Marijuana in Iowa

Emerging Trends…
the Rest of the Story

Iowa Office of Drug Control Policy
September 2016
What We Know...So Far

Does Marijuana have Helpful Properties?
Possibly. Research indicates particular derivatives of marijuana (e.g., CBD) may help provide relief to some Iowans with certain conditions.

Does Marijuana have Hurtful Properties?
Yes. Studies show the use of marijuana (i.e., THC) can cause negative health effects & result in impairment, abuse & addiction. Prevention is important.

What’s the Truth?
Stay tuned. Scientific study, including clinical trials of potential new medicines, continues at an increasingly rapid pace to get more answers.
Marijuana or Cannabis:
Dried leaves, flowers, stems & seeds from the plant, Cannabis sativa.

Cannabinoids:
Chemical compounds found in marijuana. Scientists say marijuana consists of more than 100 cannabinoids (& over 500 chemicals in total).

Cannabinoid Receptors:
Brain neuron molecules to which cannabinoids attach, disrupting mental & physical functions (memory, coordination, concentration, etc.).

Cannabidiol (CBD):
One non-psychoactive marijuana compound that may have medical value without affecting the mind or behavior.

Delta-9-tetrahyrdocannabinol (THC):
Marijuana’s main psychoactive/mind-altering compound that may also have therapeutic value.
Distinction with a Difference

Cannabis-Based Medicine:
Cannabis derivatives that test safe & effective as research-based medicines for use by health care professionals in treating patients with valid medical needs, & regulated to reduce public safety risks.

Medical Marijuana:
Differing forms of cannabis approved by legislative or popular vote in some states for treating various health conditions, with fewer controls & safeguards than FDA-approved medicines.

Iowa Law:
Permits regulated use of limited quantities of CBD oil to treat qualified patients with intractable epilepsy.
# Examples of Plant Derivatives

<table>
<thead>
<tr>
<th>Drug/Medicine</th>
<th>Plant Source</th>
<th>Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aspirin</td>
<td>Willow</td>
<td>Fever &amp; Pain</td>
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<tr>
<td>Atropine</td>
<td>Belladonna Plant</td>
<td>Pupil Dilator in Eye Exams</td>
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<tr>
<td>Digitalin</td>
<td>Foxglove</td>
<td>Heart Medication</td>
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<tr>
<td>Menthol</td>
<td>Eucalyptus Tree</td>
<td>Cough Medicine Ingredient</td>
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<tr>
<td>Morphine</td>
<td>Opium Poppy</td>
<td>Pain Reliever</td>
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<tr>
<td>Quinine</td>
<td>Quinine Tree</td>
<td>Malaria Preventive</td>
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<tr>
<td>Reserpine</td>
<td>Snakeroot</td>
<td>Hypertension</td>
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<tr>
<td>Taxol</td>
<td>Pacific Yew</td>
<td>Ovarian Cancer Drug</td>
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<tr>
<td>Tubocurarine</td>
<td>Curare Tree</td>
<td>Surgical Muscle Relaxant</td>
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<tr>
<td>Vinblastine</td>
<td>Periwinkle</td>
<td>Hodgkin’s Disease</td>
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<tr>
<td>Vincristine</td>
<td>Periwinkle</td>
<td>Leukemia Drug</td>
</tr>
<tr>
<td>Cannabidiol (CBD)?</td>
<td>Cannabis Plant</td>
<td>Seizure Control…(TBD)?</td>
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2001 Scientific American
Marijuana Laws & Use by Teens by State

“Medical” & “Recreational” Marijuana Laws (2016 Governing.com)

Past Month Use by 12-17 Year Olds (2013-2014 NSDUH)

- Olive = “Medical” marijuana (*25 & DC). [OH June 2016]
- Lime = “Medical” & “Recreational” marijuana (4).
- Not Shown: Low THC non-psychoactive “CBD” oils (18, including Iowa, where the Pharmacy Board recommended in 2015 the Legislature consider rescheduling CBD only).
Scientific Positions on Marijuana

• The FDA has not approved the use of marijuana as medicine, saying “there is currently sound evidence that smoked marijuana is harmful.”

• The Institute of Medicine has declared smoking marijuana is unsafe, & “marijuana is not modern medicine.”

• The National Institute on Drug Abuse reports “marijuana is addictive,” with nearly 4.5 million Americans meeting the clinical criteria for marijuana abuse or dependence.
Health Group Positions on Marijuana


• The American Academy of Pediatrics “opposes marijuana use by children & adolescents...the use of ‘medical’ marijuana outside the regulatory process of the FDA...&...legalization of marijuana.”

• The American Epilepsy Society supports rapidly advancing research, saying marijuana “should be studied using the well-founded research methods that all other effective treatments for epilepsy have undergone.”
Marijuana Health Effects

• Marijuana can: cause breathing problems; impair body movement & memory; alter moods & senses; elevate heart rates; cause difficulty thinking & problem solving; cause temporary hallucinations or paranoia; & worsen schizophrenic symptoms. It’s also linked to: depression; anxiety; teen suicidal thoughts; & when used by pregnant moms, brain & behavioral problems in babies. Studies suggest moderate THC amounts can be excreted into breast milk.

2016 National Institute on Drug Abuse

• Marijuana can be addictive. 30% of users may develop some degree of problem use, which can lead to dependence or in severe cases, addiction. About 9% of users become dependent, rising to 17% in those who start as teens. Marijuana users also report lower life satisfaction, poorer mental health, poorer physical health & more relationship problems.

2016 National Institute on Drug Abuse
Marijuana Health Effects

• More U.S. citizens met the American Psychiatric Association’s diagnostic criteria for marijuana abuse/dependence than for pain relievers, cocaine, tranquilizers, hallucinogens & heroin combined.
  2011 U.S. Substance Abuse & Mental Health Services Administration, National Survey on Drug Use & Health

• Blood vessels in rats took at least 3 times longer to recover function after only 1 minute of breathing 2\textsuperscript{nd}-hand marijuana smoke vs. 2\textsuperscript{nd}-hand tobacco smoke. The arteries of rats & humans are similar in this response. Temporary effects from 2\textsuperscript{nd}-hand marijuana smoke could become long-term problems if exposure occurs often enough.
  2016 Journal of the American Heart Association/American Stroke Association

• People who abuse or are dependent on marijuana are 3 times more likely to abuse or be dependent on heroin.
  2015 Centers for Disease Control
Marijuana/Cannabis a.k.a.

<table>
<thead>
<tr>
<th>Then</th>
<th>Now</th>
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<tbody>
<tr>
<td>Weed</td>
<td>Hash or Honey Oil</td>
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<tr>
<td>Grass</td>
<td>Wax or Earwax</td>
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<tr>
<td>Pot</td>
<td>Budder</td>
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<tr>
<td>Reefer</td>
<td>Crumble</td>
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<tr>
<td>Hash</td>
<td>Shatter</td>
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<tr>
<td>Hemp</td>
<td>Black Glass</td>
</tr>
<tr>
<td>Joints</td>
<td>Edibles</td>
</tr>
<tr>
<td>Blunts</td>
<td>Reggie</td>
</tr>
<tr>
<td>Buds</td>
<td>Loud</td>
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</table>
Marijuana’s Increasing THC Potency
Plant Material (“Weed”) Seized in U.S.

U.S. THC levels averaged less than 1% in 1972.
2014 University of Mississippi Marijuana Project

University of Mississippi Marijuana Project, through 6-22-16
New Marijuana’s Rising THC Potency
Hash Oil Seized in U.S.

“Concentrates” (hash oils, waxes & marijuana-infused edibles) may contain THC levels of 80+%.  
2014 U.S. Department of Justice, Drug Enforcement Administration, National Drug Threat Assessment Summary

2015 Colorado THC levels averaged 17.1% for regular marijuana & 62.1% for “concentrates.”
2015 Rocky Mountain HIDTA

University of Mississippi Marijuana Project, through 6-22-16
Concentrates
Beyond the Plant…

“Green Crack” wax

“Ear Wax”

Butane Hash Oil (BHO)

Hash Oil Capsules

“Budder”

“Shatter”
Concentrates
Beyond the Plant...
Marijuana “Concentrates”

Hash Oil
(aka: honey oil or 7:10)

THC is chemically extracted from the cannabis plant with a solvent to produce a thick amber or brown colored viscous liquid. About one or two drops equals one “joint.” Hash oils are often used in electronic smoking devices for vaping that is smokeless & odorless.

Estimated THC Content = 40-80%
Marijuana “Concentrates”

Wax (aka: budder, crumble, earwax)

Whipping hash oil during the THC extraction process thickens the product to create marijuana wax. It has a consistency similar to earwax, thus its name. “Dabbing” is inhaling vapor from wax on a heated surface.

Estimated THC Content = 50-80%
Marijuana “Concentrates”

Building upon the THC extraction process used for hash oil, shatter is created in multiple steps that include use of a pressure vacuum. The result is an amber or yellow colored thin & brittle cake-like product with an even higher THC content.

Estimated THC Content = 80-90% or higher
Marijuana “Concentrates”

Highly concentrated THC-infused food products with delayed effects on unsuspecting users—particularly children drawn to product packaging—can lead to psychotic episodes & other dangers.

THC estimate: 50% or higher
One way to extract THC from the marijuana plant is with a Butane Hash Oil (BHO) lab, which involves the use of the flammable solvent butane. One byproduct is lab-related explosions, fires & personal injuries…including in Iowa.
Marijuana “Concentrates”

Regular daily users of high-potency marijuana (~16% THC), similar to forms found in the U.S., are 5 times more likely than non-users to have a psychotic disorder. Weekend users are 3 times as likely to suffer psychosis.

2015 Lancet Psychiatry, Kings College London

“2 deaths connected with edible marijuana products have Colorado lawmakers scrambling to toughen regulations & experts warning of bizarre behavior as consumers eat powerful pot-infused foods.”

May 8, 2014 USA Today

The self-inflicted shooting death of a 22-year old on a family ski trip is blamed on 4 marijuana gummy bears.

March 26, 2015 Denver Post

26.5% of teenage marijuana & e-cigarette users report using electronic devices to vaporize more potent marijuana & hash oil.

September 2015 Yale University, Pediatrics Journal
New Marijuana in Iowa

Approximately 9.5% of all 2015 marijuana samples submitted to the Iowa crime lab involved marijuana “preparations,” or “concentrates” (e.g., hash oils, waxes & marijuana-infused edibles).

2015 Iowa Department of Public Safety, Division of Criminal Investigation
Current Youth Marijuana Use
Past 30 Days: Iowa vs. U.S.

- 5.02% of all Iowans 12+ & 5.17% of Iowa teens are current marijuana users.
- 54% of Iowa 11th graders say marijuana would be easy or very easy for peers to get in their neighborhood or community.
- 24% of Iowa 11th graders see no risk smoking marijuana once or more a week, about twice as many as 15 years ago.

2015 Monitoring the Future Survey & 2014 Iowa Youth Survey
Youth Marijuana Attitudes vs. Use Among U.S. 12\textsuperscript{th} Graders

College students daily marijuana use surpassed cigarette smoking for the 1\textsuperscript{st} time in 2014.

Monitoring the Future Survey, 2015
Youth Substance Use 40-Year Trends
Current Use (past 30 days) Among U.S. 12th Graders

Monitoring the Future, 1975-2015
Iowa Youth Marijuana Attitudes
Among Iowa 11th Graders

Iowa Teens Perceiving No Risk Smoking
Marijuana Once or More a Week

Iowa Youth Survey, 2014
Drugs of Choice: Iowa Youth
Primary Substance for 5,026 Juveniles in Treatment

- Marijuana: 66.3%
- Alcohol: 21.9%
- Other: 7.5%
- Meth: 4.1%
- Cocaine: 0.2%

Iowa Department of Public Health, 2014
Drugs of Choice: All Iowans
Primary Substance of Choice by Iowans in Treatment

Iowa Department of Public Health, 2014
Marijuana Use in Iowa
Past 30-Days: Pre-Teens & Teens vs. All Iowans

2003-2004

6.38%

4.7%

2013-2014

5.17%

5.02%

Ages 12-17

Ages 12+

National Survey on Drug Use & Health,
Most Iowans are not *current* marijuana users (past 30 days).

**Iowa Youth 12-17 years old currently using marijuana.**
- Use: 5.17%
- Do Not Use: 94.83%

**Iowans 12 & older currently using marijuana.**
- Use: 5.02%
- Do Not Use: 94.98%

2013-2014 National Survey on Drug Use & Health
Iowa College Students Risking Aid Due to Drug Conviction

*In 2014-2015, 6 of 175,424 qualified for suspension of federal financial aid due to a drug conviction (vs. 7 in 2013-2014, 10 in 2012-2013 & 14 in 2011-2012).

Federal law permits students to requalify by completing treatment.
Of 3,842 total prison admissions:
• 130 (3.4%) were for marijuana trafficking (manufacturing delivery, intent to deliver & conspiracy)
• 50 (1.3%) were for 3\textsuperscript{rd} or subsequent marijuana possession,
• 3 (0.08%) was for 2\textsuperscript{nd} or subsequent marijuana possession, and
• None (0%) was for 1\textsuperscript{st}-time marijuana possession.
Iowa Marijuana ER Visits
Cannabis Use as Causal or Contributing Factor

Marijuana impairs/worsens respiratory systems, heart rate, coordination, judgment, memory, problem-solving & mood. It contributes to auto crashes & can cause severe anxiety & psychosis.

Iowa Department of Public Health, 2014
Iowa Drug-Impaired Driving
2015 Non-Alcohol Evaluation Findings by Drug Recognition Experts

IDPS, 2015
Iowa Drug-Related Traffic Fatalities
Number Killed in 2014 Testing Positive for Illicit Drugs

15% of those killed in Iowa traffic fatalities in 2014 tested positive for illicit drugs.

- Marijuana: 15
- Meth
- Rx
- Synthetic
- Opium
- Other

Does not include alcohol-related fatalities. Alcohol & poly-drug combinations were detected in some crashes.

Source: IDOT, 2014
Iowa was the 4th most frequent state destination for Colorado marijuana seized in highway interdictions in 2015.

2016 El Paso Intelligence Center

Source of Marijuana Seized in Iowa
2015 Iowa State Patrol Significant Highway Interdictions

California 53.3%
Colorado 40%
Wyoming 6.7%
Iowa Department of Public Safety, 2015
Marijuana Case Studies

Diversion (Leakage)

• Highway Patrol yearly interdiction seizures of Colorado marijuana increased 37% since Colorado legalization (288 in 2013 vs. 394 in 2015). Of 36 different destination states in 2015, the most common were Missouri, Illinois, Texas, Iowa & Florida.

  2016 El Paso Intelligence Center, U.S. Drug Enforcement Administration

• Seizures of packages containing Colorado marijuana in the U.S. mail increased 427% in the 3 years “recreational” marijuana has been legal (average of 70 parcels 2010-2012 vs. 369 parcels 2013-2015). The amount of marijuana seized in these packages increased 471% (average of 129 pounds 2010-2012 vs. 736 pounds 2013-2015).

  2016 U.S. Postal Inspection Service

• The #1 complaint of Denver convention & leisure visitors (49%) is downtown environment: homelessness, youth, panhandling, safety, cleanliness & drugs.

  2014 Visit Denver Survey
Marijuana Case Studies
Use/Abuse

• “Medical” marijuana laws do not increase adolescent marijuana use, but adolescent use is higher in “medical” marijuana states.
  2015 Hasin, Wall, Keyes, Cerda, et al., Lancet

• “Medical” cannabis laws amplify recreational juvenile cannabis use by allaying social stigma & placating fear that cannabis use could potentially result in a negative health outcome.
  2015 Stolzenberg, D’Alessio & Dariano, International Journal of Drug Policy

• College students’ use of marijuana continues a decade-long increase, even as the abuse of many other substances declines.
  38% of college students reported using marijuana in 2015, up from 30% in 2006. 2016 Monitoring the Future Survey/University of Michigan

• The top 21 states (& DC) for current marijuana use among teens all have approved “medical” marijuana. 2013-2014 National Survey on Drug Use & Health
Current Youth Marijuana Use Rates
Age 12-17 in “Medical” vs. Non-“Medical” Marijuana States

In the top 21 “use” states, “recreational &/or “medical” marijuana is legal.

* “Recreational” & “medical” marijuana were legal in Colorado & Washington State in 2014.


*** Maryland, New York & Minnesota “medical” marijuana legislation was enacted during 2014. Pennsylvania & Ohio passed such laws in 2016.

(States in blue have no “recreational” or “medical” marijuana laws.)

2013-2014 National Survey on Drug Use & Health
Marijuana Case Studies
Impact on Youth

• Current Colorado youth marijuana use increased an average of 20% in 2 years of legalization (2013/2014), compared to a 4% decline nationally. 2013-2014 National Survey on Drug Use & Health

• Current marijuana use in Colorado during the 2 years “recreational” marijuana has been legal (2013-2014) increased an average of 17% among college-aged residents & 63% among adults vs. the 2-year average before legalization. 2013-2014 National Survey on Drug Use & Health

• Marijuana use in the 1st year of college can lead to students skipping classes, lower grades & later graduation. 2015 University of Maryland School of Public Health, College Life Study

• 77% of American teens now believe smoking pot is safe. 2014 Behavioral Health Barometer, U.S. Substance Abuse & Mental Health Services Administration
Marijuana Case Studies

Impact on Youth

- Persistent marijuana use during adolescence can cause a long-term 8-point drop in IQ, & harm attention span & memory.  
  2012 National Academy of Sciences, Dunedin Study

- 62% of all Colorado public school drug expulsions & suspensions were for marijuana violations.  
  2015-2016 Colorado Department of Education

- 82% of Colorado School Resource Officers report an increase in marijuana-related incidents since legalization. 45% said students got marijuana from friends who obtained it legally, 24% said black market, 22% said parents & 9% said stores or dispensaries.  
  2016 Colorado Association of School Resource Officers Survey

- A small amount of secondhand marijuana smoke may damage blood vessels, according to a study of rats with arteries similar to humans. Vessels took at least 3 times longer to recover after a minute of secondhand marijuana smoke vs. tobacco smoke.  
  2016 American Heart Association
Marijuana Case Studies
Impact on Youth

- The average rate of marijuana-related children’s hospital visits in Colorado nearly doubled from 1.2/100,000 population 2 years prior to legalization vs. 2.3/100,000 2 years afterward.  
  2016 University of Colorado, JAMA Pediatrics

- Regional Poison Center pediatric marijuana cases in Colorado increased more than 5-fold from 9 in 2009 to 47 in 2015. Many exposure cases involved marijuana-infused edible products.  
  2016 University of Colorado, JAMA Pediatrics

- States decriminalizing marijuana saw a 30+% increase in poison center call rates for children requiring medical intervention from 2005-2011 vs. no change in other states.  
  2014 Annals of Emergency Medicine

- 1 in 6 infants & toddlers admitted to a Colorado hospital with coughing, wheezing & other symptoms of bronchiolitis tested positive for marijuana exposure.  
  2016 American Academy of Pediatrics
Marijuana Case Studies
Impact on Youth

• Marijuana exposure rates among children 5 & under increased 16%/year after legalization in affected states, & child exposures rose 147% from 2006-2013. 2015 National Poison Database System, Clinical Pediatrics Journal

• From 2013-2014, marijuana-related poison calls increased 50% in Washington State. Calls involving children nearly doubled. 2015 Washington Poison Center

• Since legalization in Washington State in 2012, poison center calls related to THC-infused products increased 312.5% & calls related to marijuana oil increased 850% over the course of 3 years. 2016 Northwest High Intensity Drug Trafficking Area, Washington State Poison Center

• Marijuana was involved in 98% of 2013-2014 Seattle Public School student drug violations, plus 48% of Washington State student expulsions & 42% of suspensions. 2016 Northwest High Intensity Drug Trafficking Area
Marijuana Case Studies
Other Impacts

- Marijuana-related traffic deaths in Colorado increased an average of 48% since legalization (2013-2015).
  2015 Colorado Department of Transportation

- As of January 2016, Colorado had 424 retail marijuana stores statewide, compared to 322 Starbucks and 202 McDonald’s.
  2016 Rocky Mountain High Intensity Drug Trafficking Area

- 68% of Colorado’s local jurisdictions have banned “medical” & “recreational” marijuana businesses.
  2016 Rocky Mountain High Intensity Drug Trafficking Area

- Some marijuana potency values have been surprising strong, close to 30% THC, while many samples have little or no CBD.
  2015 American Chemical Society/Charas Scientific Labs of Colorado

- People who abuse or are dependent on marijuana are 3 times more likely to abuse or be dependent on heroin.
  2015 Centers for Disease Control
“Medical” Marijuana: Alternatives

• Research shows a few orally-administered synthetic medicines containing the cannabis plant’s principal psychoactive compound tetrahydrocannabinol (THC) do have therapeutic potential to relieve pain, control nausea, stimulate appetite & decrease ocular pressure. Smoking or ingesting crude marijuana is not required.

• Dronabinol (Marinol) & Nabilone (Cesamet) are FDA-approved & legally available as prescription pills.
**“Medical” Marijuana: Alternatives**

- A mouth spray (Sativex) with 2 cannabinoids extracted from the cannabis plant failed FDA-authorized tests for cancer pain, but may be tested on spasticity problems.

- An oral liquid (Epidiolex) containing the non-psychoactive & nearly pure cannabis extract Cannabidiol (CBD) is an FDA orphan drug in a fast-track study in Iowa & elsewhere to treat severe seizures. Initial clinical trial results are encouraging & if all goes well an Rx product could be on the market in early 2018.

- 18 states, including Iowa, now permit limited use of CBD solutions by patients with severe medical needs.
CBD Laws in 18 States
Differences in Scope

Production & Distribution vs. Possession Only

- 22% (4/18) Produce & Distribute
- 78% (14/18) Possess Only [includes 3 FDA state clinical trials]

THC Levels: Under 1% vs. Over 1%

- 28% (5/18) Over 1% THC
- 72% (13/18) Under 1% THC

10 states have CBD minimum levels

National Alliance for Model State Drug Laws, 2016
“Medical” Marijuana: Research

• A systematic review & meta-analysis found most uses of “medical” marijuana would not pass FDA review due to a lack of reliable evidence to support the drug’s use. June 2015 Journal of the American Medical Association

• 14 of 24 “medical” marijuana programs were essentially nonmedical in practice, but enrolled over 99% of all participants, mostly in western states with fewer regulations. 2016 Columbia University Medical Center

• 58% of respondents to a poll about prescription drug availability & cost opposed changing the government’s approval standards to make drug reviews quicker. 2016 National STAT-Harvard School of Public Health

• Adults who use marijuana are 5 times more likely to develop an alcohol use disorder. 2016 Columbia University’s Mailman School of Public Health & City University of New York

• Using marijuana & alcohol together impacts driving more than using either substance alone. 2015 National Institute on Drug Abuse
“Medical” Marijuana: Research

- NIH invested $111 million in 281 cannabinoid research projects in fiscal 2015, including 49 ($21m) to examine potential therapeutic properties of cannabinoids & 15 ($9m) on CBD. This is in addition to 17 independently funded research projects approved since 1999 to study possible therapeutic uses of marijuana/derivatives.

- The DEA says the number of authorized researchers is growing. 399 active researchers were registered as of June 2015 to study Schedule I controlled substances. Of these, 265 were studying marijuana & extracts, including CBD (41 with human subjects).

- The U.S. Senate Drug Caucus held a hearing in 2015 to lower CBD research barriers & said the U.S. Justice Department would analyze CBD for potential medical benefits. The Administration also removed an extra federal research requirement.
U.S. Marijuana Policy Continuum


<2006
All
Illegal

1996
California
Approves
“Medical”

2012
Colorado
Approves
“Personal”

2014
Utah
Approves
“CBD Oil”

Changing Attitudes: Quest & compassion for therapy, financial incentives, social justice, privacy concerns, social media/internet, etc.?

Critical Considerations: Medical efficacy, research outcomes, public safety & holistic policy!
What’s Next?

• Clear the language clutter & confusion.

• Skepticism can be healthy (“How do you know?”).

• Scientifically vet non-psychoactive CBD for medical possibilities.

• Psychoactive marijuana (mind-altering THC) is another matter.

• Include public safety in the conversation.

• #1 question: “Is it good for Iowa kids?”

• Accelerate research, heighten education & foster understanding.
Share the News & Stay Safe!

Iowa Office of Drug Control Policy
Visit Our New Website: https://odcp.iowa.gov