

# Developing Treatments



## Pain

Pain serves a useful function, even though that may not be immediately obvious to the sufferer! It is a way of letting us know that something is wrong with our body and needs attention.

Pain is registered when pain receptors send messages along pathways of nerve fibres to the brain. Pain suppressing drugs block these pathways to the brain. They do this by obstructing the sites where messages are passed from one nerve cell to another.

For most of medical history, opium, or drugs derived from opium, formed just about the only effective treatment for pain. This situation only changed with the development of new analgesic and Non-Steroidal Anti-Inflammatory Drugs (NSAIDs) in the 20<sup>th</sup> century.

## Herbal Remedies

### An Anglo Saxon remedy for headache

*Against headache: rue and pennyroyal and beet's root and woodruff; take as much of each as you can pick up with your forefinger and thumb; pound them small, and melt butter and take off all the scum, and put it into a clean pan and boil the plants well in it, and wring them through a cloth; add oil if you can get it; and smear his head with it wherever it aches. ('The Lacnunga Manuscript', around 1000 AD)*



Two herbs that people have used in the past to treat pain are henbane and mandrake. Henbane is so powerful that it can bring on a narcotic trance. For centuries surgeons used mandrake as an anaesthetic in operations.

**Henbane**, woodcut illustration from John Gerard's *The Herbal or general history of plants*, 1633 edition.

## Opium

Opium poppies (*Papaver somniferum*) were grown for their pain-killing properties by the Ancient Sumerians, Egyptians and Assyrians. The Romans, medieval physicians, and doctors in every period through to the late 1800s, have relied on opium. However, it is highly addictive.

Opium is important, not just in itself, but also as the basis of other pain-killers. Laudanum is tincture of opium. Morphine, codeine and papaveretum are all opium alkaloids. In turn other pain-killers are derived from morphine.

*“Opium is...our chief medicine for relieving pain and procuring sleep – our right hand in practice...the physician could ill spare it in his battle with disease and pain.”* (William Dale, 1871)

## Laudanum

Laudanum is a tincture of opium – an extract of opium in alcohol. In the 1800s it was the most readily available pain-killer. Many people became dependent on it and some died from overdoses. It was not only the adult population who ran these risks. Infants were given sweetened preparations of laudanum, sold under names such as ‘Mother’s Quietness’.

### *Photograph shows:*

**Ball of opium resin**, from India, circa 1880-1930.

**Confection of opium**, late 1800s.

**Papine**, around 1900.

A preparation of opium. The label on the back states that papine is the pain-relieving principle of opium. It claims that papine is a safe opiate for children and has less side-effects (such as nausea and constipation) than any other preparation of opium.



**Opium poppy heads**, 20<sup>th</sup> century.

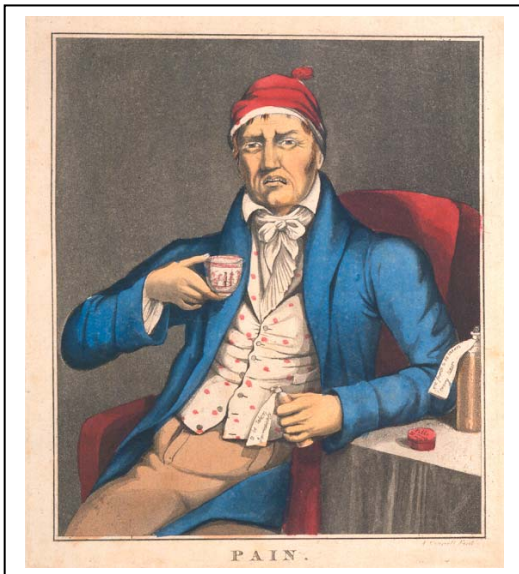
**Jar for powdered opium**, around 1900.

**Sticks of opium resin**, date uncertain.

**Opium and rhubarb tablets**, around 1900. To relieve colic and gastric pain.

**Bottle for laudanum**. This bottle originally belonged to a home medicine chest and dates from the 1800s.

**Tincture of opium**, circa 1970-1980.



**Caricature entitled 'Pain'.** (Hand coloured etching and aquatint, circa 1835).

Here the nature of the pain is unspecified. Likewise we don't know what medicines the sufferer is taking, but he seems to be resorting to more than one remedy. He holds a medicine bottle labelled 'to be Taken Immediately'. On the table are a pillbox marked 'Pills one Morning and Night' and a bottle with the direction 'one fourth to be taken every hour'.

## Morphine

Morphine (an alkaloid of opium) is a very powerful pain-killer. It was first synthesised in 1805 by an apprentice pharmacist, Friedrich Wilhelm Serturmer, who found that it put animals to sleep. At first it was believed to be non-addictive. It was even thought that it could be used to treat opium dependence. However, it was itself addictive. Thousands of wounded soldiers in the American Civil War were given morphine and became addicted to the drug.

## Codeine

Codeine was developed in the early 1800s, soon after the synthesis of morphine. It too is an alkaloid of opium. While codeine can be extracted from opium, today it is synthesised from morphine by the process of methylation. Codeine is a less powerful pain-killer than morphine and so it is used to treat only mild to moderate pain.

**Photograph shows:**

**Morphia lozenges, 1800s.**

**Ampoules of morphine hydrochlorate** for hypodermic injection. French or Turkish, 1900-1918.

**Gelatine lamels of morphine hydrochloride,** first half of the 20<sup>th</sup> century.

A lamel is a sheet of small gelatine squares, each square containing a dose of the drug. The square is cut out, floated on water and then swallowed.

**Morphine hydrochloride suppositories,** mid 20<sup>th</sup> century.

**Codeine tablets,** late 1800s.



## Chlorodyne

In the 1800s the medicine Chlorodyne was created from a combination of the anaesthetic chloroform and morphine. It was widely advertised and produced in vast quantities as an 'own brand' medicine by local chemists. As with other pain-killing drugs of its day, people died from accidental overdoses.



**Photograph shows:**

**Freeman's Original Chlorodyne, late 1800s.**

**Dr J Collis Browne's Chlorodyne, circa 1950s/60s.**

Dr Collis Browne created this preparation when serving with the Indian Army in 1848. An amended formula is still sold today.

## Heroin / Diamorphine

Heroin was first synthesised from morphine in 1874. Its pharmaceutical name is diamorphine.

Diamorphine is a very powerful pain-killer, but also a highly addictive one. (However most patients only take it for brief periods of time and so do not become dependent.) It is still used to relieve severe levels of pain that result from injury, surgery, heart attack or chronic diseases such as cancer.

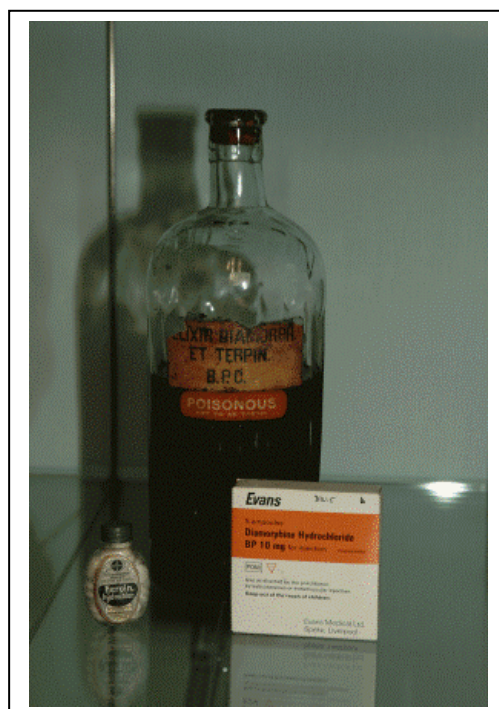
In 2000 Dr Harold Shipman was given a life sentence for murdering a large number of his patients through administering lethal doses of diamorphine.

**Photograph shows:**

**Elixir of diamorphine and terpineol, around 1900.**

**Heroin hydrochloride tablets, around 1900.**

Manufactured by Bayer, the German company who first produced aspirin.



**Diamorphine hydrochloride ampoules for injection, 1977-1980.**

## Cannabis

Cannabis has been used for pain relief for thousands of years. However, it was most extensively used in the 1800s, as an alternative to more addictive drugs. Allegedly, Queen

Victoria took it for period pain for years. By the 20th century, cannabis was becoming viewed more as an intoxicant than a medicine and in this country its use was made illegal in 1971. However, anecdotal evidence suggests that multiple sclerosis sufferers in particular benefit from taking the drug.

In a test case in May 2005, five Britons lost their appeal against convictions for illegally using cannabis for pain relief. However, multiple sclerosis patients in the UK are now able to obtain cannabis-based pain relief on the NHS. The drug is a mouth spray called Sativex. It contains two chemicals found in cannabis (tetrahydrocannabinol and cannabidiol).



**Photograph shows:**

**Specimen bottle of cannabis seeds**, around 1900. This was originally housed in the Government Central Museum in Madras.

**Specimen jar of cannabis plant** (Indian Hemp), 1800s. These are the tops of the female plant.

## Popular Medicines

In the Victorian era, pharmacists sold a range of preparations to the public that claimed to bring relief from pain, and these remained popular into the 20<sup>th</sup> century. Often great claims were made for these medicines.

**Photograph shows:**

**Sequah's Prairie Flower**, late 1800s or early 20th century.

'Sequah's Prairie Flower' was an oil to ease rheumatic pain. In the late 1800s Sequah himself drew great crowds. He claimed to be an 'American-Indian Medical Man' but in fact he came from Yorkshire.

**Sloan's Liniment**, first half of the 20<sup>th</sup> century.

This liniment claimed to relieve a whole spectrum of pain including rheumatism, sciatica, lumbago, neuralgia, stiff neck, neuritis, backache and sore throat.

**Kaputine**, first half of the 20<sup>th</sup> century.

This claimed to cure headache, neuralgia, and nerve pains, all in the space of ten minutes. The British Medical Association stated that "*its claims to uniqueness are amusing.*"

**Baker's Backache pellets**, early 20<sup>th</sup> century.

These claimed not only to cure backache, lumbago and sciatica, but also kidney trouble, gravel and pains in the loins.



## Paracetamol

There are several different versions of the history of Paracetamol. However they all agree that the drug was first synthesised in the late 1800s. Unlike the majority of modern pain-killers it is not a Non-Steroidal Anti-Inflammatory Drug (NSAID) and does not reduce inflammation. An advantage of not being an NSAID is that it is gentler on the stomach. It is used to relieve mild pain, is a component of many cold remedies, and is considered the first-line treatment in osteoarthritis.

People who are attempting to commit suicide often use paracetamol because it is a potent drug that is available without prescription. It is potentially more dangerous than other over-the-counter drugs such as aspirin. This is because paracetamol overdoses often cause liver failure. There have been many cases where a suicidal person has survived an overdose and changed their mind, yet still died a few days later from liver damage.



**Panadol (Paracetamol)**, circa 1970 -1980. In 1956, 500mg tablets went on sale in the UK under the trade name Panadol.

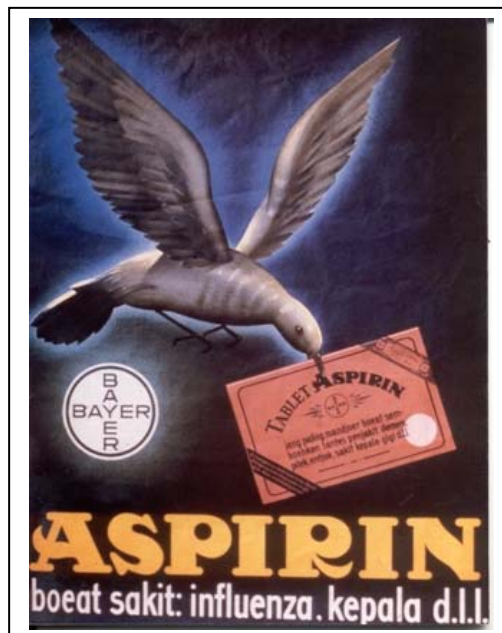
## Non-Steroidal Anti-Inflammatory Drugs (NSAIDs)

Today the most widely used pain-killing drugs are NSAIDs. As their name suggests, they not only reduce pain but also inflammation. Some forms of pain are registered when body tissues produce chemicals called prostaglandins. NSAIDs stop the release of prostaglandins and thereby lessen pain. Aspirin is the current best-selling NSAID, Ibuprofen the second.

The latest breakthrough in the field of NSAIDs is the arrival of medicines known as Cox-2 inhibitors which are proving highly successful against arthritic pain.

Ordinary NSAIDs block both kinds of enzyme involved with prostaglandin production – Cox-1 and Cox-2. But Cox-1 helps protect the stomach lining from acid attack. Cox-2 inhibitors only block Cox-2, not Cox-1, thereby reducing the risk of gastrointestinal side effects. However, there is evidence that Cox-2 inhibitors can increase the likelihood of heart attack and stroke, so the different risks need to be weighed up.

**Bayer's advert for Aspirin**, mid-20th century. Aspirin was developed from the 18<sup>th</sup> century discovery that willow bark could ease rheumatic pain. The pharmaceutical product derived from this, Aspirin, was launched by the German company Bayer in 1899.





### A range of NSAIDs, 1996-2001.

Ibuprofen was first synthesised by a team at the Boots Pure Drug Company in December 1961. The first clinical trial was conducted in 1966 by Dr Tom Chalmers at the Northern General Hospital in Edinburgh, Scotland. Chalmers clearly showed that ibuprofen reduced joint swelling and tenderness and improved joint function in patients with rheumatoid arthritis. In 1969, Boots launched ibuprofen in the UK as a treatment for rheumatoid arthritis under the brand name Brufen.