

# Psychoactive Substances

GE1328 BMS CityU 2015

Part 2:

## Cannabis and Opiates

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# Male (left) and female (right) flowers of *Cannabis sativa*



## ***Cannabis sativa*, marijuana**

The resinous monoterpenes of *Cannabis sativa* (Cannabaceae) have been used in China for thousands of years. Cannabis is probably native to central Asia. The plant was used in early times from the Near East to China.



- This plant is the source of a useful fiber, hemp, for ropes. Seed oils from cannabis are used as edible oils in many Asian cultures.
- The plant has also been used medicinally and for its psychoactive properties.
- It is now **legal** for recreational use in Uruguay, Portugal, 7 US States and Washington DC.





CityU GE13282015 Cannabis sativa L.

W. Müller

- According to USDA sources, **cannabis is the number one cash crop in the U.S. today.**
- Cannabis is described in ancient Chinese writings as well as in ancient Hindu texts from India. In India, the psychoactive properties of this plant were discovered.

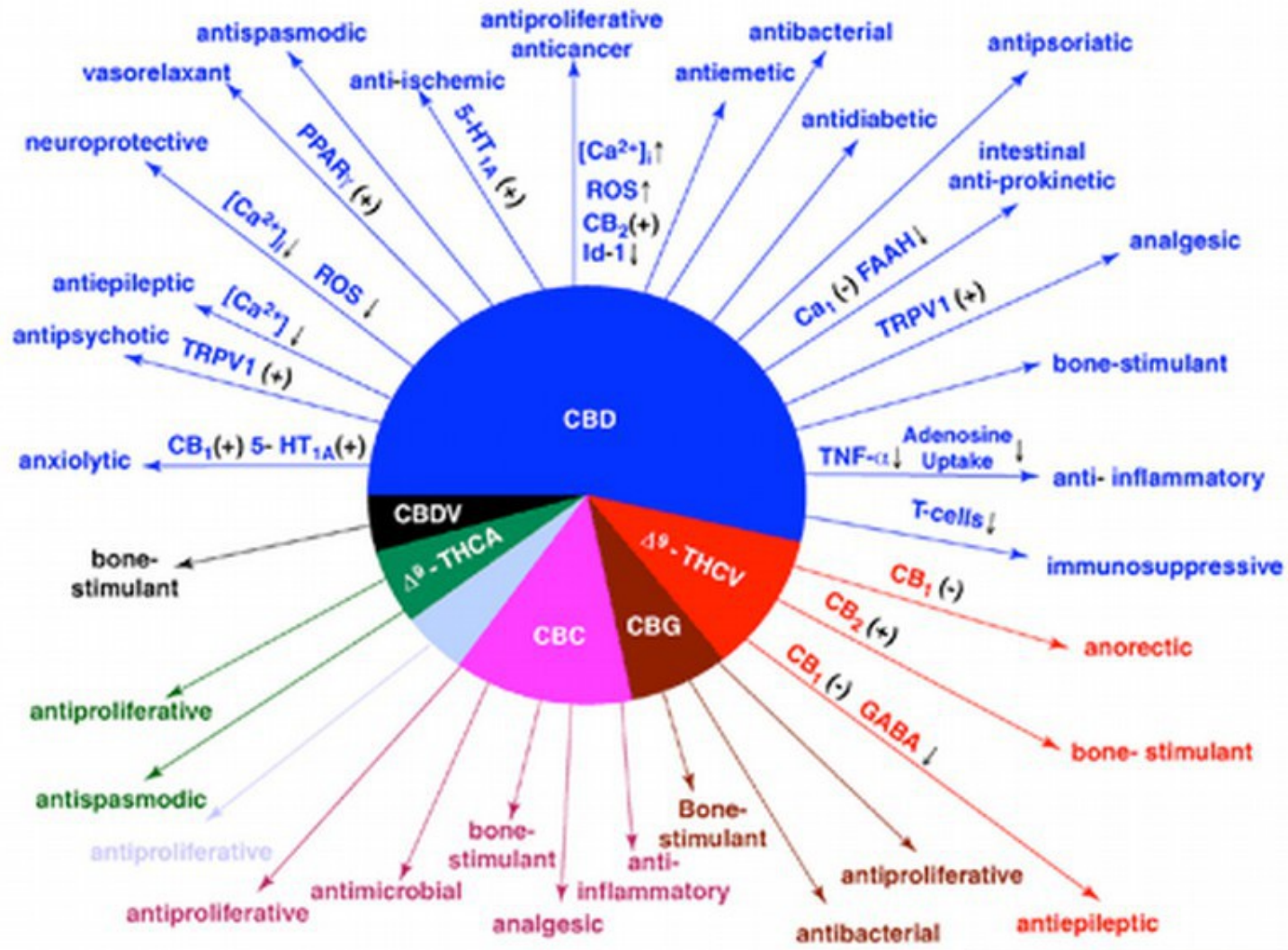
- It is still debated whether cannabis is hallucinogenic or not. Different cultivars were selected for fiber and drug use.
- Cannabis resin was originally eaten; in India that is the most common way that it is used today. Marco Polo reported the use of hashish in the East.
- By the time of the Crusades, the use of marijuana was found throughout Asia and Africa.
- Smoking (anything) was developed by the American Indians and this process did not get introduced into Europe until the 1500's.







# Actions of Cannabinoids



TRENDS in Pharmacological Sciences

# health effects of cannabinoids

Cannabis plants can exhibit wide variation in the quantity and type of cannabinoids they produce. The mixture of cannabinoids produced by a plant is known as the plant's cannabinoid profile. Selective breeding has been used to control the genetics of plants and modify the cannabinoid profile.

	THC-A	THC	THC-V	CBN	CBD-A	CBD	CBC-A	CBC	CBG-A	CBG	
Pain Relief		■		■		■		■		■	analgesis
Reduces Inflammation	■				■	■		■	■	■	anti-inflammatory
Suppresses appetite			■								anoretic
Stimulates appetite		■				■					appetite stimulant
Reduces vomiting and nausea		■				■					antiemetic
Reduces contractions in the small intestine						■					intestinal anti prokinetic
Relieves anxiety						■					anxiolytic
Tranquilizing, used to manage psychosis						■					antipsychotic
Reduced seizures and convulsions	■		■			■					antiepileptic
Suppresses muscle spasms		■		■		■					antispasmodic
Aides sleep				■							anti-insomnia
Reduces the efficacy of the immune system						■					immunosuppressive
Reduces blood sugar levels			■			■					anti-diabetic
prevents nervous system degeneration						■					neuroprotective
Treats psoriasis						■					antipsoriasis
Reduces risk of artery blockage						■					anti-ischemic
Kills or slows bacteria growth						■	■	■		■	anti-bacterial
Treats fungal infection						■	■			■	anti-fungal
Inhibits cell growth in tumours/cancer cells	■				■	■		■		■	anti-proliferative
Promotes bone growth			■			■		■		■	bone stimulant.

*These statements have not been evaluated by Health Canada, National Health Service or the Food and Drug Administration. Always consult with your physician before taking any medication. Effects of these individual cannabinoids are from peer-related scientific literature. Trends in Pharmacological Science, Volume 30, Issue 10, October 2009, P515-527*

# Cannabis Makes Mice Hungry

Koch M, Varela M, Kim JG *et al. Nature* 2015 doi: 10.1038/nature14260 18-02-2015



POMC neuronal activation is indispensable for appropriate promotion of feeding triggered by CB1R activation in the state of satiety -and hunger!



- Cannabis was brought to the New World by the Spanish and the British in efforts to establish a fiber crop.
- In the US Midwest, this plant was introduced in W.W. I and W.W. II as a source of fiber for ropes. Cannabis has become naturalized and widespread in many areas of the region. Most of the wild cannabis in the US Midwest has little psychoactive material in it.

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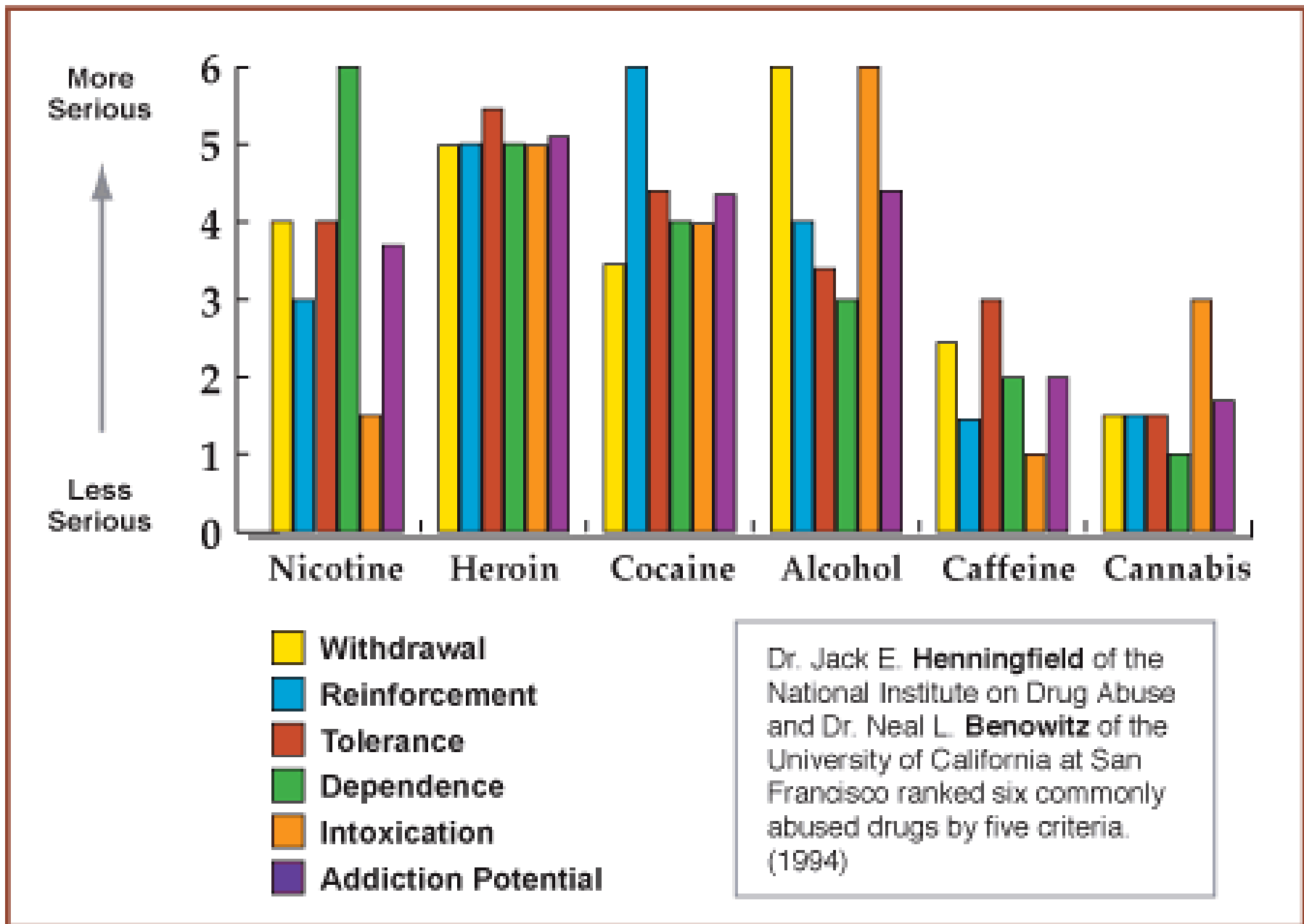
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# How does cannabis compare to other drugs?





# Poppies and their products

- Poppies are widely cultivated for the seeds and for seed oil. They are also grown for both legal and illicit sources of opium.
- Morphine and codeine are isolated from crude opium and are widely used for medicinal purposes. Both are addictive.
- The acetylated derivative of morphine, heroin, is even more addictive. Heroin does not occur naturally.



## Poppy Flower & Capsule

# *Papaver somniferum*







## Unprocessed Opium

- Opium has been used for thousands of years as a narcotic. In 3000 BCE, Sumerian tablets describe use of the plant.
- Opium was used by most cultures of the Near East to relieve pain.
- Although often associated with China, the drug was first introduced there by Arab traders in the 7th century CE.
- The drug was originally used as a treatment for diarrhea much as it is today.

- In the 17th century, the Dutch introduced smoking to Taiwan (Formosa) and people began to mix opium and tobacco as a treatment for malaria. The practice soon became popular in China.

- Although Chinese officials tried to ban the import of opium, first the Portuguese, then the British, forced them to accept this material in trade. This was brought on because the Chinese had little interest in other European goods and the Europeans had to have something to trade for silk, tea, and spices.
- England established opium plantations in India to trade with China.









- During the 1800's there were a series of opium wars in which the British (and later Germany, Russia, France, and the U.S.) took control of some key port cities of China in order to force the Chinese to trade with them. Hong Kong was one of these.
- The use of opium didn't come under control until the Communist government took over in 1949.



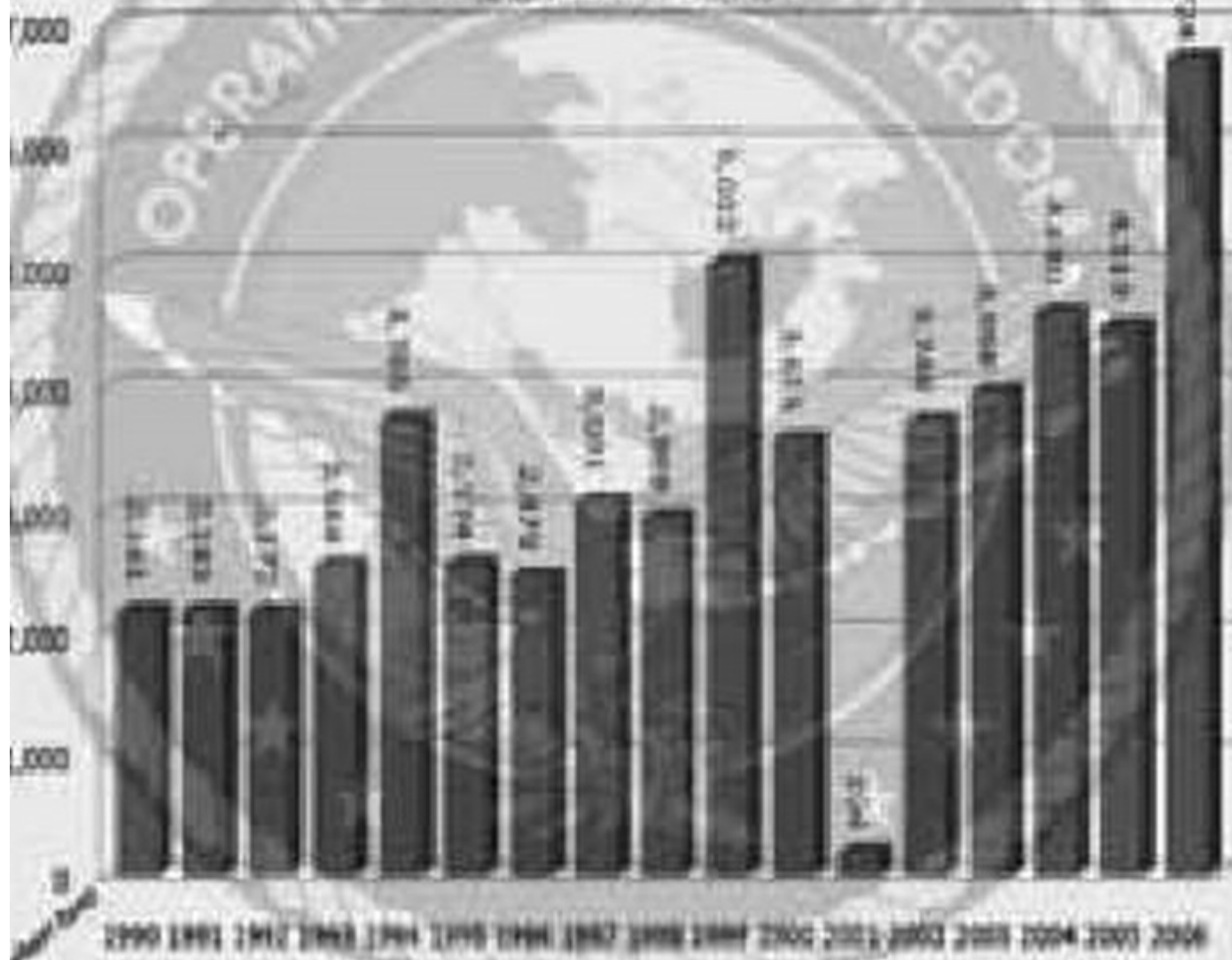




# Afghanistan

## Potential Opium Production

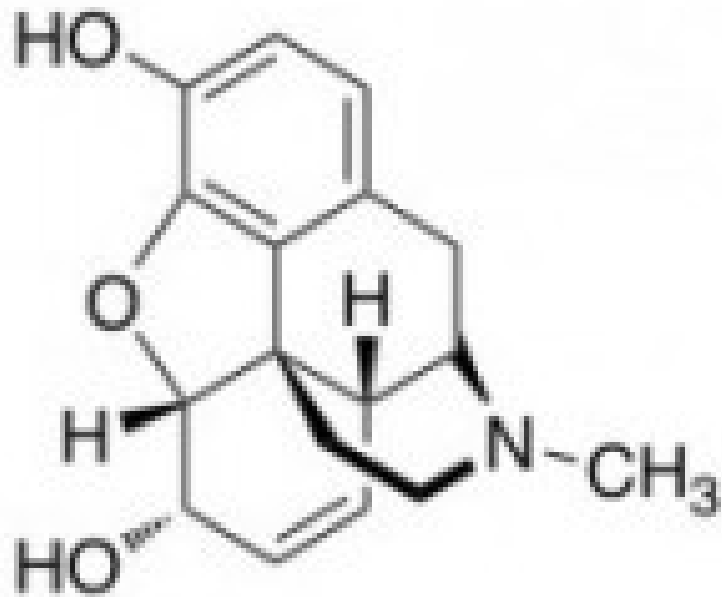
1990 to 2006



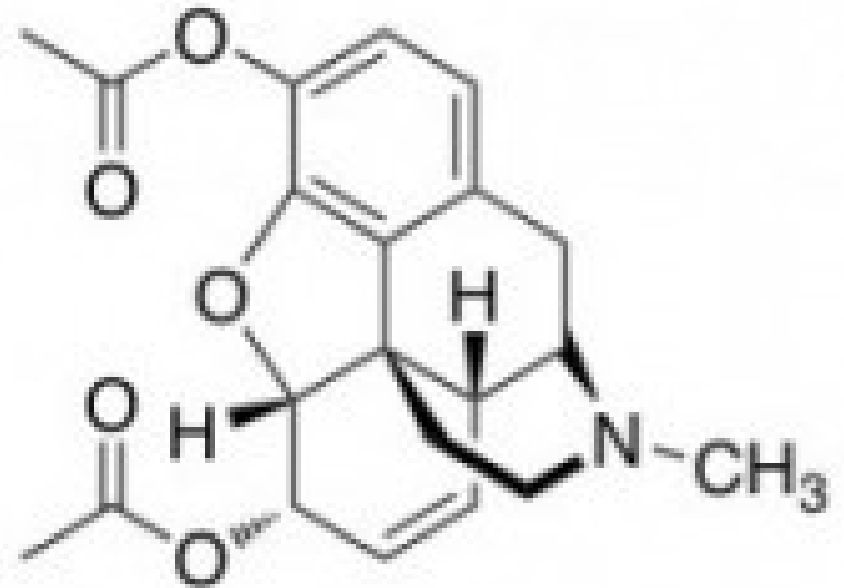
Source: United Nations Office on Drugs and Crime

- Opium wasn't commonly used in Europe until 1525 when Paracelsus discovered a way to dissolve it in alcohol. This medicinal preparation, paregoric, became popular. It is still used to stop diarrhea.
- Morphine was isolated in 1803 and the purified alkaloid could be given in measured doses.
- Morphine is an potent analgesic and it was widely used in the US Civil War. More than 45,000 soldiers returned home as addicts.

# Chemical Structures of Morphine and Heroin



morphine



heroin



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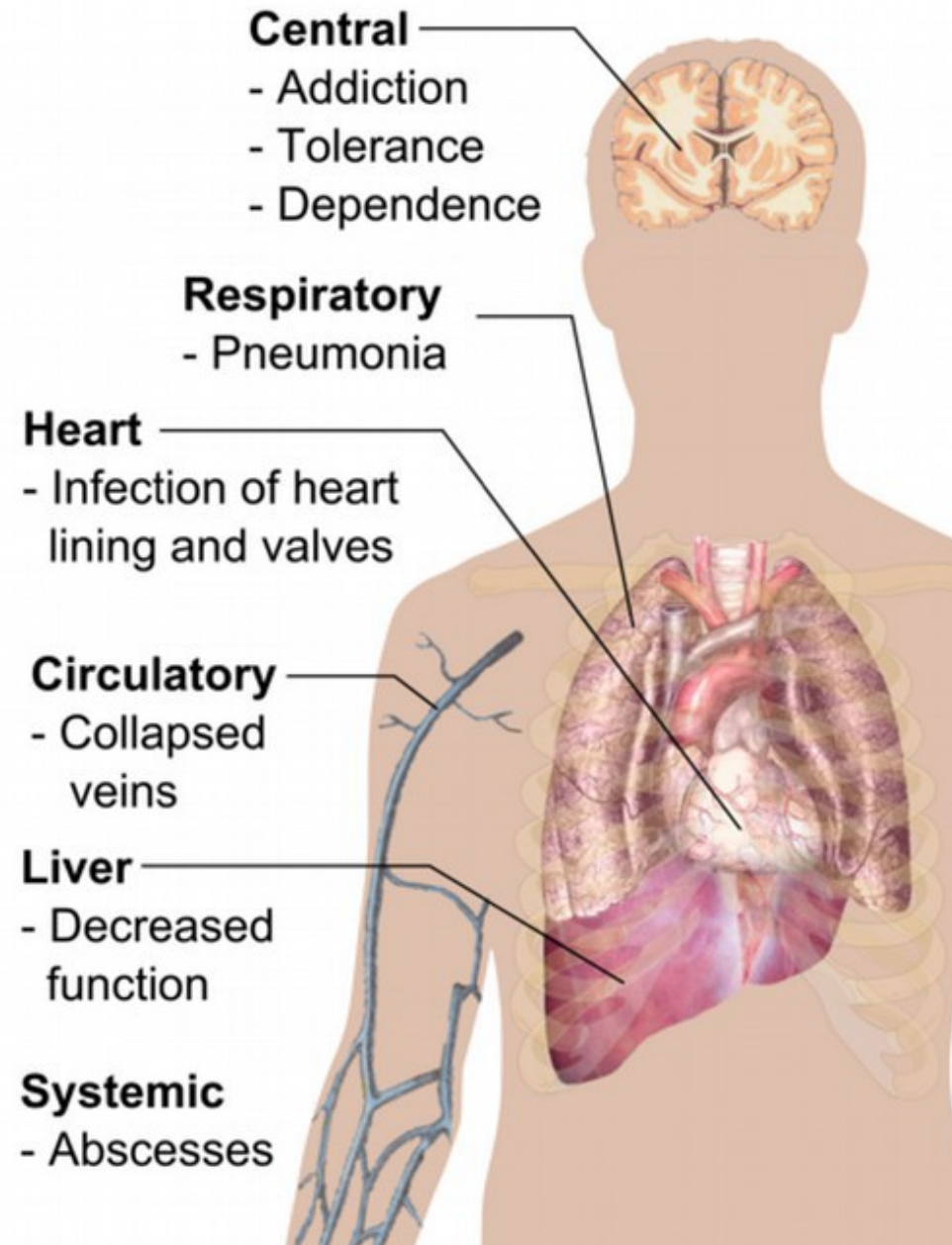
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# Long-term effects of Heroin



**END OF PART TWO**