The History of Cancer

There seems to be a new development in the fight against cancer almost every day; more accurate targeted surgery, focused radiotherapy, less toxic, more effective chemotherapy and the introduction of genetic and other techniques all promise greater success in the elimination of this most sinister of diseases. Known for 5,000 years, the last 100 and particularly the last 50 have seen huge developments.

It is perhaps not surprising that the ancient Egyptians reported on the existence of cancer, although the word itself was not coined until Hippocrates used the term carcinos to describe different types of tumour.

The earliest known recording of information about tumours occurs in an Egyptian papyrus dated about 3000 BC. It is a substantial piece of writing and identifies the disease for which there was no treatment, although ulcerated lesions were cauterised with a hot poker-like instrument.

There is evidence of cancer in the preserved mummies of the period and the presence of tumours of the skull and of the long bones of the limbs have been found.

Hippocrates (460-370 BC) chose the word carcinoma to describe these inexorable lesions because the finger-like projections, which spread through adjacent tissues as the lesions grew, suggested to Hippocrates the appearance of a crab.

The Roman physician, Celsus (28 BC -50 AD), employed the description and translated it into the Latin brachia cancri (arms of the crab) shortened to cancer. Galen, a Greek physician who lived from 130-210 AD lived in Rome and he first used the term oncos, the Greek word for swelling, to describe the tumours and from which the modern word oncology is derived.

Galen had a profound effect on the practice of medicine, such as it was, for more than 1,200 years.

Hippocrates had described the presence of four humours in the body; blood, phlegm, yellow bile and black bile.

Black bile was believed to be secreted by the spleen and the kidney and was implicated as the cause of melancholy. Indeed, the word melancholy is derived from the Greek word meaning black bile.

It was also believed that black bile in excess could cause cancer.

Hippocrates’ theory was enthusiastically embraced by Galen and his teachings about black bile and cancer survived through the dark ages and the medieval period. Alternative hypotheses and therefore the development of medical knowledge were
frustrated by the prohibition by religious authorities of allowing physicians to undertake post mortems.

After the fifteenth century as surgery developed and post mortems became more common, other theories of cancer developed.

Amongst them was the idea that lymph, created from a filtrate of the blood and circulating throughout the body, was suspected as the cause of cancer by many eminent physicians in the 16th and 17th centuries.

**John Hunter (1728-93)** was also suspicious that lymph was implicated in cancer formation and spread.

In 1761, John Hill proposed that the use of tobacco snuff was the cause of nasal cancer.

A wealth of other theories developed and hypotheses advanced included that breast cancer was caused by milk clotting and that cancer was the result of poisoning.

In the mid-nineteenth century, the German pathologist, Muller, identified the fact that tumours formed from cells which were not like normal cells.

Virchow (1821-1902) believed, incorrectly, that cancers metastasised within or through a liquid. Karl Thiersch, a German surgeon, identified that cancer metastases occurred by spread of malignant cells.

**Other theories included that cancer was caused by chronic irritation or that it was infectious.**

With the arrival of the twentieth century, research and investigation was beginning to gain pace. A host of man-made and naturally occurring agents were implicated in the causation of cancer.

As a result of the early use of X-rays, which had been discovered at the end of the nineteenth century, the first case of radiation related cancer was identified in a laboratory technician who had been over-exposed.

**As early as 1907, a study in the United States discovered that some Europeans, such as the Germans and the Irish, living in America and who ate a lot of meat, had higher rates of cancer than the Italians and the Chinese who ate very little.**

Two researchers, Rous and Shope, took research into cancer forward. In 1911 Peyton Rous discovered that cancer could be induced in healthy chickens by injecting them with a cell-free extract of the tumour of a sick chicken.

This finding provided the first demonstration that cancer could be caused by a virus – an oncogenic virus.

The tumour was a sarcoma, which is a malignant growth which occurs in muscle, bone, nerves, cartilage, tendons, blood vessels and the fatty and fibrous tissues.

The American virologist, Richard Shope, discovered the papillomavirus which bears his name and which infects rabbits.

The change it produces, notably in cottontail rabbits, which Shope studied,
results in the development of horn like cancers typically on or near the rabbit’s head. As a result of his work, it was recognised by later researchers that a link existed between the papillomavirus and warts and subsequently cervical cancer.

At about the same time, researchers in Japan discovered that coal tar extracts applied to rabbits’ ears induced cancer. Strides were made in breast cancer when, in 1926, Lane-Claypon recognised that breast cancer was associated with specific risk factors which included not breastfeeding, being childless and conceiving the first child at a later age.

Papanicolaou in Greece discovered that malignant cells were shed from the cervix of a woman with cervical cancer and the so-called Pap-test was the result.

In 1934 Wood and Gloyne made the first association between lung cancer and asbestos and, five years later in 1939, smoking and lung cancer with first unequivocally linked.

The 1940s was the time when chemotherapy first became a significant weapon in the treatment of cancer.

During the second world war, nitrogen mustard derivatives were identified as an effective treatment for lymphomas and methotrexate, a derivative of folic acid, was introduced for the treatment of childhood leukaemia.

At the same time research was proceeding on the effect of hormones on those tumours which were associated with hormonal activity.

Deprivation of the hormonal signals could inhibit the effect of metastases of hormone dependent tumours.

With the arrival of the fifties perhaps the modern era of cancer therapy arrived. The structure of DNA was elucidated and chemotherapy started to cure patients. By the end of the 50s, mortality from testicular cancer had diminished considerably.

In the sixties, mammography was found to be effective in screening for breast cancer and trials occurred on the various techniques of management of breast cancer following diagnosis.

In the seventies, the volume of developments became too huge to list.

The arrival of ultrasound and the CT and MRI scans, the development of many new investigations and the enormous range of new pharmaceutical products saw a considerable improvement in diagnosis, proliferation of treatment and burgeoning cures.

During this period scientists discovered two groups of genes associated with cancer. Oncogenes cause cells to grow out of control and become cancerous.

They are the result of mutations of some normal genes which are responsible for cell division and differentiation.

Tumour Suppressor Genes repair DNA and regulate the process of cell division. They also provide a built-in obsolescence system, telling cells when to die. Failure of these cells leads to uncontrolled growth. In the 1990s, two genes associated with the development of breast cancer were discovered.

Medicine for Managers articles are not intended to be a source of medical advice. Their purpose is to familiarise the non-medical reader about current key medical disorders. Any medical or medicinal products mentioned by name are examples only and should not be regarded as an endorsement of their use.
They are BRCA1 and BRCA2.

Their presence has enabled physicians to be able to advise those women with a higher risk on the options for minimising risk. Other cancers found to have a familial (and therefore genetic) component include ovary, thyroid, colon and rectum.

However, familial cancer is relatively rare (less than 15% of all cancers) compared to those tumours which arise spontaneously.

The understanding of cancer and its genesis is vital in the development of therapy to defeat it.

Surgery and radiotherapy target an area where the cancer is present and chemotherapy generally attacks cells because they are actively dividing rather than specifically because they are malignant.

We are at the gateway now of developing chemotherapeutic agents which can target and destroy or inactivate individual cells.

So, where are we with cancer in the UK now. Cancer Research UK publishes regular updates.

- New cases of cancer (2014)
  - 356,860 cases
- Deaths
  - 163,444 deaths
- Survival for 10 years
  - 50%
- Preventable cancers
  - 42%

Breast, prostate, lung and bowel cancers account for 553% of all cancers. Thyroid, liver, melanoma skin cancer and kidney cancers have shown a marked increase in the last decade.

There have been fewer stomach and bladder cancers over the past decade. Half of all cancers in the UK are diagnosed annually in people over 70 and the highest incidence is in people over 85.

Cancer is more common in white and black males than in Asian males and more common in white females than in black or Asian females.

Of those four most common cancers, the incidence, deaths and 10-year survival data shows:

- **Breast**
  - 55,222 cases, 11,433 deaths, 78% survival
- **Lung**
  - 46,403 cases, 35,895 deaths, 5% survival
- **Prostate**
  - 46,690 cases, 11,287 deaths, 84% survival
- **Bowel**
  - 41,265 cases, 15,903 deaths, 57% survival

The battle against cancer goes on. Research will find the keys to targeted attack on the disease in time and eventually it will be consigned to history.

For our daily living, we too can help to minimise the risks of the disease. Simple measures include:

- Stopping smoking
- Exercising regularly
- Reducing meat and refined carbohydrate intake
- Eating plenty of fruit and vegetables

In the meantime, the UK is fortunate to have very effective cancer services and dedicated teams of healthcare workers.

Of course things could be better but we should not minimise the huge strides that
have occurred and continue to occur against the disease.

I wanted to end this piece with a quote and there are thousands from which to choose.

Perhaps the laconic Alan Bennett:

“Cancer, like any other illness, is a bore”

or Harold Pinter who quoted his nurse:

“Cancer cells are those that have forgotten how to die”

But, let me end with an optimistic quote from the late Patrick Swayze, who died aged 57 of pancreatic cancer:

“Together we can make a world where cancer no longer means living with fear, without hope, or worse.”

paullambden@compuserve.com

Medicine for Managers articles are not intended to be a source of medical advice. Their purpose is to familiarise the non-medical reader about current key medical disorders. Any medical or medicinal products mentioned by name are examples only and should not be regarded as an endorsement of their use.