Medical Marijuana in the Workforce

Recommendations for the Occupational Physician
Robert S. Goldsmith, M.D., M.P.H.
June, 2014

What This Is...And What It Isn’t

IS:
• Historical context
• Legal and social context
• Pharmacodynamics overview
• Information on impairment
• MRO implications
• ACOEM Pharma/MRO position

IS Not:
• Free samples
• Opinion on the medical value of cannabinoids
• Information on the health impacts of the drug
• Definitive legal opinion
• Discussion of the safety of recreational marijuana
• Consideration of Marinol®, Casemet® or other synthetics
• ACOEM position statement
A Fundamental Question

Did this use constitute a workplace hazard?

- Yes. Marijuana increased the risk of injury.
- No. The nature of the job and the timing of use made workplace risk unlikely.
- It depends. (On what?)
A Secretary with Multiple Sclerosis
State office building, Augusta

A 54 year-old administrative assistant with MS has been authorized by her physician to use marijuana to relieve back spasms and pain. She intends to use the drug in the evening to improve her sleep and thus help her to continue working.

Does this use constitute a workplace hazard?

- Yes. Marijuana increases the risk of injury.
- No. The nature of the job and the timing of use make workplace risk unlikely.
- It depends. (On what?)

Three Codependent Variables
Impact on worker, workplace and public safety

- The social context
- The law
- The drug, the route and the person
A Brief History of a Long Period

2737 B.C., The first cannabis therapy recorded by Chinese Emperor Shen Neng
- Tea used for gout, rheumatism, malaria and poor memory

1830 - Medicinal marijuana is introduced to the U.S. by Dr. W.B. O'Shaughnessy.
- Rheumatism, tetanus and infantile convulsions

1850 - Marijuana entered into the U.S. Pharmacopeia
- Inflamed skin, incontinence, venereal disease, chorea, epilepsy, anorexia nervosa, uterine atony, migraines, depression and other ailments

1800's - Municipal poison control ordinances

1905 - Pure Food and Drug Act
1907 - California becomes first state to outlaw marijuana as a poison

1930's - 2000 preparations worldwide, 280 manufacturers
- Glaucoma and cancer-related anorexia cachexia

1980's - Discovery of human cannabinoid transmitter system

1937 - Federal Marijuana Tax Act
1970 - Tax Act replaced by the CDAPCA
1996 - California Compassionate Use Act

Wide Variation in State Laws Exist

- Cancer - 15 states
- Glaucoma - 15 states
- HIV/AIDS - 15 states
- Epilepsy - 15 states
- Severe nausea - 13 states
- Cachexia - 14 states
- Severe or chronic pain - 12 states
- Severe muscle spasms - 11 states
- Multiple sclerosis - 5 states
- Hepatitis C - 3 states
- Alzheimer's Disease - 3 states
- Inflammatory bowel disease - 4 states
- Amyotrophic lateral sclerosis (ALS) - 2 states
- Intractable spasticity - 2 states
- Anorexia - 2 states
- Appetite loss - 2 states
- Any terminal illness or admission to hospice - 2 states
- Any other medical condition approved by state legal agency - 12 states

- Spinal cord damage with spasticity - 2 states
- Nail-patella syndrome - 1 state
- Cramping - 1 state
- Parkinson's disease - 1 state
- Arthritis - 1 state
- Migraine - 1 state
- Muscular dystrophy - 1 state
- Post-traumatic stress disorder - 1 state
- Any chronic or persistent condition - 1 state
- Migraine - 1 state
- Muscular dystrophy - 1 state
- Post-traumatic stress disorder - 1 state
- Any chronic or persistent medical condition - 1 state
The Social Pendulum

Cannabis Physiology-The Basics

- Humans have a cannabinoid neurotransmitter system
  - Endogenous cannabinoids essential
    - Appetite, mood, immune system, memory
  - Over 400 chemicals isolated from C. sativa smoke
    - +/-60 cannabinoids, including $\Delta^9$ THC and CBD
  - CB$_1$ receptors modulate the neuropsych effects of cannabis
    - THC is active at CB$_1$ sites
  - CB$_2$ sites active in gut and lymphatic systems

- The psychotropic effects of marijuana are related to THC:CBD, route of administration, frequency of use, technique, and other factors
### Pharmacokinetics

- Although cannabinoids are metabolized by both hepatic and extrahepatic tissue, liver microsomal enzymes are the predominant route
- Highly lipophilic
- Route of exposure makes all the difference
- Metabolism is highly variable from person-to-person

#### Route of Administration as a Variable

<table>
<thead>
<tr>
<th>Route of Administration</th>
<th>Inhaled</th>
<th>Transdermal</th>
<th>Ingested</th>
<th>Vaporized</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum concentration in minutes</td>
<td>•</td>
<td>• Emulsions and patches</td>
<td>• Usually in lipid carrier</td>
<td>• Kinetics similar to inhalation</td>
</tr>
<tr>
<td>Bioavailability 2-50+%</td>
<td>• Effects begin in minutes</td>
<td>• No first pass effect</td>
<td>• Absorption highly variable</td>
<td>• Combustion of contaminants and byproducts may be avoided</td>
</tr>
<tr>
<td>Effects begin in minutes</td>
<td>• Peak 15-30 minutes</td>
<td>• Absorption limited by aqueous layer</td>
<td>• First pass effect</td>
<td>• Kinetics similar to inhalation</td>
</tr>
<tr>
<td>Peak 15-30 minutes</td>
<td>• Taper starts 2-3 hours</td>
<td>• Steady state in 1.4 hours</td>
<td>• Effects begin in 30-90 minutes</td>
<td>• Combustion of contaminants and byproducts may be avoided</td>
</tr>
<tr>
<td>Taper starts 2-3 hours</td>
<td></td>
<td>• Maintained for &gt;48 hours</td>
<td>• Peak 2-3 hours</td>
<td></td>
</tr>
</tbody>
</table>
Neurocognitive Effects

Multiple variables: [THC], study design, dose, etc.

Definitive conclusions elusive—in some studies effects evident for up to 2 weeks after use

Clearly impairs verbal and visual memory, executive functioning, visuoperception, psychomotor speed, and manual dexterity

Automobile research
  - Impairs braking time
  - Affects lane tracking
  - Risk aversion
  - Increased crash risk
  - Higher fatalities

Source: University of Alabama
Marijuana Potency Monitoring Project

MRO Considerations

Federal testing programs (DHHS, DOT, NRC, etc.) provide no leeway for medical marijuana use

Can’t use breath analysis. Legal implications of blood testing.

Is overt intoxication a reasonable standard?

Per se driving laws:
Washington and Colorado DUI standard 5.0 ng/ml whole blood
Levels don’t correlate well with impairment

Lab positives should be considered as MRO positives and should be managed through standard procedures
ACOEM Pharma/MRO Recommendations

1. It is reasonable, and responsible for employers to ban the use of marijuana at any time by employees, contractors and other workers. Although the prohibition does not at this time conflict with federal law, including the Americans with Disabilities Act, employers must carefully review state law before establishing policy. The review should include anti-discrimination and similar laws, particularly as they apply to the use of marijuana while not at work. In some states, disciplining an employee based solely on a failed marijuana drug test could have legal implications.
2. Given the pace of legal change and emerging case law, and expanding knowledge on risk and benefit, companies should schedule review of existing policies on a regular basis.

3. Approval or tolerance of medical marijuana should not be considered in any industry for which specific federal or state safety standards prohibit its use. This includes industries that are required to adhere to federal drug testing procedures.

4. Workers who are suspected of being intoxicated with marijuana should be removed from the workplace immediately.

5. For employers who feel morally or ethically obliged to tolerate the use of medical marijuana, or who believe tolerance is required by state law, the following guidelines should be observed:
   a) An occupational physician trained and knowledgeable on the impact and evaluation of potentially impairing substances in the workplace should be included, with legal counsel, in any discussion about company policy or individual use of medical marijuana.
   b) The employer should establish and consistently apply clear guidelines on the situations for which use of medical marijuana would be considered. At minimum, employees requesting approval for marijuana use should be required to provide documentation from the authorizing provider containing diagnosis and medical basis, schedule of use, and estimated duration.
   c) The occupational physician-reviewer along with legal counsel should assure that the medical condition of the requesting worker matches the current state approved list. She/he should work with site management to assess the risk of residual impairment and should not approve the accommodation if there is reasonable concern about the safety of the worker, coworkers, or the general public.
d) Marijuana should not be permitted while an employee is on duty unless the employer can determine with certainty that the associated neurocognitive and judgment impairment will not pose risk to user, coworkers, or the public. This includes assurance of safe transport to and from the job site.

e) Given the evidence that inhaled THC may impair complex human performance for >24 hours after ingestion, employers should not assume that marijuana use between shifts (such as evening use prior to return to work the following morning) is uniformly safe.

7. ACOEM supports research toward improved understanding of the pharmacodynamics, pharmacokinetics and occupational risks of marijuana use.

8. Given the dynamics of the legal and scientific landscape it is important for occupational physicians to frequently review the relevant literature and their approach to workers who use, or may use this form of therapy.

Where is This Heading?
Your guess is as good as mine

<table>
<thead>
<tr>
<th>Likelihood</th>
</tr>
</thead>
<tbody>
<tr>
<td>More states will approve medical marijuana</td>
</tr>
<tr>
<td>Sativex will be approved in other countries</td>
</tr>
<tr>
<td>Designer pot may manipulate the THC:CBD ratio</td>
</tr>
<tr>
<td>Cannabidiol (Epidolex®) approval by the FDA</td>
</tr>
<tr>
<td>DEA reclassification to CII</td>
</tr>
</tbody>
</table>