

A full life despite Diabetes

Dr Lawrence Daunts Diabetes

by Dr Donald Gould

ROBERT DANIEL LAWRENCE was one of the first to demonstrate that diabetics can live as long, as well and as busily as anybody.

Lawrence was a doctor. He died two years ago at the age of 76, which means that he lived some eight years longer than the average British male. He lasted for half a century after his diabetes had been diagnosed, and the discovery of his illness was made a couple of years before Banting and Best discovered insulin.

The discovery and isolation of insulin by Frederick Banting and Charles Best in Toronto in 1921 came none too soon for young doctor Lawrence, for at that time he had already resigned himself to an early death. But instead, following the great Canadian achievement, he was able to fill a long life with a record of accomplishments most men would envy.

Robert was a boy of Aberdeen, the silver-granite Scottish seaport famous for its beauty, its kippers and its learning. He went to Aberdeen Grammar School, and then on to the university—an institution which had been turning out remarkable scholars since 1494. Young Lawrence showed himself worthy of the place by winning gold medals for his work in anatomy, surgery and medicine. But he was no solemn bookworm. He was one of those twice-blessed mortals who can apply the same compulsive effort to learning as well as to doing—he not only won academic honours, but also excelled in sports. As a hockey player he was nearly

of international standard, and some time after he had left the university he was described in a student magazine as “one of the best all round men the University has ever seen.”

He qualified as a doctor in 1916 and immediately joined the Royal Army Medical Corps, for his country was in the toils of the first World War. Most of his time he served in Asia, where he learned of human poverty and wretchedness more harrowing than any he had thought to see. And this he never forgot. After the war he obtained a junior post on the resident staff of King's College Hospital in London. His ambition was to become a surgeon. To do this he needed to pass the examinations leading to a Fellowship of the Royal College of Surgeons of England. These are really formidable tests. The first part of the examinations consists of searching questions on anatomy and physiology, demanding for their answer a good deal more learning than the average medical student acquires while reading for his degree. The final examinations require the candidate to show an encyclopaedic knowledge to disease, and in particular, disease which can be treated by surgical techniques. And, most particularly, the examiners demand that the candidate should show that he very well knows how to practise those techniques.

It was while he was preparing for this final test that Lawrence learned, quite by accident, that he was a diabetic. One day he was chipping away with a hammer and chisel at the skull of a dead man in the anatomy room of King's College Hospital. He was rehearsing a then all-too-common operation called a mastoidectomy, in which the surgeon has to lay open a bone near the back of the head which develops an abscess as a result of an infected ear. Nowadays drugs like penicillin are usually able to clear

up ear infections before the germs have spread into the skull bone, and mastoidectomies are almost a thing of the past.

As he chipped away at the skull, a splinter of bone flew up and pierced his right eye. The wound became septic, and soon the other eye began to be affected (infection of one eye often provokes inflammation in the other).

Young doctor Lawrence was, of course, immediately admitted to hospital, the hospital in which he worked. He described the incident as follows:

“It was usual where I was warded for the Night Sister to teach the probationers (nurses in training) how to test urine, which was done in the side-room of the ward. And one night they happened to test mine and found it loaded with sugar. Our biochemist, Dr. G. A. Harrison, found my blood sugar over twice the normal and diagnosed diabetes without doubt. This had never been suspected, as I had been looked upon as a healthy and vigorous young man indeed, playing tennis and hockey with no classical symptoms of diabetes—no noticeable thirst or polyuria (the passage of unusually large quantities of urine). And the inclination to fall asleep studying in the late evening is, I think you will agree, quite physiological and normal in the study of anatomy and other dull subjects.”

And so it was that a young man who had been wholly unaware of any sort of fault in his body and who was, indeed, better than most at both learning and sport, suddenly found himself to have an illness brought about by a fault in body chemistry—an inability to deal efficiently with sugar.

Lawrence, of course, knew exactly what the results of those tests on his blood and urine implied. He knew that sugar is the principal substance which the countless millions of cells in the body use as fuels to produce the energy they need for their various tasks. He knew that, for reasons not even now completely understood, diabetics cannot burn sugar in their cells in the normal fashion, so that

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the sugar absorbed from the food remains unused, and piles up in the blood, and spills out of the body in the urine. He knew that a diabetic who had got to the stage of feeling ill could be temporarily improved if only he would rigorously avoid taking sugar as well as other common foods such as bread and potatoes, which turn to sugar in the digestive tract.

He also knew that dieting could not cure the disease. It might stave off serious trouble for a time, it might diminish the build-up of sugar in the blood and the spill-off of sugar in the urine, but cutting down sugar and sugar-producing foods in the diet couldn't correct the fault in the cells—the fault which stopped them using their normal source of energy efficiently.

In short, once he knew that he had diabetes, Robert Lawrence knew that he must prepare himself for an early death. Some 20 years earlier the Russian, Oscar Minkowski, and the German, Baron Joseph von Mering, had shown convincingly that the disease was associated with the lack of some substance normally produced by the pancreas. But that knowledge fell short of pointing to a remedy. The Toronto discovery hadn't yet been made.

So Dr. Lawrence, nearing 30 and with the sight of one eye permanently impaired, dropped his career in surgery and set off for Florence. He had a passion for art, and hoped that the warmth and wonder as well as the fees to be earned by an Englishman in private practice would combine to make his last months pleasant. He did splendidly at first, taking care of his diet, and knowing very well the quirks and vagaries of his own condition. He started dancing and playing tennis again—occupations he had not been able to pursue since the accident in the anatomy room. But then he fell victim to bronchitis. He recorded his deterioration as follows:

"All my energy and muscle disappeared. I could not walk up the stairs to my room, and would even fall down if I tried. I was fortunate there was a lift, so I struggled on."

During this time he had been in contact with Dr. Harrison, the biochemist at King's who had originally confirmed the diagnosis. Harrison had written to Florence, telling Lawrence of the newly discovered insulin, but it seems that the sufferer maintained his proper professional scepticism—even although it was his own life which was at stake—and had refused to become excited at these unlikely tales from across the Atlantic.

But in the Spring of 1923, rather more than a year after the first news of insulin had been broken to the world, Harrison sent a cable to Robert Lawrence, in Florence, couched in imperative terms:

"I've got some insulin. It works. Come back quick."

Not all of Lawrence's scientific scepticism and reserve could stand up against a summons of that power and promise. He set off for London by motor car with a Florentine friend as a companion and co-driver. They got there, with Lawrence more dead than alive. He was put to bed at once in the casualty ward of his old hospital, and from almost that moment he never looked back.

I say "almost that moment", because, of course, his first and immediate visitor was Dr. Harrison, and the two men discussed how the new wonder drug, insulin, should be used on the freshly repatriated guinea-pig. How large, for example, should the first dose be? Finally, records Dr. Lawrence, they settled on 20 units "as a nice round figure."

In the event, this proved too large a quantity. Because of lack of insulin, a diabetic has too much sugar in this blood. Too much insulin, however, has the opposite effect, and the level of sugar in the fluids bathing the cells of the body falls below the quantity essential for their liveliness. In particular the nerve cells in the brain stop working briskly. A diabetic who has had an overdose of insulin (or a normal dose of insulin at a time when he is starving, so that his body sugar reserves are low to start with) will suffer faintness, and perhaps unconsciousness, and, if the overdose

is extreme, even death.

It was perhaps a mixture of intelligent calculation and sheer good fortune which resulted in Dr. Lawrence receiving one of the pioneer insulin injections in a quantity which proved briefly distressing rather than permanently destructive. He quickly recovered, and he and Dr. Harrison soon discovered a dosage routine which kept Lawrence fighting fit.

It isn't difficult to understand why Lawrence, with his able and restless mind, denied the chance of pursuing his first love, surgery, and, made keenly aware of the value of life by a sudden reprieve from an expected death, should have decided there and then to devote the rest of his energies to the care of people threatened by a malady which had shown him its fangs.

He recognised, of course, the life-saving power of the insulin which Banting and Best had identified and isolation from the pancreas gland. But he recognised also if only from his own experience (of the drug) that if diabetics were to take this chance, not only of survival, but of health, energy and happiness, then they would require vastly more than a regular supply of the new potion. They would require, first of all, the most painstaking assessment of their state, so that the right mode of life, and the right pattern of diet and the right dosage of insulin could all be prescribed in terms exactly suited to the very different needs of different patients. Secondly, they would require the continuing care and interest of an expert so that the adequacy of a prescribed regimen could be judged against experience, and so that the upsets caused by changing circumstances (such as pregnancy, or even altered working hours) could be offset by a suitably modified routine. And thirdly, Lawrence, recognised that his fellow diabetics would often need, and always welcome, support and encouragement in the task of abiding by the discipline they had to follow in order to stay well.

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About a year after Lawrence had become one of the first diabetics in England to benefit from regular insulin injections. Dr. Harrison, the man who in a very real sense had saved his life, left King's College Hospital to take up a new appointment. Lawrence succeeded him as biochemist to the hospital, and as lecturer in that subject in the medical school. From then on Lawrence put a good deal of effort into research. He experimented on animals, he experimented on patients, and he constantly experimented on himself. He went through all manner of common place and far from common place manoeuvres to discover what various circumstances might do to the level of sugar in the blood, and what influence various doses of insulin might have under different conditions.

In this first flush of scientific curiosity he was often heard to say that "a day is wasted when I do not do an experiment on myself, or on a patient, or on an animal".

Those who would blame him (and there will be some) for using either conscript animals or innocent patients for the satisfaction of his sharp desire for a deeper understanding of his chosen field, ought to be told that he freely subjected himself to far more discomfort, and even risk, than he ever imposed upon either his animal or his human subjects. He would frequently mount a diabolical machine in the laboratory, known as a bicycle ergometer. This is a perfectly innocent-looking standard velocipede, fixed to a frame. But when you mount it and start pedalling, it doesn't move. Instead you find yourself trying to keep the rear wheel revolving against a breaking force which is controlled by the experimenter.

Lawrence often worked himself to absolute exhaustion on one of these instruments. He had his blood sampled and analysed before and after this ritual, in order to discover what, if anything, had happened to his chemistry.

In fact, Lawrence's research achieved little of importance. And in that he was only matching the

performance of most of his contemporaries in this most difficult field. The chemistry of diabetes is still not properly explained.

Where Lawrence excelled was in his understanding of the problems and anxieties a diabetic has to cope with as a person, on top of the normal load of troubles all of us must hoist and hump from time to time. And he further excelled in the energy and forcefulness with which he was able to demand that the special problems of the diabetic should be recognized and catered for.

He refused to stay hidden in the comfort of the laboratory, despite his enthusiasm for research. In 1925, a year after his appointment to the post at King's, he published his book on "The Diabetic Life," which has run into something like 20 English editions, and has been reproduced in five other languages. In it he successfully explained, in a manner which any intelligent reader could grasp, the nature of diabetes, and the ideas governing the treatment of the malady. This was a major contribution to his own campaign for boosting the morale and stiffening the will of the diabetic patient. For clearly a man who understands his problem will deal with it that much more calmly and effectively.

Other popular publications followed, including clear instructions on the planning of a diabetic diet. There were also numerous papers in medical journals in which Lawrence reported on his clinical experience in the handling of diabetic patients and the use of insulin.

Over the years, his influence grew. By 1931 he had left the biochemistry laboratory, to become an assistant physician to King's College Hospital, in charge of a newly created diabetic department. This post established him as an expert in his field, and encouraged an increasing flow of private patients to his Harley Street consulting rooms.

He was rapidly becoming a figure in the medical Establishment. He was given medals and honorary offices in various pro-

fessional organizations, and an honorary doctorate of the University of Toronto, the birthplace of insulin.

One of his obiturists recalled how, when dining out, Lawrence would scan the menu, not to decide whether any of the fare offered should be declined by a diabetic, but to assess whether he might, perhaps, need an extra shot of insulin in order to cope with a meal which he was most certainly determined to absorb. If the menu did look a little high in carbohydrates, then he would roll up a sleeve and give himself a short there and then, and never mind the lady to the right or to the left.

Another obituarist, writing in *The Times*, said of his late colleague that "In debate he was ruthless in exposing the weakness of an argument, and this made him a stimulating associate and companion."

He had struggled, complete with stick and acolyte, on to the platform. Then his time came to go forward to receive his honour. He pushed aside both his aides—both the stick and the man—and went all alone to the rostrum, and went back all alone to his place.

After Lawrence's death a reader wrote to the British Diabetic Association's magazine recalling the old man's brusqueness. He also recalled how the waiting patients "used to see the great man from time to time going to and from the main consulting room of the clinic, briskly skipping up the three or four steps on the journey back to his own room. His example was a tonic for all of us who encountered him."

That, of course, was the secret of Lawrence's great impact on the diabetic scene. He was not going to allow any sort of illness to get him down. And in shouting out his defiance, and in showing it to be an absolutely real thing, he managed to make some thousands of fellow diabetics feel just as angry and just as well.

(Courtesy: WHO)