

HEROIN

A close-up photograph of a pile of white, crystalline powder, likely heroin, contained within a clear petri dish. The powder is piled in the center-right of the dish. The word "HEROIN" is superimposed in large, white, outlined, sans-serif capital letters, slanted upwards from left to right, across the top-left portion of the powder.

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What is Heroin??

□ *is an illegal and highly addictive drug.*

□ *is processed from morphine.*





Discovery

- ❑ Heroin (diacetylmorphine) was first synthesized in 1874 by C. R. Alder Wright
- ❑ He had been experimenting with combining morphine with various acids
- ❑ He boiled anhydrous morphine with acetic anhydride for several hours and produced a more potent form of morphine, now called diacetylmorphine
- ❑ The compound was sent to F. M. Pierce of Owens College in Manchester for analysis

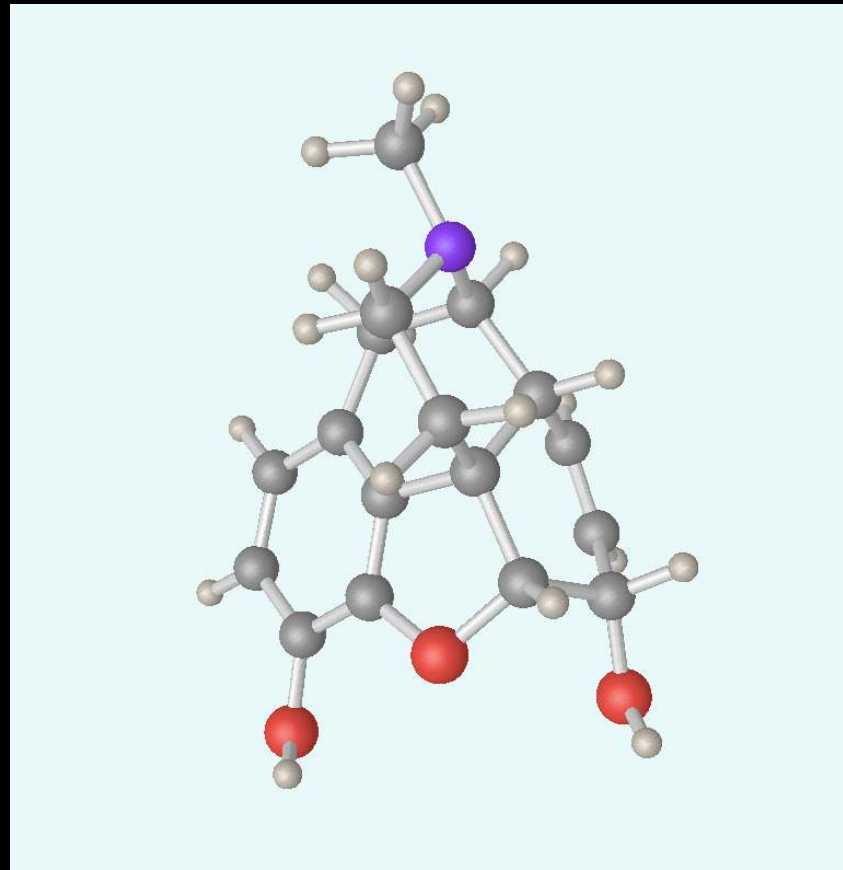
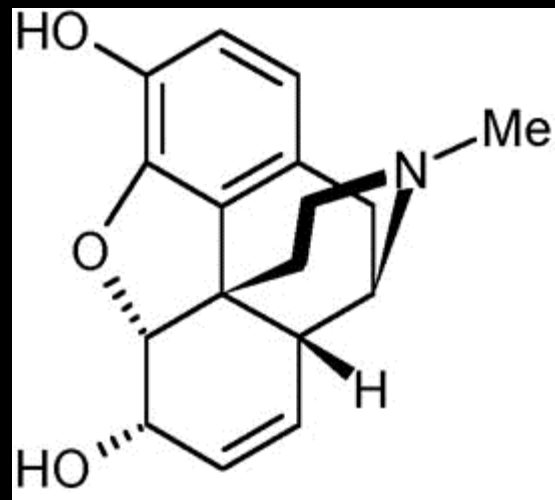


general results:

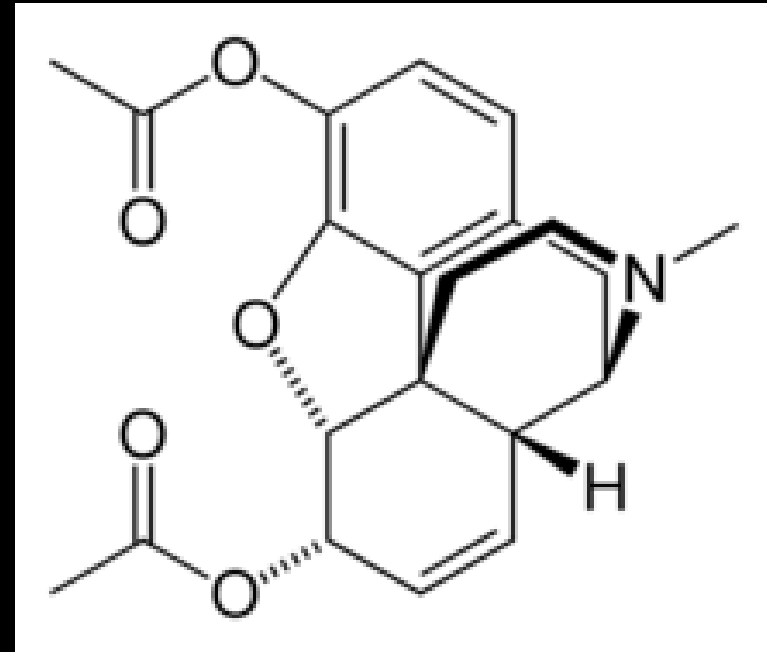
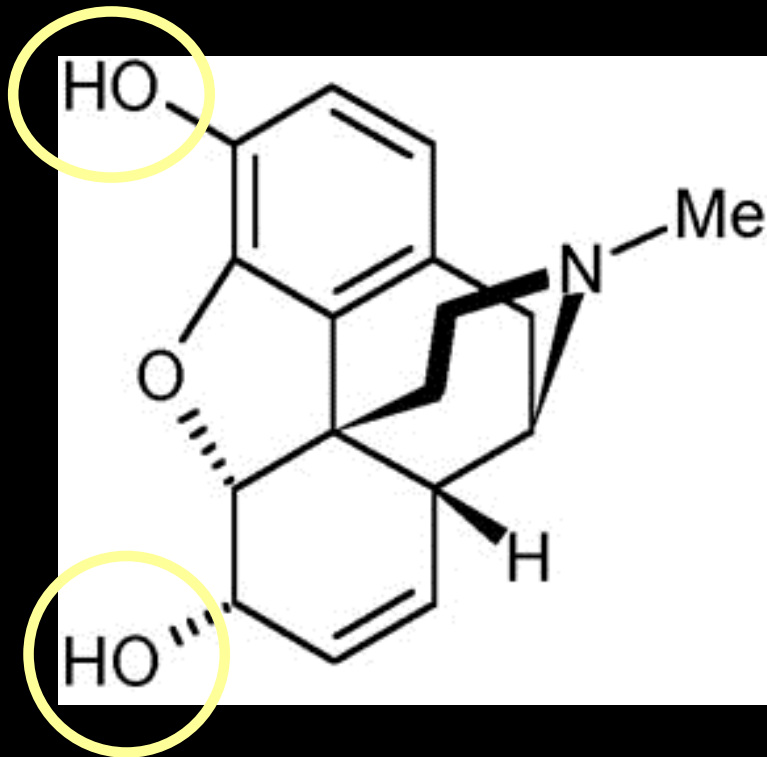
- ✓ great depression
- ✓ fear
- ✓ sleepiness speedily following the administration
- ✓ eyes being sensitive
- ✓ pupils constrict
- ✓ considerable salivation being produced in dogs
- ✓ slight tendency to vomiting in some cases
- ✓ respiration was at first quickened, but subsequently reduced
- ✓ heart's action was diminished, and rendered irregular

- From 1898 through to 1910 diacetylmorphine was marketed under the name heroin as a non-addictive morphine substitute and cough suppressant
- Bayer marketed heroin as a cure for alcohol addiction but it would soon cause addiction worse than any drug ever previously known.
- heroin is essentially a quicker acting form of morphine

Molecular modification

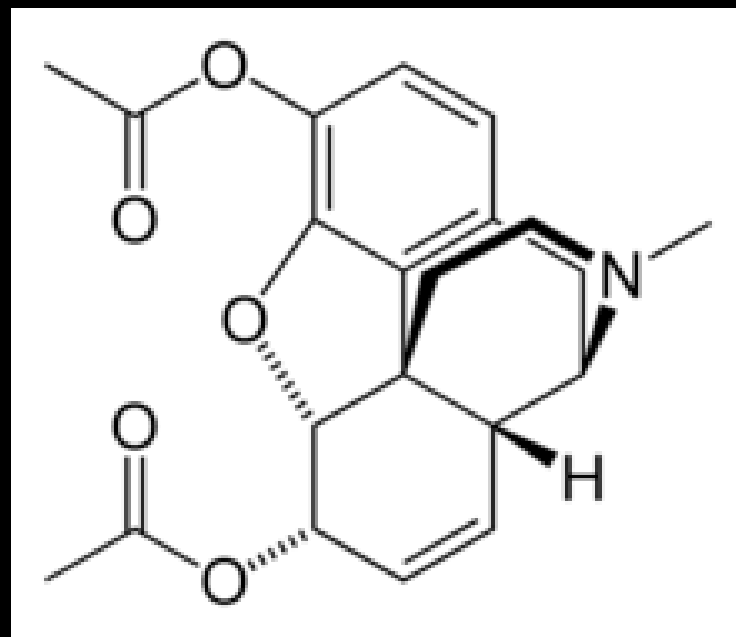
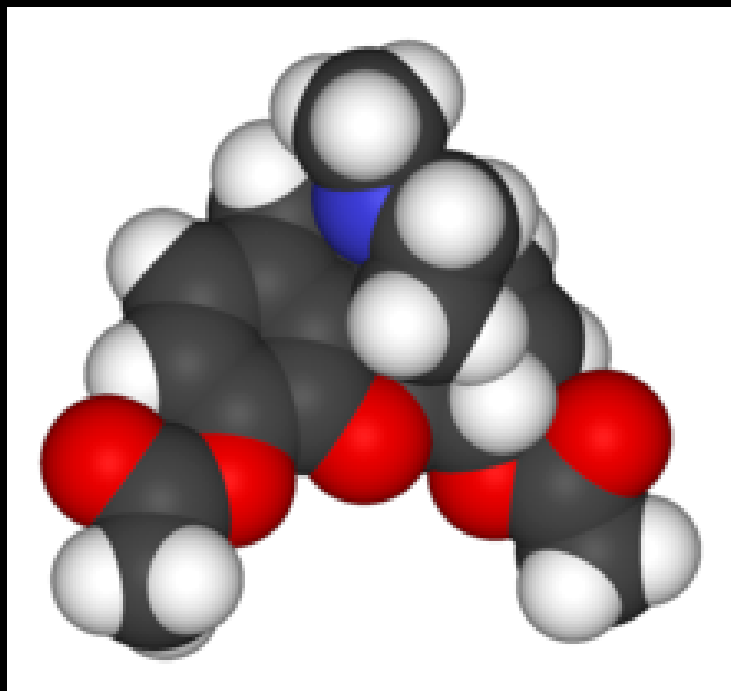


Morphine

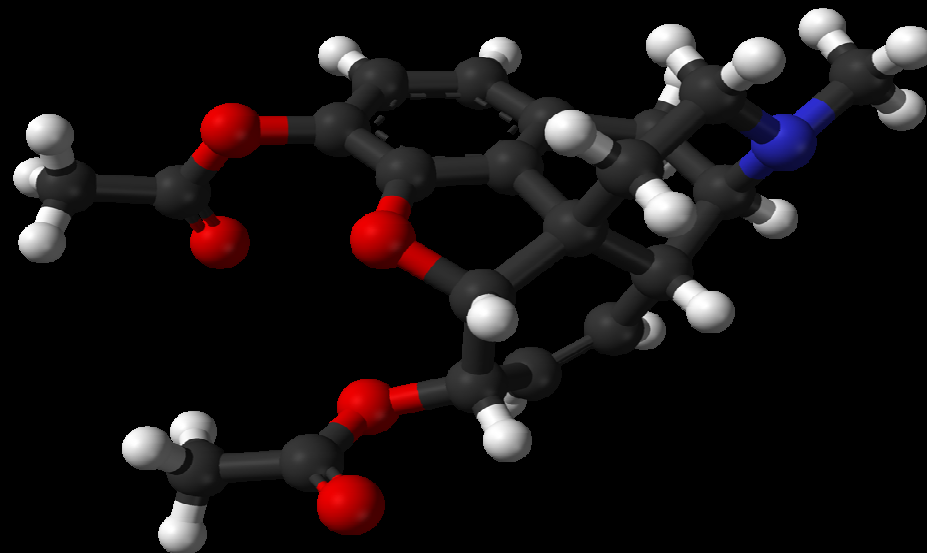


Heroin is a modified form of morphine obtained by acetylating morphine with acetic acid, so that both **hydroxyl groups** are modified. Chemically, therefore, it is *diacetyl morphine*. It is about three times more potent than morphine, and because of its increased lipid solubility it rapidly enters the brain.

Formulation development



- A white, odorless, bitter crystalline compound, $C_{17}H_{17}NO(C_2H_3O_2)_2$, that is derived from morphine and is a highly addictive narcotic.

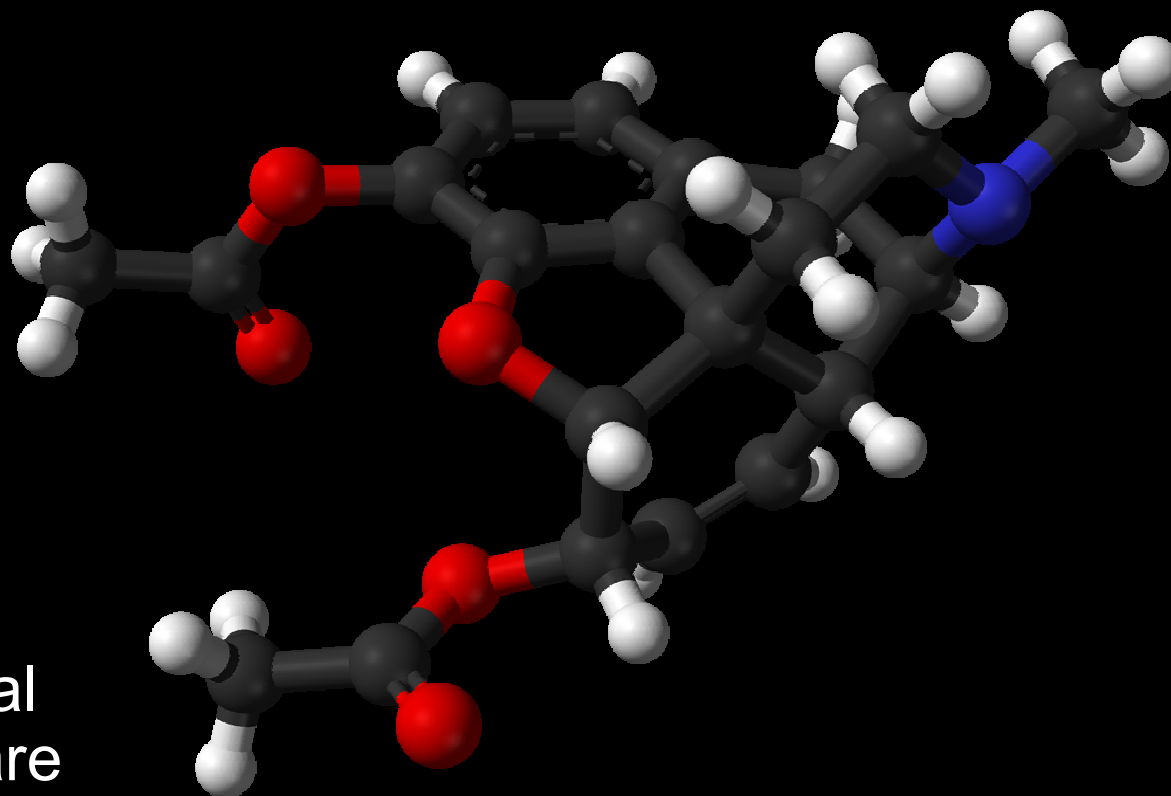


Safety test and human trials

- A clinical trial was performed in the Netherlands to evaluate the effect of medical prescription of heroin on mental and physical health and social functioning of long term, treatment-resistant, heroin-dependent patients
- Some trial patients received injectable heroin, the other were prescribed pharmaceutical heroin to be inhaled after volatilization
- diacetylmorphine for inhalation
- Diacetylmorphine base was preferred to diacetylmorphine hydrochloride



- Caffeine was added
- relatively safe to use heroin for inhalation
- smoking or nasal, oral and rectal insertion are encouraged
- users are encouraged to try a small amount first to gauge the strength, to minimize the risks of overdose



Approval for market

- In the U.S.A. the Harrison Narcotics Tax Act was passed in 1914 to control the sale and distribution of heroin, which allowed the drug to be prescribed and sold for medical purposes. In 1924 the United States Congress banned its sale, importation or manufacture.



← Old advertisement for Bayer Heroin

Bayer Heroin bottle →



Long-term effects of Heroin

Central

- Addiction
- Tolerance
- Dependence

Circulatory

- Collapsed veins

Heart

- Infection of heart lining and valves

Respiratory

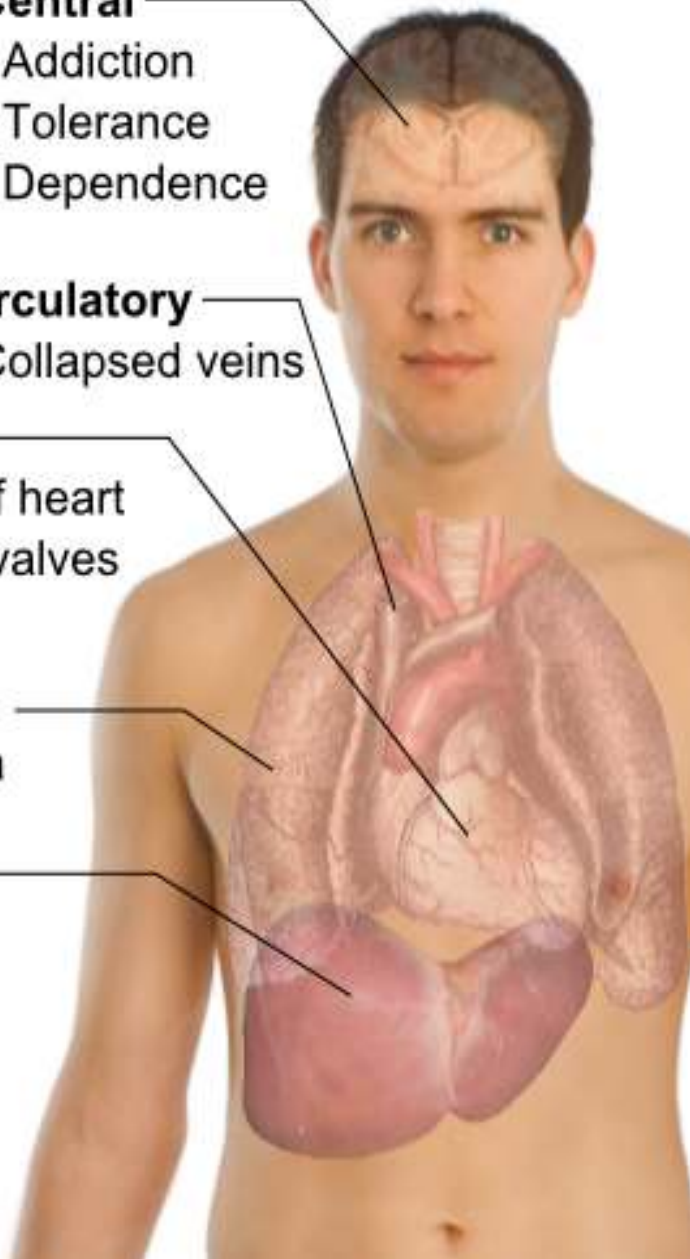
- Pneumonia

Liver

- Decreased function

Systemic

- Abscesses



Short-term effects of Heroin

Central

- Euphoria
- Alternately alert and drowsy state

Mouth

- Dryness

Skin

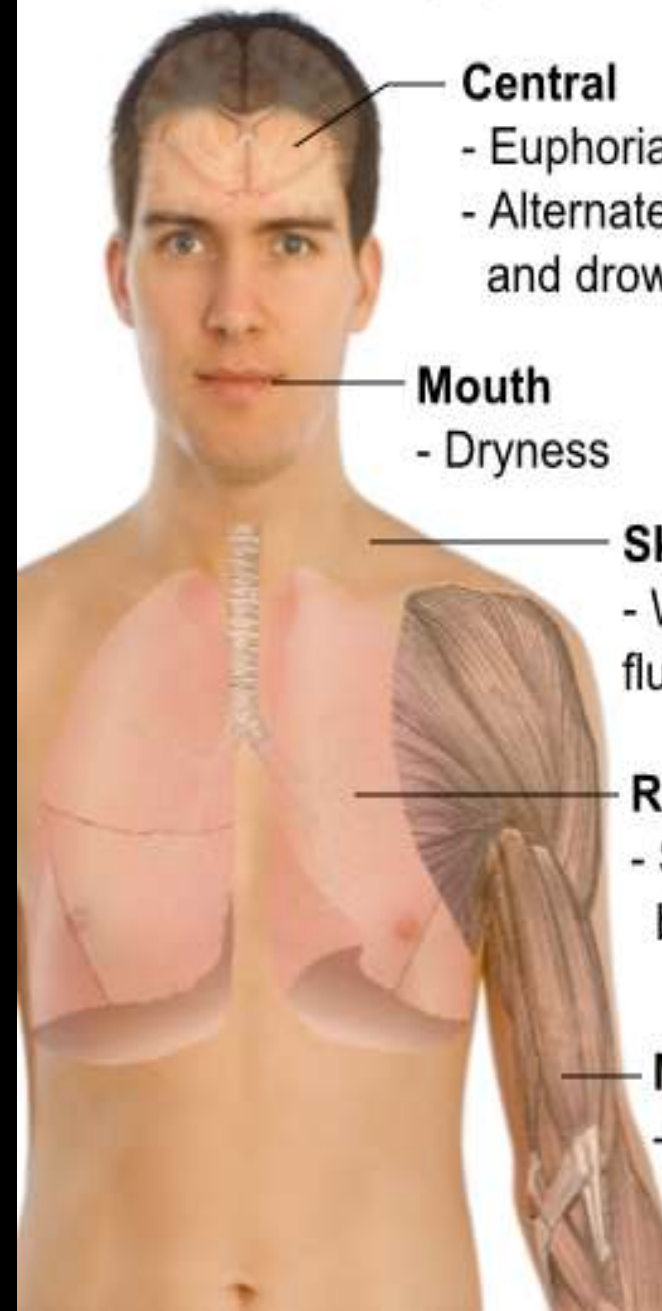
- Warm flushing

Respiratory

- Slowed breathing

Muscular

- Weakness



The End