

Marijuana Impairment

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Investigative Services Section



Objectives

- Cannabis Trend
- Minnesota Medicinal Update
- Edible Cannabinoids
- Breakdown of Cannabis/Marijuana
- Discuss the impairing chemicals in Marijuana
- Cannabis Impairment
- HF 100 / SF 73 Update



The Trend

- In 2019: Persons 12 years and older...
 - 50.2% indicated they've used MJ in their life
 - 49.2% in 2018
 - 20.8% indicated they've used MJ in the past year
 - 19.4% in 2018
 - 11.5% indicated they've used MJ in the past month
 - 10.1% in 2018



Why do we care?

- In states where marijuana has been legalized...
 - In 2018
 - Emergency-room visits related to marijuana increased by 54%
 - Hospitalizations increased by 101%
 - Suicides where toxicology tests indicated marijuana had been used increased from 7.6% in 2006 to 23% in 2017
 - In Colorado
 - The cost of marijuana to taxpayers is nearly \$5.00 for every \$1.00 gained in tax revenue
 - Marijuana-related DUIs cost approximately \$25 million in 2016



Minnesota Medicinal Marijuana

History

- 2014 – Mark Dayton signed the bill
 - Cancer, Glaucoma, HIV/AIDS, Tourettes, ALS, seizure disorders, Multiple Sclerosis, Crohn’s Disease, painful terminal illness with less than 1 year to live.
- July 1, 2015 – distribution began
 - Only liquid, pill, or vape
- Two distributors – 13 locations
 - Green Thumb
 - Green Goods of Minnesota



Medicinal Marijuana Today

- 19 qualifying conditions
 - Cancer
 - Glaucoma
 - HIV/AIDS
 - Tourette Syndrome
 - ALS
 - Inflammatory bowel disease
 - Seizures
 - Sickle Cell Disease
 - Chronic Pain
 - Irritable bowel syndrome (Aug 1, 2023)
- Severe and persistent muscle spasms
- Terminal illness (life expectancy under 1 year)
- Intractable pain
- PTSD
- Autism
- Obstructive Sleep Apnea
- Alzheimer's
- Chronic Motor or Vocal tic disorder
- Obsessive-compulsive disorder (Aug 1, 2023)

MN Chapter 4770 – Medical Cannabis

- Packaging and Labeling
 - Plain
 - Designed to maximize the shelf life
 - Tamper-evident
 - Child-resistant
 - Must not bear a reasonable resemblance to any commercially available product
 - Packaged to minimize its appeal to children
 - Must not depict images other than the medical cannabis manufacturer's business name or logo

MN Chapter 4770 – Medical Cannabis

- Labeling Requirements
 - Patient's registry identification number, Name, Date of birth
 - Name and date of birth of the designated registered caregiver
 - Name of patient's parent or legal guardian
 - Patient's address
 - Name and address of medical cannabis manufacturer
 - Chemical composition of medical cannabis
 - Recommended dosage
 - Directions for use
 - All ingredients with common names
 - Including: Color, artificial flavors, preservatives
 - Listed in descending order by predominance of weight

MN Chapter 4770 – Medical Cannabis

- Labeling Requirements – Cont.
 - Date of manufacture and batch number
 - Notice with the statement, including capitalization:
 - “This product has not been analyzed or approved by the United States Food and Drug Administration. There is limited information on the side effects of using this product, and there may be associated health risks. Do not drive or operate heavy machinery when under the influence of this product. KEEP THIS PRODUCT OUT OF REACH OF CHILDREN.”
 - Notice with the statement:
 - “This medical cannabis is for therapeutic use only. Diversion of this product is unlawful and may result in the revocation of the patient’s registration.”

What does Medical Cannabis Look Like?

- Oral Solutions (oils)
 - Sublingual Spray
 - Oral Capsules
 - Vaporization Oils
 - Topical Formats
-
- NOT (March 2022):
 - Leaves
 - Buds
 - Edibles



Can Medical Cannabis Impair You?

- What do you think?
- Can It?



The Answer.....

- It depends on...
 - Type of medication
 - Dosage
 - Person
 - Chemicals
 - Other medications
 - Anything else?

RX

PATIENTS
NAME

ADDRESS

Can You Drive While on Medical Cannabis?

- No!
- Back to the labelling requirements in Minnesota...
 - “This product has not been analyzed or approved by the United States Food and Drug Administration. There is limited information on the side effects of using this product, and there may be associated health risks. **Do not drive or operate heavy machinery when under the influence of this product.** KEEP THIS PRODUCT OUT OF REACH OF CHILDREN.”

Minnesota State Statute 152.72



MSS 152.72

- Subd. 1

- Edible Cannabinoid Product = any product that is intended to be eaten or consumed as a beverage by humans, contains a cannabinoid in combination with food ingredients, and is not a drug

- Subd. 3

- Non-intoxicating cannabinoids = no more than 0.3% THC




MSS 152.72

- Subd. 5
 - Labelling can be accessed through scan-able QR code via phone
 - Name, location, contact phone number and website of the manufacturer
 - Name and address of the laboratory used
 - Accurate statement of the amount of cannabinoids



SCAN FOR FULL PRODUCT DETAILS



Blue Dream
STRAIN: Hybrid
TYPE: Flower
DATE TESTED: 7/7/2014

	THC	CBD	CBN
REG NO:	13.2%	1.2%	<0.1%
Client Name			
Client Email			
Client Website			
Client Phone			

THC : CBD
11 : 1

mcr
VLABS
mcrvlabs.com
info@mcrvlabs.com
(508) 872-6666

PATIENT: _____ QTY: _____

This product has not been analyzed or approved by the FDA. There is limited information on the side effects of using this product, and there may be associated health risks. Do not drive or operate machinery when under the influence of this product. KEEP AWAY FROM CHILDREN.



MSS 152.72

■ Subd. 6

■ Must not:

- Bear the likeness or contain cartoon-like characteristics
- Be modeled after a brand of products primarily consumed by children
- be packaged in a way that resembles the trademarked, characteristic, or product-specialized packaging of any commercially available food or product
- Be packaged in a container that includes a statement, artwork, or design that could reasonably mislead any person to believe that the package contains anything other than THC.
- If the package contains multiple servings, they must be separated or scorn
- Package must show: Serving size, cannabinoid profile, list of ingredients and “keep this product out of the reach of children”
- Each dose – 5mg or less (combined amount). Each package – 50mg or less



Examples



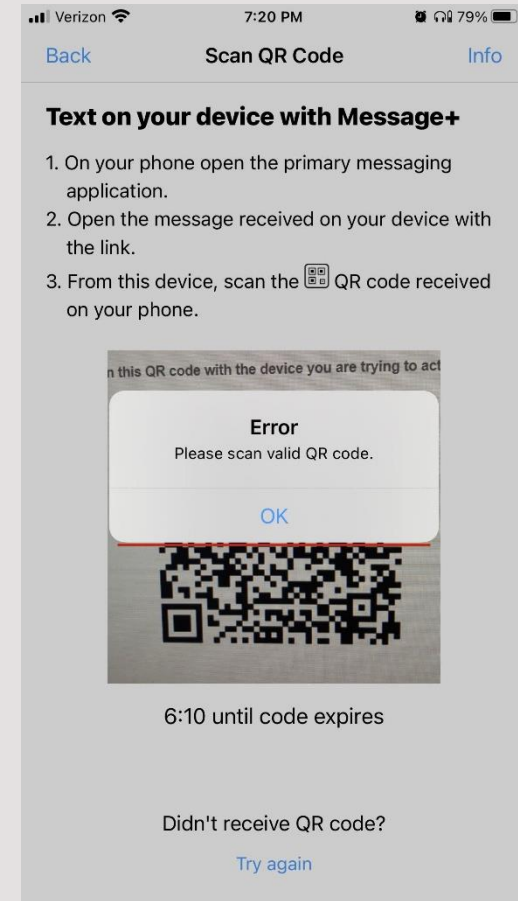
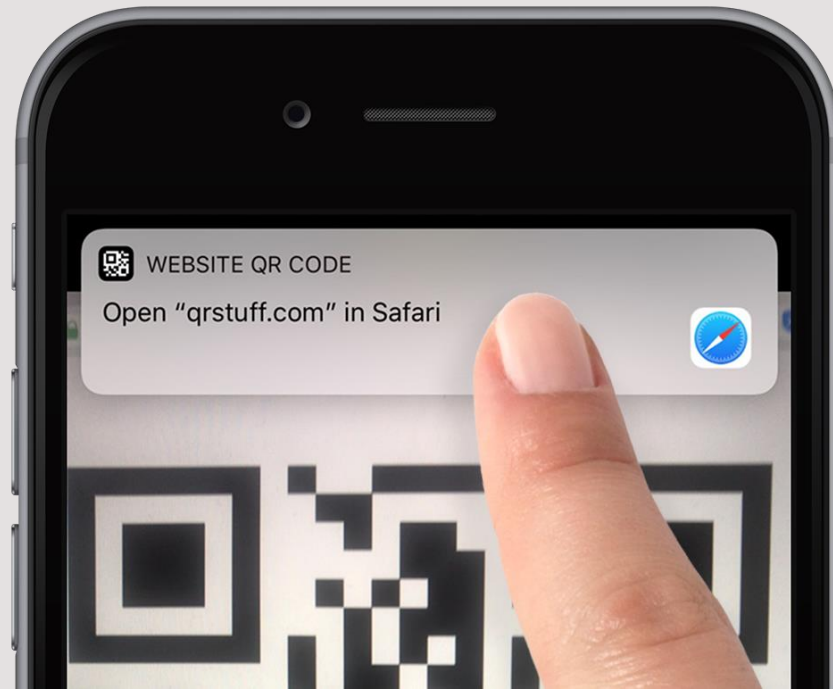
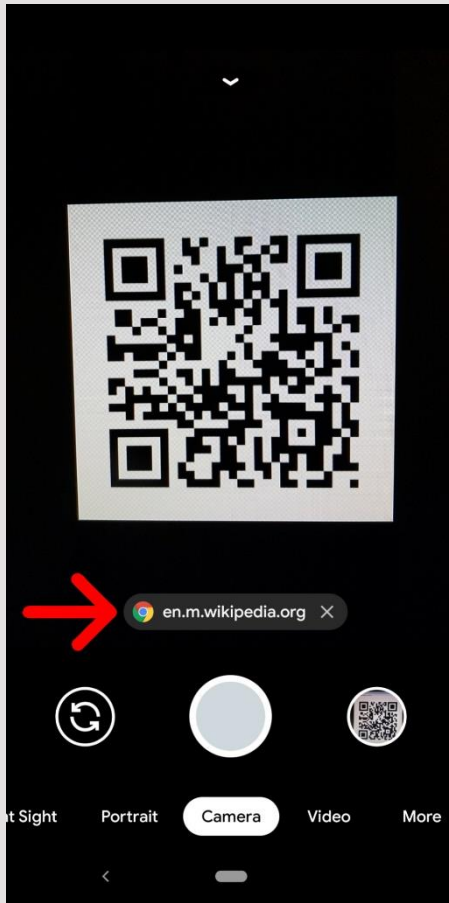
More Examples



QR Code



QR Code on Phone





Breakdown of Marijuana

Cannabis v Marijuana

- Cannabis
 - All products derived from the plant *Cannabis Sativa*
 - Contains about 540 chemicals
- Marijuana
 - Parts of or products from the plant *Cannabis Sativa* that contain tetrahydrocannabinol (THC)



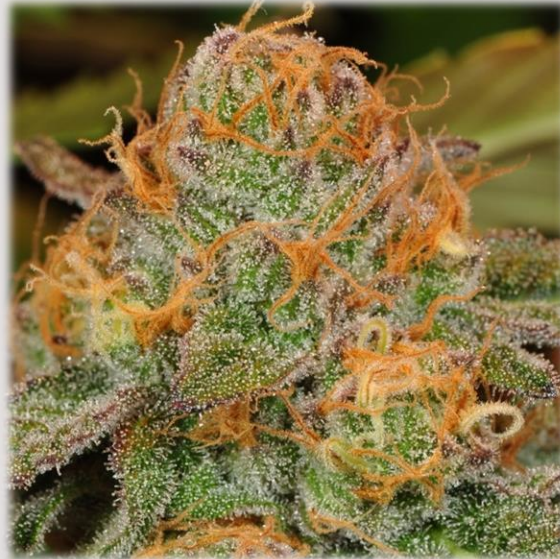
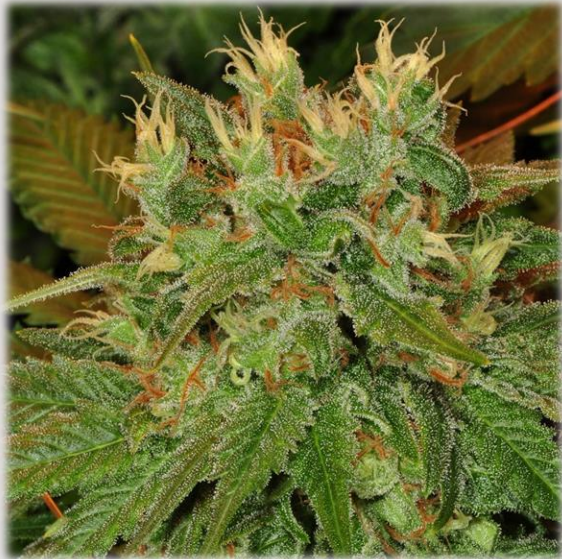
THC v CBD

- Tetrahydrocannabinol (THC)
 - Psychoactive Ingredient
 - Recreational users want high THC as it gives them the most high
- Cannabidiol (CBD)
 - Non-psychoactive
 - Medical benefits
 - Medical marijuana has higher CBD than recreational



Trichomes

- Tiny crystal-like resin gland
 - Contains more than 50% of THC/CBD in the plant



WHEN TO HARVEST YOUR CANNABIS



CLEAR TRICHOME

Not enough potency yet.
decreased yield



CLOUDY TRICHOME

Energetic High



AMBER TRICHOME

Body / Couchlock
High



MIXED TRICHOME

Combined effect
head and body
high

Types of Marijuana

- Sativa
- Indica
- Hybrid



Sativa

- Origin
 - Hot, dry climates – Africa, Central America, SE Asia, W Asia
- Plant
 - Tall and thin – Up to 12 feet high. Take longer to mature
- CBD to THC Ratio
 - Lower CBD and Higher THC
- Common Effects
 - “Mind High”
 - Anxiety-reducing
 - May feel productive and creative
- Popular Strains
 - Acapulco Gold (0.1% CBD / 15-23% THC), Panama Red, Durban Poison



Indica



- Origin
 - Afghanistan, India, Pakistan, and Turkey. Adapt to harsh, dry, and turbulent climate of the Hindu Kush Mountains
- Plant
 - Short and Stocky. Bushy greenery and chunky leaves. Faster growing, more buds.
- CBD to THC Ratio
 - Higher CBD, Lower THC
- Common Effects
 - Relaxing – May reduce nausea and pain, increasing appetite
- Popular Strains
 - Hindu Kush, Afghan Kush (6% CBD / 16-21% THC), Granddaddy Purple



Hybrid



- Origin
 - Typically grown on farms or greenhouses from combo of Sativa and Indica
- Plant
 - Depends on the combination
- CBD to THC Ratio
 - Many are grown to increase THC. Each is unique to combination
- Common Effects
 - Can be anything depending on combination
- Popular Strains
 - Pineapple Express (<0.1% CBD / 23% THC), Trainwreck, Blue Dream (<1% CBD / 30% THC)

MANY DIFFERENT STRAINS OF CANNABIS

STRAIN IS USED TO DIFFERENTIATE BETWEEN CANNABIS SATIVA AND INDICA. IT REFERS TO THE SPECIFIC BREED OF EACH INDIVIDUAL PLANT. OVER THE YEARS, FAMILIAL STRAINS HAVE DIVIDED INTO SPECIFIC SUBSECTIONS. THOUGH STRAINS MAY SHARE LINEAGE, THE DIFFERENCES ARE NUMEROUS



SATIVA STRAINS

Sativa strains have an uplifting effect and offer a cerebral high that includes:

- **Laughing uncontrollably**
- **Engaging in in-depth conversations**
- **Thinking creatively**

Sativa strains grow tall and thin - the plant can grow up to 20 feet in an outside garden. Popular strains include:

AMNESIA HAZE

Beloved by morning users, it offers an uplifting boost.

CHERRY AK

With a sweet, fruity smell and taste, this strain can help elevate a bad mood.

GREEN CRACK

Users are rewarded with a blast of exhilarated energy.

SOUR DIESEL

Despite a diesel smell, this strain offers the highest happiness quotient.



INDICA STRAINS

Indica strains have a relaxing, sedative effect, often used to:

- **Reduce stress**
- **Relieve pain**
- **Limit anxiety**

Indica strains are a bushy plant that can grow between 3 and 6 feet tall and are suitable for growing indoors. Popular strains include:

BUBBA KUSH

With a coffee and chocolate taste, this strain has a heavy tranquilizing effect.

NORTHERN LIGHTS

This pure indica is known to have come from the "mother plant."

HEROJUANA

To battle insomnia, this strain induces a heavy, relaxing sleep.

SKYWALKER OG

This strain is known for its healing properties for those with PTSD.



HYBRID STRAINS

Hybrid strains offer a mix of effects, combining the traits they inherited from their parent strains. Hybrids are known to:

- **offer a relaxing body effect**
- **Create balance of mind and body**
- **Limit anxiety**

Of the roughly 779 strains, over half of them are hybrids. Popular strains include:

BLUE DREAM

Offers a total relaxation while energizing the mind.

HEADBAND

Great for pain relief and a feeling of elation.

GIRL SCOUT COOKIES

This strain is a more extreme version of Blue Dream, so go easy!

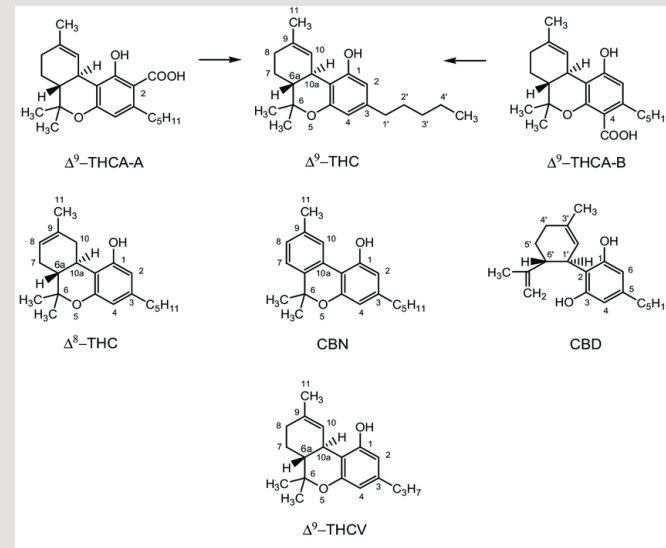
PINEAPPLE EXPRESS

This sweet, tropical strain leaves one feeling happy and euphoric.



The Impairing Chemical in Marijuana

- Tetrahydrocannabinol (THC)
 - What is it?
 - Responsible for most of the psychological effects
 - Impairing chemical in marijuana
 - Types of THC?
 - THCA
 - THCV
 - Δ -8
 - Δ -9
 - Δ -10



Tetrahydrocannabinolic Acid

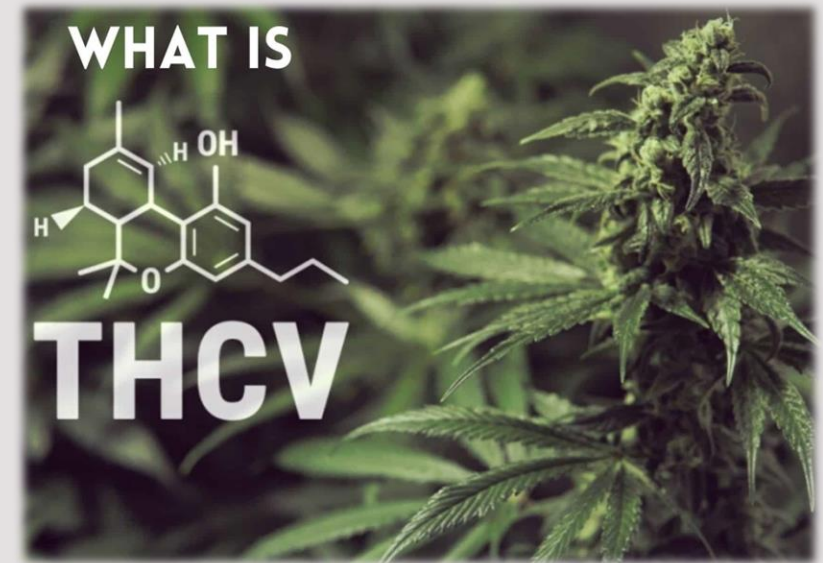
- THCA
 - Not psychoactive or mind-altering
 - Source of other three types
 - Decarboxylation - add sunlight and heat
 - Benefits:
 - Epilepsy
 - Nausea
 - Arthritis
 - Inflammation
 - Fibromyalgia
 - Chronic Pain
 - Diabetes
 - MS/ALS – muscle spasms



Tetrahydrocannabivarin

■ THCv

- Byproduct of THCA
- No mind-altering properties in *low doses*
- May feel effects more rapidly
- Appetite Suppressant
 - Can help lose weight
- Benefits:
 - Diabetes – especially type II
 - Pain and Swelling
 - Anxiety
 - Tremors from Parkinson's and ALS
 - Brain lesions from late-stage Parkinson's
 - Epilepsy
 - Alzheimer's
 - Osteoporosis and related conditions – stimulates bone growth



Delta-8 Tetrahydrocannabinol

- $\Delta 8$ -THC
 - After Delta-9 ages and is exposed to oxidation
 - Not as potent as Delta-9 – Still produces high
 - Euphoric feeling tends to be less intense than Delta-9
 - Benefits:
 - Decreases nausea and vomiting
 - Neuroprotectant – helps protect brain cells
 - Reduces anxiety
 - Stimulates appetite
 - Helps relieve pain (analgesic)
 - Can reduce tumor size
 - Helps cause the release of acetylcholine
 - Involved in memory and learning



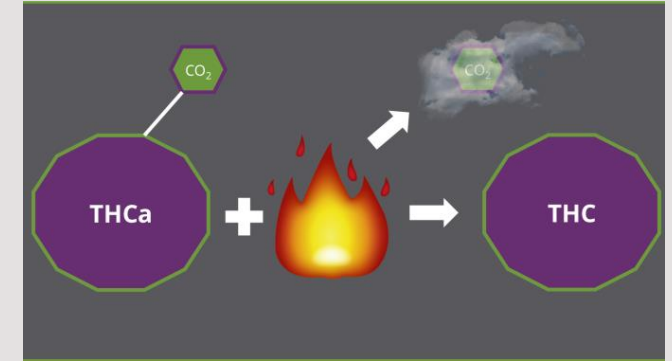
Delta-9 Tetrahydrocannabinol

■ Δ 9-THC

- Commonly referred to as THC
- Main psychoactive compound
- Concentration much higher in female plants
- Produces high

■ Benefits:

- Reduces anxiety
- Improves sleep
- Increases appetite
- Relieves pain
- Decreases nausea and vomiting
- Helps protect brain cells
- Promotes brain growth
- Helps PTSD sufferers
- Enhances our senses
- Antibacterial properties
- Antioxidant effects
- Reduces swelling and pain
- Acts as a bronchodilator – opens airways
- Relaxes muscles
- May battle tumors?
- Anti-convulsant or anti-seizure properties



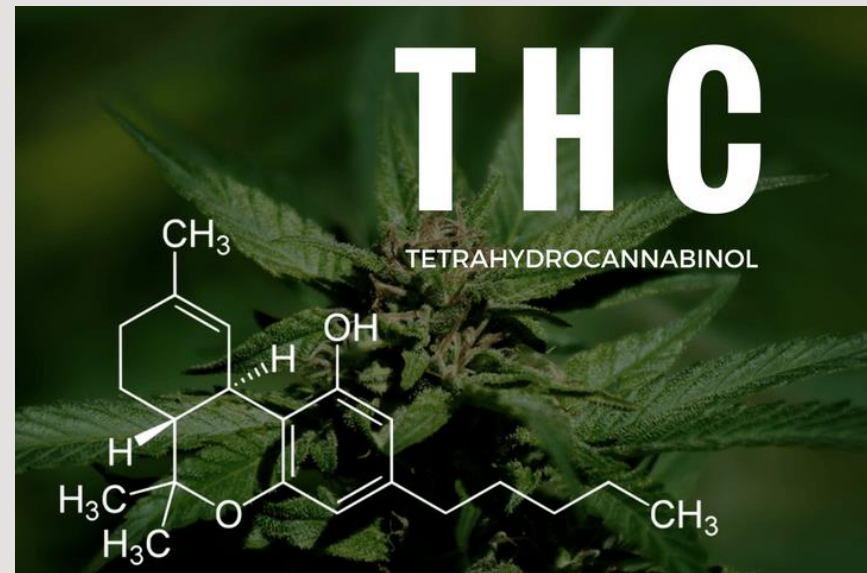
Delta-10 Tetrahydrocannabinol

- Less potent than delta-9
- Commonly processed from hemp-derived CBD
- Commonly reported to provide energizing effects (more like a sativa)
 - More of a head buzz
- Clear appearance
- Creating:
 - Crude CBD or CBD isolate
 - Use derivatives of Vitamin C and Carbon **or** solvents and acids



THC Levels

- Mid 1990's
 - Averaged 2% to 4%
- 2014
 - Averaged 14%, some strains leveling 37%
- CBD
 - 0.3%
- Edibles
 - Unknown due to manufacturer
- Wax (Dab)
 - 60% to 99.99%
- Leafline Labs Products
 - 5mg to 1200mg THC
 - 1200mg would be used for Chronic Pain or like conditions



Shatter/Dab/Wax/Resin/Hash



A close-up photograph of a green cannabis leaf and a rolled paper, likely a cigarette or joint, resting on a blue textured surface. A magnifying glass is positioned over the rolled paper, suggesting an inspection or analysis. The background is softly blurred, showing a white surface and a dark shadow.

DWI Enforcement

CRIMJIG 29.04: Driving Under the Influence of a Controlled Substance - Elements

“There is no set standard as to the quantity of a controlled substance a person must ingest before a person is regarded as being ‘under the influence.’ When a person is so affected by a controlled substance that the person **does not possess that clearness of intellect and control of themselves as they otherwise would have**, that person is under the influence of a controlled substance.”



Effects of Cannabis

- Relaxation
- Euphoria
- Relaxed inhibitions
- Disoriented
- Altered time and distance perception
- Lack of concentration
- Impaired memory
- Altercations in thought process
- Drowsiness
- Sedation
- Mood changes



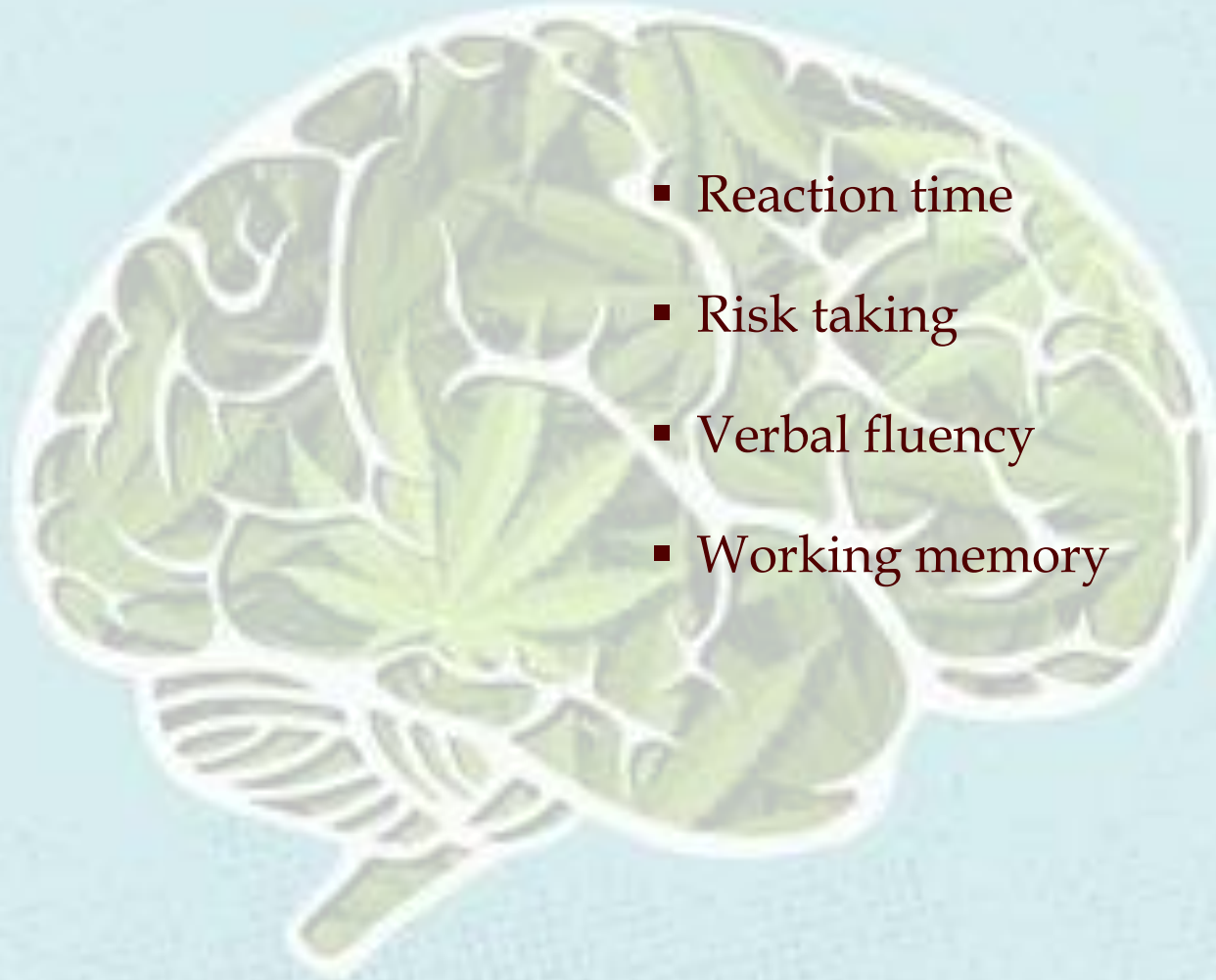
Other characteristics

- Odor of marijuana
- Debris in mouth (green tongue)
- Red, bloodshot eyes
- Body tremors
- Eyelid tremors



Cannabis Effects...

- Attention
- Concentration
- Decision-making
- Impulsivity
- Inhibition
- Reaction time
- Risk taking
- Verbal fluency
- Working memory



Field Sobriety Testing

- If possible, conduct:
 - Horizontal Gaze Nystagmus
 - Walk and Turn
 - One Leg Stand
 - Modified Romberg Balance Test
 - Lack of Convergence
 - Take a pulse



Example...



What will you see?

- No HGN (poss. LOSP)
- Lack of Convergence
- Poor balance
- Elevated pulse
 - Duck on a pond
- Eyelid and body tremors
- Residue
- Slurred speech
- Possible dilated pupils

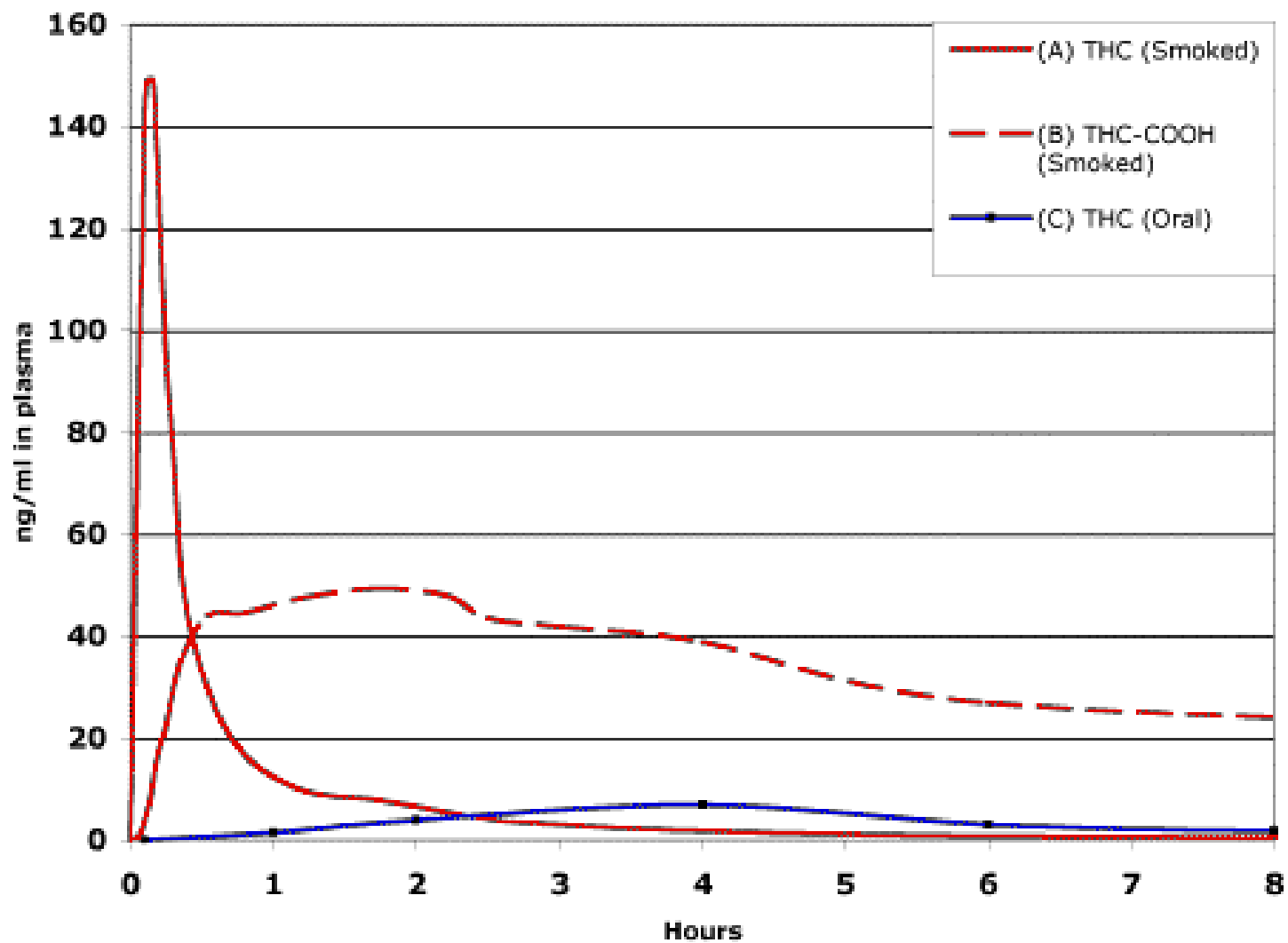


Lack of Convergence





Blood Levels of THC & Metabolite



BCA Results

MINNESOTA DEPARTMENT OF PUBLIC SAFETY
Bureau of Criminal Apprehension - Forensic Science Laboratory

Lab No. XXXXXX
Report No. 1

Results of Laboratory Examination

The following are results confirmed by Liquid Chromatography/Mass Spectrometry:

<u>Type of Drug:</u>	<u>Concentration</u>	<u>Associated Expanded Uncertainty</u>	<u>Units</u>
delta-9-tetrahydrocannabinol (delta-9-THC)	2.95	±0.52	ng/ml
11-hydroxy-delta-9-tetrahydrocannabinol (an active metabolite of delta-9-THC)	1.07	±0.16	ng/ml
11-nor-9-carboxy-delta-9-tetrahydrocannabinol (an inactive metabolite of delta-9-THC)	65	±15	ng/ml
delta-8-tetrahydrocannabinol (delta-8-THC)	Not Detected		
Cannabidiol (CBD)	Not Detected		
Cannabinol (CBN)	Not Detected		
Cannabigerol (CBG)	Not Detected		



Totality of the Circumstances

- Officer's training & experience
- Driving Conduct (if applicable)
- Observations
- Admissions
- Performance on field sobriety tests
- DRE Exam
- Test Results





What is a DRE?

Drug Recognition Expert (Evaluator)

- Highly trained
- Determine whether an individual is under the influence of drugs
- Determine whether an individual is under the influence of a combination of substances
- Determine whether the person is injured or ill
- Identify what category(ies) of drug(s) someone is on
- Document their observations



Training

- 9-day classroom
 - Pre-School
 - DRE School
- Certification trip out of MN
- Final Knowledge Exam
- Recertification
 - 2 yearly instructor-witnessed evaluations
 - 8 hours of continuing education



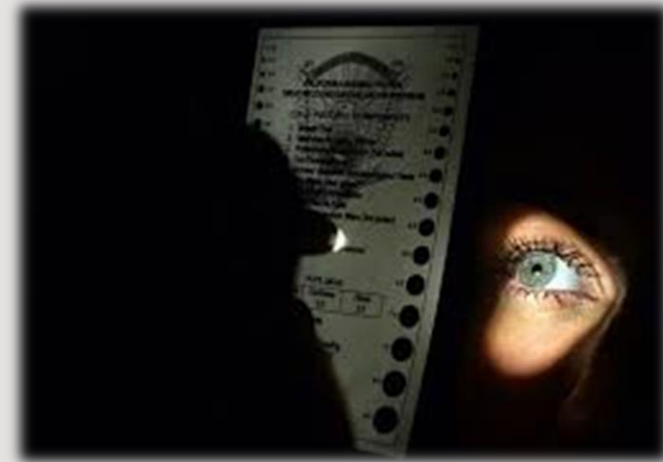
12 Step Process

1. Breath Alcohol Test
2. Interview of Arresting Officer
3. Preliminary Examination
4. Eye Examination
5. Divided Attention Tests
6. Vital Signs



12 Step Process

7. Dark Room Checks
8. Check for Muscle Tone
9. Check for Injection Sites
10. Interrogation of Subject
11. Opinion of Evaluator
12. Toxicological Sample





H.F. 100 / S.F. 73

Cannabis Legalization



Cannabis vs. Marijuana vs. THC

- Task Force requested a cleanup of language to make it consistent.



H.F. 100 / S.F. 73

- Prohibits using while driving



- Open packages in trunk



Oral Fluid Roadside Testing Pilot Project







Questions



Thank you!

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