

# Cannabis For First Responders

Jenni Salomon



**Endocannabinoid  
System**

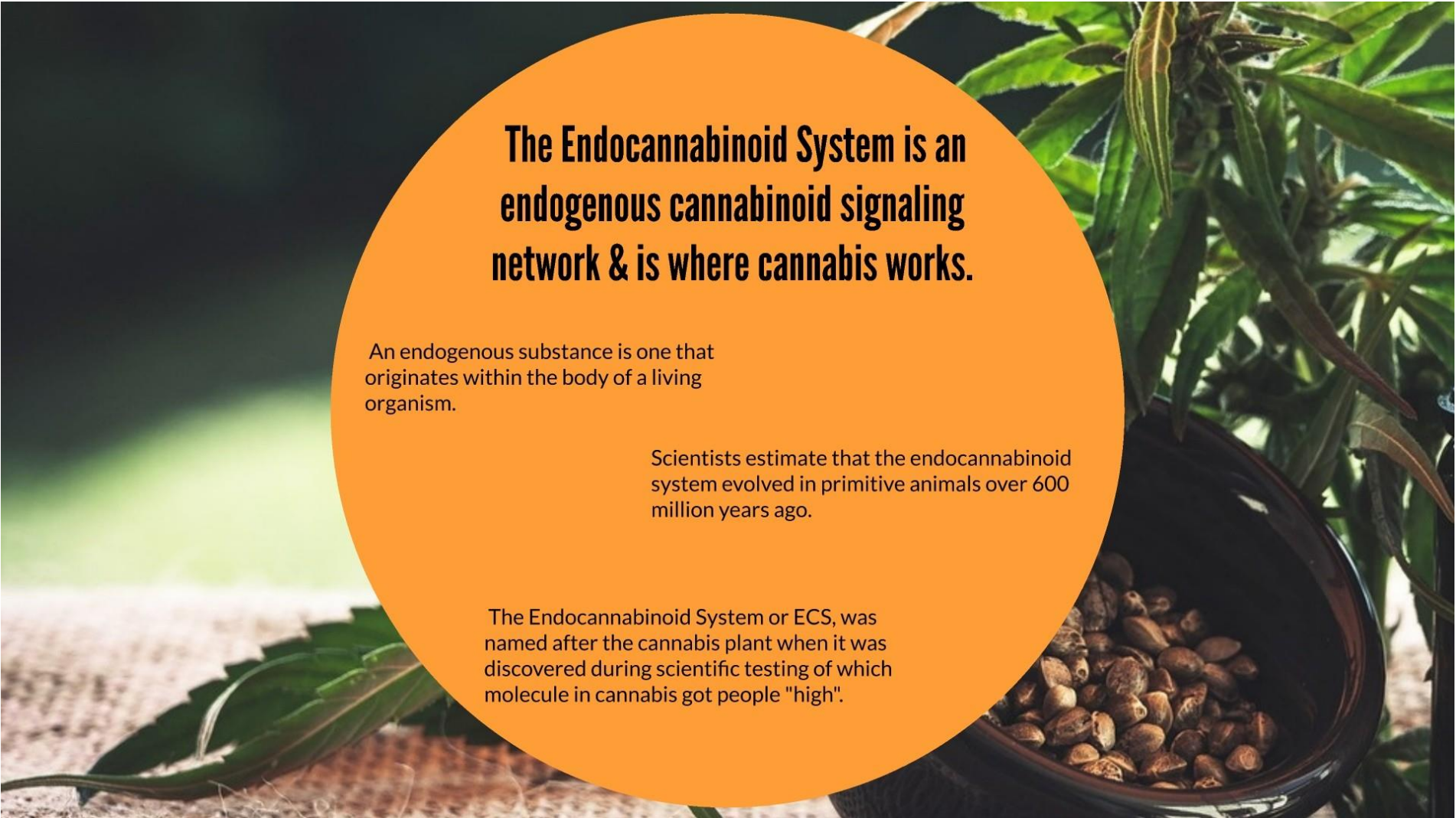
***Cannabinoid  
Receptors***

**Cannabinoids**

**Cannabis  
Pharmacology**

**Case Studies**

**IN BRIEF**

The background image shows a cannabis plant with green serrated leaves and developing buds in a dark pot. In the foreground, a dark bowl is filled with brown, textured cannabis seeds. A large orange circle is overlaid on the image, containing text.

## **The Endocannabinoid System is an endogenous cannabinoid signaling network & is where cannabis works.**

An endogenous substance is one that originates within the body of a living organism.

Scientists estimate that the endocannabinoid system evolved in primitive animals over 600 million years ago.

The Endocannabinoid System or ECS, was named after the cannabis plant when it was discovered during scientific testing of which molecule in cannabis got people "high".

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**Cannabinoid receptors are present throughout the body. There are potentially more cannabinoid receptors than any other receptor system**



## **CB1**

Is predominantly present in the nervous system, connective tissues, gonads, glands, and organs. The amygdala has a lot of receptors. This area of the brain regulates anxiety and the fight or flight response.

## **CB2**

is predominantly found in the immune system and its associated structures.

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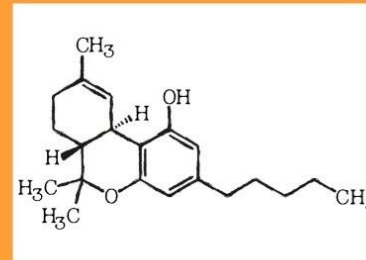
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Endocannabinoids are the substances our bodies naturally make to stimulate these receptors. They are synthesized on-demand, have a local effect and short half-life

Phytocannabinoids are plant substances that stimulate cannabinoid receptors.

THC is the most psychoactive and the most famous, but other cannabinoids such as cannabidiol (CBD) and cannabinol (CBN) are gaining the interest of researchers due to a variety of healing properties.



Synthetic cannabinoids are lab produced. THC, marketed as dronabinol (Marinol), and nabilone (Cesamet), a THC analog, are both FDA approved drugs for the treatment of severe nausea and wasting syndrome.

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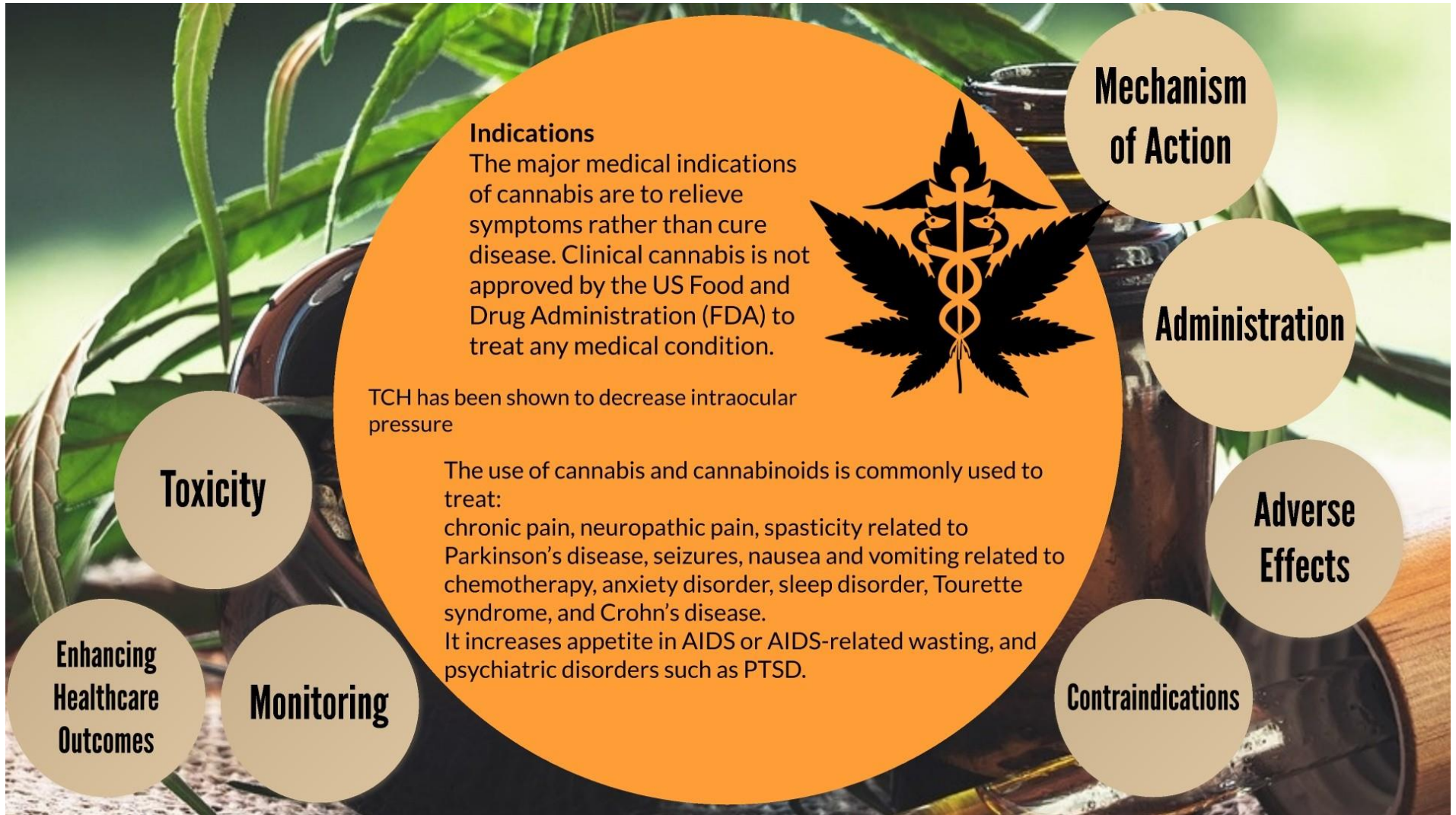
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**The mechanism of action is still being researched**  
**There are widespread cannabinoid receptors in the brain and peripheral tissues known as the endocannabinoid system. The endocannabinoid system regulates metabolism, appetite, blood pressure, glycemic control, immune response, and sense of reward.**



**Cannabis is administered orally, sublingually, or topically. It can also be smoked, mixed into foods, and brewed as a tea.**




**Typically cannabis is smoked, which has the advantage of rapid onset and easy titration, as well as allows it to be delivered to the brain and circulation rapidly.**

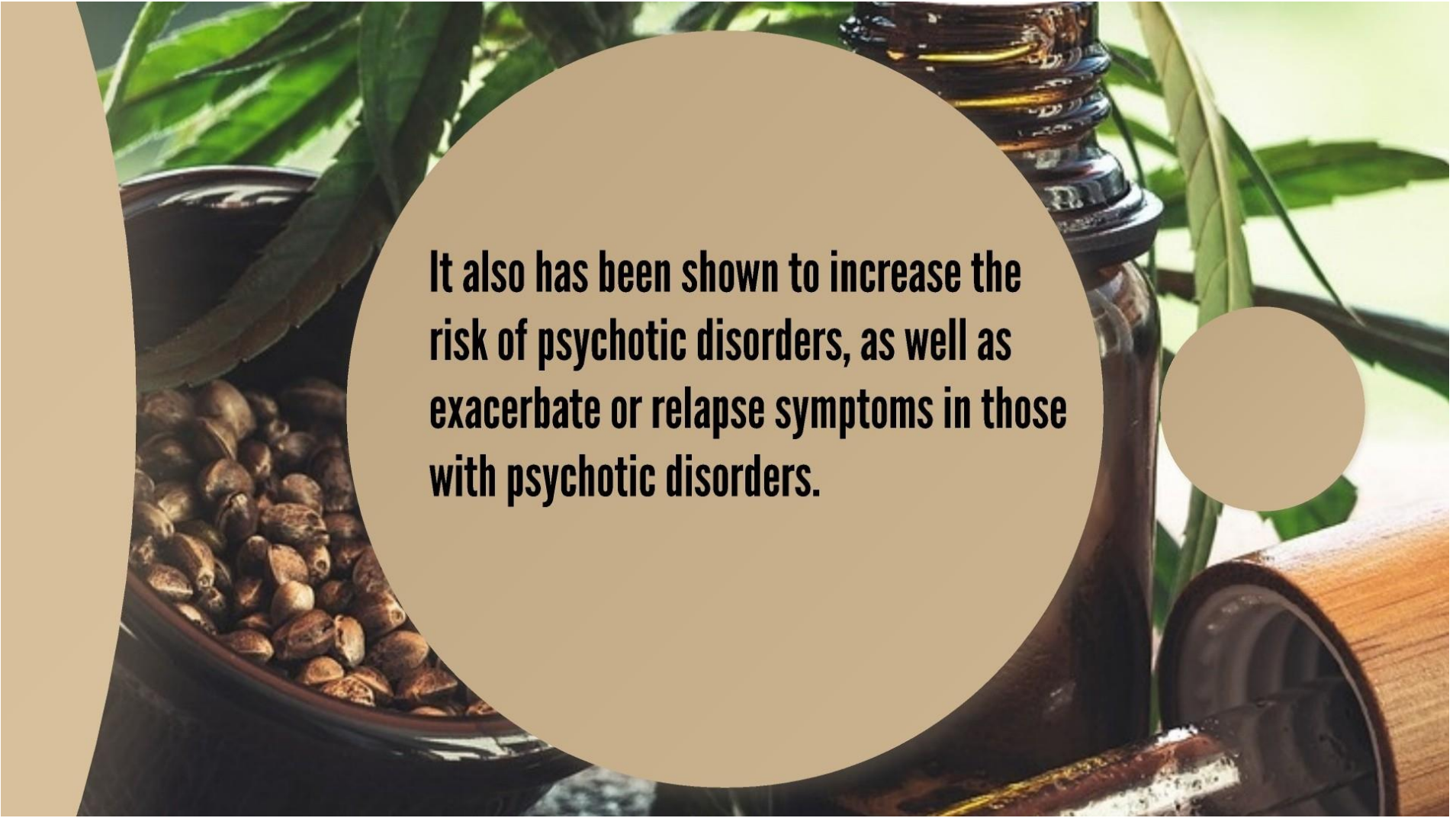


**When ingested orally, the pharmacokinetics vary greatly, and the onset of action is delayed with maximum blood levels being reached up to six hours post ingestion and with a half-life of up to 20-30 hours.**

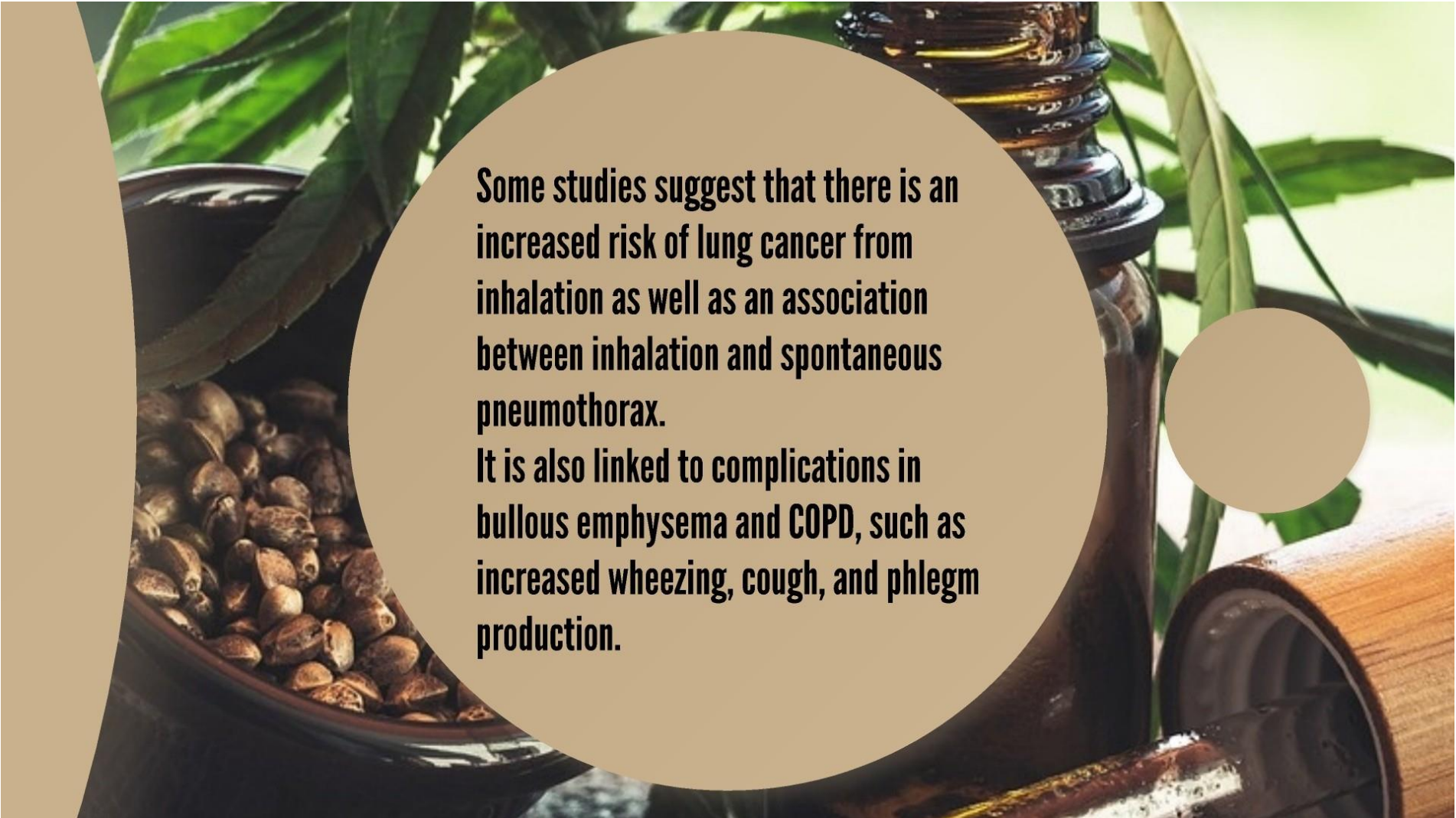
**The topical route, has been used for arthritic pain with varying success.**



**The most common emergency caused by marijuana ingestion is a panic attack. Other common adverse effects include dizziness, dry mouth, nausea, disorientation, euphoria, confusion, sedation, increased heart rate, and breathing problems.**

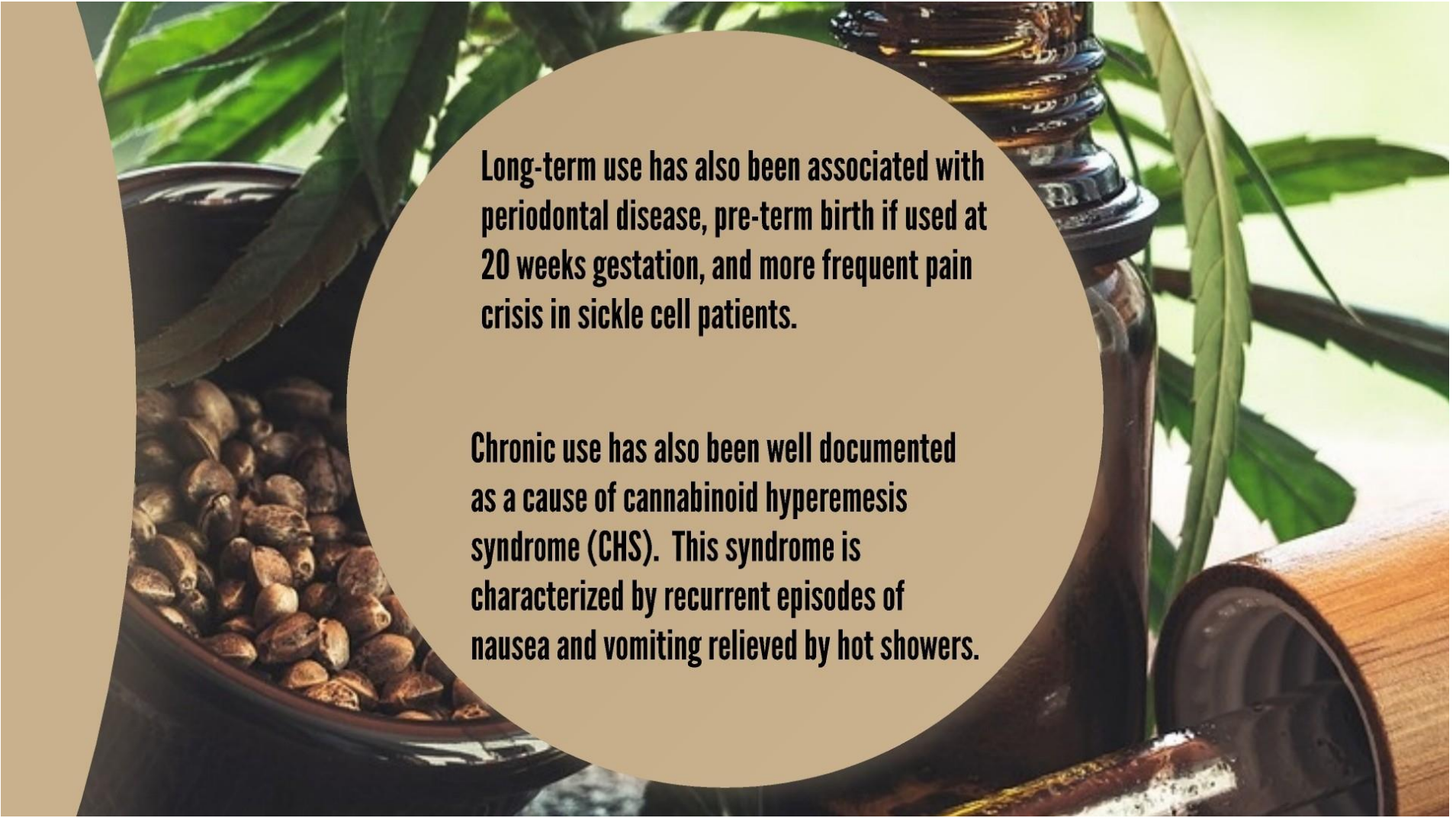


**It also has been shown to increase the risk of psychotic disorders, as well as exacerbate or relapse symptoms in those with psychotic disorders.**



**Some studies suggest that there is an increased risk of lung cancer from inhalation as well as an association between inhalation and spontaneous pneumothorax.**

**It is also linked to complications in bullous emphysema and COPD, such as increased wheezing, cough, and phlegm production.**

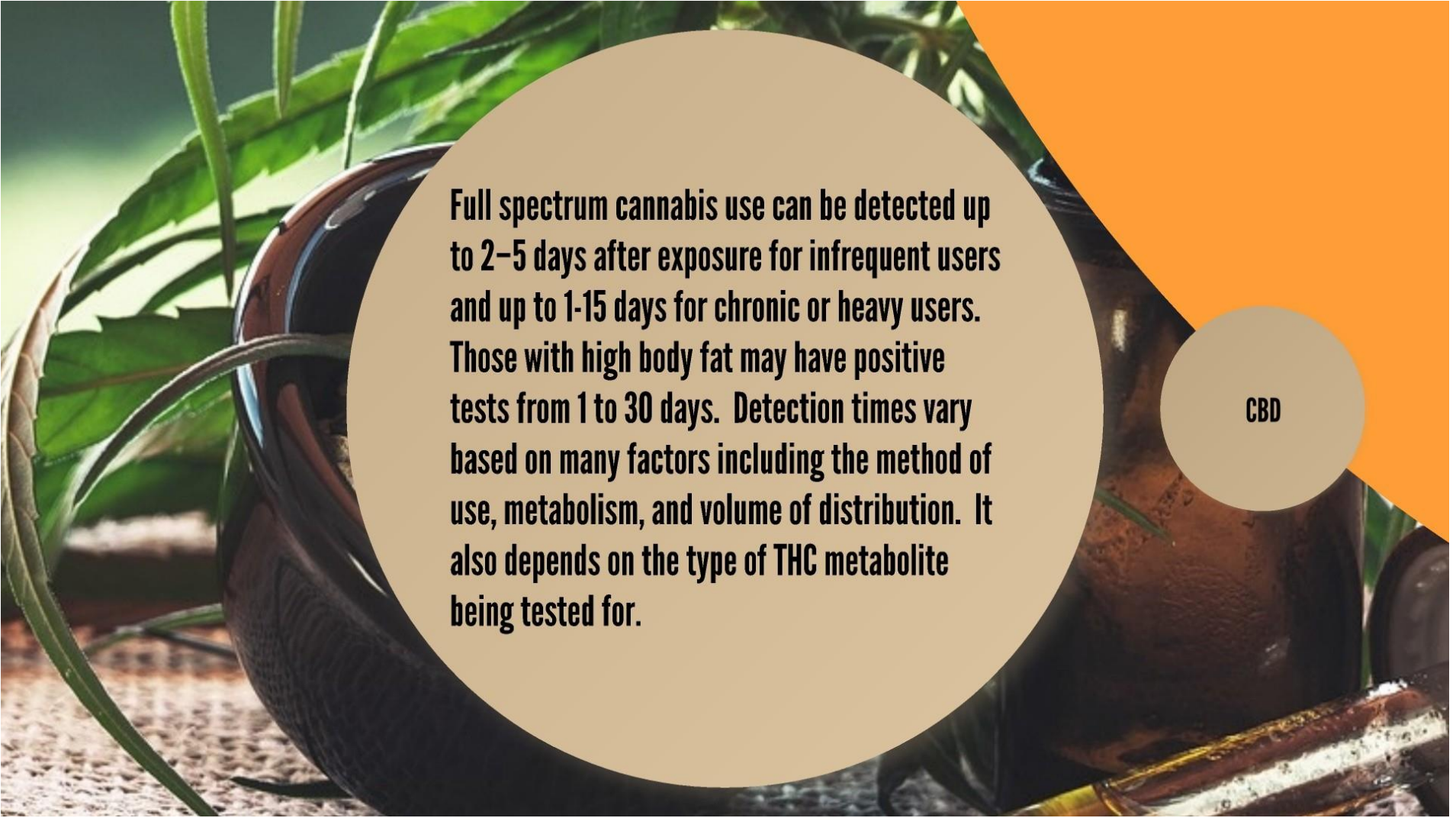


**Long-term use has also been associated with periodontal disease, pre-term birth if used at 20 weeks gestation, and more frequent pain crisis in sickle cell patients.**

**Chronic use has also been well documented as a cause of cannabinoid hyperemesis syndrome (CHS). This syndrome is characterized by recurrent episodes of nausea and vomiting relieved by hot showers.**

**Medical contraindications are cardiovascular disease, arrhythmias, poorly controlled hypertension, severe heart failure, history of psychotic disorder, patients under eight years old, pregnant women, or nursing women.**






**Full spectrum cannabis use can be detected up to 2–5 days after exposure for infrequent users and up to 1-15 days for chronic or heavy users. Those with high body fat may have positive tests from 1 to 30 days. Detection times vary based on many factors including the method of use, metabolism, and volume of distribution. It also depends on the type of THC metabolite being tested for.**

**CBD**





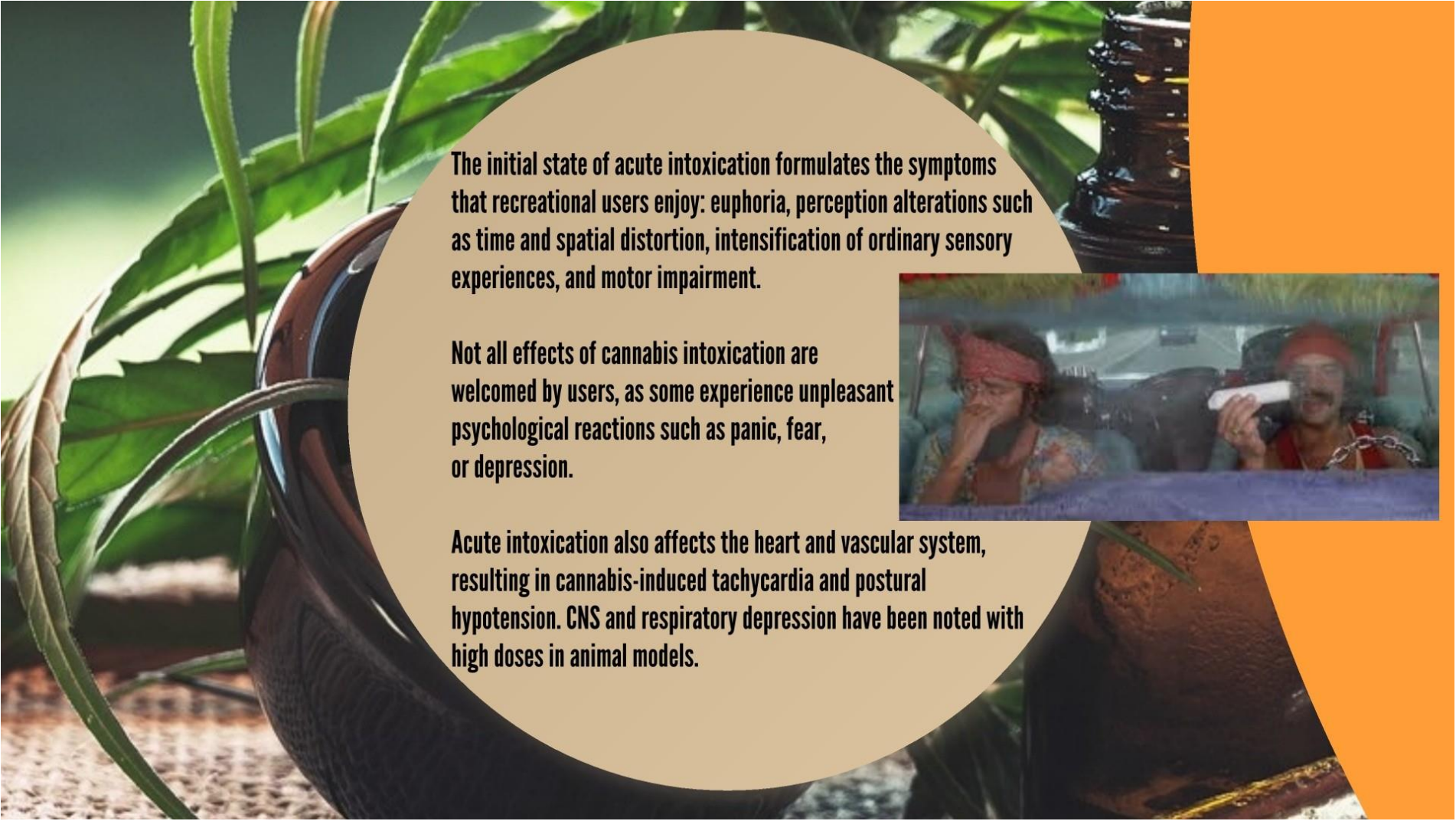
**Due to federal laws all CBD products must be extracted from hemp and not marijuana. By definition, hemp contains less than 0.3% THC. The extract will also only contain negligible amounts of THC.**

**Isolate**



**The most basic form of CBD is an isolate.**  
**Isolates contain nothing except pure, isolated CBD.**  
**There are no other cannabinoids, terpenes, or flavonoids.**






**The initial state of acute intoxication formulates the symptoms that recreational users enjoy: euphoria, perception alterations such as time and spatial distortion, intensification of ordinary sensory experiences, and motor impairment.**

**Not all effects of cannabis intoxication are welcomed by users, as some experience unpleasant psychological reactions such as panic, fear, or depression.**

**Acute intoxication also affects the heart and vascular system, resulting in cannabis-induced tachycardia and postural hypotension. CNS and respiratory depression have been noted with high doses in animal models.**





Studies show that inhaled doses of 2 to 3 mg of THC and ingested doses of 5 to 20 mg THC can cause impairment of attention, memory, executive functioning, and short-term memory.

Doses > 7.5 mg/m<sup>2</sup> inhaled in adults and oral doses from 5 to 300 mg in pediatrics can produce more severe symptoms such as hypotension, panic, anxiety, myoclonic jerking/hyperkinesia, delirium, respiratory depression, and ataxia.


Conjunctivitis is a consistent physical exam finding regardless of the route of administration.

There have also been various reports of patients presenting with cyclic vomiting syndrome/cannabinoid hyperemesis.

Cannabis intoxication can lead to acute psychosis in individuals and can produce short-term exacerbations of pre-existing psychotic diseases such as schizophrenia.

## K2 & Spice


**As opposed to  
phytocannabinoids,  
marijuana synthetics have  
caused deaths**

A photograph of a cannabis plant and a glass bottle, with a large circular text overlay. The background shows green cannabis leaves and a brown glass bottle. A large, light-colored circle is centered over the image, containing text. A smaller, similar circle is on the right side of the bottle, also containing text.

**Over 140 million people use cannabis worldwide. Trends in the US to decriminalize marijuana have led to increased exposures reported to poison centers and presenting to emergency departments. Exposure characteristics are generally related to excessive use in adults and inadvertent ingestions in small children.**

Clinical cannabis education for allied health professionals, industry professionals and consumers aims to increase knowledge in cannabis basics, pharmacology, and dosage methodologies.

**Treatment of  
Cannabis Toxicity**



## Treatment of cannabinoid toxicity is largely supportive and focuses on symptomatic and supportive care.

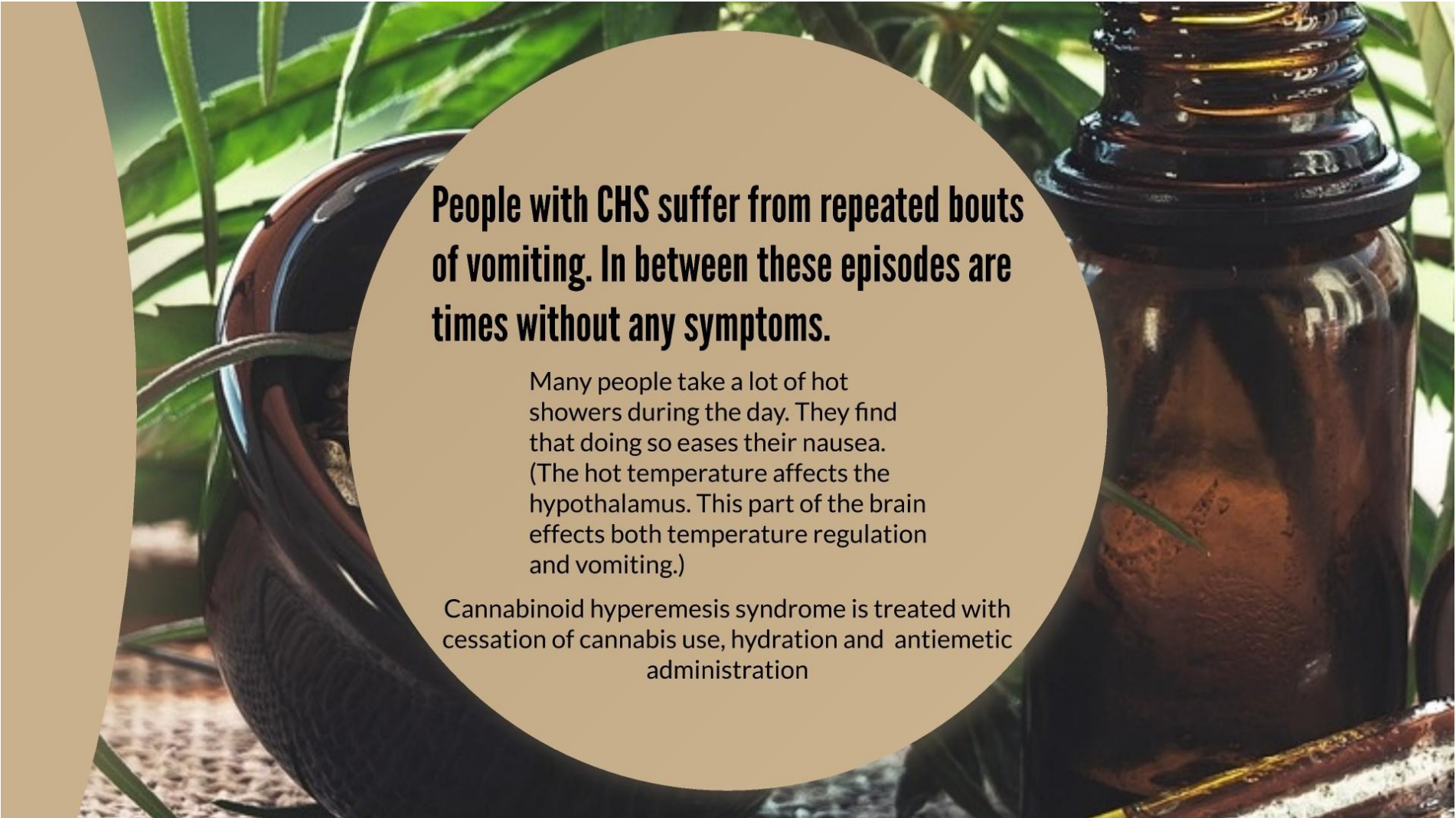
Pediatric patients may require longer observation and support, as well as the involvement of social services to assure safety in the home.

Tachycardia is treated in an ER with benzodiazepines and hydration unless a specific dysrhythmia is present.

If chest pain is present, it is reasonable to obtain a 12-lead electrocardiogram to assess for myocardial ischemia or infarction, as there is thought to be an elevated risk up to 4.8 times for MI within 1 hour of marijuana use.

Agitation or acute psychosis should be treated with benzodiazepines or, if necessary, antipsychotic agents, such as haloperidol or olanzapine.

**CHS Treatment**



**People with CHS suffer from repeated bouts of vomiting. In between these episodes are times without any symptoms.**

Many people take a lot of hot showers during the day. They find that doing so eases their nausea. (The hot temperature affects the hypothalamus. This part of the brain effects both temperature regulation and vomiting.)

Cannabinoid hyperemesis syndrome is treated with cessation of cannabis use, hydration and antiemetic administration



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**Consider these differential diagnoses**

- Allergy and environmental asthma
- Anxiety disorders
- Atrial tachycardia
- Benzodiazepine toxicity
- Brief psychotic disorders
- Delirium
- Depression
- Hallucinogen use
- Panic disorder
- Primary hypersomnia

**A case study  
FOR the use  
of clinical  
cannabis**

**Recreational  
Use Case  
Study**

**A 72-year-old female presented to seek support around a decline in her quality of life and challenges with her emotional and psychological well-being**



Her challenges were primarily associated with managing a generalized anxiety disorder and debilitating symptoms of vertigo.

The patient was also experiencing ongoing grief associated with losing her late husband of 50 years only a few years earlier.

Initially, a benzodiazepine was prescribed to treat her anxiety. The patient stopped taking this after two days due to incessant shaking. The patient was then prescribed another benzodiazepine. She reported that she did not consume this drug due to concern that she would have a similar reaction

She expressed desperation to improve her deteriorating health and quality of life. From the onset of these challenges, she had sought support from her medical team and this care continued throughout the intervention.

# The patient undertook a mental health intervention in 16 week format.

In the sixth week, the patient reported that she had sourced her own medical cannabis oil.

By the tenth week, the patient reported significant improvements to her quality of life. She was continuing to adhere to her protocol that involved recommencing daily physical exercises and meditation practices.

She reported that her medical team could not prescribe her a cannabis oil but that they supported and encouraged her to continue the cannabis oil as a daily treatment.

Although the future role that medical cannabis will play in healthcare is unknown, this case demonstrates how the patient was able to significantly benefit from the introduction of medical cannabis into her mental health intervention. In this case, the benefits for the patient using medical cannabis as a treatment in the both the short term and longer-term far outweighed the potential risks that may require consideration for children or adolescents.

# **You are dispatched to a private residence in a gated community on a Friday evening in fall for a 17 year old male with an unknown medical problem.**

**Upon arrival, you are met by the patient's older sibling and a few young adults. The house is well kept and you observe no immediate hazards**

**The sibling reports they consumed homemade "edibles" approximately 90 minutes prior to calling 911. They further explain that the patient consumed approximately 20 THC infused gummy bears**



# **The 17 year old patient is found in thier bedroom, complaining of severe anxiety. Patient is inconsolable and is unable to stop crying**

Pt denies desire to harm self or others.

Pt denies any accute injury

Pt complains of anxiety and extreme thirst

Pt denies allergies

Pt is compliant with prescribed Zoloft 25mg daily for anxiety and depression

Pt denies any other pertinent medical history.

Pt's last oral intake was "two handfuls" of THC infused gummy bears 90 min ago.

There are no other significant preceding events.

HR: 112 RR: 20 BP: 110/64 w/o orthostatic changes SP02: 99% PERRLA

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A background image featuring a cannabis plant with green serrated leaves and a dark bowl filled with dried cannabis buds. A large orange circle is overlaid on the center of the image, containing text. To the right of the orange circle are two smaller, light-colored circles, one containing 'NY' and the other 'National'.

**There is a need for more rigorous testing on the use of medical cannabis to support patients and better manage their symptoms.**

**There are significant safety risks posed for the patients if they access medical cannabis from an unregulated source and use it without supervision.**

**NY**

**National**



**In July 2014, Governor Andrew M. Cuomo and the New York State Legislature enacted the Compassionate Care Act to provide a medical marijuana program.**

**In light of the COVID-19 crisis, NY state legislators have to wait until next year to legalize marijuana for adult recreational use.**

Marijuana laws are changing at a rapid pace across all 50 states.

As of 2019, eleven states, two U.S. territories, and the District of Columbia have legalized recreational use of cannabis. Thirty-three states, four U.S. territories, and D.C. have legalized medical use of the drug.

**A congressional vote on a bill to federally legalize marijuana will take place in September.**

**The Marijuana Opportunity, Reinvestment and Expungement (MORE) Act will hit the floor during the week of September 21.**

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