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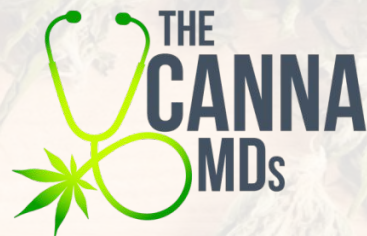


Pain Exposed! The Functional Approach to Relief, Rehabilitation + Resolution



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The World of Pain

- Pain influences the cognitive + physical experience
- Perception of pain is nuanced + varies by individual
- Poor pain control impacts social behavior + productivity





Categorizing Pain

- Nociceptive
 - Somatic pain: damage to skin, deep tissue, muscle
 - Visceral pain: damage to internal organs
- Neuropathic
 - Pain from changes within the nervous system





Why So Much Chronic Pain?

- Improved treatment of traumatic conditions often results in chronic conditions
- Longer life spans often result in more degenerative, pain-producing conditions





Increased Incidence + Prevalence of Pain

- Headaches, back + joint pain are most prevalent
- Chronic pain from autoimmune + metabolic syndromes are increasing
 - Fibromyalgia, diabetic neuropathy, rheumatoid arthritis
- Endocannabinoid system modulating pain may help end the pain epidemic





Endocannabinoid System (ECS) + Pain

- ECS down regulates signals that contribute to inflammation, a root cause of pain
- CB1+ CB2 receptors inhibit adenylate cyclase which prevents allodynia (type of pain)
- CB receptors also help block pain via neurotransmitters (acetylcholine, glutamate, dopamine)





The Role of CB1 + Pain

- Most abundant in central nervous system (primarily hippocampus, cerebellum, basal ganglia)
- Modulates nociceptive + neuropathic pain
- Mediates analgesic effects on visceral pain from GI tract





The Role of CB2 + Pain

- Most abundant in peripheral tissues + immune cells to suppress release of inflammatory cytokines, leukotrienes
- CB2 receptors expression increases in inflamed tissue





Ligands That Manage Pain

- Anandamide (endogenous) acts on CB1 receptor to mediate inflammation-induced pain
- THC + CBD (exogenous)
 - THC – prefers binding to CB1
 - CBD – indirect effect for binding to receptor, but still modulates pain
 - CBD can alter mood, providing minimal psychotropic effect





The Indirect Role of CBD

- Inhibits fatty acid amide hydrolase (FAAH), enzyme breaks down anandamide
- Higher anandamide levels mean more CB1 interaction to reduce inflammation
- Helps counteract psychotropic effect of THC
- Manages anxiety, which helps alter pain perception





Beta-caryophyllene for Pain

- Terpene acting like a cannabinoid
- Binds to CB2 for analgesic + anti-inflammatory effect
- Present in herbs + spices such as black pepper, cloves





Cannabis Makes a Difference

- Significant option to opioid use, abuse + related mortality
- States with medical cannabis
 - Pain killer prescription reduced by 1800 daily doses (Medicare data 2010-2013)
 - 23% fewer hospitalizations due to opioid abuse (1997-2014)
 - 31% reduction opioid overdose mortality (1999-2014)





Cannabis + Opioids

- Cannabinoids + opioids have synergistic effect without increasing cardio-respiratory failure (due to lack of cannabinoid receptors in the brain stem)
- THC can trigger release of endogenous opioids to help pain
- Combination therapy will decrease total opioids necessary





Root Cause Resolution to Pain

- Functional approach is an individualized, in-depth analysis
- Diseases associated with pain (arthritis, fibromyalgia, migraines, seizures) are typically endocannabinoid deficiencies





ECS Responds to a Holistic Approach

- Remove foundational barriers so ECS can restore balance to the body
 - Nutrition, acupuncture, yoga, sex, laughter, meditation, breathe work help address homeostatic balance
 - Normalized sleep helps reduce inflammation and manage pain





A Systematic Approach to Cannabis Formats

Format	Onset	Relief Duration	Qualities
Smoking	Rapid	2-4 hours	
Vaporizing	Rapid	2-4 hours	Easy to titrate
Edibles + capsules	Slow	6-8 hours	Unpredictable bioavailability
Tinctures	Rapid	2-4 hours	Easy to titrate Increased bioavailability
Suppositories	Rapid	6-8 hours	Deliver 2x blood levels cannabinoids as ingested formats





Individualizing Treatment

- Combining CBD + THC is preferable to avoid biphasic effect (increased dose with decreased effectiveness)
- High dosing with CBD is not necessarily most effective strategy
- Less is more – use only enough to relieve symptoms
- Too much THC can create unpleasant side effects; if so, counteract with CBD as an antagonist





Most Effective Ratios

- CBD to THC (1:1) best for neuropathic + musculoskeletal pain
- Headaches
 - Tension – high CBD, low THC
 - Migraine – THC dominance (2.5-25 mg THC inhaled, sublingual, or topical on region of pain)
- For THC beginners, start with CBD only + slowly titrate in THC as needed to relief pain





Sleep for Healing

- Rehabilitation occurs during quality sleep which can be aided with cannabis
- THC, CBN, myrcene are sedative
- Lifestyle medicine approach facilitates pain resolution





Endocannabinoid Reset

- Ongoing lifestyle changes are key to maintaining pain control
- Discontinuing cannabis use for 2-7 days may be necessary if pain relief has plateaued
- Cannabis use may be less when resuming after a cannabis fast





Cannatherapeutics to Treat Pain

- Consider affordability + product quality in the process
- Integrative approach with pain regimens can mitigate chronic pain epidemic
- Educated healthcare providers + patients are essential for client success

