Cannabis (Marijuana) and Cannabinoids

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Cannabis (marijuana) is an alternative treatment option for pain and spasticity after spinal cord injury (SCI). This page outlines basic information about cannabis and its use after SCI.

Key Points

- ‘Cannabis’ refers to products derived from the cannabis plant, such as marijuana, which can be used as a drug for recreational or medical purposes.
- Cannabis-related products may be inhaled as a smoke or vapor or taken by mouth as a capsule or spray. These products may be plant-derived or synthetic.
- Smoking cannabis is not recommended due to the risks associated with inhaling smoke.
- Cannabis products are used as alternative treatments for pain and spasticity after spinal cord injury.
- The safety of cannabis products for use after SCI is not known. Please consult your health providers for detailed safety information.
- Research on cannabis use after SCI is in its early stages. Studies done so far show that cannabis products may have beneficial effects on pain and are unclear about its effects on spasticity. More research is needed to establish if cannabis is a safe and effective treatment after SCI.

What is cannabis?

Cannabis is a term that refers to the products of cannabis (hemp) plants, a group of plants from central Asia that are now cultivated around the world. Common preparations of cannabis include marijuana, which is the dried leaves and flowering tops of the plant; and hashish, which is its condensed resin. Cannabis has been used for thousands of years as a medicine and recreational drug.

Currently, cannabis is a controlled substance in most regions, including Canada, because of its psychoactive effects. However, exceptions are made in some places for approved medical uses. Cannabis has been studied as a treatment for conditions as diverse as nausea associated with cancer chemotherapy; loss of appetite in people with HIV; and spasticity associated with multiple sclerosis.
Cannabinoids
Cannabis has its unique properties because of naturally-occurring chemical compounds within the plant called cannabinoids. Cannabinoids act on receptors on the surface of cells called cannabinoid receptors, causing effects on body processes like pain, memory, appetite, and immune responses.

Cannabinoids occur naturally within the body (endocannabinoids); in cannabis plants (phytocannabinoids); and can also be synthesized in a lab (synthetic cannabinoids). There are more than 60 cannabinoids present in cannabis, with the most well-known being Delta-9-tetrahydrocannabinol (commonly known as THC), which is responsible for many of the psychoactive effects for which cannabis is known. Other cannabinoids, like Cannabidiol (also known as CBD), are not psychoactive and may have different effects such as helping to reduce inflammation.

How is cannabis used?
Medical cannabis products are available in many forms, including as dried leaves and flowers, resins, oils, capsules, mouth sprays and other forms. These products may be derived from the cannabis plant or synthesized in a lab (synthetic).

Cannabinoid medications
Cannabinoid medications are available in some countries. These products are pharmaceuticals that require a prescription from a physician. Like other medications, these products are registered with a Drug Identification Number (DIN) in Canada or with the Food and Drug Administration (FDA) in the United States.

Prescription cannabinoid medications often use isolated cannabinoid compounds or combinations of cannabinoids. This includes products such as:

- **Nabilone (Cesamet)**, a synthetic cannabinoid similar to THC that is taken by mouth as a capsule.
- **Dronabinol (Marinol)**, synthetic THC that is taken by mouth as a capsule. Please note that dronabinol is no longer available in Canada.
- **Nabiximols (Sativex)**, a mix of cannabis plant-derived THC and Cannabidiol that is taken as a mouth spray.

Prescription cannabinoid medications are carefully regulated and monitored for their composition and effects on the body and developed to minimize accompanying intoxication.

Other medical cannabis products
Other cannabis products, such as plant-based products (including medical cannabis/marijuana) also require a doctor’s approval. The laws and regulations required to get approval differ by country and region. In Canada, use of medical cannabis requires authorization for use from a physician.
These products are usually inhaled or taken by mouth. Smoking is the most common method; however, there are serious concerns about the negative health effects to the user and those nearby associated with inhaling and exhaling smoke, which contains many of the same harmful compounds as tobacco smoke. Vaporization is another method where the cannabis leaves are heated to form a vapor that is then inhaled. Cannabis can also be taken by mouth in the form of food items or other products like capsules and mouth sprays. Each different form and method of cannabis use will change how the drug affects the body.

It is important that you closely follow the directions of your health providers for use of medical cannabis and prescription cannabinoid medications. Speak to your health provider for more detailed information.

**Non-medical cannabis products**

Non-medical cannabis products, like those that are available in some places for recreational use, have much greater variation in their chemical composition than cannabis products intended for medical use. It can be difficult to know exactly what dose you are receiving and the risks and side effects for using these products may be unknown. Non-medical cannabis products are not recommended for treating symptoms of SCI.

**What are the risks and side effects of cannabis?**

The safety of medical cannabis use after SCI is not yet known. However, a number of risks and side effects of other cannabis use are known. Many of the short-term side effects of cannabis have been reported to be mild to moderately severe and related to the dose of the drug taken. However, uncommon but serious adverse effects may also exist. Furthermore, the risks to long-term users are not well known and some side effects may be related to regular use over time.

This is not a complete list; speak to your health provider for detailed information about the risks and side effects of cannabis use.

**Short-term side effects of cannabis may include:**

- Dizziness and lightheadedness
- Dry mouth, throat irritation, and cough
- Drowsiness
- Altered judgment and attention
- Anxiety and agitation
- Hallucinations
- Disorientation and confusion
- Increased heart rate
- Impaired coordination and balance
- Impaired short-term memory
- Headache
- Paranoia and psychosis
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Interactions with other medications

Long-term cannabis use may be associated with:

- Addiction and withdrawal
- Airway problems like chronic bronchitis
- Possible increased risk of mental disorders like anxiety, depression, schizophrenia, and psychosis in people at risk for these conditions
- Possible increased cancer risk with long term smoking, although this is not yet clear

An emerging concern is the effects that cannabis use may have on adolescents and young adults. Studies have suggested that cannabis use early in adolescence may alter brain development and could be related to the development of psychotic disorders as adults.

What is cannabis used for after spinal cord injury?

Cannabis may be used as an alternative treatment for certain symptoms of SCI. Research has only studied the use of cannabis products in the treatment of pain and spasticity after SCI.

Cannabis for pain

Early research provides moderate evidence that smoked and vaporized cannabis may help to reduce neuropathic pain. There is also weak evidence that oral cannabinoid sprays may help to reduce neuropathic pain.

Among this early research, only one study was specific to people with SCI (the other studies also included people with other neurological conditions). Further research specific to people with SCI is needed to determine if cannabis is safe and effective for pain after SCI.

Cannabis for spasticity

Research on cannabis products for spasticity after SCI has been conflicting. Three studies provide support that cannabinoid medications and vaporized cannabis may help with spasticity after SCI. However, two other studies have been inconclusive about whether cannabis products helped.

Overall, these studies show that cannabis-based treatments may have benefits in the treatment of spasticity, but further research through larger and more rigorous studies are needed before conclusions can be drawn about how effective they are.
The bottom line

Overall, there is early evidence that cannabis products may help to treat neuropathic pain after SCI and conflicting evidence about whether they help to treat spasticity after SCI. More studies are needed to confirm these findings.

It is not known whether cannabis is safe to use after SCI, especially over the long term, since cannabis use is associated with a number of potential risks and side effects. Until more research is done, it is important that you discuss this treatment option with your health providers in detail to find out if it is a suitable and safe treatment option for you.

For a list of included studies, please see the Reference List. For a review of what we mean by ‘strong’, ‘moderate’, and ‘weak’ evidence, please see SCIRE Community Evidence Ratings.

Abbreviated Reference List

This page has been adapted from SCIRE Project (Professional) “Pain Management” and “Spasticity” Chapters:


Full reference list, glossary terms, and related resources available online from: www.scireproject.com/community/topic/cannabis/.