Medical Marijuana Awareness Webinar

CANNABIS & MULTIPLE SCLEROSIS

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Please send your questions using the Q&A button at the bottom center of your screen. The speakers will answer after the presentation. The Q&A feature is public. Both panelists and attendees will see your question.
Setting Boundaries & Disclaimers

The purpose of this group is to provide a safe, supportive and judgment free zone where we can advocate for and discuss medical cannabis, as well as local and state resources.

It is best to always discuss with your physician before making any medical decisions about your health. The goal of this group is to engage with the community and to help educate Medical Cannabis through discussion.

No matter our background, we are all coming together as medical cannabis patients, students, advocates, and researchers.
**Multiple sclerosis (MS)** is a disease that causes **demyelination** (disruption of the myelin that insulates and protects nerve cells) of **spinal nerve** and brain cells

- There are four types of MS
  - RRMS: Relapsing-remitting multiple sclerosis,
  - SPMS: Secondary-progressive multiple sclerosis, the most common type
  - SPMS: Primary-progressive multiple sclerosis
  - PRMS: Progressive-relapsing multiple sclerosis

- There is currently no cure, but treatment may slow its progression

- Marijuana may be useful for treating several symptoms for this condition
The marijuana plant, or Cannabis Sativa, has dozens of chemical that can affect your mind and body.

**MULTIPLE SCLEROSIS BREAKDOWN**

It is the breakdown of the thin sheet that offers protection and insulation to the brain and spinal cord, known as myelin sheets.

Symptoms of MS can include:
- Visual changes including double vision or loss of vision
- Numbness
- Tingling or weakness (may range from mild to severe)
- Paralysis
- Vertigo or dizziness
- Erectile dysfunction (ED, impotence)
- Pregnancy problems
- Incontinence (or conversely, urinary retention)
- Muscle spasticity
- Incoordination of muscles
- Tremor
- Painful involuntary muscle contractions
- Slurred speech
- Fatigue

**Main symptoms of Multiple sclerosis**

- **Central:**
  - Fatigue
  - Cognitive impairment
  - Depression
  - Anxiety
  - Unstable mood

- **Visual:**
  - Nystagmus
  - Optic neuritis
  - Diplopia

- **Speech:**
  - Dysarthria

- **Throat:**
  - Dysphagia

- **Musculoskeletal:**
  - Weakness
  - Spasms
  - Ataxia

- **Sensation:**
  - Pain
  - Hypoesthesias
  - Pareesthesias

- **Bowel:**
  - Incontinence
  - Diarrhea or constipation

- **Urinary:**
  - Incontinence
  - Frequency or retention

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CANNABIS & MULTIPLE SCLEROSIS

Multiple Sclerosis (MS) is a degenerative and chronic disease of the central nervous system, with an autoimmune component, that affects the brain and the spinal cord. It is the second cause of disability in young adults after car accidents.

In MS, the immune system attacks the protective sheath (myelin) that wraps the axons of the neurons in the brain and spinal cord, causing communication issues between the brain and other parts of the body. With the passing of time, it can cause permanent damage of the neurons, provoking a permanent disability of different parts of the body.

There are different types of MS depending on the course of the disease: relapsing-remitting or chronic (primary, secondary).

Evidence shows alterations in different parts of the endocannabinoid system in MS patients and its animal models:

- Anandamide (AEA) was increased in the cerebrospinal fluid and plasma of MS patients in remission (Di Filippo et al., 2007).
- Cannabinoid CB1R and CB2R receptors and FAAH enzyme of endocannabinoid degradation were augmented in nervous system lesions of MS patients (Benito et al., 2007).
- A decrease in the enzyme FAAH was found in the blood of patients with secondary progressive MS (Jeah-Gilles et al., 2009).

Based on these data, medical treatment with Cannabis could diminish the neuroinflammation of this disease and, therefore, the damage.

Symptomatology improvement of MS patients consuming recreative Cannabis led to the first study of Cannabis and MS (Petro and Ellenberger, 1981). More studies were performed in the following years.

Several controlled clinical trials were performed, showing a limited evidence of cannabinoids effects (THC + CBD) in one of MS symptoms: spasticity (Zajicek et al., 2005).

MEDICINAL CANNABIS IN MULTIPLE SCLEROSIS

1981

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2002

Several controlled clinical trials were performed, showing a limited evidence of cannabinoids effects (THC + CBD) in one of MS symptoms: spasticity (Zajicek et al., 2005).

2011

Sativex ® approval, the first cannabis based medicine (THC and CBD in 1:1 ratio) to be commercialized for spasticity treatment in MS.

CANNABINOIDS IN ANIMAL MODELS OF MS

The administration of phytocannabinoids, endocannabinoids and synthetic cannabinoids in animal models of MS improves the motor symptomatology associated with the disease and its development (Chiurghi et al., 2018).

- **Decay of neuroinflammation:**
  - Cannabinoids have a potent anti-inflammatory effect in MS. This effect is mediated by the activation of CB2 receptors in immune and glial cells, and in CB1R/CB2R of the blood brain barrier cells.

- **Increase of endogenous reparative mechanism:**
  - Cannabinoids promote the regeneration of myelin sheaths in the nerve fibers, and protect from neuronal death. These effects are mediated by the activation of CB1 receptors in oligodendrocytes and neurons.

It is necessary to explore in depth the cannabinoid effects in order to develop therapies for MS patients, and diminish motor and cognitive decline associated to the disease.

CANNABIS does not have a cure. There are treatments that help to recover from the relapses, to control the symptoms, and to change the evolution of the disease:

- **Treatment for the relapses:** Corticosteroids, Plasma exchange.
- **Treatment to modify the evolution:** Beta Interferons, Glatiramer Acetate, Fingolimod, Dimethylfumarate, Occluzumab, Natalizumab, Alemtuzumab, Trifluonimide, Siponimod, Mitoxantrone.

MEDICAL MARIJUANA AWARENESS WEBINARS

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References

- World Health Organization (Multiple Sclerosis Atlas, 2013). who.int
- Mayo Clinic. www.mayoclinic.org

An Infographic by Oliph Illustration
<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
</tr>
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<tbody>
<tr>
<td>1981</td>
<td>Researchers found motivation in anecdotal accounts of MS patients who reported that inhaling cannabis gave relief from spasticity. Combined with scientific discovery that THC is able to inhibit muscle spasms in animal studies, opened the door to a multitude of scientific inquiries.</td>
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<tr>
<td>1997</td>
<td>University of Arizona Health Sciences Center in Tucson studied 112 patients with MS by inhaling cannabis and found reduced spasticity, pain, tremors, depression, anxiety, and paresthesia.</td>
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<td>2003</td>
<td>The Office of Medical Bioethics &amp; University of Calgary studied 420 patients with MS by inhaling cannabis and found a reduction in several symptoms: anxiety, depression, spasticity, and chronic pain.</td>
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<td>2006</td>
<td>Hunters Moor Regional Neurological Rehabilitation Centre, UK replicated the study with Sativex, a cannabis synthetic, as an oromuscal spray delivering 2.7 mg THC and 2.5 mg CBD. And found a reduction in spasticity, neuropathic pain, and neuropathic pain of other etiologies. (Barnes, 2006)</td>
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<td>2017</td>
<td>The National Multiple Sclerosis Society published a Cannabis Summary regarding using cannabis for the treatment of MS and has stated their key points:</td>
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<td>• “People with MS experience symptoms that may not be adequately controlled with FDA approved medications. Some people with MS have tried cannabis products to relieve these symptoms.”</td>
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<td></td>
<td>• “Based on existing evidence, cannabis products are probably effective for treating patient reported symptoms of spasticity and pain. Cannabis is probably not effective for MS-related tremor or urinary incontinence.”</td>
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<td></td>
<td>• The potential adverse effects of cannabis products, including new or worsening cognitive symptoms, psychosis, tolerance and dependence, as well as drug to drug interaction.</td>
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<td>2019</td>
<td>77 patients diagnosed with MS found alleviation of symptoms by way of cannabis usage “seen most in pain (71%), spasticity (43%), and sleep (42%). In addition, 34% of patients were able to decrease and discontinue other medications including opioids, stimulants, and benzodiazepines.</td>
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The National MS Society supports the ability of people living with MS to make informed choices about their treatments with their MS health care providers, including the use of medical cannabis.

“To date, the major active metabolites [identified] in medical marijuana are Δ9-tetrahydrocannabinol (THC) and cannabidiol (CBD), and these have been found to have benefits in individuals with MS, particularly regarding pain and spasticity.”

... Clyde E. Markowitz, MD, Director of Multiple Sclerosis Center at Penn Medical

“Reports of cannabinoids’ ability to reduce MS-related symptoms such as pain, spasticity, depression, fatigue and incontinence are plentiful in scientific literature.”

... NORML [National Organization for the Reform of Marijuana Laws]
THE ENDOCANNABINOID SYSTEM
CBD works with CB1 and CB2 receptors and has powerful indirect effects still being studied.

**THE HUMAN ENDOCANNABINOID SYSTEM**

CBD, CBN and THC fit like lock and key into existing human receptors. These receptors are part of the endocannabinoid system which impact physiological processes affecting pain modulation, memory and appetite, plus anti-inflammatory effects and other immune system responses. The endocannabinoid system comprises two types of receptors, CB1 and CB2, which serve distinct functions in human health and well-being.

CB1 receptors are primarily found in the brain and central nervous system, and to a lesser extent in other tissues. CB2 receptors are mostly in the peripheral organs, especially cells associated with the immune system.

**THE HUMAN ENDOCANNABINOID SYSTEM**

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The endocannabinoid system [ECS] regulates a variety of physiological processes including appetite, pain and pleasure sensation, immune system, mood and memory.
CANNABIS HELPS YOUR BODY PRODUCE IT’S OWN MEDICINE

Endocannabinoids

Endocannabinoid's brain derived

Phytocannabinoids plant derived

FATTY ACIDS

NEURONS

LONG CHAIN FATTY ACIDS

THE BODY PRODUCING AND DISTRIBUTING ENDOCANNABINOID’S
WHAT IS MEDICAL CANNABIS/MARIJUANA?

CBD - Cannabidiol
Non-Psychoactive cannabis component - Also found in Hemp

THC - Tetrahydrocannabinol
Psychoactive cannabis component
The Entourage Effect

CBD in Hemp & Cannabis

CBD
- Relieves pain
- Reduces inflammation
- Prevents slowing of bone growth
- Reduces bacterial growth
- Inhibits cancer cell growth
- Promotes bone growth
- Reduces inflammation
- Relieves pain

CBG
- Relieves pain
- Reduces inflammation
- Inhibits cancer cell growth
- Promotes bone growth
- Slows bacterial growth
- Reduces inflammation
- Relieves pain

CBDA
- Relieves pain
- Reduces inflammation
- Inhibits cancer cell growth
- Promotes bone growth
- Slows bacterial growth
- Reduces inflammation
- Relieves pain

CBN
- Relieves anxiety
- Slows bacterial growth
- Suppresses muscle spasms
- Tranquilizes
- Treats psoriasis
- Vasorelaxant

THC
- Tetrahydrocannabinol
- Inhibits cancer cell growth
- Reduces vomiting and nausea
- Relieves pain

THCV
- Tetrahydrocannabinol
- Reduces inflammation
- Reduces risk of artery blockage
- Reduces small intestine contractions

CBD
- Antibacterial
- Inhibits cancer cell growth
- Neuroprotective
- Promotes bone growth
- Reduces seizures and convulsions
- Reduces blood sugar levels
- Reduces function in the immune system
- Reduces inflammation
- Reduces risk of artery blockage
- Reduces small intestine contractions
- Reduces vomiting and nausea
- Relieves pain
- Relieves anxiety
- Slows bacterial growth
- Suppresses muscle spasms
- Tranquilizes
- Treats psoriasis
- Vasorelaxant

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THE PLANT - HEMP vs MARIJUANA

HEMP CANNABIS SATIVA

LEAVES
- Mulch & compost
- Biofuel
- Tea & juices*
- Animal fodder & bedding*
  *not legal in Australia

STEM
- Textiles
- Building materials
- Paper

ROOTS
- Topical ointments
- Soil conditioner

SEEDS
- Foods
- Industrial products
- Body care products

MARIJUANA CANNABIS INDICA

Trichomes
- are a blanket of crystal resin coating the cannabis plant.
- They contain:
  - Terpenes
    - Essential oils giving plants a distinctive aroma and flavor

The plant is trimmed down into buds, which come together in a cola at the top of the stem.
• Narrow leaves
• Longer flowering cycles
• Better suited for warm climates with long season

• Short in stature
• Broad leaves
• Shorter flowering cycles
• Better suited for colder climates with shorter season

Cannabinoids

Terpenes

Your Biology, Dosing, Consumption Method
WHAT ARE TERPENES?

- Terpenes are the most common plant chemicals in nature.
- Found in flowers, spices, fruits, vegetables and essential oils

Endocannabinoid System - Highway
Anandamide - Driver
Cannabinoid - Passenger (CBD/THC)
Terpenes navigate/shapes the Cannabinoid journey like a GPS
α-PINENE

- **AROMA**
  - Pine

- **POTENTIAL MEDICAL VALUE**
  - Treatment of:
    - Asthma
    - Pain
    - Ulcers
    - Anxiety
    - Cancer

- **VAPORIZES AT**
  - 311°F (155°C)

- **POTENTIAL EFFECTS**
  - Alertness
  - Memory Retention
  - Counteracts some THC effects

- **ALSO FOUND IN**
  - Pine Needles
  - Rosemary
  - Basil
  - Parsley
CARYOPHYLLENE

AROMA
- Pepper
- Spicy
- Woody
- Cloves

VAPOORIZES AT
- 266°F (130°C)

POTENTIAL EFFECTS
- Stress Relief

POTENTIAL MEDICAL VALUE
- Treatment of:
  - Pain
  - Anxiety
  - Depression
  - Ulcers

ALSO FOUND IN
- Black Pepper
- Cloves
- Cinnamon
LINALOOL

AROMA
Floral

VAPORIZES AT
388°F (198°C)

POTENTIAL MEDICAL VALUE
Treatment of:
• Anxiety
• Depression
• Insomnia
• Pain
• Inflammation
• Neurodegeneration

POTENTIAL EFFECTS
Mood Enhancement
Sedation

ALSO FOUND IN
Lavender
STANDARD DOSING FORMS

- Sublingual Drops/Tinctures
- Inhalation Vape Pens
- Capsules
- Topical’s
- Sprays
- Flower
- Crumble & Shatter
- Suppositories
- Edibles
## STANDARD DOSING FORMS

<table>
<thead>
<tr>
<th>FORM</th>
<th>TIME TO WORK</th>
<th>EFFECTIVENESS</th>
</tr>
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<tbody>
<tr>
<td><strong>SUBLINGUAL DROPS/TINCTURE</strong></td>
<td>15-40 Min</td>
<td>4-6 Hours Taking cannabis in through the mouth under your tongue, absorbs via the digestive system or blood vessels in the mucous membranes in the mouth.</td>
</tr>
<tr>
<td><strong>VAPE PEN</strong></td>
<td>Almost Immediately</td>
<td>2-4 Hours Electronic vaporizing device Inhaling through the lungs</td>
</tr>
<tr>
<td><strong>CAPSULES</strong></td>
<td>30 min - 2 hours</td>
<td>5-8 Hours When taking cannabis in through the mouth, it enters the bloodstream after being digested or broken down in the stomach and absorbed into the digestive system.</td>
</tr>
<tr>
<td><strong>EDIBLES</strong></td>
<td>15-40 Min</td>
<td>4-6 Hours Gummies, brownies, dots, cookies, et al</td>
</tr>
<tr>
<td><strong>TOPICALS</strong></td>
<td>Almost immediately</td>
<td>1-2 Hours A topical medicine is applied to the skin directly ‘on top’ of the place where it is needed.</td>
</tr>
<tr>
<td><strong>TRANSDERMAL PATCH</strong></td>
<td>10 min - 1 Hour</td>
<td>8 - 72 Hours A topical medicine is applied to the skin directly ‘on top’ near the neck, inside of legs, top of hands/feet, back of neck</td>
</tr>
<tr>
<td><strong>SPRAY</strong></td>
<td>Almost Immediately</td>
<td>2-4 Hours Absorbs via the digestive system or blood vessels in the mucous membranes in the mouth.</td>
</tr>
<tr>
<td><strong>FLOWER</strong></td>
<td>Almost Immediately</td>
<td>1-5 Hours <strong>REQUIRES A FL STATE FORM</strong> Inhaling through the lungs 3.5oz/35 days: 4oz in possession</td>
</tr>
<tr>
<td><strong>CRUMBLE SHATTER</strong></td>
<td>Almost Immediately</td>
<td>1-6 Hours Inhaling through the lungs</td>
</tr>
</tbody>
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TruNano Technology

TruNano Ratio Tincture is made with our nano-emulsion technology
Achieved through process of sonification
Quicker onset
The bioavailability of these products are over 90%
Acts like a water-soluble molecule
1:8, 8:1 CBD:THC  $55
Trupowder 5mg scoop, 200mg total, $50
TruTincture Drops
- 10mg each
- 10 count
- $20
Delta 8 Products

- **TruClear:** 1:1 (Delta 8: Delta 9)
- **TruPods:** 1:1:1 (Delta 8: Delta 9: CBD),
  1:1 (CBD: Delta 8),
  1:1 (Delta 8: Delta 9)
- More expansion in this line
BALANCED LIVING
A SENSE OF
RESTORATION &
CONTROL

Maintaining Emotional Wellbeing
- Talk, Animal, Music, or Art Therapies
Proper Diet, Exercise & Healthy Habits
Balancing Spiritual Wellbeing
Cognitive Health: Meditation or Tai Chi
GROUP DISCUSSION