

CBD IN DENTISTRY

Information for the Dental Professional



Introduction

By now, I am sure everyone has heard of cannabis. Most have probably heard of CBD and THC, and some have heard about Cannabinoids, The Endocannabinoid System, or maybe even Cannabinoid Receptors. But what about Phytocannabinoid vs. Endocannabinoid? Liposomal vs. Emulsion? Synergistic Effect or Entourage Effect? CB1 vs. CB2?

What does it all mean, and does it even matter?

It is likely that these terms have been presented in the course of advertising and it can be confusing to separate marketing claims designed to sell products from actual science. Understanding the difference is an important step in being able to discuss the benefits of cannabis and cannabinoids with your patients.

During the course you will learn (Course Objectives):

- *The basics of how cannabis and cannabinoids affect the body*
- *Categories of cannabinoids and their sources*
- *Similarities and differences among cannabinoids*
- *How the Mammalian Endocannabinoid System functions in the body*
- *Current product developments to support the use of Cannabinoids in dentistry*
- *Current evidence supporting the benefits of cannabinoids in healing*
- *Dental conditions that may be treated with CBD*

While the research is relatively new, it seems like the benefits are undeniable. So, let's look at some of these terms, describe what they all mean, and begin to look at how you can add CBD based products into your dental armamentarium.

Your patients will thank you!

Where does CBD come from?

Cannabis & Cannabinoids

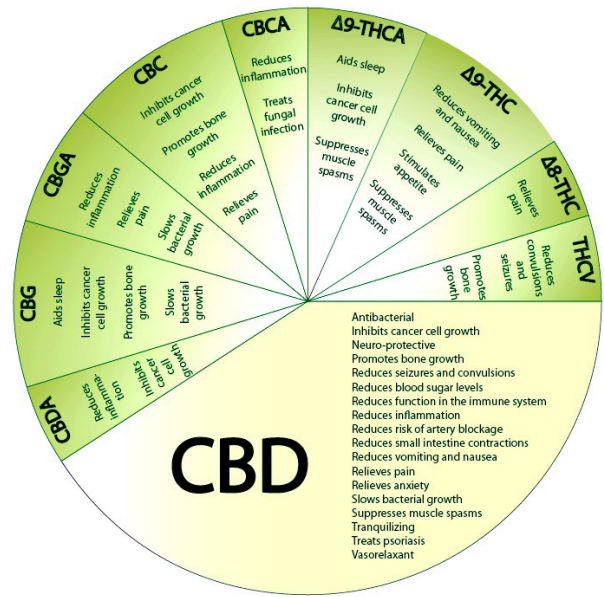
Phytocannabinoids

Any Cannabinoids that are isolated from the Cannabis plant are considered Phytocannabinoids, meaning they are naturally synthesized by plants. There are other well-known Phytocannabinoids routinely extracted and used for health benefits such as Echinacea from Echinacea flowers and Humulene from the Hops plant, but today we will be discussing the Cannabinoids that are isolated from the Cannabis plant. Plants are not the only source as there is a second distinctive category of Cannabinoids called Endocannabinoids.

Endocannabinoids

An Endocannabinoid is any Cannabinoid naturally produced by the body. The difference between a Phytocannabinoid and an Endocannabinoid is the source – not the type or structure of the molecule. One of the most common Endocannabinoids, Anandamide, is responsible for providing people with the euphoric feeling known as a “Runners High” experienced by long distance runners.

Regardless of the source, all Cannabinoids are similar on a molecular level, with comparable structures and functions, however, Endocannabinoids, like Anandamide, are generally produced on-demand in relatively small quantities and only when needed.



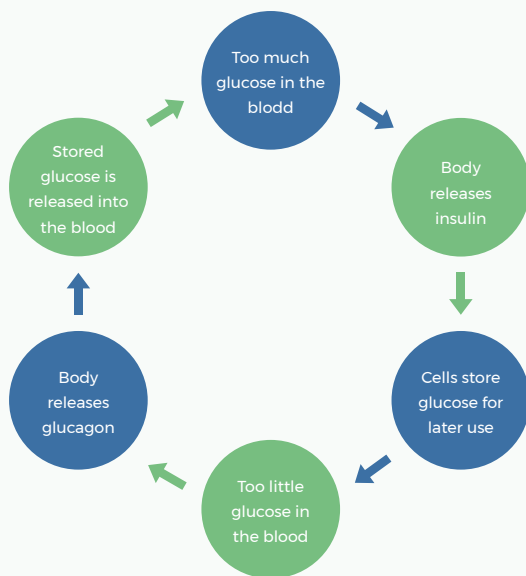
“While CBD constitutes approximately 40% of the extracted volume, over 110 different Cannabinoids have been isolated and identified.”

Fun Fact: Anandamide is also called “The Bliss Molecule” because it is named after the Sanskrit word for “bliss”. Anandamide can also be found in raw chocolate and is believed to be the reason people experience pleasure when eating chocolate.

How does CBD work?

Maintaining Homeostasis

The body is a complex organism that must regulate and balance many systems to maintain overall health. This balance is the ideal resting state for a cell, also known as homeostasis. The body achieves homeostasis through cooperation between interconnected physiological systems to balance temperature and pH, digest food, preserve blood sugar levels, and many other complex functions. Research is suggesting that the primary role of Cannabinoids is maintaining this homeostasis of individual body systems in order to add to the overall health and well-being of the individual (Viveros 2008).



Receptors and Homeostasis

On a cellular level, homeostasis is achieved using complex structures embedded in the cell walls called cellular receptors. These are highly specialized chemical structures, composed of proteins, that are embedded in the membrane layer of a cell. Receptors are responsible for intracellular communication ultimately helping the body to maintain homeostasis. They are tasked with actively keeping cells balanced regardless of constant internal and external changes.

For example, the sucrose receptor is responsible for maintaining proper blood sugar levels in the body by responding to increased or decreased sucrose levels in the blood. When the receptor recognizes sucrose in the blood stream, it converts the sucrose into glucose which is stored in the cell, lowering your blood sugar level to a normal level and storing energy for future. As your blood sugar lowers, the receptor will convert the stored glucose into sucrose to raise your blood sugar to a normal level creating balance in the body and maintaining homeostasis. In addition to sucrose receptors, we have recently identified a new category of cellular receptor known as “Cannabinoid Receptor”. Though Cannabinoid receptor research is relatively young, having only been discovered in the 1980’s, we know that within the body, there are two major categories CB1 and CB2 receptors.

How does CBD work?

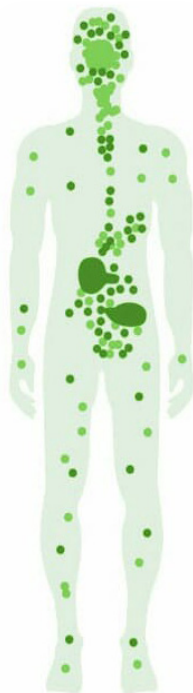
CB1 Receptors vs. CB2 Receptors

CB1 receptors are some of the most common receptors in the body. Primarily associated with the central nervous system and highly concentrated in the brain, CB1 receptors interact directly with THC and are responsible for delivering the psychoactive properties of Cannabis. If CB1 receptors in the brain are not activated by THC, then the user WILL NOT get “high”. While CB1 receptors are primarily associated with the central nervous system, they are located throughout the body and play a role in hormone production, cardiovascular health, and digestion (Foria 2018).

CB2 receptors are primarily found in the immune system and are typically more variable among species. CB2 receptors are distributed throughout cells of the spleen, reproductive tissues, areas of the brain, and are highly concentrated in the epidermis. They help to regulate the immune system and may provide antioxidant and anti-inflammatory effects by regulating the body’s response to pathogens (Javed 2016).

CB1 Receptors

CB1 receptors are concentrated in the brain and the central nervous system, a system in the body that maintains core functions such as motor activity, pain perception, stress response, and memory.



CB2 Receptors

CB2 receptors are widely distributed throughout the peripheral organs in the body, serving as core components in the immune system, muscular system, and cardiovascular system.

How does CBD work?

Cannabinoid Synergy or “Entourage Effect”

Cannabinoids have an ability to bind to – or activate – both CB1 and CB2 receptors. This is true of both Endocannabinoids and Phytocannabinoids – with one major exception. CBD is unable to activate CB1 or CB2 receptors itself. Instead, CBD will change the shape of the receptor and will make it much more efficient at binding with naturally occurring Endocannabinoids already in the system – for instance, Anandamide (Laprairie 2015).

Like an enzyme, we find that the body’s naturally occurring reactions occur much more efficiently in the presence of CBD. By acting as an allosteric modulator for the CB2 receptors CBD increases the affinity of a multitude of other Cannabinoids (Namdar 2019).

The naturally occurring Endocannabinoids in your body function more efficiently in the presence of CBD than they would by themselves in a form of synergy. This phenomenon is referred to as “The Entourage Effect” (Namdar 2019). The body works smarter, not harder.

Our body has abundant targets for Cannabinoids known as Cannabinoid receptors, responsible for regulating and balancing multiple bodily systems. We are able to enhance the body’s natural ability to maintain homeostasis on a cellular level by supplementing with Phytocannabinoids, like CBD.

How does CBD work?

Bioavailability

When a patient ingests Cannabis, medicine, or any other substance, not all the constituents of the item are processed by the body for benefit. For the substance to be used beneficially by the body, it must enter the blood stream and reach its intended target. Regardless of the substance, whether it is a vitamin, mineral, or pharmaceutical salt, only a portion of the substance introduced to the body will reach its intended target before the body naturally filters the material away. The proportion of a drug or substance that enters the bloodstream can be referred to as “Bioavailability”.

This is an important concept when dealing with Phytocannabinoids, like CBD, for two major reasons:

- 1) Phytocannabinoids like CBD are fat soluble while the human body is primarily made of water.
- 2) The stomach lining of the human body will begin to break down the Phytocannabinoid and CBD molecules before they enter the blood stream, also known as “first pass metabolism”.



How can we increase the bioavailability of products designed for ingestion, and ultimately ensure the beneficial compounds are reaching their intended targets?

How does CBD work?

Overcoming fat solubility with “Emulsions”

The human body is water based, and the Cannabinoids we have been exposed to are fat soluble. We have long known the problem with trying to dissolve oil into a water mixture. In order to overcome these problems of solubility, pharmaceutical companies have been performing treatments that help fat soluble molecules mix in water. The same treatments are now performed on oil extractions of Phytocannabinoids to increase bio-availability. **How?**

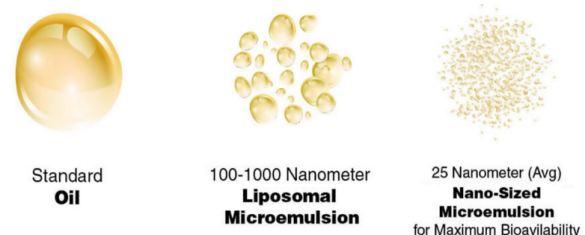
We are all familiar with Mayonnaise, but not everyone knows this is a stable mix of two substances that normally are unable to mix: oil and vinegar. The process of mixing two normally immiscible (or “unmixable”) substances into a stable concoction is also known as “An Emulsion”.

By creating a stable mixture of water and oil, we are making the Phytocannabinoids water soluble. What happens when we ingest a water-soluble substance? It immediately can mix into the bloodstream, increasing the bio availability drastically.

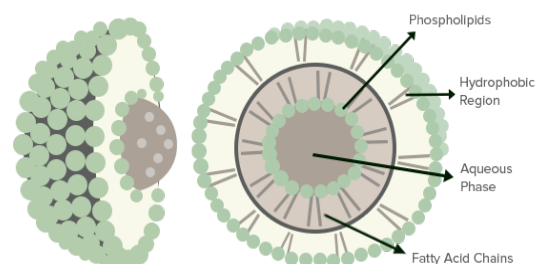


Overcoming first pass metabolism through Advanced Chemistry – The Liposomal Microemulsion

In a highly advanced process long performed in the pharmaceutical industry, the Phytocannabinoid oil is treated to become a Liposomal Microemulsion. Not only is the oil water soluble, but the individual oil droplets have been broken down to much smaller individual sizes. This small size (approximately 25 microns) is small enough to pass through the membranes of the body that are normally impermeable, including the stomach lining. By reducing the size of the individual droplets of oil to such a small size that they pass through the stomach lining, we are effectively able to bypass the first pass metabolism of the human body.



STRUCTURE OF LIPOSOME



What conditions can CBD treat?

Anxiety

Anxiety and dental phobia affect 1 in 4 patients (Armfield 2013). When experiencing dental anxiety, patients may experience an elevated heart rate, heightened levels of awareness and sensitivity, and may be more likely to avoid or delay dental care in order to minimize the overwhelming feeling of anxiety and fear. In a fearful state, the body releases adrenaline, cortisol, and norepinephrine. Recent studies report that Cannabinoids help to regulate the “fight or flight” feelings by stabilizing stress hormones and thereby easing anxiety (Blessing 2015). Our body’s natural Endocannabinoid system receptors respond to the Cannabinoids in hemp and process CBD at a cellular level. In instances of appointment related anxiety, it can be difficult, if not impossible to manage dental procedures without potentially harmful sedatives. This situation leads to added fear and cost and may lead to additional oral health complications when treatment is delayed. Researchers have found that compared to a placebo, CBD products absorbed by the bloodstream “significantly decreased” medical procedure-induced anxiety in patients. “Confirming several preclinical and clinical studies, recent results indicate that acute doses of CBD can decrease anxiety,” (Linares 2018).

General Pain & Inflammation

Pain is the body’s natural protection from internal damage. When a patient experiences pain, it is often a side effect of swelling and inflammation localized in a specific part of the body. The American Dental Association (ADA) reports suggest that Cannabis is capable of anti-inflammatory properties (ADA 2019). When CBD enters the body, it reacts with the body’s natural Endocannabinoid system to essentially block the brain from receiving pain signals and reducing the perception of discomfort. CBD can alleviate pain and prevent inflammation of gum tissue that can be experienced during dental procedures or dental cleaning appointments (Genaro 2017). As the research continues, this list will grow. Incorporating CBD into a daily practice

could prove to increase the comfort level of patients who suffer from symptoms associated with chronic inflammatory conditions like periodontal disease, gingivitis, or peri-implantitis.

Temporomandibular Joint Disorder (TMD)

Approximately 12% of adults in the United States suffer from some variation of TMD or discomfort associated with the Temporomandibular Joint (TMJ). TMD is typically associated with symptoms of temporomandibular joint (TMJ) pain, limited range of motion, malocclusion, sleep apnea, bruxism, joint stiffness, muscle pain, and chronic headaches or migraines (10, 12, 15). It’s one of the most common musculoskeletal concerns that patients discuss with their dentists. Pain is nearly always the chief complaint (Macfarlane 2002). Depending on the severity of their discomfort, patients may be unable to maintain a normal diet. Traditional symptom management typically involves the use of bite splints, physical therapy, massage, NSAIDs, muscle relaxers, cosmetic injection, a combination of two or more therapies, and in rare circumstances, surgery. Cannabidiol provides an alternative option. When blended for topical absorption, concentrated CBD products applied to the TMJ may provide relief of symptoms by reducing inflammation and relaxing muscular tissues.

CBD Products for Dental Professionals

Canna Botanical Dentistry has developed the ideal topical products and natural supplements to address the most common types of stress, pain, and inflammation associated with dental visits. These all-natural, pharmaceutical grade supplements have been made with the highest quality standards and are conveniently packaged with your patients in mind.

The Dental Anxiety Relief CBD Appointment Pack

includes three precisely dosed Phytocannabinoid-Rich (PCR) CBD softgels: Rest, Relax and Recover. Made with the highest quality of farm-grown, pharmaceutical grade hemp, the CBD Appointment pack is designed to increase sleep quality, decrease anxiety associated with dental procedures and speed healing.

Rest

an oral dose of 25 mg of broad spectrum-pharmaceutical grade CBD blended with 1mg. Melatonin and Roman Chamomile is taken at bedtime the night before your patients scheduled dental appointment to help ease restlessness and deliver a better night's sleep while increasing the levels of bioavailable CBD in their system.

Benefits: Better sleep and anxiety relief

Relax

an oral dose of 25 mg of broad spectrum-pharmaceutical grade CBD is taken the morning of your patients scheduled dental appointment to help boost their available Cannabinoids and reduce stress. Boost the bioavailable CBD levels in your patients system in preparation for their dental appointment.

Benefits: Anxiety relief and boosted levels of bioavailable CBD

Recover

an oral dose of 25 mg of broad spectrum-pharmaceutical grade CBD blended with 10mg. Curcumin is taken at the time of your scheduled dental procedure to pro-

mote healing and reduce pain-causing inflammation associated with certain dental procedures. Recover will provide the last boost to your Endocannabinoid system in the form of bioavailable CBD while also providing all the proven anti-inflammatory and antioxidant qualities of curcumin.

Benefits: Anxiety relief, boosted levels of bioavailable CBD, reduced pain and inflammation

TMJ Relief CBD Roll-On

Canna Botanical Dentistry's newest groundbreaking solution to address pain and inflammation associated with the Temporomandibular Joint, TMJ Relief Topical CBD Roll-on, is designed to provide targeted relief of the uncomfortable symptoms associated with the TMD and offers a natural alternative to over the counter or prescription pain medication. Combining the knowledge of the Pharmaceutical industry, cosmetic industry, and dental profession, this roll-on product has been specially formulated using transdermal carrier oils to ensure maximum bioavailability. TMJ Relief is drug-free and safe for facial application.



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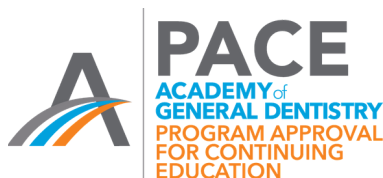
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Safety Statement

CBD is not currently regulated by the FDA like other pharmaceuticals, leaving it up to the manufacturer to determine standards for their product. Pharmaceutical grade CBD is manufactured at the highest levels of safety, efficacy, and consistency. It is essential to choose a CBD product that has been manufactured by a company that holds itself to the same high standards required of medical grade products and pharmaceutical drugs. This includes strict quality standards in addition to third-party lab analysis of the finished product.

Canna Botanical Dentistry CBD products contain 0.0% THC. The patent-pending hemp extraction process used in the production of Canna Botanical Dentistry CBD products removes undesirable compounds (such as THC) and preserves beneficial Phytocannabinoids and terpenes, without the use of harmful chemicals. These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent a disease.



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