

PHARMACY *a long and proud history*

THE EXPLOSION THAT SAVES LIVES

Joseph Priestly (1733-1804) is credited with the discovery of eight gases including *dephlogisticated air* (oxygen) and *nitrous oxide* (laughing gas). Antoine Lavoiser (1743-1794) the founder of modern chemistry, named *dephlogisticated air* 'oxygen'.

Lack of oxygen to the heart muscle (Angina pectoris) causes characteristic symptoms and possible death if not treated.

Antoine Balard (1844) synthesised *amyl nitrite* and noted its vapour caused him a severe headache (due to dilated blood vessels).

English surgeon Thomas Brunton (1876) discovered that inhaling *amyl nitrite* relieved the pain of angina. It worked immediately and the effect lasted for up to one hour.

Examining other nitrites he found they had similar effects, as did Alfred Nobel's *nitroglycerine*, however, they all caused severe headaches.

A blockage, constriction, damage, old age or over-use can all cause serious plumbing problems – these are very serious if the plumbing is your own blood vessels!

Clearing the blockage can temporarily fix the problem while its cause is being sorted out and preventative action is being taken. Why not blast away the blockage and open up the blood vessels with *nitroglycerin*?

At Westminster hospital, William Murrell's research showed that the severe headaches caused by *nitroglycerin* inhalation were due to over-dosing. In 1878 he began to successfully treat patients with angina pain by dissolving

a 0.5 mg tablet of *nitroglycerin* under the tongue. The medical profession rapidly adopted this treatment and to avoid alarm the name *nitroglycerin* was changed to **glyceryl trinitrate** or **trinitrin**. As they say: the rest is history.

Nitroglycerin was discovered in 1847 by an Italian chemist, Ascanio Sobrero, who tasted it and suffered a violet headache. Nitroglycerin was a highly unstable substance until Alfred Noble discovered by accident that it became stable if you absorbed it in clay – he thus created dynamite.

Workers at the dynamite factory often experienced facial flushes and severe headaches when they returned to work after the weekend on Monday. They called the headaches 'Monday headaches', confirming the powerful vasodilating properties of nitroglycerin.

It wasn't until the 1980s that we knew how *nitroglycerin* worked. Three pharmacologists in the USA – Ferid Murad, Robert Furchgott and Louis Ignarro – proved how *nitroglycerin* is converted to *nitric oxide* a **natural vasodilator** and were jointly awarded the 1998 Nobel Prize in Medicine.

Analogues of *nitroglycerin* (nitrates) have been developed to produce longer acting anti-angina medicines such as *isosorbide dinitrate* and *mononitrate* for prophylactic use. These also have headache problems.

As the mysteries of medical/medicine discoveries unravel we see how important the curiosity factor is. It may have killed the cat, but without it mankind would still be in the dark ages.



Portrait of Monsieur Lavoisier and his wife (1788). Painted by Jacques-Louis David