

Cancer Research

Underlying all orthodox cancer treatment is the belief that it is scientific in some way. Both patients and doctors base their faith in modern medicine on this credo. It is presumed that behind everything that doctors do there is a vast machinery of scientific expertise that is creating, testing and evaluating products and processes. And which, in the case of cancer, is going all out to find a cure with no other consideration being allowed to hinder this effort.

But even a casual look at modern medicine will find very little that is based on such scientific procedures. Dr Luisa Dillner, an assistant editor of the British Medical Journal explains:

‘Less than half of what doctors do now is based on solid scientific evidence...This is not to say that doctors are lazy or incompetent. It is partly that medicine moves so fast it is hard to keep up with the latest evidence of what works and what does not. ‘ (Guardian, October 1995)

The simple fact is, there is no proof that surgery and radiation are effective methods of treatment of cancer. Chemotherapy, on the other hand, has been very heavily tested by scientific methods of extreme rigor - and found, on the whole, not to be effective.

Doctors would claim that it would be unethical to require surgery and radiation to be put to rigorous tests because it is generally accepted within the profession that they do work. The basis of any test is doubt. If you really don't know whether or not a form of treatment is effective then it is proper to do a test. If there is no doubt, then doing a test would only deprive a number of patients of treatment that would definitely be beneficial for them. This would be unethical.

This is a good argument as far as it goes. It may even be valid in any individual case. But medical statisticians as we have seen have not found much support for this position. The American Hardin Jones presented a paper nearly 30 years ago arguing that his statistical analysis overall suggested that no treatment was better than any treatment - indeed it was four times better! People who received no treatment were likely to live four times longer than people who did receive treatment. There has been no marked change since then.

It may be that doctors and statisticians are looking at different things. Since doctors are focused on the tumour, not the patient, they may be able to claim successful treatment even though a patient's survivability may not be affected at all. The treatment was a success even though the patient died.

‘Proof’ and the clinical trial

Proof, in the context of medicine, has a very specific meaning. It means that something has been demonstrated to be true in a double-blind clinical trial. This is a specialised experimental procedure which is the end result of a series of other clinical trials. It will help if we have an idea of the whole process.

The double-blind clinical trial can be applied to any practice or treatment. However, since most of these trials relate to the development of drugs we will see how it is applied in this area. Usually the initial idea is developed in the laboratory. A scientist has found a chemical agent that appears to be toxic to cancer cells in petri dishes. This is tried out on rats or mice to see if the effect persists and also to see what dose levels might be appropriate for humans. This is the preliminary stage. Once a drug has come through it is given a phase I clinical trial. About 20 humans are given the drug. They are terminal patients who have volunteered. The sole purpose of this trial is to determine dose levels.

It is not expected that any of the phase I patients will actually survive. The next step is to see which cancer tumours are likely to be the most responsive to this new drug. Different groups of about 20 patients each, all having the same type of cancer, are tested to determine what the response rate is. Does the drug work better for breast cancer or colon cancer or what? This is the objective of the phase II trials, which again are conducted on patients who have no further orthodox treatment options. They have been treated, the treatments have been ineffective and they are now considered terminal. If the results are acceptable then the process moves to the last phase.

The phase III clinical trial focuses on one particular drug regime and applies it to thousands of patients - all with the same cancer - over a period of time. These patients are in two groups: the experimental group - which receives the new drug - and the control group, which doesn't. Instead they get a placebo which is identical to the drug but which contains nothing of any medical benefit. It is best if the patients don't know who is receiving the drug: this is known as a blind trial. The trial becomes double-blind when even the doctors dispensing the drug don't know who is getting the new drug and who isn't.

In very simplified terms this is the process that all new drugs go through in order to get approval for their general use. It is also the procedure used to assess the value of the drug.

However, once a drug has been approved in this way, doctors will start using it in different unapproved ways. This is admitted by the authors of *Everyone's Guide to Cancer Therapy*, who write:

'...many drug programs in standard use are not listed as 'approved'. They are used because experience with patients has shown they are effective.'

This applies to about half of all current uses of anti-cancer drugs in North America. Where is the science there? The critic may ask. The treatment is based solely on 'experience' - and this experience must first have been obtained by applying the drug randomly in an empirical - let's see what happens if we do this - manner..

For patients recommended to join a clinical trial the key implications of all this has to be taken on board. Firstly, they should understand that apart from the clinical trial, their doctors have run out of ideas about what to do with them. Their cancer is 'terminal' (I have put the word in inverted commas because some patients undoubtedly owe their lives to being classified as terminal. They have therefore been saved from grueling radiation and pointless chemotherapy and they have been free to look at the unorthodox treatments). Secondly, patients should remember that no standard chemotherapy regimes have established themselves for the vast majority of cancers over the last twenty to thirty years. Since the clinical trials of the past two to three decades have not been successful, the chances of a new drug being successful are also remote.

How is it that rigorous scientific procedures are not producing the goods?

It is hard to imagine that there should be any problem with the the focus of modern scientific research and the means it uses to advance knowledge and thereby aid the development of cancer treatments. Unfortunately, a closer examination reveals fundamental flaws.

Flaw 1

Dr Gerald Dermer, who published his views in his book *The Immortal Cell*, pointed out one major

flaw, a flaw so great it invalidates all laboratory based cancer research. When most people talk about cancer they are, correctly, thinking about the tumours in people's bodies. These tumours consist of rapidly reproducing cells which have specific characteristics depending on what kind of cancer they are. If a breast tumour spreads to the lung, the resulting tumour is still composed of cells that have the characteristics of the original breast cancer cell. However, when cancer researchers think of cancer cells, they are thinking of the cells they observe in petri dishes in their laboratories, cells which derive from cell lines.

What are cell lines?

In 1951, a woman by the name of Helen Lane became a patient at John Hopkins Hospital in Baltimore, Maryland. She had cervical cancer and she eventually died of this disease. But her cells live on. Cells from her tumour were removed and placed in a petri dish with a culture to feed them. This was yet another attempt to persuade tumour cells to grow outside the body. All previous attempts had failed. Helen Lane's cells successfully made the leap from existence *in vivo* (ie in the living body) to existence *in vitro* (ie in a petri dish). 45 years on, these cells continue to reproduce and continue to be used in research and are known as the HeLa cell line.

It is actually not easy to create a cell line. Tumour cells will generally live a short time in a petri dish before dying off. But very occasionally, something else happens. One or more cells display different behaviour. They keep on dividing and do not die off. The result is a cellular culture that has evolved to living in a petri dish. It is effectively immortal. It just keeps on dividing. This is the birth of an ancestral line of cells all of which derive from this individual parent.

It is the fact that these cells grow quickly and are standardised that makes them attractive. Scientists can then conduct daily experiments on them and publish monthly papers. The rule of the research game is publish or perish. Cell lines then provide an efficient source of cancer cells to work on. The alternative of using fresh tumour cells is less appealing. Malignant cells living in a tumour, just removed from a patient, are more difficult to work with. Real tumours do not just consist of malignant cancer cells. Various types of normal cells are also present. Another problem is that the tumour itself remains alive for only a short period of time, so it is difficult, if not impossible, to measure the effects of experimental procedures on these living cancer cells while they are alive. These difficulties slow the work and limit the kinds of experiments that can be performed. As a result, fewer papers are published by the even fewer scientists who study tumours than are published by the vast majority of researchers who study cell lines.

So using cell lines seems to make a lot of sense. However, in order for a cell to adapt to life in a petri dish it has to change at a fundamental level, and that change makes it very different from a normal tumour cell, with different characteristics. Such changes invalidate the results gained from research on cell lines. The information gained applies to cell lines - but not to real living cancer cells in real living tumours in real living people.

How different are cells in vitro from cells in vivo?

Dermer points out a number of differences. First, cancer cells in the body are genetically stable. Their characteristics remain fixed. A breast cancer cell that metastasizes in the lung five years later will be identical to the original breast tumour cells. In contrast, cells in cell lines are notably unstable at the chromosomal level. The number and structure of the chromosomes in the cells change in a random way over time. Scientists working with such cells assume the genetic instability derives from the original breast cancer cell. Pathologists know that's not true.

Another important difference is that cancer tumour cells taken from the body have clear sex chromosomes; cells in cell lines commonly lose these sex chromosomes altogether. A third difference is that when fresh from a living human, a breast cancer cell is very different from a lung cancer cell is different from a rectal cancer cell. In cell lines they are indistinguishable. This had a costly result.

For a decade or more many scientists who believed they were studying prostate cancer cells or liver cancer cells or bladder tumour cells were actually studying the HeLa line of cells. What had happened was that contamination had occurred and the HeLa line is a particularly dominating cell line. If a cell from HeLa gets into a petri dish containing cells from another line, it quickly colonises the dish and annihilates the other cells. This is what had happened at a number of institutes - and they never noticed. They didn't notice because there was nothing to distinguish one cell line from another. It was only when the weight of anomalous results became apparent over a period of a decade or more that the problem was discovered. But it may be that this contamination continues, yet as long as papers are accepted for publication, nothing else matters - except that the possibility of a cure remains forever a mirage and people will continue to die.

The list goes on. Pathologists know what they know - and their knowledge is dependable because it is based on the examination of fresh living tumours. Experimental cancer researchers know something else. But what they know is not necessarily applicable to human cancer. But pathologists and laboratory cancer experimenters occupy different scientific worlds and do not communicate much with each other. Dermer comments: '...the cancer research community is almost devoid of people who understand human cancer.' For those hoping for answers from cancer research, this is a major obstacle, one which can perhaps be overcome by demanding research informed by pathologists' expertise on specific types of cancer.

Flaw 2

On first examination, it appears that we can learn a great deal from animal studies. Animal studies are based on a simple premise: that all mammals share a great many physical similarities and that what is true for one species has an increased chance of being true for another. So far, so good. The problem is that there are substances that are seriously toxic for rats that have no effect on mice. There are viruses that will devastate man, which are quite innocuous for other primates - AIDS being one. Malaria is another. Almost every ape and monkey has its own susceptibilities to a different type of malarial parasite - but very few species share susceptibilities with each other. In short, what is true for rats and mice has no necessary predictive value for man.

Flaw 3

Medical science has built a cult round the double-blind clinical trial. The reason for its status is that it is assumed to provide irrefutable results. But is this true? Can we rely on the results gained from clinical trials?

To answer this question I am going to compare two trials conducted to see if vitamin C was an effective agent in the fight against cancer. One of these trials was not double blind, though it was a controlled study, conducted by the famous vitamin C protagonist, Linus Pauling. The other was a double-blind clinical trial conducted by Dr Charles Moertel, a noted opponent of vitamin C. These two trials came up with very different results. The former showed that vitamin C had the power in

some cases to cure terminal cancer patients and for many others to extend their lives. The latter showed that it didn't have this effect at all.

The Pauling trial was conducted in co-operation with Dr Cameron at Vale of Leven Hospital in Scotland. Cameron, like Pauling believed in the efficacy of vitamin C. He could not therefore ethically refuse to give it to any of his patients for the purposes of a double or even a single blind clinical trial. However, he reasoned that the other doctors at the hospital did not share his views and since cancer patients were distributed to doctors on a random basis, he could simply compare his vitamin C taking patients with the patients being seen by other doctors. In addition, he also asked another doctor to compare his patients with 1,000 past patients, matched by age and disease, who had already received treatment.

Because the trial was not double-blind, the normal demeanor of the presiding doctor ceased to be a factor. Both Cameron and Pauling made a point of encouraging and exhorting their patients to feel hopeful about the potential for a cure. The result was very positive. A number of these patients were still alive ten years later compared with none from any of the other groups.

The Mayo Clinic trial was however a true double blind trial conducted by doctors sceptical of the value of the substance they were testing - and dealing with patients who had no idea what they were taking. The doctor-patient interaction was made to be as bland and as non-psychologically supportive as possible - in order to rule out the placebo effect*- the effect, which has been clearly demonstrated in a wide range of circumstances for people to be cured despite taking pills of no medical value.

(*Note: This effect is very important and will be discussed later. Here it should simply be noted that mainstream medicine seeks as far as possible to eliminate it - partly because doctors see themselves as having two functions: firstly as treaters of ill people and secondly as scientists helping in the broadening of knowledge. Doctors, naturally, convince themselves that the second function is there to support and inform the first. This, however, can only be done at the expense of the placebo effect - and this effect is a major gun in the armoury of all healers. Many doctors actually feel that it is somehow wrong to make use of the placebo effect. It is unscientific therefore it is fraudulent. The patient of course doesn't care if the cancer has gone away as a result of a placebo effect. He is just damned pleased to be free of the cancer.)

So, in the Cameron-Pauling trial the patients became involved. They bought into it. Doctors and patients were partners fighting for the same cause. In the Mayo Clinic trial, on the other hand, the doctors didn't even know what they were testing and their patients, too, were deliberately kept in the dark. Doctors remained aloof, patients remain passive. We can therefore assume that the patients in Cameron-Pauling's test felt better about their situation. This 'feeling good' response may have had a critical importance as we can see from the following.

It has been argued by Hans Selye in a book called *The Stress of Life*, that the body goes through three stages in responding to stress:

1. Alarm Reaction
2. Stage of Resistance
3. Stage of Exhaustion.

Most terminal cancer patients are in the final stage. Stages one and three are typified by over-production of corticoid hormones. Corticoids are stress hormones and they depress the immune

system. This explains the link between stress and illness. They make the body feel bad to tell the mind that it is time to take a rest. In the Stage of Resistance corticoid hormone levels are normal. Now, vitamin C has among its many functions the regulation of the production of corticoid hormones. So, in Stages 1 and 3, the vitamin C intake may be used to produce corticoid hormones rather than go to the aid of the immune system. It may therefore have no protective value to the patient. Indeed it may hasten death. The only way to make it valuable is to force the patient back from the stage of exhaustion into the stage of resistance. This can only be done by psychological means: the emotions reflect the physiological status of the body and, similarly, the physiology reflects the emotional status of the body. Happy, involved people are resisting. Tired, frustrated, depersonalised people are exhausted. Hopeful patients live, hopeless patients die.

And so double-blind studies, that deliberately keep patients in a state of uncertainty and helplessness, that see patients as mechanical objects not as active biological beings, cannot detect the value of chemicals that to be effective depend on the patient's own psychological attitude. People are not things but clinical trials assume they are. That is the flaw.

Flaw 4

There are flaws of omission as well as of commission. The key flaw of omission is that the whole focus of attention is on the cancer cell - not on the person who has cancer. The bio-chemical terrain in which the cancer cell develops and lives is hardly considered. If we believe that the cancer cell arrives in the body as an act of God - and has no bio-chemical origin - this might make sense. This of course is one of the dividing lines between orthodox and unorthodox medicine. Orthodox researchers focus on the problem in its most reduced state - the chemicals in the cancer cell. Unorthodox researchers look at the whole body of the person who has cancer and seek to determine what is different about that body. As a result they have found that vitamin C and omega 3 oils, for example, are deficient in people with cancer. By restoring the balance of these chemicals they claim to obtain good results. But this is not mainstream research and so gets little funding.

To put this in another way, let us take an analogy. The modern scientific cancer researcher is in the position of a Martian who, seeking to understand the game of tennis, approaches the task by minutely analysing a tennis ball. He may come up with fascinating information on the performance potential of the ball and the industrial processes required to produce it but this will lead to any real understanding of tennis as a game.

Flaw 5

Clinical trials are a cumbersome method of progressing from one truth to another. Ultimately, they require vast resources of time, effort, people and money. If we were to depend entirely on clinical trials scientific progress would slow to a snail's pace. Problems are subjected to a reductive analysis to ensure that all possible variations are controlled and that any result that emerges can have only one cause - and the means of action of that cause are clear. Requirements such as these enable science to take leave of common sense.

There are also other requirements that have to be satisfied before and during the human phase clinical trials. One of these requirements is that the exact means by which the drug achieves its effect has to be described.

Some years ago, scientists at the University of Texas had successful results using Chinese herbs

against cancer. The project director was quoted as saying, 'We have something that works, or at least seems to. Our problem, however, is that *we do not know why or how it works*, and until we do, we cannot develop this as a modern medicine.'

So, these Chinese herbs are kept away from patients even though there is scientific evidence based on scientifically controlled tests that they work. Is this a sane way to go about the management of our health profession? As consumers of the work of doctors we are entitled to ask this question. Clearly the risk-benefit question is not being applied to the problem: what is the risk involved? What is the potential benefit?

If 'proof' is the only acceptable standard then there is no reason for assuming that smoking causes cancer. The association of tobacco with cancer is statistical. No proof of a classical nature exists - yet 99.99% of scientists believe that tobacco causes cancer. Thalidomide was withdrawn from the market - but there was never any proof that it caused birth defects - yet there is no doubt that thalidomide caused those defects. So when doctors and scientists insist on the necessity of *proof* they are being seriously dishonest.

Perhaps we need proof that the concept of 'proof' is a useful concept.

Flaw 6

Even the results of clinical trials cannot be accepted uncritically. As Dr Steven Rosenberg, Chief of Surgery at the US National Cancer Institute says:

'I think as many as many as 30 percent of scientific articles contain results or conclusions that are wrong and are not reproducible. A good many more stretch their conclusions far beyond what their evidence will support.'

It is his view that 'not all people who do science are scientists'; that much depends on the subjective judgement of the investigator - and so ultimately, scientists, like himself, will tend to distrust all information that doesn't come from a respected source. As he himself says:

'Unless I personally know the author, know that he or she is reliable, I am very skeptical of all but the most rigorously proven experimental results.'

Flaw 7

The last flaw is this: they have not come up with a cure for cancer.

As breast cancer patient Hazel Thornton says:

'There is much rejoicing for small advances, but I believe we should be asking, is this activity leading us to finding a cure, and why these treatments do not work and why, in spite of these treatments, the death rate is still so high?'

But how is it possible that billions have been poured into research with no results?

This frustration with the current state of research methods and objectives is shared by many others who have read widely around the subject. For decades now, the general public has been told that cancer research is getting closer and closer to finding a cure. But the sad fact is, despite the billions of pounds and dollars poured into cancer research, it is unlikely that there will be any sudden breakthrough in the near future.

I have an image of how it is. Imagine an engineer is told to build a highway from London to Birmingham. He builds a road which has three lanes in both directions and is made of the very best materials. But there's a problem: it doesn't go to Birmingham; instead it goes to Bristol. Is it a good road? Yes, perhaps, if you look at the construction only. But not if you consider its purpose, if it doesn't go where it is supposed to go.