

# Know Your Medicine



**Cannabis as Medicine**  
**How Cannabis Works**  
**Cannabinoids**  
**Terpenes**  
**Treatment Guidelines**



COMPASSIONATE SCIENCES™  
ALTERNATIVE TREATMENT CENTER

# Cannabis as Medicine



## What You Should Know

**Pal-li-ate:** to reduce the violence of a disease; *also:* to ease symptoms without curing the underlying disease; *adjective*, palliative.



Medical science and history show that *Cannabis* is an effective palliative, a class of medicines that ease human suffering. Natural and gentle, *Cannabis* is used to treat symptoms of many diseases and conditions, and some of the side effects<sup>1</sup> of pharmaceutical drugs.

The science of medical *Cannabis* lags behind its use and more research is needed. Strong science supports the use of *Cannabis* as an analgesic painkiller, an anti-emetic for nausea and as an appetite stimulant. There is less scientific support for the use of *Cannabis* as an anti-inflammatory, despite significant anecdotal evidence. Scientists are also investigating whether it slows, or partially reverses, certain diseases such as cancer.

### DISEASE-CONDITION

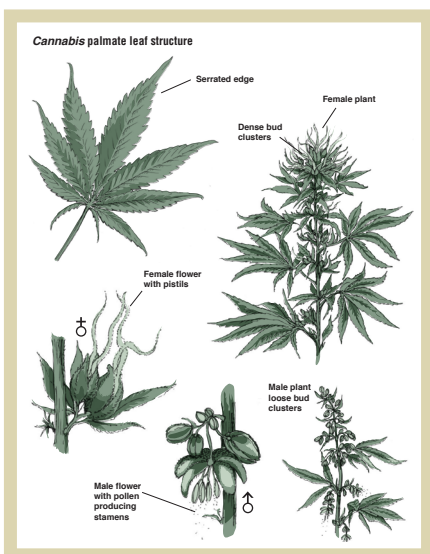
- |                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"><li>• Cancer</li><li>• Multiple Sclerosis</li><li>• HIV-AIDS</li><li>• Epilepsy and seizure disorders</li><li>• Glaucoma</li><li>• Rheumatoid Arthritis</li><li>• Crohn's Disease and Irritable Bowel Syndrome (IBS)</li></ul> | <ul style="list-style-type: none"><li>• Cachexia (wasting syndrome)</li><li>• Chemotherapy-induced Nausea and Vomiting (CINV)</li><li>• Pain-induced nausea</li><li>• Neuropathic Pain</li><li>• Disease-related anorexia (loss of appetite)</li><li>• Muscle spasms and spasticity</li></ul> |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

The medical benefits of *Cannabis* come from chemicals called cannabinoids and terpenes, which interact with the central nervous and immune systems. Best known is THC (delta-9 THC), the cannabinoid that produces the high, or the psychotropic effect. These calming and euphoric effects are therapeutic and THC has other medical benefits. However, the other cannabinoids and terpenes are also shown to play an important medicinal role and should be considered by patients.

### Cannabis

is a genus of flowering plants in the hemp family. Native to Asia, it has been cultivated worldwide over thousands of years. Traditionally, there were three classes: *Cannabis sativa*, *Cannabis indica* and *Cannabis ruderalis*. But these may be the most common of almost 700 variations of the genus. Sativas tend to be rich in THC while indicas tend to also be abundant in other cannabinoids. However, the distinct characteristics of each vary with environment, growing method and curing.

<sup>1</sup> Adverse, late or long-term side effects of pharmaceuticals used to treat chronic debilitating diseases.



# How Cannabis Works

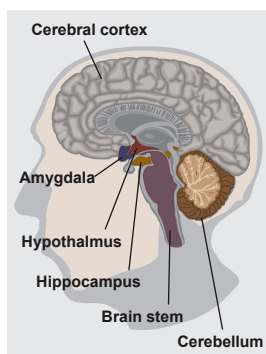
## Biochemistry

The active ingredients in *Cannabis* – cannabinoids and terpenes – are delivered to the blood through the lungs (when inhaled), the digestive system (when consumed) or the skin (when applied topically). From the blood, they are available to the brain, central nervous system and immune system.

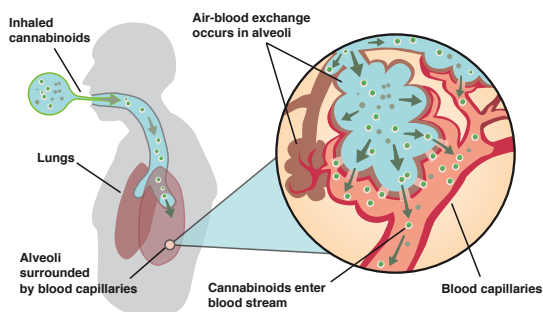
Humans are built to interact with cannabinoids, with endocannabinoid systems of special receptor molecules embedded in our brains and along neural pathways. The receptors influence the flow of chemical signals to the brain.

Cannabinoids bind with the endocannabinoid receptors, creating medicinal effects by suppressing signals such as pain, nausea and depression while boosting signals of appetite and euphoria.

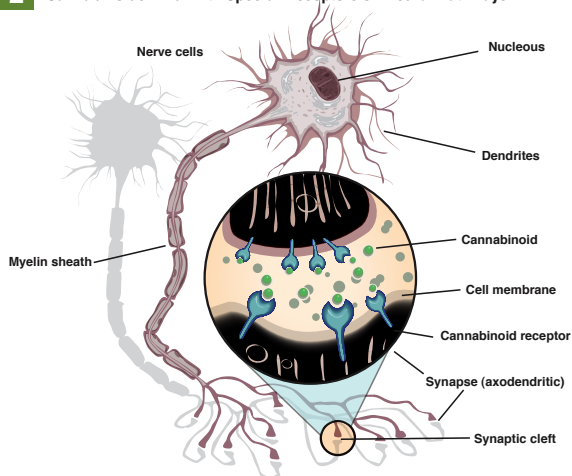
### Areas of Brain with High Concentrations of Cannabinoid Receptors



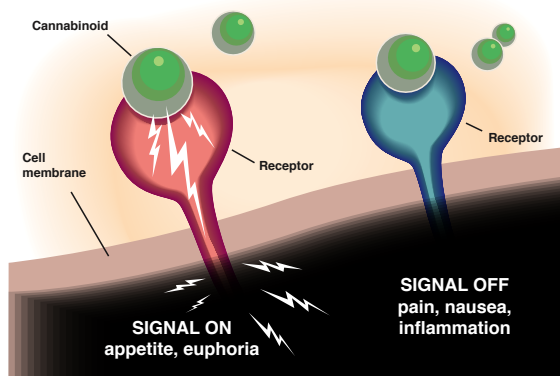
### 1 Inhaled Cannabinoids Enter the Blood Through Alveoli in the Lungs



### 2 Cannabinoids Bind With Special Receptors on Neural Pathways



### 3 By Binding With Receptors, Cannabinoids Turn Signals On or Off to Create Medically-beneficial Effects

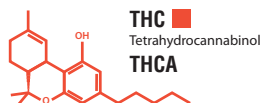


# Cannabinoids

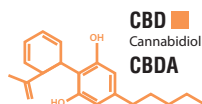
## What You Should Know

### CANNABINOID

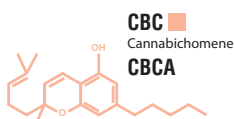
### BENEFIT



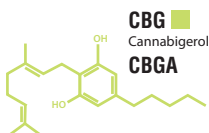
Psychotropic, painkiller, anti-inflammatory, anti-microbial



Relieve anxiety, convulsions, depression, inflammation and nausea sedative, sleep aid and muscle relaxant



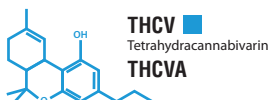
Anti-inflammatory, painkiller, treats acid reflux, anti-anxiety, antidepressant



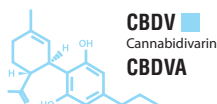
Painkiller, muscle relaxant, anti-erythemic analgesic, digestive aid, stomachic (stomach function)



Mild psychotropic, may stimulate bone growth, anesthetic, anti-convulsive, analgesic, anti-anxiety



Anti-obesity, aids memory, calming aid, antibacterial, antiviral, immune system



Anti-inflammatory, analgesic, protects cells lining digestive tract

While THC gets the attention, there are over 70 cannabinoids in *Cannabis*. The other cannabinoids – and terpenes – are believed to have therapeutic effects and must be considered by patients.

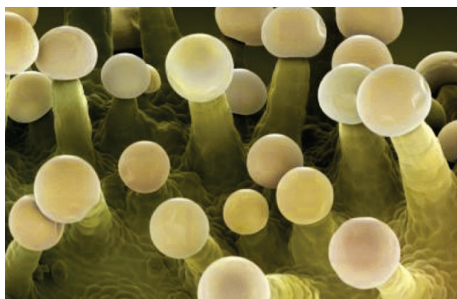
Among other effects, cannabinoids suppress pain and nausea while stimulating appetite, euphoria or calm. They are also thought to interact, with CBC enhancing the effects of THC, and CBD enhancing both THC and CBC.

### Did you know that there is no THC in Cannabis?

Raw *Cannabis* contains the acidic compound THCA, not the neutral compound THC. THCA is converted into THC by the heat of combustion, vaporization or cooking in a process called decarboxylation. This rule applies to all cannabinoids: naturally occurring acidic CBDA converting to CBD, CBGA to CBG and etc.

The acidic versions have traditionally been considered biologically inactive. However, depending on the method of preparation and administration, not all of the acidic cannabinoids are converted during decarboxylation (particularly in edibles). Research suggests that these residual compounds may have medicinal effects. In edibles, they are psychotropic.

The presence of all the major cannabinoids should be taken into account by patients when evaluating a strain of medical *Cannabis*.



# Terpenes

## What You Should Know










### Do you use smell when choosing your medical Cannabis?

Then you are familiar with terpenes – aroma and taste molecules in the essential oils of plants. Terpenes provide each plant's distinctive scent, or essence, and are used to attract pollinators, repel pests and discourage herbivores. Humans have used them for therapeutic purposes and in a wide range of products – from perfumes to soaps and pharmaceuticals.

Like roses or spices, different strains of *Cannabis* have unique odors ranging from sweet to acrid and skunky to floral – the chemical signatures of terpenes. Terpenes are also building blocks of chemicals such as THCA, the acidic version of THC. They are major components of *Cannabis* resin and extracts produced from these resins. Up to 30% of the resin in *Cannabis* smoke consists of terpenes.

Scientists believe that terpenes account for some of the medical benefits of *Cannabis* including painkilling and anti-inflammatory effects. They also exhibit other useful effects. For example, terpene content is one of the biggest differences between *Cannabis sativa* and *Cannabis indica*. The general rule that patients often prefer *sativas* for daytime use and *indicas* for nighttime use suggests that the sedative effects of *Cannabis* are influenced by terpenes.

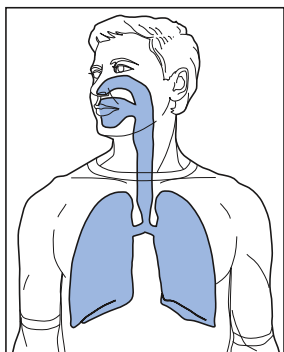
Patients should take into account the content of major terpenes when evaluating various strains of medical *Cannabis*. This information can help you select the best medicine, with your desired therapeutic effects.

TERPENE	BENEFIT	AROMA
 <b>Pinene</b> Also found in pine needles	Anti-inflammatory Anti-bacterial Bronchodilator Aids memory	Pine Earth
 <b>Myrcene</b> Also found in hops	Sedative Sleep aid Muscle relaxant	Flowers Pungent Earth
 <b>Limonene</b> Also found in citrus	Treats acid reflux Anti-anxiety Antidepressant	Citrus Fresh spice
 <b>Terpinolene</b> Also found in coriander	Analgesic Pain reduction Digestive aid Stomachic	Pine Herbal Anise Lime
 <b>Linalool</b> Also found in lavender	Anesthetic Anti-convulsive Analgesic Anti-anxiety	Flowers Lavender Citrus Fresh spice
 <b>Terpineol</b> Also found in mugwort	Calming aid Antibacterial Antiviral Immune system	Pleasant lilac Citrus Wood
 <b>Caryophyllene</b> Also found in black pepper	Anti-inflammatory Analgesic Protects cells lining Digestive tract	Citrus Spice
 <b>Humulene</b> Also found in basil	Anti-inflammatory	Robust Herbaceous Earth
 <b>Ocimene</b> Also found in thyme and alfalfa	Decongestant Antiseptic Antiviral Bactericidal	Citrusy green Wood Tropical fruit

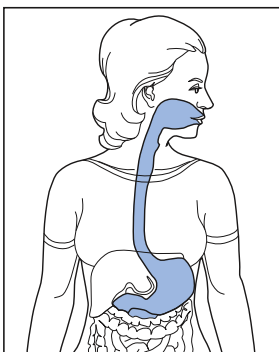


# How to Take Cannabinoid Medicines

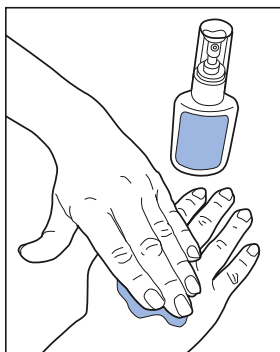
## Methods and Forms of Administration



**Inhalation**



**Ingestion**

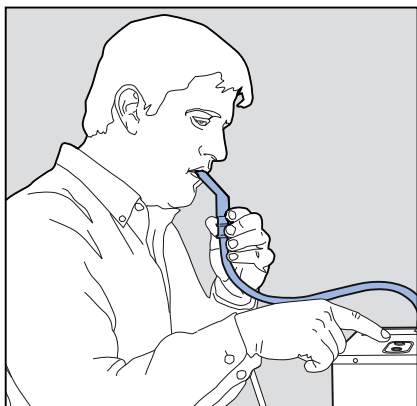


**Topicals**

### Inhalation

Inhalation is the fastest-acting method of administration other than intravenous injection. When inhaled, the active ingredients of *Cannabis* pass directly into the bloodstream from the lungs. Peak blood levels are achieved within 5-20 minutes and the pharmacological activity is typically over within 3 hours.

- Smoking is the most common form of inhaled administration, but is hazardous to health. Smoked *Cannabis* also loses therapeutic ingredients that burn and escape in second hand smoke.
- Vaporizers are the preferred method for rapid relief of inhalation without the toxic and carcinogenic by-products of smoking. In a vaporizer, *Cannabis* heats to a point below combustion (390°F or 200°C) where the therapeutic ingredients are released in a mild, smokeless vapor that is readily absorbed by the lungs.
- Nebulizers provide another inhaled option. A nebulizer delivers a single dose of medicine in an aqueous solution that is aerosolized as a mist for inhalation.



**Inhaled Forms:** Vaporizer or nebulizer; smoked via cigarette, pipe or smoking device. Inhaled Forms Available in New Jersey: dried *Cannabis* flowers administered by vaporizer or smoking.

## Oral Administration

Oral administration is a slower-acting method because the active ingredients of *Cannabis* must pass through the gastrointestinal tract during digestion before entering the bloodstream. Pharmacological effects occur in 30-90 minutes. Oral administration also alters the chemistry of therapeutic ingredients by “first pass” metabolism in the digestive tract.

- Edible forms such as brownies and lozenges have widely variable effects on the body and subject active ingredients to changes during digestion e.g., THC is converted into strongly psychotropic 11-hydroxy THC.
- Sublingual forms are administered under the tongue and may be faster acting than edibles as the medicine is absorbed into the blood through the mucosal membrane in the mouth.

**Edible Forms:** brownies and confections, drinks, candy, lozenges.

**Sublingual Forms:** Oral sprays, oils and tinctures (alcohol-based solutions)

## Topical Administration

Topical forms are typically used as creams or lotions to treat localized pain and discomfort, delivering active ingredients to the bloodstream through the skin. Topical lotions are available in New Jersey.

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<sup>12</sup>First-pass metabolism



# Side Effects<sup>1</sup>

## Short-Term Physical

- Increased heart rate for up to 3 hours after treatment may increase the chance of heart attack -- older patients and those with heart problems may be at higher risk
- Increased appetite
- Changes in blood pressure
- Bloodshot eyes and dilated pupils
- Impaired body movement
- Breathing problems (particularly when *Cannabis* is smoked)

## Short-Term Mental

- A psychotropic high
- Euphoria
- Altered senses
- Altered sense of time
- Changes in mood, which can include anxiety and paranoia
- Difficulty with thinking and problem-solving
- Impaired memory

## Long-Term<sup>1</sup>

- Dependency and a mild withdrawal syndrome
- Cancer and cardio-pulmonary damage when *Cannabis* is smoked
- Complications with child development during and after pregnancy
- May affect brain development in children and teens
- Hallucinations, paranoia and worsening symptoms in patients with pre-existing schizophrenia

## Precautions While Using *Cannabis*

- Women should not consume during pregnancy or while breast feeding except on the advice of the certifying practitioner, and in the case of breastfeeding mothers, including the infant's pediatrician
- May cause dizziness, drowsiness and impaired judgment
- Do not drive, operate machinery or perform hazardous activities
- Consuming alcohol will increase dizziness, drowsiness and impaired judgment
- May increase the effects of other drugs that cause drowsiness e.g., antidepressants, antihistamines, sedatives, pain relievers, anxiety and seizure medicines and muscle relaxants



# Overdose and Addiction



Patients with concerns about the risk of addiction or a history of substance abuse should consult their physician and a certified substance abuse counselor before using medical *Cannabis*.

Scientific literature indicates that, in practice, it is difficult and quite rare to overdose on *Cannabis* since its administration requires ongoing deliberate and complex actions such as smoking or ingesting. However, recent cases of overdose and adverse consequences have been reported among those who use potent strains and usage methods designed maximize their effects.

Regular use of *Cannabis* can lead to dependency and a mild withdrawal syndrome. A federal government study showed an increase in dependency rates, including among young people, over the past 20 years. Some authorities have considered illegal marijuana as a gateway drug that leads to the use of more dangerous and addictive substances.



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for you...for your loved one*



**All the Information You Need**  
**[www.csatc.org](http://www.csatc.org)**

Medical *Cannabis* should be  
used under the care of a physician.  
The information in this brochure is  
not medical advice. Talk to your  
doctor about physician-guided  
options available to you.

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