

Alexander Wood: inventor of the hypodermic syringe and needle

The hypodermic syringe and needle must be by far the commonest piece of equipment used in modern health care in venous and arterial sampling, drug administration and anaesthetic practice. The inventor of the syringe and attached needle as we know it today was the Edinburgh physician Alexander Wood, who was born 200 years ago, on 10 December 1817.

Before the invention of the hypodermic syringe, access to blood was by direct puncture, usually of the median cubital vein at the elbow, allowing the blood to flow by gravity into a dish below the arm. Bleeding as a therapeutic measure dates back to the early Greek physicians and flourished during the middle ages and up to Victorian times. It was used for almost every disease, especially for apoplexy, and almost invariably did more harm than good. There were many examples of injury to the underlying brachial artery, often with formation of a false aneurysm.

As for introducing drugs into the patient, apart from the oral route, there remained only the rectum, via nutrient enemata, the vagina, inhalation or rubbing the drug (especially mercury) onto the skin.

So, to return to our inventor. Alexander Wood's father was John Wood, a physician in Cupar, Fife. The family moved to Edinburgh New Town in 1821, where young Alexander attended private schools and then the Edinburgh Academy. In 1832 he matriculated at Edinburgh University, studying arts subjects as well as medicine, was twice elected President of the student medical society and graduating MD in 1839.

Wood then set up in practice in Edinburgh New Town and was appointed physician to the local Royal Public Dispensary.

In 1841 Wood began lecturing in the practice of medicine at the extramural

medical school, but he failed to be appointed to the chair of Medicine in Glasgow University in 1852, or to the same post in Edinburgh 3 years later.

Wood distinguished himself in a number of fields but is remembered today for his development of a technique to administer drugs by means of a hypodermic syringe. He became interested in this problem by the work of James Young Simpson, Professor of Obstetrics in Edinburgh, who introduced the use of chloroform as an anaesthetic agent in obstetrics in 1847. In 1855, Wood published a paper in the *Edinburgh Medical and Surgical Journal* entitled 'A new method of treating neuralgia by subcutaneous

“ [Wood] was involved in many important medical issues, including sanitary reforms, the vaccination act, medical registration and sanitary reform. ”

injection' in which he described using a syringe to treat a case of neuralgia by injecting morphia close to the site of the pain. Wood noted the subsequent deep sleep of his patient following the injection, but believed his technique was only of value for its local effect. His syringe consisted of a glass tube and nozzle, fitted with a glass plunger and attached to a metal needle with a bevelled tip – very much like its modern counterpart. A specimen of his apparatus is in the museum of the Royal College of Surgeons of Edinburgh.

Four years after Wood's publication, a London surgeon, Charles Hunter, used this technique to inject various drugs to treat a variety of generalized diseases, claimed the invention as his own and engaged in a dispute with Wood over priority for the hypodermic technique.

Alexander Wood, in addition to this work on the use of the syringe and needle, published papers on a number of diseases,

including laryngitis, erysipelas (that dreaded, often lethal spreading streptococcal infection of the pre-antibiotic era), scarlet fever, skin diseases and rheumatism.

Wood was a keen proponent of the new ideas emerging in medicine at this time; of a medical profession that was well educated, unified and governed by a duly licensed body; a profession that would play an important role in public health. He attacked with vigour unorthodox (and unlicensed) forms of medical practice. For example, in 1844 he published 'Homeopathy unmasked' – its laws were unscientific, its notion of dilution was absurd and its medicines were without effect. In contrast, in 1851 he published 'What is mesmerism?' which examined the basis of the observed phenomena of hypnosis – he speculated that under hypnosis the will and the motor function of the subject became uncoupled between the brain and spinal cord.

Wood had a long and distinguished association with the Royal College of Physicians of Edinburgh. He was admitted as Fellow in 1840, was elected to its Council 6 years later, was elected secretary in 1850 and served as its President from 1858 to 1861. He served as the College representative of the Scottish branch of the General Medical Council. Here he was involved in many important medical issues, including sanitary reforms, the vaccination act, medical registration and sanitary reform.

Wood was a deeply religious man. He taught in Sunday schools from his student days onwards. He helped to fund and run a local free church school. He suffered from angina and dyspnoea for some years before his death and increasing deafness led him to retire from medical practice in 1873. He died at his home in Edinburgh in 1884 after a short illness.

Next time you use a syringe, which will probably be within the next 24 hours, spare a moment's thought for this remarkable Victorian, Dr Alexander Wood. **BJHM**

Conflict of interest: none.

Professor Harold Ellis is Emeritus Professor of Surgery, Guy's, King's and St Thomas' School of Biomedical Sciences, London SE1 1UL