



Medicine for Managers

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Just Count Slowly to 10

As a world, we take casually the idea if we have a medical problem that needs some sort of surgical intervention. By injection or by inhalation, for the most simple of procedures or the most major of surgical interventions, however fit, frail or infirm the individual may be, an anaesthetic will ensure that the procedure can be done in a pain free manner, either with the person made numb in the affected area or asleep.

Anaesthesia must have been regarded as one of the holy grails of medicine. The idea that any disease or disorder, able to be treated by drainage, repair or removal, which could be carried out without inflicting pain, usually worse than that produced by the disease itself, must have been every surgeon's wish.

As far back as the Egyptians, opium, hashish, Indian hemp and alcohol were used to dull the senses before surgical intrusion.

In Roman times, a mixture including opium, mandrake juice, concocted from the fruit of the Mandrake plant and found in the Mediterranean region and the Himalayas, hemlock, a poison coming from a plant which is fatal even in small doses but which causes paralysis, and boar bile (*goodness knows why*) was reported as used before 'cutting'.

One thousand years ago, surgeons continued to use drugs such as opium, either by mouth or applied on sponges to induce sleepiness and some analgesic effect, both to ease the agony of

surgery and to relieve some of the pain which would inevitably follow.

By the seventeenth century opium had often been replaced by laudenum (opium dissolved in alcohol) to try to reduce the anguish and suffering of surgical exigences in pursuit of restoration of some sort of recovery and health.

The result of any lack of availability of any sort of profound analgesic or anaesthetic and the short time that any administered agent actually worked, meant that, for surgeons, speed was of the essence.

A surgeon's skill would be measured by, amongst other things, his speed of operation. A leg could be amputated in seconds if

gangrenous and other surgical procedures were often things like drainage of an abscess, dental extractions or highly dangerous Caesarian sections.

In 1811, it is reported that the English Novelist, Fanny Burney, underwent a mastectomy. No conventional anaesthetic was available and it is said that she did not even have opium or indeed any alcohol. She herself described screaming throughout the whole period of the incisions and she said that “I almost marvel that it rings not in my ears still, so excruciating was the agony”.

It is reported that she fainted twice from the pain of the incision.

The drugs used in the potions or concoctions were all dangerous and it was likely that, if the disease didn't kill you, the potions or the surgery employed would do so. It was felt by many surgeons that a deeply drugged or drunk patient could be much more difficult to manage than an alert one suffering acute pain.

Things changed in the eighteenth century. In the 1770s, Joseph Priestley discovered nitrous oxide. The year before, he had discovered oxygen.

Humphrey Davy published research into nitrous oxide in 1799, describing its two principal actions as euphoria (he coined the term 'laughing gas' and analgesia.

Davy, working at the Royal Institution in London, assisted by a young Michael Faraday, gave demonstrations of the use of nitrous oxide and they used ether experimentally, as well.

Subsequently, ether was identified. Amazingly it had first been synthesised in the thirteenth century and the compound (diethyl ether) was reported to have soporific and analgesic effects. Surgeons grew increasingly interested in the clinical use of what was a sweet-smelling organic compound, made by distilling ethanol (alcohol) with sulphuric acid.

In 1844, in the USA, a dentist named Horace



Wells recognised the value of nitrous oxide and had one of his teeth removed by a colleague, John Riggs, after the gas was administered by Gardner Colton, a travelling showman who had been demonstrating nitrous oxide for entertainment. Wells subsequently gave a demonstration at Harvard Medical School.

In 1846, Boston dentist William Morton acted as anaesthetist for John Collins, professor of surgery at Massachusetts General Hospital, in

Boston and, as the re-creation picture shows, a young man had a tumour removed from his neck. The patient, Gilbert Abbot, recovered. This event was the turning point for the new generation of anaesthetics.

Word spread quickly about this huge advance and it was reported that, in 1846, a dentist extracted a tooth using ether in Dumfries and Dr Francis Boott, an American, anaesthetised a woman for a tooth extraction in London.

The latter procedure was done in the presence of the London Surgeon, Robert Liston, who subsequently amputated the diseased thigh of a patient using ether and called the technique “The Yankee Dodge” also in 1846.

The following year, in 1847, James Simpson of Edinburgh used chloroform for the first time to relieve pains of childbirth, later used extensively for obstetric patients, including for Queen Victoria.

For the next few years, anaesthesia was gradually introduced into surgical practice although it was quite slow and was punctuated by some deaths which perhaps slowed progress. In London Dr John Snow developed skill and expertise and published some of the earliest instructional literature. He administered chloroform to Queen Victoria in 1853 and to Princess Beatrice in 1857.

Unfortunately, it took some time for the medical benefits of anaesthesia to be fully understood and appreciated and the use of the emerging drugs were valued for their recreational uses and in the early nineteenth century, ‘laughing gas parties’ and ‘ether frolics’ were all the rage.

So, nitrous oxide, ether and chloroform were all available and recognised and the cartoon shows the accidents occurring with chloroform. The use of these agents in surgery was limited because of a key complication; infection.

The fact that anaesthesia was used for members of the Royal family stopped the murmurings about the risks of anaesthesia and its use mushroomed. Nitrous oxide was popular but it was used without oxygen making it suitable for only the briefest of procedures such as dental extractions. Furthermore, nitrous oxide had to be manufactured where it was used because the technicalities of storing the gas in cylinders,

which would not be invented for many years. This limited its usefulness.

Simpson, who pioneered the chloroform in 1847, also recognised the value of local anaesthetic. He proposed cooling

which led to the invention of the ether spray and the technique called ‘freezing’.

A similar agent, ethyl chloride, is still used today for numbing local areas of skin, often to incise an abscess.

The numbing effects of cocaine were first described in the 1860s and, in 1884, in Vienna, Sigmund Freud investigated its effects with colleague, Carl Koller.



This was to be overtaken by the work of Joseph Lister and his development of antiseptics and the introduction of the carbolic spray in operating theatres in the early 1880s. That too encountered considerable resistance largely because surgeons disliked the smell and messiness of the spray. However, the technique was refined and, with improving anaesthetic techniques, surgery blossomed.

Gradually the use of general anaesthesia progressed in parallel with improvements in surgical technique.

Improvements continued more rapidly with war and the necessity to operate on servicemen injured in battle. Many had abdominal and chest wounds and the technical difficulty of operating in those areas was increased by the tightness of the muscles.

The problem was eventually overcome through recognition of the effectiveness of the South American arrow-tipping poison, curare.

The drug produced muscle paralysis and therefore relaxation. The drug was introduced into anaesthetic practice in 1942 by Johnson and Griffith in Montreal. The muscles were relaxed and therefore, less anaesthetic was needed simply to retain the patient

unconscious. Of course it was important to ensure that the anaesthetist oversaw the ventilation of the patient because the drug paralysed the diaphragm and chest muscles and so, without adequate artificial ventilation, the patient would die of asphyxia.

Eight years earlier, in 1934, another major step forward occurred with the introduction of Pentothal, a fast-acting intravenous barbiturate which could induce anaesthesia in seconds rather than the minutes often required for an inhalation technique.

The induction of anaesthesia was therefore much smoother and patients felt much more relaxed with the simple 'scratch in the arm' rather than a rubber mask clamped over the face.

However, the more rapid induction demanded improved skills and knowledge on the part of the anaesthetists, necessary to minimise the morbidity and mortality which occurred as a result of anaesthetic, as well as of surgical complications.

Anaesthetic skills were intimately entwined with intensive care and that the patients who were taken to intensive care units needed the skills of the anaesthetist to manage the cardiac or respiratory failure which so often accompanied serious illness.

In 1948, the first modern local anaesthetic, lignocaine was introduced and it still remains in use to this day.

Local anaesthetic can be infiltrated into an area to produce numbness but it can also be directed to anaesthetise a nerve thus producing numbness and paralysis in the area and muscles

served by that nerve. The use of nerve blocks rapidly developed and expanded beyond anaesthesia to many other medical specialities where it has become a valuable tool for managing a wide range of chronic and acute conditions and for achieving pain relief.

GPs with an interest in anaesthesia had been in the vanguard of the development of the skills but, with increased complexity, there was the necessity for improved, reproducible, recognised skills to be created, agreed and taught to the next generation of anaesthetists.

Lord Nuffield endowed the first Academic Department of Anaesthesia in Oxford in 1937.

The first director of department was Professor Sir Robert McIntosh. The College of Anaesthetists, originally part of the Royal College of Surgeons but now independent, developed and with it came increased learning and examinations in anaesthetics to demonstrate that expertise.

Formal training started in 1935 with the award of the Diploma in Anaesthetics. Later the Fellowship examination became the standard for those wishing to pursue a career in anaesthetics.

Many of the drugs which formed such a central part of early anaesthetics have now passed into history but the drugs of today are, in many cases simply modifications or refinements of those original agents.

Anaesthetics now has a prodigious success rate, for two reasons; because of the high standard of training that now occurs and because of the amazing equipment which supports the procedures in anaesthesia. It is an interesting thought that, in general, one is less likely to die in the period whilst under an anaesthetic, competently administered by an anaesthetist, than during the whole of the rest of one's pre-terminal life!

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