

## What will doctors be doing by 2050?

- Privatisation of the NHS
- Advances in gene technology, and diseases
- Changes in surgery
- Babies and smoking
- Implants and the heart

## A day in the life of a doctor in the year 2050

### 10.00 am

The new European Working Time Directive means that the hours of work are now just 43 hours per week, so there is no need to be in the hospital before 10.00. All patient files are stored on computer, so the morning ward round takes only a few minutes. Voice recognition software has developed, so, dictated notes can be downloaded straight on to the computer. The obvious advantage being that notes can actually be read! There is no time delay, and a particular patient's notes can be accessed from all over the hospital.

There used to be a problem with security, but now it is almost impossible to introduce a virus into the computer system, and there are several passwords that limit the level of access to confidential information. The solar panels on the roof of the hospital can trap much more energy than was thought possible 50 years ago, (even with little sunlight, as is expected in England!), so if there is a power failure, the hospital can still run as normal. There are also back-up generators, in case of a power failure during the night.

Patients are directly referred from either primary care, or A & E. Much more information is now accessible on the Internet, and the 24-hour helpline is widely used, so the role of the General Practitioner (G.P.) no longer exists. Instead, patients go directly to the Primary Care Centre in the hospital.

The health service costs were reduced as a result of this, because patients were not being referred from their G.P. to the hospital. However, the government wanted to reduce costs further, and throughout the last 50 years the NHS has been gradually privatised. This began with offering patients more choice. Patients on longer waiting lists could choose, if they so wished, to travel further in order to go to a private hospital. The independent sector was used to cut waiting lists, and recently most of the NHS has become privatised.

Hospital wards are no longer being closed in order to cut costs, and hospitals are not in millions of pounds of debt. However, not all patients are able to pay for the treatment that they need. This means that patients, who cannot pay, have to be transferred to one of the few NHS hospitals still remaining. This is not the ideal solution, as patients may have to travel many miles in order to receive free care, and often it is not possible for family and friends to visit them. Unfortunately, this is the only solution for some patients. The two – tier hospital system that was once feared when foundation hospitals were introduced, is now a reality.

Some private hospitals do allow pets to visit within certain hours. It has been shown that this can quicken a patient's recovery. For some time, this idea was disputed, because of the spread of diseases, in particular, the added risk of tetanus. It also took many years for pet visitations to be authorised because of the

bird flu pandemic. After effective vaccines were proved for these diseases, pets were allowed to visit their owners, although, some hospitals still fear the spread of disease.

### 10.30 am

A meeting is being held to discuss reproductive cloning. The United Kingdom was granted a licence to clone human cells for research, for the first time 46 years ago, in 2004. The outcome of that research has been positive in that there is now an effective treatment for diabetes. There have also been advances in treatments for Parkinson's disease and Alzheimer's disease, though there is still no effective cure. Researchers have been asking for a license to clone human cells for reproductive purposes for many years, and the permission was granted in America five years ago. It was thought that the U.K. would soon follow, but the opposition has been strong, and there is an ongoing debate as to whether human cloning for reproductive purposes should be allowed.

In my opinion, we are all born individuals, and should not die copies. Admittedly, social pressures have increased, so people are feeling the need more and more to be as close to 'perfect' as possible. What is technically possible is not always ethically good. Human foetuses should only be modified if a serious disease is detected, for example HIV. The RNA interference technique has been adapted, so that the CCR5 gene that HIV needs to enter cells can be switched off.<sup>1</sup> This new technology means that the disease has almost been wiped out in the U.K. There is currently research into possibilities of switching off genes causing other diseases. Also, cheaper solutions to HIV and other viral diseases are being researched, so that less economically developed countries can also benefit. The aim is to eliminate some diseases world wide, for example, in 2005, polio was eliminated when Nigeria had finished vaccinating children.<sup>2</sup>

### 12.00 pm

The theatre sessions have changed dramatically from what they were 50 years ago. Most of the operations can be carried out from a different site, because of the use of a robotic arm, and computer images which occur in real time. The surgeons are still skilled, but their hand movements are relayed to a different site. This is useful if there is a world renowned surgeon in the USA for example, and the patient is too ill to fly across the Atlantic. The operation can be carried out with hundreds of miles between the patient and surgeon. There are fewer invasive operations, and much more laparoscopic surgery, than was carried out just less than 50 years ago.

Very few operations actually require the surgeon to be present in theatre. Operations requiring definite precision, such as face transplants, require a surgeon to be present. These operations are only carried out when absolutely necessary. The ethical debate is subsiding, as research has shown that it is possible to use the patients own stem cells. There is also continuing research into robotic surgery, for which there may only need to be one member of staff in theatre.

### 1.30 pm

Quick bite to eat!

### 1.37 pm

The afternoons consist largely of clinics, viewing patients with many different complaints. As the MMC (Modernising Medical Careers) dictated many years ago, doctors are now trained in general medicine or surgery for more years, and some may then not choose to specialise. The clinics are therefore more general, and a wide range of patients are seen. There is only a short interval between patients, because notes simply have to be dictated.

Infant mortality has been low in the U.K. for a long time, but now, it is lower than ever. Just under 50 years ago, malaria killed over one million people per annum. This figure has fallen dramatically since the introduction of synthetic anti-malarial drugs, which kill malaria. These drugs are available more easily than the expensive plant extracts which had also been shown to be an effective cure for malaria.<sup>3</sup> This drug helps to cure patients, but does not stop malaria spreading. It is thought that mosquitoes may be able to help stop malaria. The CTL4 gene in the mosquito needs to be disabled in order to kill parasites.<sup>4</sup> Gene technology means that research scientists know how to switch off a gene, but this method is impractical due to the size and numbers of mosquitoes. Researchers are looking for cheaper chemicals, which may be used as a pesticide. Since malaria affects mainly the less economically developed countries, a cheaper solution needs to be found.

There is a fairly low technology solution, which may help reduce the risk of cancer. This can be practised in the U.K., as well as abroad. A study has shown that pregnant mothers can help reduce the risk of their child having cancer, especially leukaemia, by eating more fruits, vegetables and protein in the year before pregnancy. The current cure for leukaemia is a bone marrow transplant, using the patients own stem cells to reduce the risk of rejection. In the past, anti-rejection therapy could be used. Now, however, embryonic stem cells can be used to produce 'new blood'. This has been one of the most useful advances within the last few years, as patients are no longer at risk of rejection. Also, some Jehovah Witness families are willing to accept blood transfusions, as the blood originally came from the patient.

The problem of premature babies, resulting from smoking mothers is almost non – existent. Ten years ago the government was finally able to make nicotine patches and chewing gum free. After balancing the costs, it was realised that far more money was being 'wasted' on the treatment for various diseases resulting from smoking, and that it would be cheaper for the government to make the patches and chewing gum free. Smokers had two incentives to quit; living a healthier life, and saving money. Although some people still choose to smoke, potential mothers are more aware of the risks involved, and most choose to quit smoking before starting a family.

### 3.05 pm

Quick break as a patient has forgotten about their appointment. This used to happen 50 years ago, but there is still no fool – proof way of ensuring patients get to their appointments, and on time!

### 3.15 pm

A post-operative review is carried out for a patient who has recently had a VentrAssist, a type of left ventricular assist device, implanted. This technology was developed years ago, but has now been fine-tuned and is relatively cheap. It runs

alongside the heart, and the only side effect is that patients no longer have a pulse. This is because there is a continuous stream of blood due to the spinning impeller. The continuously moving blood is less likely to clot, so reducing the risk of the patient having strokes and thrombosis.<sup>5</sup>

The VentrAssist was once run on rechargeable batteries, though now many implant devices, such as, pacemakers, are run using body heat. The enormous advantage of running an implant using a biothermal battery is that patients will not require an operation in a few years time to replace the batteries. The biothermal battery is constantly recharged using heat from the patient.

The advances in medicine have had an impact on the whole population, even if people have been fortunate enough not to have to go into hospital. People are tending to live much longer, and the life expectancy for both men and women have increased by 6 years since the year 2000. The present government, have, of course, used this to their advantage, and the retirement age is now 70!

Technology has advanced so much in the last few years, that the question is no longer 'how do we do...?', but is instead 'should we do...?' As in the case of reproductive cloning, it is possible to clone a human baby, but is it morally correct? It is now possible to replace tissue and organs using the patient's own stem cells, but for how long should this be continued? If a person's organs and blood can be replaced, when do doctors, or the patients themselves decide to stop? Is medicine heading towards immortality?

4.59 pm

The clock is obviously slow, so time to leave the hospital!

References:

New Scientist, 14<sup>th</sup> August 2004, pg 12

New Scientist, 3<sup>rd</sup> April 2004, pg 6

New Scientist, 21 August 2004, pg 15

New Scientist, 3<sup>rd</sup> April 2004, pg 18

New Scientist, 31<sup>st</sup> July 2004, pg 19