

## The health impact of cannabis

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### Cannabis: a brief history



**1845** Cannabis is introduced in modern science

**1854-1942** Cannabis is listed in the USP as analgesic, antispasmodic

**1937** Marihuana Tax Act: Cannabis becomes illegal

**1944-1964** Discovery of THC

**1970** Controlled Substance Act: Illegality is confirmed

**1988-1990** Discovery of cannabinoid receptors

**1992-1999** Discovery of the brain endocannabinoid system

**2018** Medical use of cannabis legal in 30 States and DC

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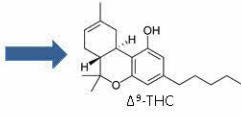
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### How does cannabis work?



**Δ<sup>9</sup>-THC**



Cannabinoid receptors



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### Two cannabinoid receptors



**CB<sub>1</sub>**

Brain, peripheral neurons, adipocytes, hepatocytes, etc.

Stress, pain, energy balance



**CB<sub>2</sub>**

Innate and adaptive immune cells (B lymphocytes, macrophages)

Immune response?

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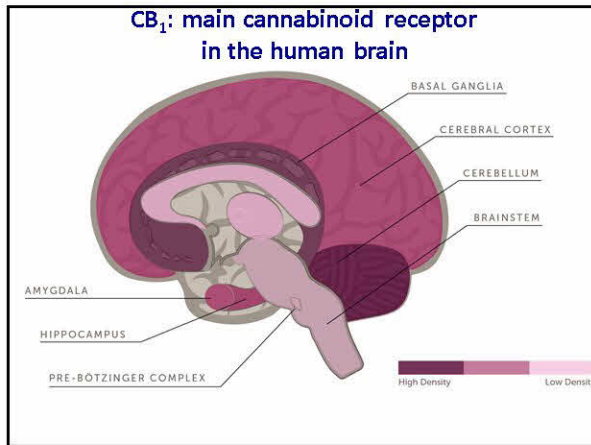
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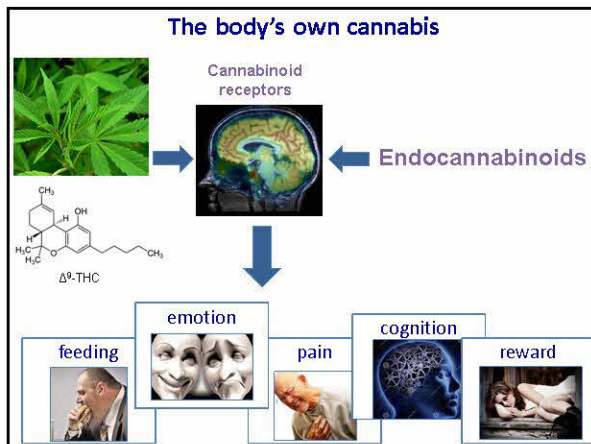
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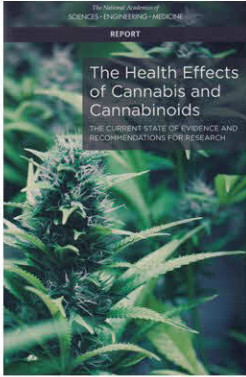
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**NASEM report**  
January 2017



Sixteen-member panel, assisted by NASEM staff

Twenty-four thousand primary studies from 1999-2016

Focus on 'systematic reviews'

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468-page report; Fifteen conclusions and four recommendations

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**Therapeutic effects**  
(Cannabis or cannabinoids)

**Conclusive or substantial evidence of effectiveness:**

- Chronic pain in adults (substantial)
- Chemotherapy-induced nausea (conclusive)
- Spasticity in MS (substantial)

**Moderate evidence of effectiveness:**

- Sleep apnea and sleep disturbances associated with fibromyalgia, chronic pain and MS

**Limited evidence of effectiveness:**

- Weight loss in persons with HIV/AIDS
  - Tourette syndrome
  - PTSD

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**Therapeutic effects**

**Insufficient evidence to support or refute effectiveness:**

- Cancers (including glioma)
- Anorexia nervosa, cachexia
- Irritable bowel syndrome
  - Epilepsy\*
  - ALS
- Huntington's disease
- Parkinson's disease

**Limited evidence of ineffectiveness:**

- Alzheimer's dementia
- Glaucoma\*\*

\* Epidiolex® (CBD) approved for some forms of child epilepsy after Committee's deadline.  
\*\* Due to short duration of action.

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### Qualifying conditions for cannabis use in California

- Cancer
- Anorexia
- AIDS
- Chronic pain
- Spasticity
- Cachexia
- Persistent muscle spasms, including those associated with multiple sclerosis with epilepsy
- Seizures, including, but not limited to, those associated with epilepsy
- Severe nausea
- Glaucoma
- Arthritis
- Migraines

**WARNING**

Any other chronic or persistent medical symptom that substantially limits the ability of the person to conduct one or more major life activities (as defined by the Americans with Disabilities Act of 1990) or, if not alleviated, may cause serious harm to the patient's safety or physical or mental health.

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### Health effects

- Cancer
- Cardiac and metabolic risk
- Respiratory disease
- Immunity
- Injury and death
- Prenatal, perinatal and neonatal exposure
- Psychosocial
- Mental health

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