



CANNABIS vs. PAIN: Strategies to Combat CRPS

24 March 2018 San Jose, CA

Mara Gordon

mara@auntzeldas.org

Cannabis as a Panacea



Medical Conditions

Acne	Endocrine Disorders	Obesity
ADD and ADHD	Epilepsy and Seizures	OCD
Addiction	Fibromyalgia	Osteoporosis/Bone Health
AIDS	Glaucoma	Parkinson's Disease
ALS	Heart Disease	Prion/Mad Cow disease
Alzheimer's Disease	Huntington's Disease	PTSD
Anorexia	Inflammation	Rheumatism
Antibiotic Resistance	Irritable Bowel Syndrome	Schizophrenia
Anxiety	Kidney Disease	Sickle Cell Anemia
Atherosclerosis	Liver Disease	Skin Conditions
Arthritis	Metabolic Syndrome	Sleep Disorders
Asthma	Migraine	Spinal Cord Injury
Autism	Mood Disorders	Stress
Bipolar	Motion Sickness	Stroke and TBI
Cancer	Multiple Sclerosis (MS)	
Colitis and Crohn's	Nausea	
Depression	Neurodegeneration	
Diabetes	Neuropathic Pain	

List courtesy ProjectCBD.org

State Approved Conditions

- Acne
- ADD and ADHD
- Alcohol Dependence
- ALS
- Alzheimer's disease and Dementia
- Anorexia/Cachexia (wasting syndrome)
- Anxiety and Panic Attacks
- Arnold-Chiari malformation and Syringomyelia
- Osteoarthritis
- Autism
- Auto-immune Diseases
- Causalgia
- Chronic inflammatory demyelinating polyneuropathy (CIDP)
- Crohn's disease and Ulcerative Colitis
- CRPS (Complex Regional Pain Syndrome Type I & II)
- Cirrhosis (Decompensated)
- Dravet syndrome
- Dystonia
- Fibromyalgia
- Fibrous dysplasia
- Glaucoma
- Hepatitis C
- HIV/AIDS
- Hospice patients
- Huntington's disease
- Hydrocephalus
- Inflammatory autoimmune-mediated arthritis
- Inflammatory Diseases
- Interstitial cystitis
- Irritable Bowel Syndrome (IBS)
- Lennox-Gastaut syndrome
- Migraines and other types of Headaches
- Mitochondrial disease
- Multiple sclerosis
- Muscle spasms
- Muscular dystrophy
- Myasthenia gravis
- Myoclonus (adult)
- Nail-patella syndrome (NPS)
- Nausea/vomiting
- Neurofibromatosis
- Neuropathies and Neuropathic pain
- Opioid Dependence
- Osteoporosis
- Pain
- Parkinson's Disease (PD)
- Peripheral neuropathy
- Post-concussion syndrome/Post traumatic brain injury(TBI)
- PTSD
- Residual limb pain
- Rheumatoid arthritis (RA)
- Schizophrenia
- Seizures (adult)
- Severe myoclonic epilepsy of infancy
- Sickle Cell Disease and Anemia
- Sjogren's syndrome
- Skin Conditions (non-cancer)
- Sleep Disorders
- Spasticity disorders, including Spastic Quadriplegia
- Spinal cord disease (including but not limited to arachnoiditis, Tarlov cysts, hydromyelia & Syringomyelia) and Spinal Cord Injury
- Spinocerebellar ataxia (SCA)
- Stress
- Systemic Lupus Erythematosus (SLE)
- Terminal illness
- Tourette syndrome (TS)
- Traumatic brain injury (TBI)

California, Since 1996

Compassionate Use Act – Prop 215

Sec. (1) a-b The people of the State of California hereby find and declare that the purposes of the Compassionate Use Act of 1996 are as follows:

(A) To ensure that seriously ill Californians* have the right to obtain and use marijuana for medical purposes where the medical use is deemed appropriate and has been recommended by a physician who has determined that the person's health would benefit from the use of marijuana in the treatment of cancer, anorexia, AIDS, chronic pain, spasticity, glaucoma, arthritis, migraine, or any other illness for which marijuana provides relief.

(B) To ensure that patients and their primary caregivers who obtain and use marijuana for medical purposes upon the **recommendation of a physician** are not subject to criminal prosecution or sanction.

(C) To encourage the federal and state governments to implement a plan to provide for the safe and affordable distribution of marijuana to all patients in medical need of marijuana.

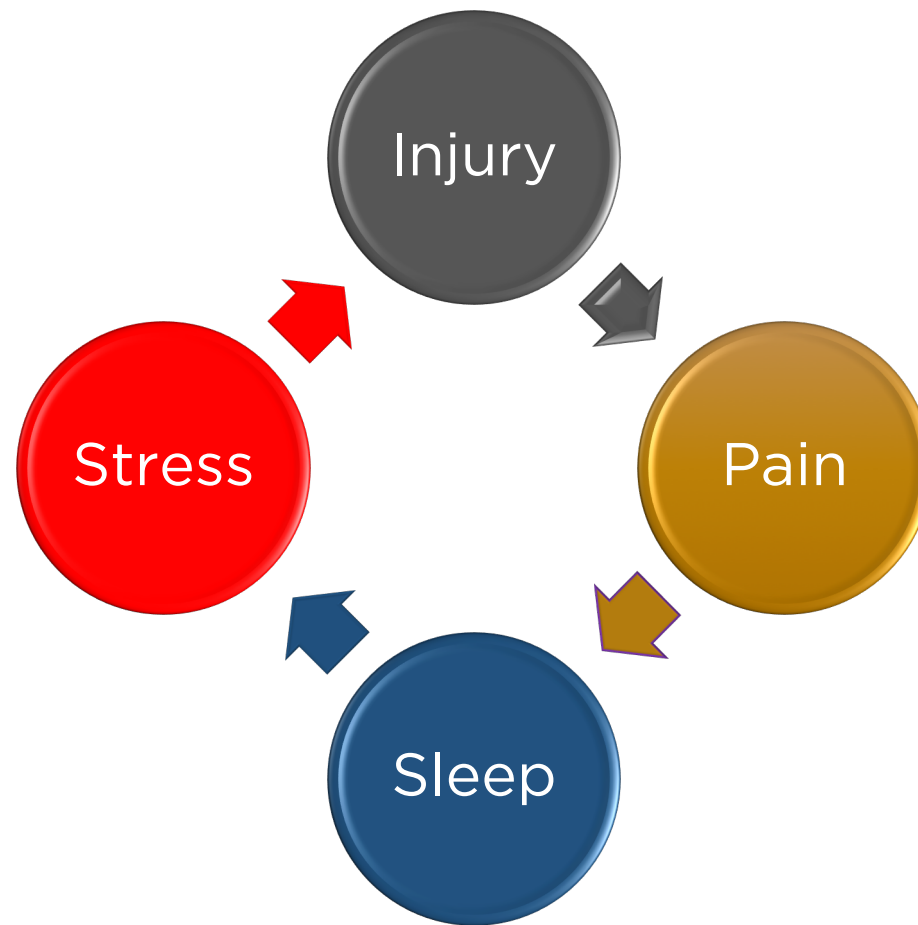
*BOLD added by me

Common Symptoms of CPRS

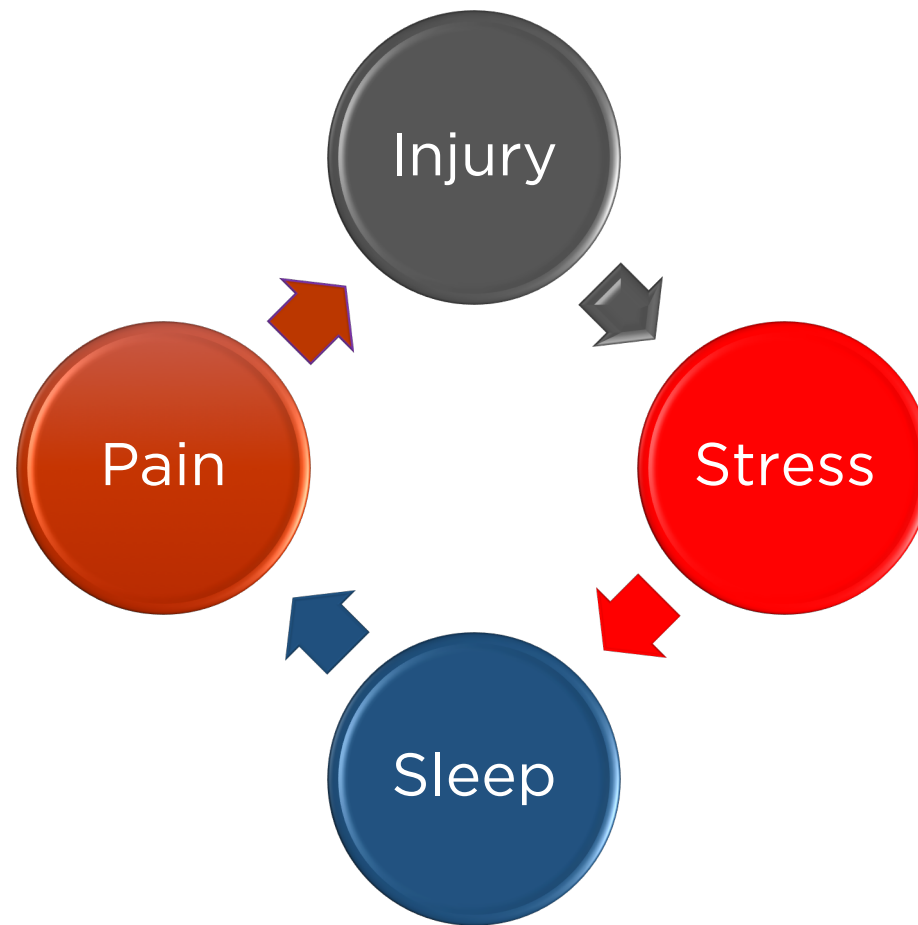
- The key symptom is, **chronic, intense pain** that is out of proportion to the severity of the injury (if an injury occurred) and which gets worse over time rather than better. It most often affects the arms, legs, hands or feet and is accompanied by:
 - burning pain
 - increased skin sensitivity to touch
 - changes in skin temperature: warmer or cooler compared to the opposite extremity
 - changes in skin color: often blotchy, purple, pale or red
 - changes in skin texture: shiny and thin, sometimes excessively sweaty
 - changes in nail and hair growth patterns
 - swelling and stiffness in affected joint
 - motor disability, with decreased ability to move affected body part

https://www.health.ny.gov/diseases/chronic/reflex_sympathetic/

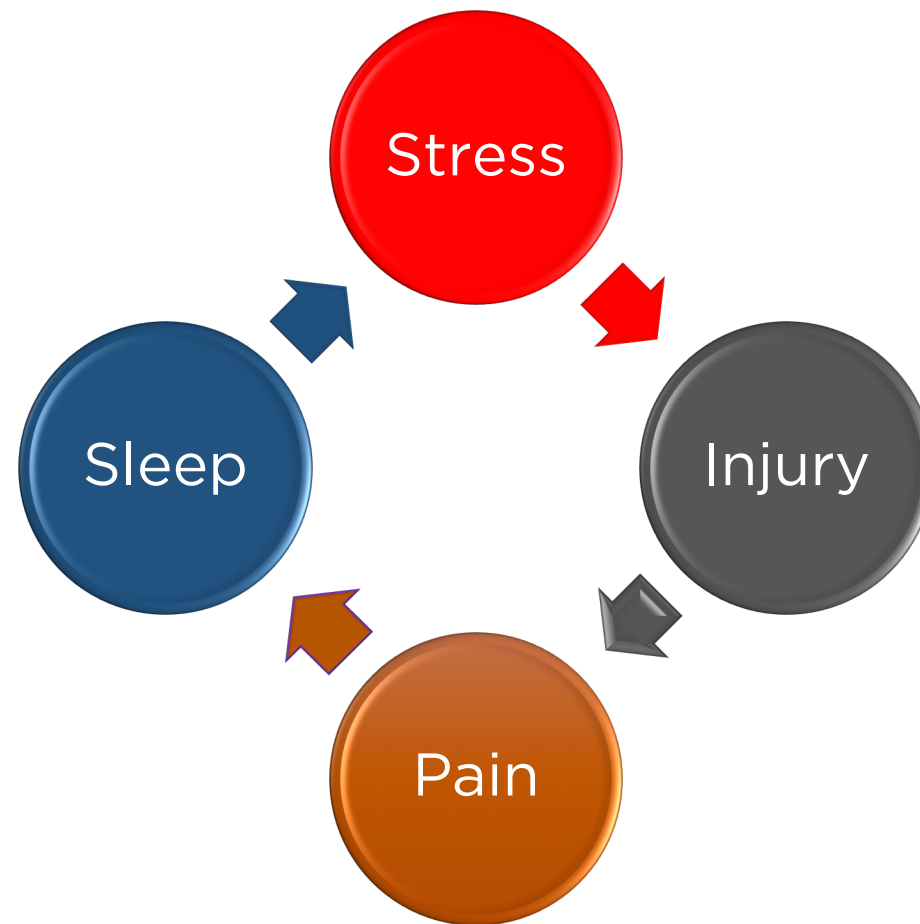
Cycle of Pain



Cycle of Pain



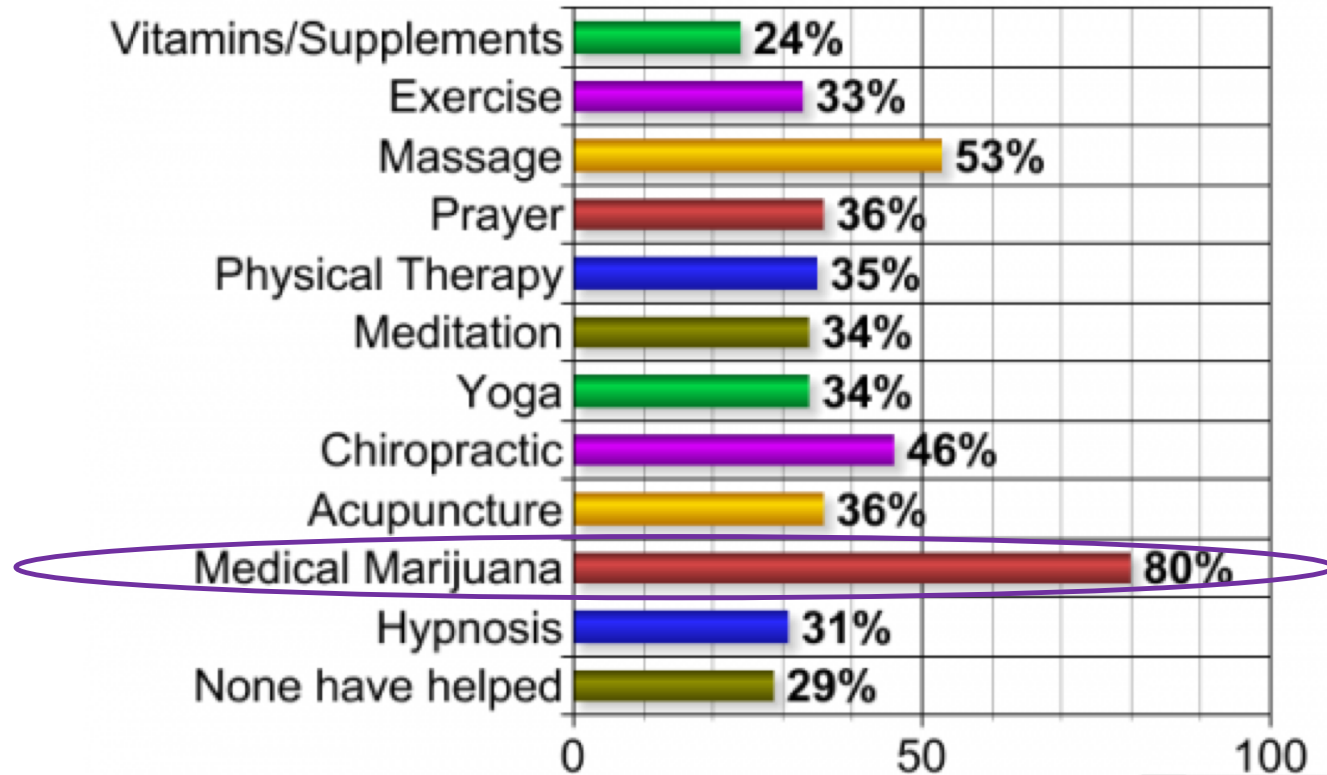
Cycle of Pain



Marijuana Rated Most Effective Alternative Treatment for Pain

Posted on September 18, 2014 in [Alternative Pain Therap](#)

WHICH ALTERNATIVE TREATMENTS
HAVE HELPED RELIEVE YOUR PAIN?



SOURCE: <http://nationalpainreport.com/marijuana-rated-most-effective-alternative-treatment-for-pain-8824875.html>

Common Non-Surgical Treatments

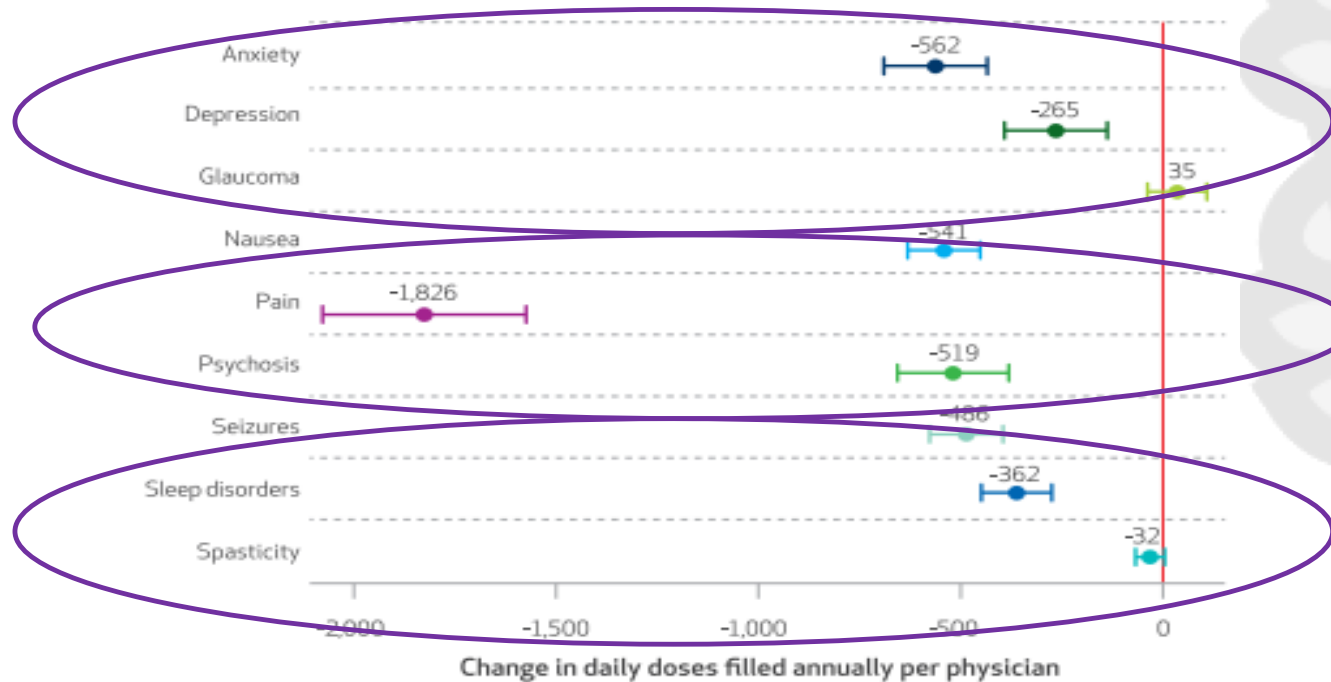
- Bisphosphonates – Reduce bone loss
- Non-steroidal anti-inflammatory drugs (NSAIDs) to treat moderate pain, including over-the-counter aspirin, ibuprofen, and naproxen
- **Corticosteroids** that treat inflammation/swelling and edema, such as prednisolone and methylprednisolone (used mostly in the early stages of CRPS)
- Drugs initially developed to treat seizures or depression but now shown to be effective for neuropathic pain, such as **gabapentin**, pregabalin, amitriptyline, nortriptyline, and duloxetine
- **Botulinum** toxin injections
- **Opioids** such as oxycodone, morphine, hydrocodone, and fentanyl. These drugs must be prescribed and monitored under close supervision of a physician, as these drugs may be addictive.
- N-methyl-D-aspartate (NMDA) receptor antagonists such as dextromethorphan and **ketamine**, and
- Topical local anesthetic creams and patches such as **lidocaine**.

Source: National Institute of Neurological Disorders and Stroke: Home » Disorders » Patient Caregiver Education » Fact Sheets

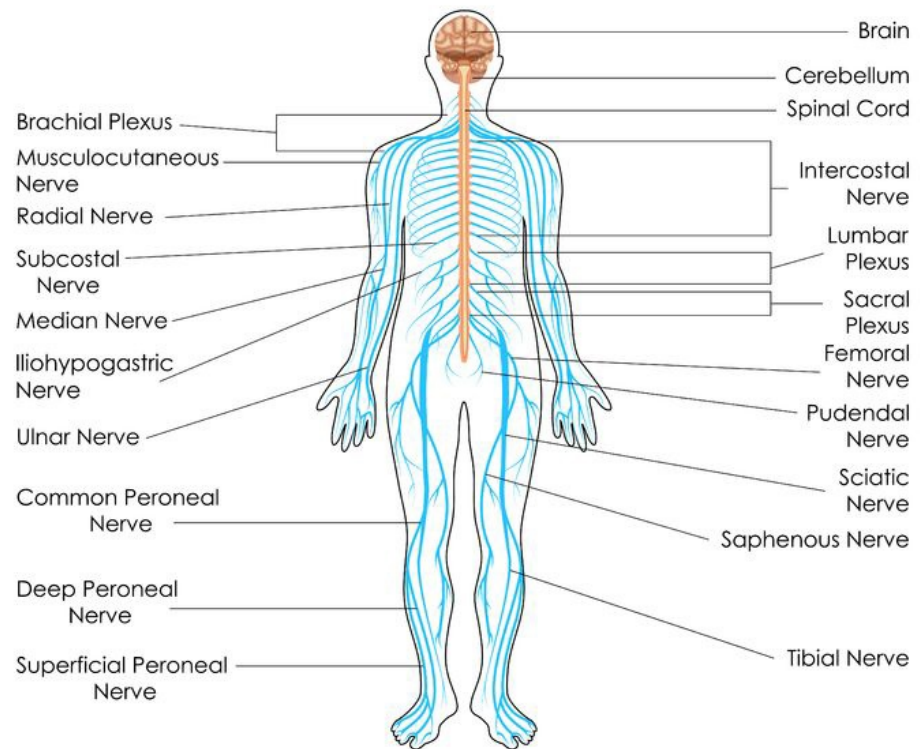
Reduction in Pain Drugs Prescribed in Legal Cannabis States

EXHIBIT 3

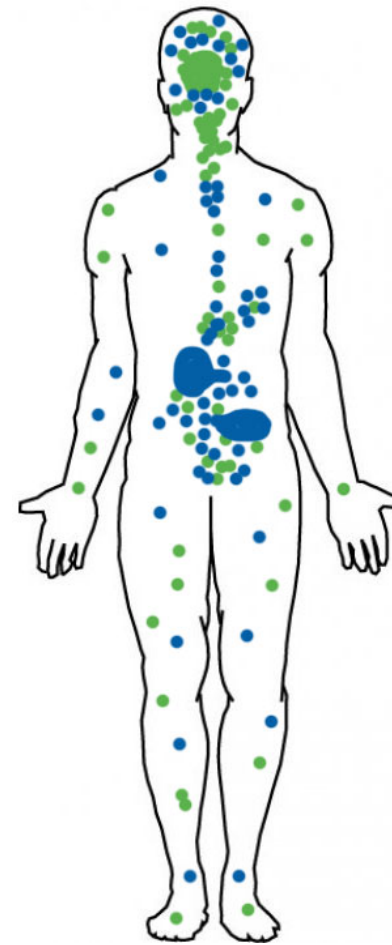
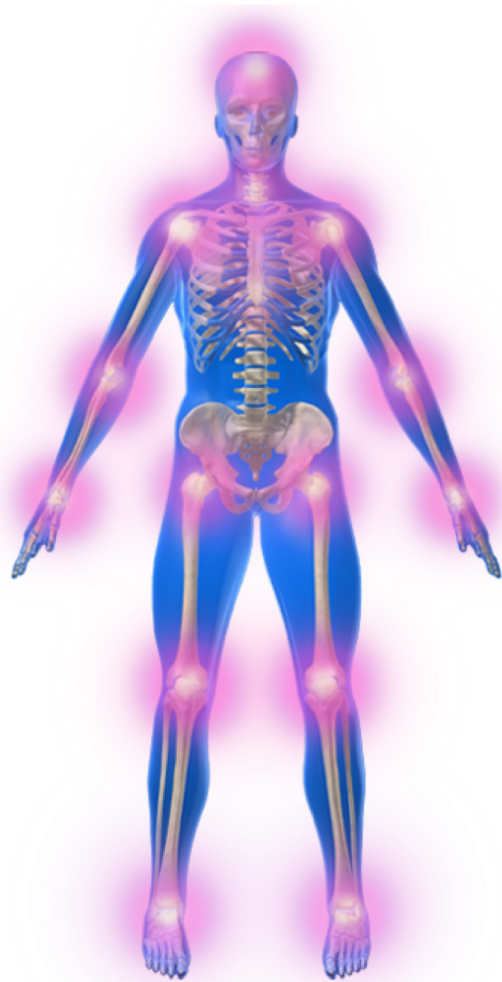
Average numbers of daily doses filled for prescription drugs annually per physician in states with a medical marijuana law, by condition categories studied, compared to the average numbers in states without a law



Chronic pain,
unlike acute
pain, serves
NO protective
biological
function.



NERVOUS SYSTEM



CB₁

CB₂

The Health Effects of Cannabis and Cannabinoids: Current State of Evidence and Recommendations for Research



CONCLUSION 4-1 There is substantial evidence that cannabis is an effective treatment for chronic pain in adults.



Suggested citation: National Academies of Sciences, Engineering, and Medicine. 2017. *The health effects of cannabis and cannabinoids: Current state of evidence and recommendations for research*. Washington, DC: The National Academies Press.

The National Academies of
SCIENCES • ENGINEERING • MEDICINE

Molecular and Synaptic Mechanisms

Activation of cannabinoid receptor 2 attenuates mechanical allodynia and neuroinflammatory responses in a chronic post-ischemic pain model of complex regional pain syndrome type I in rats

Jijun Xu, Yuying Tang, Mian Xie, Bihua Bie, Jiang Wu, Hui Yang, Joseph F. Foss, Bin Yang, Richard W. Rosenquist, Mohamed Naguib ✉

“A study using a synthetic selective CB2 agonist reduced symptoms of CRPS in an animal model, mainly the increased sensitivity to physical stimuli. The agonist exhibited several anti-inflammatory and neuroprotective actions which likely resulted in the improvement. It is likely THC would share at least some of these effects since it also activates CB2.”

Enhanced Anandamide Plasma Levels in Patients with Complex Regional Pain Syndrome following Traumatic Injury: A Preliminary Report

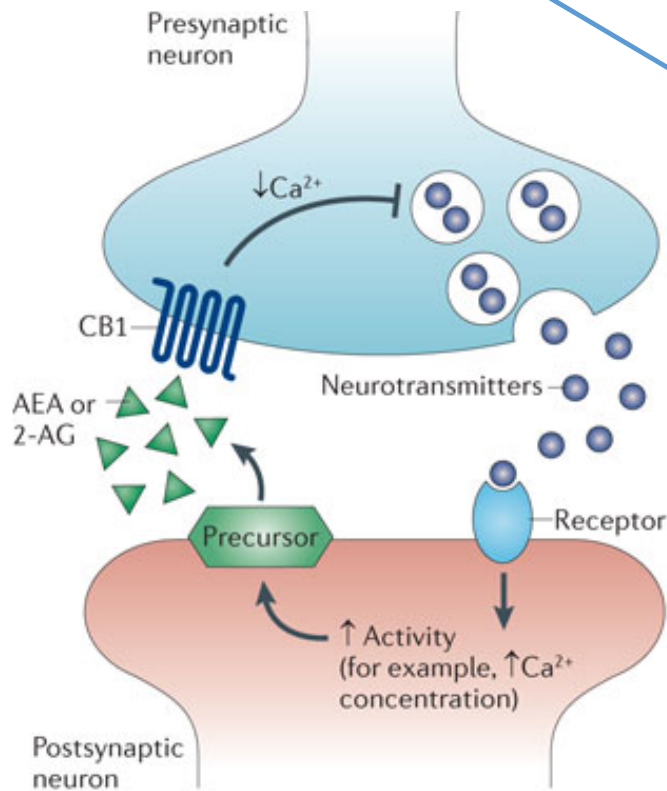
Kaufmann I.^a · Hauer D.^a · Huge V.^a · Vogeser M.^b · Campolongo P.^c · Chouker A.^a · Thiel M.^a ·
Schelling G.^a

 [Author affiliations](#)

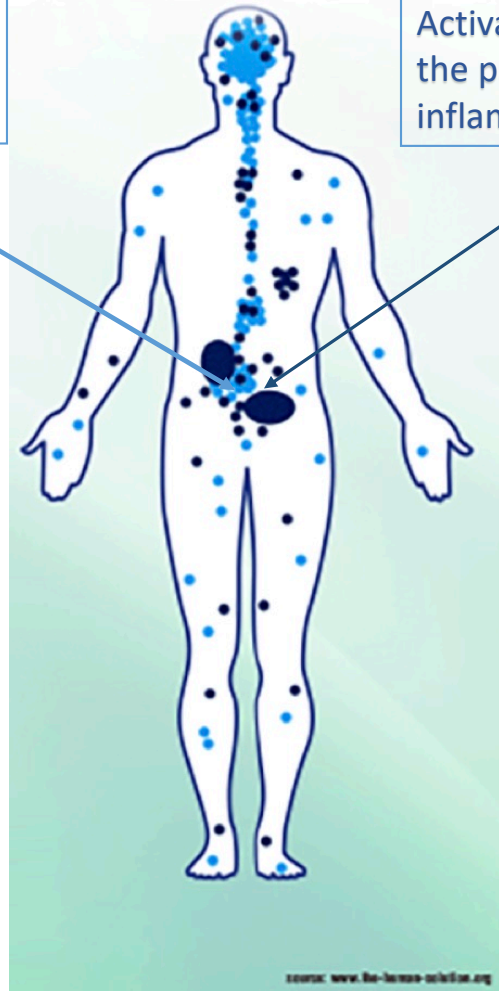
Keywords: [Complex regional pain syndrome](#) · [Stress](#) · [Pain](#) · [Endocannabinoid](#) · [Anandamide](#)

“... our study has shown for the first time that the peripheral ECS is activated in highly stressed individuals with CRPS. With respect to the pain-limiting and anti-inflammatory actions of the endocannabinoid anandamide, it is suggested that the elevated anandamide level is probably autoprotective and CRPS patients might therefore benefit from pharmacologic manipulation of cannabinoid receptor-dependent signaling.”

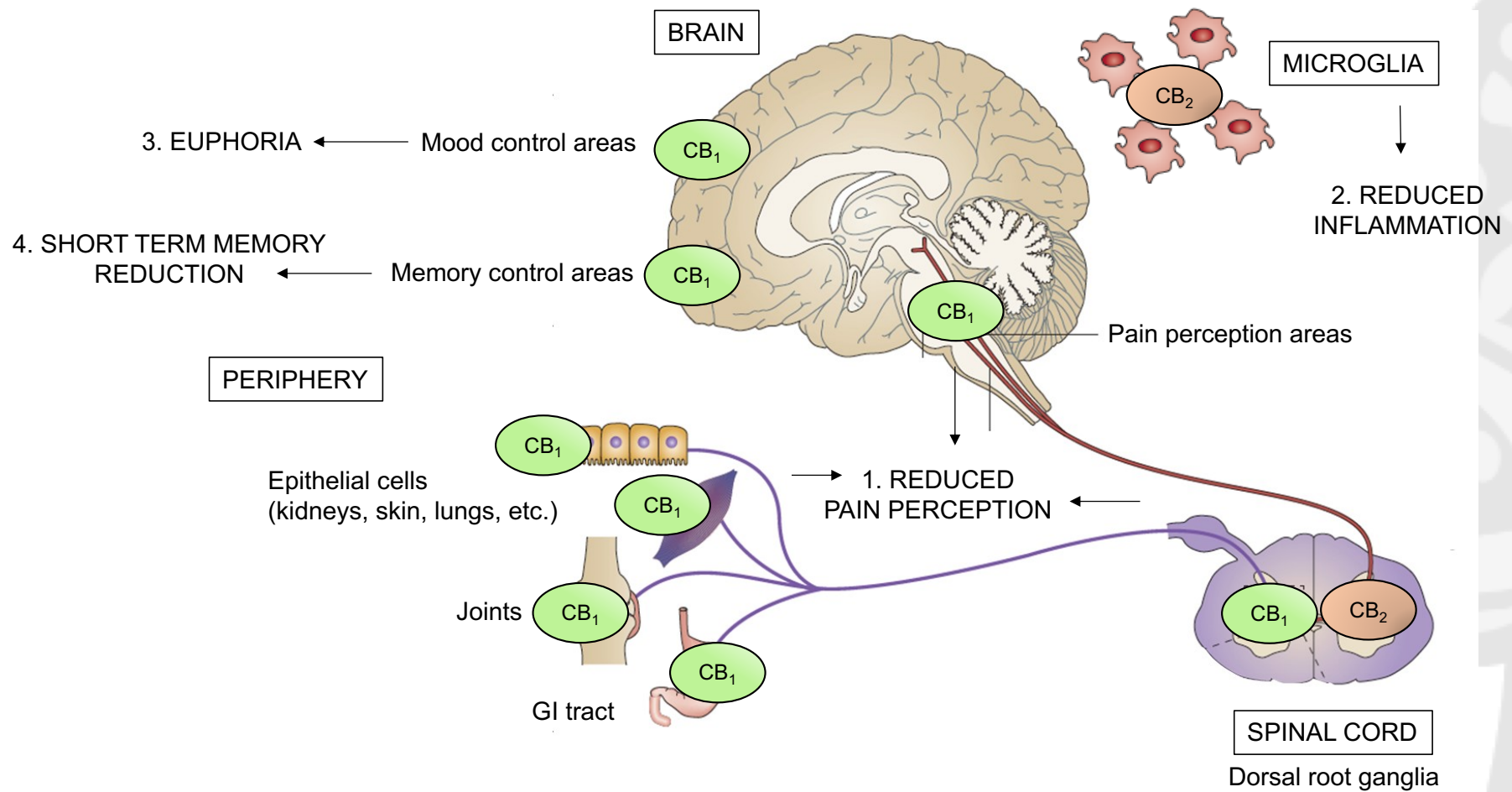
Activation of CB1 Receptors BLOCK the Neurotransmitters from sending the PAIN signal



Activation of CB2 Receptors CONTROLS the pain response by BLOCKING inflammation



Courtesy Dr. Cristina Sanchez, Complutense University




Courtesy Dr. Cristina Sanchez, Complutense University


What to look for in a medicine

- Tetrahydrocannabinol (THC)
- Cannabidiol (CBD)
- Cannabichromene (CBC)
- Cannabigerol (CBG)
- **Terpinolene** - Anti-inflammatory and analgesic synergy observed with an NSAID
- **Geraniol** - Promotes functional recovery and attenuates neuropathic pain in rats with spinal cord injury
- **Pinene** - Appeared to synergize with linalool and octanol to exhibit significant anti-inflammatory and analgesic effects
- **Limonene** - Reduced pain signaling in chemical and thermal models
- **Myrcene** - Reduced neuropathic pain
- **Bisabolol** - Anti-inflammatory action and blocks pain signaling
- **Linalool** - Reduced hyperalgesia in chronic non-inflammatory muscle pain model
- **Beta-caryophyllene** - Analgesic effects in models of inflammatory and neuropathic pain


How Much to Take? Chronic Pain

Medicine : 1	19238 Date Created : 2016-11-29
Target Cannabinoid: Tetrahydrocannabinol (THC)	
Terpenes: Alpha-pinene,Beta-caryophyllene,Limonene,Linalool,Myrcene	
Target Dose: 30 mg	
Frequency: 2 x daily	
Dosage 1: 15 mg Morning	
Dosage 2: 15 mg Evening	
Ingestion Method: Sublingual	
Sublingual 	
Dosage Notes: take after eating a fat source such as almond butter or avocado	

THC ~ 15mg x 2 per day

Medicine : 2	19238 Date Created : 2016-11-29
Target Cannabinoid: Cannabidiol (CBD)	
Target Dose: 20 mg	
Frequency: 1 x daily	
Dosage 1: 20 mg Afternoon	
Ingestion Method: Sublingual	
Sublingual 	
Dosage Notes: take after consuming a fat source such as almond butter or avocado	

CBD ~ 20mg x 1 per day

Medicine : 3	19238 Date Created : 2016-11-29
Target Cannabinoid: Tetrahydrocannabinol (THC)	
Target Dose: 30 mg	
Frequency: 3 x daily	
Dosage 1: 10 mg Morning	
Dosage 2: 10 mg Afternoon	
Dosage 3: 10 mg Evening	
Ingestion Method: Topical	
Topical 	
Dosage Notes: Use as frequently as needed to relieve pain	

TOPICAL ~ 10mg x 3 per day

Conclusions

- Cannabis has numerous medical benefits
- State laws make it unequally available to patients
- Cannabis is proven to be effective against pain
- There's more to cannabis than THC and CBD.
- We need more research



Aunt Zelda's™

Thank you.

Mara Gordon

mara@auntzeldas.org