Ann Arbor, MI: Institute for Social Research, University of Michigan. Retrieved from: mtfpanel2023.pdf (monitoringthefuture.org).

MASSACHUSETTS GENERAL HOSPITAL

SYCHIATRY ACADEMY

Original Article

Substance Use Among College Athletes: A Comparison Based on Sport/Team Affiliation

Jason A. Ford PhD

Pages 367-373 | Published online: 07 Aug 2010

Cite this article https://doi.org/10.3200/JACH.55.6.367-373

Abstract

Objective: Prior research shows that college athletes have higher rates of substance use, especially alcohol, than do college students who are not involved in athletics. To augment the literature, the author sought to determine which sports/teams are at the greatest risk for substance use. **Participants:** The author used data from the 1999 Harvard School of Public Health College Alcohol Study, a national survey of college and university students in the United States. **Methods:** A series of chi-square and logistic regression models examined variation in substance use among college athletes on the basis of sport/team affiliation. **Results:** Findings indicated that male hockey and female soccer athletes were the most likely to report substance use and that male basketball and cross-country/track athletes reported lower levels of substance use.

Conclusion: There is variation in substance use on the basis of sport/team affiliation, and future researchers

Highest SUD Rates
Male Hockey
Female Soccer

Alcohol U

Journal of American College Health Volume 55, 2007 - Issue 6

Performance Enhancing Substances in Athletes

MASSACHUSETTS GENERAL HOSPITAL
PSYCHIATRY ACADEMY

Androgens (testosterone, danazole etc)*

Muscle mass and strength

Growth Hormone, growth factors*

Muscle mass growth

Decrease adipose (fat)

Stimulants (methylphenidate, amphetamine)*

Enhance performance

Beta agonists/antagonists, sympathomimetics

Improve tremor, performance, oxygenation

Substances (nicotine, other substances*)

*** Denotes Banned Substances by WADA (World Anti Doping Agency)**

Reardon C and Creado. Substance Abuse and Rehabilitation 2014:5 95–105

Cannabis and Athletics

MASSACHUSETTS GENERAL HOSPITAL
PSYCHIATRY ACADEMY

- **WADA lists cannabis as an in-competition prohibited substance**
- **Doping analyses are conducted for cannabis, hashish, or other cannabis products**
  - **Urine 11-nor-delta-9-tetrahydrocannabinol-9-carboxylic acid (carboxy-THC), the major metabolite of delta-9-tetrahydrocannabinol (THC)**
  - **Concentrations >15 ng/ml (cut-off value) for confirmatory analytical procedures are considered doping.**

- Studies have shown that the use of cannabinoids may reduce anxiety, but do not improve sporting performance (Bergamaschi & Crippa, 2013).

- Cannabis used by athletes for pain control; assistance with sleep (varied cycles)

Gil et al., INTERNATIONAL REVIEW OF PSYCHIATRY, 2016 http://dx.doi.org/10.1080/09540261.2016.1212821

ETTS
OSPITAL
ACADEMY

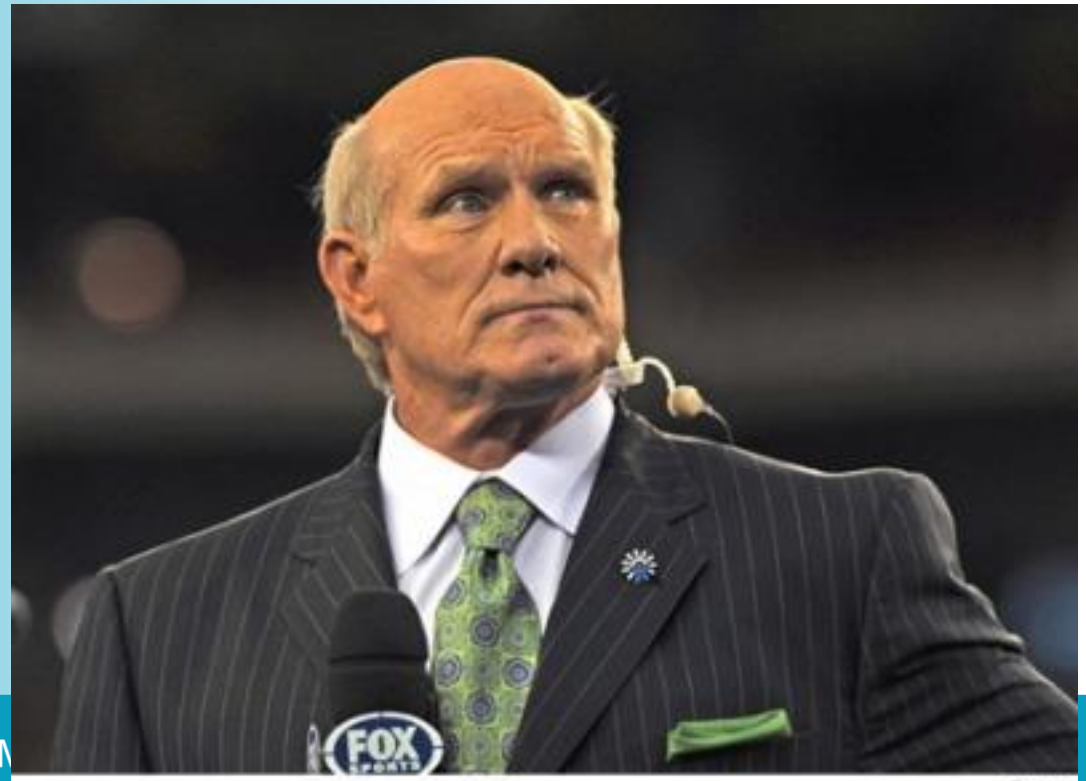
Scott Eyre

NBA / Getty Images

Chris Kaman

Jason Kidd

Terry Bradshaw



Getty

ADHD, Post-concussion, & Treatment

MASSACHUSETTS GENERAL HOSPITAL
PSYCHIATRY ACADEMY

- Treatment of ADHD may also improve post-concussive syndrome
- Use of stimulants & modafinal for concussion and/or (traumatic) brain injury
    - Targeted symptoms: arousal, disinhibition
    - General focus and concentration
    - Enhanced processing speeds
    - Unclear effects on complex processing
- Non-specific response to stimulants
    - Nonspecific response (Rapoport et al. Science, 1978; Wilens and Kaminski 2022)
- Caveats-
    - Careful with side effects: some indication of increased adverse effects with more “brain injury” (vs ADHD)
    - To “return to play” faster, some players are using stimulants to improve post-concussive testing

Wilens & Spencer, Stimulants Revisited, Psych Clin N Am 2000
Willmott C and Ponsford J. *J Neurol Neurosurg Psychiatry* 2009 May; 80:552.)

Treatment

MASSACHUSETTS GENERAL HOSPITAL
PSYCHIATRY ACADEMY

- Mandated Treatment
  - Know requirements
  - Use to benefit of player
  - Careful about confidentiality (e.g. shared information with teams/leagues)
- Psychotherapeutic modalities
  - CBT
  - Acceptance and commitment therapy
  - Mindfulness-based interventions

Daley MM, Reardon CL. Mental health in the youth athlete. *Clin Sports Med*. 2024;43:107-126

Treatment

MASSACHUSETTS GENERAL HOSPITAL
PSYCHIATRY ACADEMY

- Pharmacologic treatments
- Potentially problematic side effects:
  1. Sedation
  2. Weight gain/loss
  3. Tremor
- Careful prescribing opioids to prevent illicit substance use/use disorder
- Careful with controlled pharmacological treatments for Olympic or Professional Athletes
- Consideration of neurotherapeutics (not banned, not stigmatizing)

Daley MM, Reardon CL. Mental health in the youth athlete. *Clin Sports Med*. 2024;43:107-126
Dougherty J, Baron D. Substance Use and Addiction in Athletes: The Case for Neuromodulation and Beyond

League Rules, ADHD & Stimulant Use

MASSACHUSETTS GENERAL HOSPITAL
PSYCHIATRY ACADEMY

- **High School Sports**
  - **Generally not urine tested**
  - **Generally no specific rules for stimulant use**

- **College Sports/ NCAA**
  - **Urine tested for drugs of abuse**
  - **Requires documented clinical diagnosis and ongoing monitoring by physician**

League Rules, ADHD & Stimulant Use

MASSACHUSETTS GENERAL HOSPITAL
PSYCHIATRY ACADEMY

- **Professional Sports**
  - **Urine tested for steroids, enhancing agents & drugs of abuse**
  - **Generally specialized and certified clinicians**
  - **Requires therapeutic use exemptions (TUE) for use**

- **International Olympic Committee**
  - **Urine tested for steroids & drugs of abuse**
  - **Generally not allowed**

Treatment of Opioid Use Disorders

MASSACHUSETTS GENERAL HOSPITAL
PSYCHIATRY ACADEMY

- **Buprenorphine and Methadone banned substances (WADA)**
- **Naltrexone not banned**
- **Lower retention rates in treatment and outcomes**
  - **Cited RCT: 1 year positive outcome with buprenorphine/nal < 50%; Relapse rate of 57%**
  - **Naltrexone IM relapse rate 65%**

Dougherty and Baron, Int J Environ Res Public Health. 2022 Dec; 19(23): 16082

Summary

- **Mental Health and nicotine use/SU disorders common in athletes**
- **Athletics not protective against SUD**
- **MI and brief interventions effective**
- **Treatment needs to consider the lifestyle of the athlete, pharmacotherapy needs to consider effects on performance and banned substances (waivers)**