Hidden in Plain Sight: The Growing Problem of Appearance and Performance Enhancing Substances in the General Population

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SCOPE OF THE PROBLEM

- 2.4-4 million Americans have reported using anabolic steroids
  - Not typically athletes – about 80% use to enhance looks
  - >1 million experienced dependence
- Usage starts in 20’s
  - 7% of high school students admit anabolic steroid usage
- Users rarely candid with doctors – doctors rarely probe for steroid use
- Street Steroids – imported from China
  - Mixed with baby oil, ArmorAll, horse urine, etc → garbage!

NSF International (Brian Jordan)

- NSF Mission: protect and improve human health
- Motivation for dietary supplements = performance, health, appearance
- Consumer wrong assumption that dietary supplements are food and evaluated by the FDA – WRONG
- NSF Safe for Sport = tests for 270 banned substances
- Common Adultered Dietary Supplements – not labeled or not approved ingredients
  - Muscle building – steroids, SARMs, herbals
  - Pre-workout – stimulants like DMAA, PEA, DMBA, oxilofrine
  - Weight loss – stimulants in high doses, prescription meds, herbals

Scope of the Problem with Armed Forces (Dr. Patricia Deuster)

- Performance enhancing SUBSTANCES = includes dietary supplements, drugs, etc.
- 32% of Active Duty report daily dietary supplement use
  - Report using body building supplements daily: 13% male; 5.4% female
  - Report using weight loss supplements daily: 6.3% male; 8.6% female
- Concerns:
  - Believe that there is FDA oversight
  - Be better than the enemy
  - Adverse events

  **CHAMP/USADA’s analysis of various “performance enhancing dietary supplements”**
  - 49.2% (n = 179) products tested positive for anabolic steroids

- APR 2015 – developed research agenda for appearance and performance enhancing supplements within USSOCOM
Additional Info

- Question: How do these substances enter the US? Answer (from DEA): Steroids are typically imported/smuggled in whereas SARMs are not under the controlled substance act
- MLB – only allowed to use NSF verified products

MEDICAL CONSEQUENCES

- Observational studies are the only feasible methods to assess long-term effects
- Anabolic steroid use is viewed as cheating in sport
  - Most neglected public health problem with non-athlete young men
- Pre 1980’s – anabolic steroid use in athletes
- Post 1980’s – increased usage in non-athlete weight lifters and recreational bodybuilders
- Now starting to see the combined effects of long-term effects and aging
- Muscle Dysmorphia Syndrome – common in males – obsession to be muscular and lean
  - Aversive symptoms: dissatisfaction with body size and shape; functioning poorly in occupation and social life
  - Highly engaged in weightlifting and body building
  - Highly likely to use performance enhancing drugs
- Life threatening concerns: homicide/suicide, CVD, neuro, dependence
  - ↑ LDL; ↓ HDL
  - ↑ artery plaque
  - ↑ left ventricular mass – impacts blood pressure
  - Mania; Depression with withdrawal
  - Higher standardized mortality ratio among steroid users
- Anabolic steroid withdrawal syndrome – occurs after consumption greater than a couple weeks
  - Suppresses HPT axis
- Gateway to opioid abuse, increase in risky sexual behavior, shared needles

Cardiac and Neuropsychiatric Effects of Anabolic Steroids (Dr. Harrison “Skip” Pope)

- Cardiac Issues: blood pressure, ↓ LDL, cardiomyopathy, thrombus formation, atherosclerosis, dyslipidemia
  - Diastolic ventricle stiffness – unable to fill up with blood
    - Partial recovery from former anabolic steroid users
  - Hardening of arteries in blood vessels of the heart – at least 1 diseased coronary artery segment
    - Increased risk of MI/stroke
    - Longer steroid usage = ↑ atherosclerosis
- Brain / Neuropsychiatric Issues: acute manic/hypomanic, withdrawal depression, chronic cognitive
  - Apoptosis = programmed cell death
Significant change in visual spacial memory & recognition memory paired associates learning
- 1 year of anabolic steroid use = lose 1.5 years of visual spacial memory
- Detox neurotoxins in brain – 50% less with anabolic steroid usage
  - Helps prevent Alzheimer’s disease
  - Increased risk for joint and cartilaginous injuries
  - Increased risk of life time tendon rupture
    - Upper-body tendon ruptures occur almost exclusively in anabolic steroid users

Body Image and Appearance and Performance Enhancing Supplements Use (Dr. Tom Hilderbrandt)
- Body image disturbance – onset pre-puberty
- GOOD: ↑ wt, strength, satisfaction, self-esteem, appearance
- BAD: 94% report side effects (mood); side effects down played by users
- UGLY: body dysmorphic disorder
  - Addiction – 1/3 meet criteria for dependence
  - Leads to polypharmacy
  - More exercise leads to more issues with dependence
- Body image, diet/exercise, and polypharm all play a role together

Body Image
Diет/Exercise
Polypharm

TOOL TO FIGHT – EDUCATION

Center for Drug Free Sport (Laura Gray)
- AXIS app/online tool
- Dietary supplement inquiry and risk analysis
  - Risk level rating 1-3
  - Very similar to NMCD
- Education email campaigns
- Label screening
- myPlaybook – available for NAIA/NCAA schools

USADA (Dr. Adam Beharry)
- True Sport
- Supplement 411 – realize, recognize, reduce
  - Partner with Stanford for health professional CME’s
    - http://www.usada.org/resources/healthpro/

**Pediatric Education (Dr. Michele LaBotz)**

- Artificial Protection – online tool for PCM’s (think cyber challenge interaction)

**Taylor Hooton Foundation (Don Hooton)**

- Educating America’s youth and their adult influencers
- Objective: To get young people to understand why they shouldn’t be using steroids even if it were not against the rules.
- 85% of young people have never had a parent/coach/teach talk with them about the dangers of performance enhancing drugs
- Hoot’s Chalk Talk – large group education sessions
- All Me League – pledge for a performance enhancing drug free lifestyle
  - Support from every MLB team
  - Billboards and TV commercials