69. Dr Ken McHardy

(1) Tell me about your background.

I was born and brought up in Aberdeen, where I still work. There weren't any doctors in my family, before myself. My brother has since gone into medicine, after me, but I'm not really sure what it was that took me to be interested in following a career in medicine. I went to school locally; I did well at school. I can't remember when I decided that I would be pursuing a medical career, but I certainly did well at academic subjects, and so on. And at some point, perhaps during secondary school, it became plain to me that medicine was the career I was going to follow. And... but there was no inspirational moment or flash of light that made that happen, that I can recall; it just turned out that way. I did my secondary school education at Aberdeen Grammar School. This was a state school, back in the days of selective secondary education, where, what would have been the equivalent of the 11 plus, or sometimes called the control examination, was used to separate approximately 30% of the most able students from others, in Scotland. I had, in fact, gone to that school about three years earlier, because it had a primary department, and there were some people allowed in, around about mid primary school, who had been doing well at primary school. And so, that was my first meeting with Aberdeen Grammar School, which was a very old and well-established school in the city. And, certainly back in those days of the sixties and early seventies, there was a lot of pride still afoot in attending a school. I don't know that it's the same with many children, nowadays, in their school - certainly not my children. But that's the school that I did my secondary education at.

(2) Tell me about your training.

I proceeded from Aberdeen Grammar School to Aberdeen University, in October 1973. Again, you meet people from other places, who can't understand what you're doing going to the local university. It didn't occur to me, certainly, to go to any other university. I've no idea what the competition would have been like, in those days, but it seemed a natural progression. So, that's us parochial Scots all over. So, I went on to local university. We started with classes in the city centre, at Marischal College. Aberdeen University was an amalgam of two universities that combined in 1860, although the first had been established in the late fifteenth century, and apparently had one of the first professors of medicine anywhere in the world. So, the Marischal College buildings, in the city centre, is where I did much of my early training, and, of course, that started with lots of dissection in the anatomy room. We used to do many hours of dissection, and it therefore amazes me that I know so little about anatomy, now. After a year predominantly there, we moved up towards the hospital campus for most of our teaching. And the newer medical school buildings, dating from around the 1960s and early 70s, are located in the same site as one of the biggest hospital complexes in Europe, at Aberdeen Royal Infirmary and associated hospitals. The teaching was quite a lot of lectures. I suppose we would typically have had something like three or four lectures a day. We did clinical ward-based teaching

from the summer of the second year I was at University. I entered second year of an old-fashioned six-year course. There were about a quarter of us went directly to second year, either from school or from completing science degrees, and I was one of those. So, it was towards the summer term of the third year that we started going on to wards, and then we had three more years after that, that were a mixture of lectures and tutorials and ward work. The final year was principally clinical attachments, around a variety of different medical units. And there were affiliated units in Scotland: I, for example, did paediatrics at Stirling and Falkirk, and did my obstetrics training at the now demolished Cresswell Maternity Hospital in Dumfries. So, a fairly rounded education. There weren't a huge number of staff. We all knew who all the professors were. It's not... seem to be the case, nowadays; there are far more senior staff and far more professors. The medical class was just over a hundred, during my time in it. So, I certainly made a point of knowing everyone in my class, although it still amazed me that some people didn't know other people in the class, who they had shared classes with for years. That'll be a more familiar concept to some, who perhaps trained in bigger medical classes that were, perhaps, twice that size, in some other medical schools.

(3) What did you learn about diabetes, during your training?

I think that my first clinical encounter with diabetes, that I still remember, was meeting a young man, who I was sent to clerk at the bedside, presumably during my first or second term as a clinical student. And this was at the old City Hospital - which, again, is no longer in existence - down near the beach end of the city. It had been the fever hospital, at one time, but it functioned, at that stage, as some of the general medical capacity in the city. And that's where the two consultant diabetologists - at the time, John Stowers and Mike Williams - worked. And when I was a student on their unit, I remember being taught by Professor Stowers on this young man, as I say, in his twenties, who, by that stage, was already almost blind, and had nephrotic syndrome. And I remember, also, reading in the newspaper that this chap died, not very long afterwards. And that may have been one of the first patients who I'd seen, as a student, who I subsequently noted to have died, and certainly the youngest patient, in my early career.

Can you remember what the orthodoxies were, regarding diabetes, during your training?

Well, I suppose, following it sequentially, we would have done some biochemistry and physiology, where diabetes was touched on, but that would have been taught by people who were not clinicians, and so had no direct clinical experience. As regards the case I alluded to, and several others, I would have met diabetes during my general clinical training. But then there would have been a block of diabetes teaching specifically, which, again, would have been a mix of lectures from the diabetologists, who were seeing the patients, as well as probably lectures on the pathology and the biochemistry of diabetes, from people who really weren't involved in the clinical aspects of it. I remember undertaking a project, which

I think was part of a subject that was called community medicine, in those days; it's sort of public health medicine is a more popular term for it, now. And we had done a project, as a group, looking at the potential value of having a diabetes screening system. And I remember, as part of that, going to interview John Stowers, and also Lilian Murchison, who, by that stage - she was appointed in 1976 - was the third consultant diabetologist in Aberdeen. So, I remember having discussions about setting that up, so that was additional visits. And then, I can remember one visit to the diabetic clinic, where I was allowed to sit in and watch Professor Stowers consulting. And this was really quite a treat, I suppose. He sat at an old roll-topped oak desk, I think, that must have been his predecessor's before him. He used a proper fountain pen. He wrote lots of notes: he was the ultimate enthusiast for taking histories. Even when it was apparent that the patient didn't really know what he was talking about, he was still jotting down studiously anything that they said. And another abiding memory is that we had to go for coffee. It's no secret: Professor Stowers, who himself had diabetes for over fifty years, often ran a bit too close to the wind, and the staff nurse in the clinic had to come and remind him it was coffee time. So, we had to go for coffee, even though he was in the middle of seeing a very large number of patients. And I remember, with proper adoptive Aberdonian thrift, how he directed me to put my 5p, or whatever it was - yeah, we were post-decimalisation - into the box, and then I could have a cup of coffee. And the caricature I have in my mind, because he drank his coffee so hot and was back at his desk so quickly, is of someone who more or less put a spoon of coffee granules on his tongue and poured the kettle down his throat! Because, I can remember the difficulty of coping with having sacrificed five pence, and not being able to drink this coffee, as my blistered lips swelled up, and we had to run back through to get on with the clinic. A busy place, obviously.

(4) Any more memories from that one visit to the clinic in the mid 1970s?

Well, I suppose it would be difficult, looking back, to separate those from what's happened since, since I still consult along the same corridor as I attended that day, so many years ago; thirty plus years ago. It was clearly very busy; there were lots of people there. I was also aware that lots of people knew what was going on. It was one of these, I suppose, exposure to high density process operation, where lots of patients knew where to sit and what to do, and a few nurses marshalled them round. And these people knew what they were doing. And that's a little bit intimidating, when you turn up, and you think that having knowledge of the biochemical structure of glucose, or the function of the pancreas, might be what diabetes is about. And this was something quite different that was happening. I think, as well, I probably was just, at that stage, beginning to get the first idea about chronic disease management, where it wasn't all solving an acute problem, now. Because, the patients who would have attended the clinic, then, were people who had been coming for a long time, and who were living with the disease for a long time, and it couldn't all be diagnosed, treated and fixed in a one. I guess I hadn't been aware of that, before. But, of course, I maybe wasn't very aware of that, at the time, either; I may be reading more memories into

that stage than really existed at the time.

Any other memories of patients during your clinical training?

There's one instance that comes to mind, when I would have been round about, I guess, the middle of my clinical training years. And, although there were consultant diabetologists who taught us specifically about diabetes, a lot of our clinical training was done in general medical, and other specialty wards, of course. And, therefore, any of the general physicians could be managing people with diabetes. And I remember one instance of being taken to the bedside, by one of the most senior, and somewhat enigmatic, consultant physicians, who told us very pointedly that there were quite a few honorary senior lecturers in medicine, but he was the only honorary clinical senior lecturer in medicine. Anyway, one of the many memories of being taught in his unit was when he took us to see a girl, sat in a bed, looking rather sad, with a drip up. And he started berating this girl, in front of the group, for not looking after her diabetes properly. And this had been a girl who was admitted with diabetic ketoacidosis. What I may or may not have been aware of, at the time, but became aware of shortly afterwards, that this girl was a medical student in the class behind mine, and went on to graduate in medicine. And, I suppose, again, I'm not sure how much insight I had into this situation at the time, but clearly the idiom of the day, certainly as far as that very senior general physician was concerned, was that people managing diabetes should obey orders given by clever clinicians who knew the answers. I hope I don't practise those methods nowadays.

Were you taught anything about diet, during your training?

Certainly taught something. There were some lectures in the biochemistry course that were about food and nutrition, but I suppose that was mainly the chemical structure of enzymes, or something important like that. And I do remember one whole class session, where a dietitian, in the old surgical lecture theatre - which is again, now, changed into a different clinic - she came along with a bag full of plastic food, and showed us various food items from her bag, and presumably discussed their nutritional and calorific value. I'm afraid I don't remember too much about it, but that was probably a fairly basic amount of training. I do not recall having any specific training related to diet and diabetes, within my undergraduate curriculum, but it was quite a long time ago.

(5) Tell me what you did after your training finished in 1978.

Well, those were the days when people did two six month house officer posts; one predominantly medicine, one predominantly surgery. I did my first six month post in one of the university wards at Aberdeen Royal Infirmary. This was the ward staffed by those clinicians from the department of clinical pharmacology and therapeutics, at the time. And their specialty interests were haematology, hypertension and endocrinology, but not specifically diabetes. I did, of course, during those six months, meet quite a number of patients who had diabetes as an incidental part of their illness; who had diabetes as a potential underlying cause for some of the complications, such as coronary artery disease, or peripheral

vascular disease, that we saw them with. And there would have been one or two occasions when we managed people who were in hospital primarily because of diabetic complications. And it was probably around then that I first became aware of the Alberti regime, which was giving insulin by multiple small doses, repeatedly, that had presumably recently been first written up. I'm not sure how people managed diabetic ketoacidosis before that time.

And what did you do after that?

Following six months in paediatric surgery, when I don't remember dealing with anyone with diabetes, I then started in the medical SHO rotation. And that first involved general paediatrics, then I did a general adult psychiatry admission unit, before moving on to a series of medical units. One of the first medical units I worked on was where one of the most recently appointed diabetes consultant, at that time, worked, up at Ward 8 Woodend. So, I would have seen a few more diabetes cases coming through the unit, at that stage; increased my experience of it. And it was during that post that I went with Lilian Murchison, who was this consultant, to her peripheral clinic in Orkney, in January 1980, I think that would be. And I remember doing a consultation in one of the medical beds, up in the Balfour Hospital in Orkney, where I had to go and see this wiry little man who had come from one of the outer islands, and had suffered from diabetes for quite some time. But his major affliction, I think, was schizophrenia, or a similar illness. And I remember being directed to see this man and discuss his diabetes management with him. And I was trying to have this discussion, telling him what the good and bad things to eat were, in relation to diabetes. And this chap wasn't nearly as daft as I'm sure a lot of people thought, because he was pulling my leg as I was trying to explain to him about what he could and couldn't eat. And he was eating all sorts of cakes of one sort or another, because, apparently, his shack, that he lived in, was just full of empty lemonade bottles and cake wrappers, and so on. So, I'm trying to explain to this man, there's some better choices to eat. And the one bit that I remember was when he said he couldn't eat any cakes, and I'm telling him, "no, you can't eat cakes, they're not good for diabetes". And he then sprung his ace, when he said, "not even oatcakes?" And, of course, oatcakes... glycaemic index, oats: good food for diabetes. So, who was the daft one and who was the naïve one in that consultation? So, I remember that as a seminal point in my early exposure to diabetes.

Can you tell me a bit more about these peripheral clinics in Orkney?

Yeah, the senior hospital staff in Aberdeen provided a visiting service to both sets of Northern Isles - Orkney and Shetland - for medicine, back in those days. More recently, Shetland's had its own physicians, but there are still visiting clinics, to this day, in Orkney. Back at that time, there were two consultants who went once per month. They alternated the months that they went up to Orkney. And the consultant I was working with, being a diabetes specialist, gradually accrued a group of diabetic patients that she followed up. I think the population in Orkney would be between fifteen and seventeen thousand, maybe, over the time span that we're discussing. And so, there would have been, even at

the lower prevalence rate back then, a reasonable demand for diabetes care. But no secondary care specialist medicine on the island, although there had always been surgeons. So, we provided care, then. And the visiting clinic was largely a general clinic, but, as I say, there was some bias towards diabetes when I went with Dr Murchison.

(6) What did you do after you were a senior house officer?

In my second post-registration year, the opportunity arose to back-fill the post of one of the lecturers in endocrinology, who was overseas doing research. And so, I worked, during that year, with Peter Bewsher, who had originally come to Aberdeen as one of John Stowers' trainees, but he had moved on to work, by the late sixties, to be an academic consultant in endocrinology, rather than diabetes. But, certainly that year, during which I completed MRCP, I also gained some experience in endocrine metabolic diseases, and that will certainly have, I think, increased the risk that I was going to become a diabetologist in the future.

And what did you do after that?

After the year as a temporary lecturer, I joined the medical registrar rotation, and by October of 1981, had got six months as the diabetes registrar, it was called, which was the registrar post, principally working in the diabetic outpatient clinic. And that was, really, the steep part of the learning curve for me, I guess. I got, probably, two foolscap sheets, hand written, from my predecessor in post. So, that's what nowadays, I think, people would call induction. And then I started doing clinic lists. And, although there were always consultants present in the clinic, the diabetic clinic system that operated was of individually booked lists. So, as the registrar, I had my own list of patients to see every time I did a clinic. And there were certainly plenty of clinics to do. I did a general diabetic clinic every morning, Monday through to Friday. On Tuesday afternoon, I sat at the obstetric diabetic clinic, which Professor Stowers did with Dr Hamish Sutherland. On Thursday afternoon, it alternated between observing at Professor Stowers' endocrine clinic or doing his general medical clinic. And then, in case we were a bit short of outpatient experience, they managed two evening clinics per month, on a Wednesday - on the second and last Wednesday of the month - that I did as well. So, seven and a half outpatient clinics per week, and, as I say, a two sheet of foolscap induction programme. And there were all sorts of interesting things that came my way, at that time. I remember, for example, someone had prepared a cellophane grid with cardboard divisions, packaging the different kinds of diabetic pills. So, that was a visual aid that we could use to check if people knew what they were taking. We didn't have any computer recording of anything, at that time, so there was no VDU in the desk to get in the way of talking to patients. I also remember that I had to acquire a red biro in addition to a blue one, because diabetologists had to be able to write in two colours on insulin prescription cards. You had to write one colour - blue is what we used - for the units of insulin, and then in red we wrote the marks. Because, although we didn't use much twenty unit per cc insulin, there were two varieties - forty and eighty unit per cc insulin - widely in use, and so you had this issue

of whether you were halving or quartering the number of marks on the syringe to units of insulin that were being prescribed. And, I suppose, again to my embarrassment, I didn't realise, at that time, that understanding the two and the four times table myself, and saying that once to a patient, did not always mean that the patient understood the two and the four times table as well. And so, there was, I suppose, a lot of frustration, at that stage, that things that you had advised weren't done, because I was really too naïve to realise that what I said wasn't going to be obeyed by all the patients. They were far more sensible than I ever was, and, in any event, they had made their own choices. And so, I guess that was, as I say, a steep part of the learning curve, when I would have been seeing - I really don't know, now - but typically, I would guess, one or two new patients, and maybe twelve, thirteen, fourteen review patients would have been a list. And I was doing five and a half of those in general adult diabetes per week. So, I guess I got through quite a few patients, in the six months.

(7) And that, of course, was only part of the job, because the other part of the job was providing diabetic support to all of the Aberdeen hospitals, in terms of the inpatients with diabetes. Clearly, there are some people who had major diabetes-related problems who came to medical wards, that, back then, we were asked less often to see, because the general physicians would have thought they could handle most of that. But we certainly did a lot of work round the maternity hospital and round the surgical units, seeing patients whose need for an operation or acute illness has interfered with their routine management of their diabetes. So, we did quite a lot of work advising in perioperative management of diabetes. And this, again, was an important part in my career, because, having worked in hospital environments where whatever sort of autonomy you thought you had, you were within the ward, around a certain group of bays, with support, or in the outpatient clinic with support just next door, I was now out on a pioneering mission, travelling on my own round the hospitals. There were quite a few surgical specialities at Woodend Hospital, two and a half miles west of the Aberdeen Royal Infirmary, at that time, and even made sorties to the psychiatric hospital out in the country, and that you were really going giving consultations, substantially independently, about management of diabetes. You also had the issue that you were looking after people day after day, perhaps, even though you weren't looking after them hour after hour, so you were planning which day you would review which patient, and how many patients you would review in how many days. And, I remember, particularly tiresome was round about January or February of the winter of '81, '82; we had some of the worst snow that we'd had in a long time. And there were even one or two occasions where I think the car wouldn't go, so I was ploughing off, in my Wellington boots, two and a half miles to see patients in a different hospital. And when you think, nowadays, of how the junior doctors have to be given all the induction and support and education and bleep-free training, I don't know that it was anything like the same as that in my young day, when we just had to go and do it.

And hopefully, a lot of the time, we did it something like right, but I don't know how high the levels of scrutiny were, at that time, either.

You were working with medical staff who were not specialists in diabetes. What attitudes to diabetes did you encounter?

Yeah, that's a very intriguing issue. Everywhere that I went, you were working with people who had an agenda, whatever member of staff or whatever patient it was. And even then, it was quite clear that many patients knew far more about their diabetes than the medical or nursing staff looking after them in the peripheral surgical units. And, I suppose, whether I realised it or not, an important part of the job was to try to find a diplomatic compromise between standard hospital rules - 'we know best' approach - and the patient having some say in their own treatment.

(8) I think that it was often clear that patients were frustrated by their inability to control their own treatment, for a few days in hospital, whereas they had done it every day for the previous ten, twenty, thirty years at home. But, at the same time, of course, acute illness does interfere with a patient's ability to manage their diabetes. And so, to this day, that's still one of the enigmas that we deal with, in our inpatient work: trying to find the right balance between the patient's autonomy to manage themselves, and the hospital unit, where they are having to exercise some sensible management of the whole condition, including whatever acute problem has brought the patient to hospital. It certainly, at that time, brought me into contact with lots and lots of professionals, from lots of different areas, with lots of different attitudes. And, I guess, that that was a really important part of training, because you could, you know, lead yourself to believe, in an outpatient clinic, where you maybe have the upper hand, that this is how it is and this is how you work it, and there's only you versus the patient, if you take a confrontational model. When you go to other units all around the hospital, still as a fairly junior doctor, you're trying to exercise some rights, perhaps on behalf of the patient's autonomy, certainly on behalf of the patient's management, but often in conflict with what the unit thought was important, or not important, in terms of perioperative management. And, you know, there are all sorts of stories that you remember, of errors that were made, or things that weren't done appropriately. I can remember writing, you know, a list of points in the notes, giving instructions on how to deal with perioperative management: "Number 1 Omit morning insulin", which someone read as "10 units of morning insulin". And so, despite your best efforts - my writing's not the worst in the world - but anyway, that happened. So, I stopped writing "Number 1 Omit morning insulin": "Number 1 Don't give any insulin in the morning". And there were situations where, if a ward didn't have the particular kind of insulin you recommended, then someone thought it was okay to use something that had some of the same letters in it, and they would use that instead. And that wasn't too clever. There was a situation where a patient, I

remember, in an orthopaedic ward, wasn't too great, and I was called to see them. And I went to see the patient, and found that the staff had been diligently recording a document for the prosecution of low blood glucose results all day, and nobody had done anything about it. So, it was important to realise just how mad you were and weren't allowed to get, as a very junior doctor in someone else's domain. But still, you had a lot of work to do, and a lot of things you could influence. And, I suppose, that that would really have been the hook for diabetes, because you could actually influence things, hour to hour, that made a difference, and you could see that happening. And so, I think I was hooked from then on.

(9) Another interesting part of that first six months, as a diabetic registrar, was the Tuesday afternoon clinic in the maternity hospital. John Stowers and Hamish Sutherland, who shared that clinic, had something of a reputation in obstetric diabetes, because they arranged - I think four or five times, around five yearly intervals - an international symposium on carbohydrate metabolism in the foetus or mother, or something like this, it was called. And so, they had a lot of international speakers came to these meetings, so they certainly had been doing this two, or maybe three times, before I first worked with them in that clinic. The clinic was interesting. One thing I remember about it was the very earliest days of human insulin. The Lilly Humulin S and Humulin I were just about available, but only on a named patient basis. So, I remember filling in quite a few sheets of paper about some of the patients at the clinic, who were getting these new insulins. I also remember - nobody told me, and it was years later I realised - that I didn't actually have to dictate anything on the clinic letter about the obstetrics side of the problem, because nobody told me anything about the obstetrics side of the problem. But what happened was, these two great figures would pontificate on minor points of detail for so long, in the afternoon, that one sometimes thought you would hear a baby crying in the waiting area, because the baby may be delivered before the mother got in to have her twenty four week antenatal visit. And then, at the end of the day, off they would go and leave me to do the clinic letters. And it was years later I found out I was only meant to talk about diabetes, but I thought I was supposed to tell them about the obstetrics, too. I certainly saw quite a number of women in hospital, around about that time - in the obstetric hospital - because part of my afternoon and evening rounds would have been visiting people there. Although, perhaps less of that, other than at weekends, because Professor Stowers, and the senior registrar, Les Borthwick, probably did more of that. So, the obstetric care that came in, at that time, is another aspect of it. And, even then, I was aware that women, during pregnancy, were achieving very good standards of control, which may be something to do with the physiological input of a placenta, but perhaps even more to do with the psychological incentive of wanting to maintain good control during pregnancy, which is something that's still a major fascination of obstetric diabetic management.

What were the patients' expectations of pregnancy?

I think that there's some difficulty in answering that question, in relation to those who were actually in the maternity hospital at the time, because, I guess, perhaps, at that stage in my career, my fear of mismanaging problems was so great, that I wasn't that aware of the patients' fear of being mismanaged. Clearly, it's a high-pressure situation, obstetrics, and I'm sure that a lot of these women were really quite anxious about what was going on, and especially because of the relative amount of fuss that was made around them. But I think another important aspect, in responding to this question, is what happened, not in the obstetric hospital, but I remember always feeling some regret when I met, perhaps, middle aged women who had not had children, and who sometimes suggested, or even conceded, that it was because of their diabetes they'd been advised not to have children. And it had always been part of the Stowers and Sutherland regime that people were encouraged to have children, the sooner the better, I suppose, because they had less risk of complications. And so, with a fairly well developed heritage in obstetric diabetes, as there was in Aberdeen, it was always disappointing to find people... They had sometimes come from other parts of the country. But I guess sometimes, as well, they had decided it was too difficult, and they wouldn't proceed with having a family, and then, in their forties and fifties, perhaps regretted that they had not had this opportunity. And it was just one of, I suppose, a variety of opportunity costs that were attributed to diabetes, probably appropriately, in most circumstances, because you met people who had had different career opportunities, and so on, that had been taken from them, in relation to developing diabetes.

(10) After your six months in 1981 as the diabetic clinic registrar, what did you do next?

I left the post. I remember it finished with an evening clinic at Woolmanhill. So, having done seven and a half clinics a week, they didn't let up, and I had to start at Raigmore Hospital, Inverness, the next morning. Fortunately they carried on the morning ward round without me, as I drove up, so I joined it half way through, at eleven o'clock, I think. I, during that time, continued to see people with diabetes, and this was interesting, because I had changed hospitals to a system that used different charts, different methods, and, in fact, didn't then - or for some time after - have a consultant diabetologist. But that was when I first met up with Donald Pearson, who was an Aberdeen University lecturer in medicine, who'd started his lecturer senior registrar career in Raigmore doing general medicine, but was subsequently to be my colleague as a diabetologist in Aberdeen. So, he clearly had an interest in diabetes. And I suppose the two of us were helping to make some changes, at that time, and I got some further experience in the diabetic clinic. I can remember one interesting irritation was that the insulin prescriptions had to be written up every dose every day, whereas in Aberdeen, we had a chart where we could write up a standard prescription that only needed to be amended if that's what happened. We also used a lot of variable dose insulin, which we called sliding scale. The juniors, nowadays,

seem to talk about a variable rate infusion as a sliding scale, but we did use a lot of sliding scale regimens, back in the early eighties, where the patient would take, let's say, between twelve and sixteen units of insulin, depending on... and at that time it would mostly have been urine test results. Another interesting memory from the Inverness days: Patient going hypo in bed, and the nursing staff got the bed covered with broken digestive biscuits, and they're pouring milk over the patient's face. And the patient's looking startled, pale and beads of sweat on their forehead. And I remember saying "for goodness sake, give them some sugar". "Oh, you can't give them sugar, right enough. They're diabetic". And so, that's how they were managing hypoglycaemia in Raigmore in 1982. I remember, also, in Inverness, that I had been accustomed to using pre-mixed insulins: Rapitard, and, I guess, Human Mixtard and Human Initard would have been available, at that time. And when I went to Inverness, they were using self-mixing quick and slow-acting insulin: Velosulin, Insulatard, or whatever, preparations. And I remember suggesting to the consultant I worked for, who was a renal and general physician, that maybe we should give this patient pre-mixed insulin. And he said "look, I don't think we need these new-fangled insulins. We just want to use the one or two that we're used to". But anyway, despite that, the pioneering spirit prevailed, and at some time during 1982, the first vial of Mixtard, or whatever, came on the train, puffing up from Aberdeen to Inverness. And that was around the first time, I guess, it was used there.

(11) So, continue with your memories as a medical registrar.

On completion of my tour of duty in Inverness, I returned to Aberdeen, and spent a year working at Woodend Hospital in clinical pharmacology and oncology, as well as general medicine. And it was during that year that I got married. A few months later, I returned to the diabetes fold, to wards twenty seven and twenty eight as they were now numbered, which was where Professor Stowers and Dr Williams were working. And so, I spent that year as the ward-based diabetes registrar, predominantly doing general medicine, but, of course, we had an increased proportion of diabetic inpatients, and we were also involved in doing diabetic consults around the hospital. In addition, at some point during that year, I managed to break the diabetic registrar's grip on all of the diabetic clinics, and we would swap places one morning a week, where the diabetic registrar would come up to the ward to do the undergraduate teaching, and I would go to the clinic and do a diabetic session. And I suppose it was... I was realising that, with a bit more experience, you can get involved, in somewhat different ways, in how you're managing patients with diabetes. Hopefully there was some element of constructive maturity emerging, by that time. And a few interesting developments that were on the go, then, was the conversion to U100 insulin. That came in round about that time, where over, I don't know, maybe a year or so, all of this red and blue pen nonsense was done away with. And people no longer had to have units and marks on the syringe; they would just have U100 insulin with a single number written down. So, I've no idea if there was a dip in the shares of red biro sales; there probably weren't enough diabetologists in the UK to spot the difference. The other issue that was afoot, at that time,

would have been the introduction of human insulin. Because, as I had said, two years earlier there was a sort of trial basis in obstetric diabetes, and now it was becoming more widely available, and we were beginning to use human insulin. Perhaps almost concurrent with human insulin was the advent of the initial NovoPen. And, of course, this was an issue whereby a new device was marketed along with a whole new world. I remember, to this day, the advertisement of a big ship, and a plane, and sunshine with rays everywhere. This was the new dawn for diabetes patients that would cure everything. And, unfortunately, I think the major marketing gaff was to equate the pen with four times daily insulin injections, because, even to this day, there are many, many people who are very happy using pen injection devices, but who won't contemplate taking insulin more than twice a day. And these two didn't, of course, have to be associated, but someone clearly thought it was a good idea, at the time. So, as well, in the early days of the pen, the other, I think, marketing folly was that the pens were for sale. I think people had to pay twenty or thirty pounds, which, I suppose, was not an insubstantial sum, in the early eighties, to buy the pen. And, of course, that original pen was only used for soluble insulin, and it only dispensed two units per push of the plunger. So, I guess that there may be some people who have got worn out thumb joints from injecting with the original pen. So, there wasn't a great market in pen usage, at that time. U100, we were gradually getting people changed over on to.

(12) And can you tell me more about your colleagues, at this stage, in the early to mid eighties?

Well, because I was based in the hospital ward that did general medicine and diabetes, I had, more or less, daily contact with two of the consultant colleagues: Professor Stowers and Dr Mike Williams, who I was to succeed as consultant, round about ten years later. They had very different styles. Obviously both very committed to clinical practice, clinical involvement, and certainly had lots of experience in the management of diabetes. And it was, as ever, good - as I tell trainees today - jolly good when you get the opportunity of working with a variety of people, and you can see that there are different ways, as it were, of skinning the same cat. And I think that Professor Stowers would always have erred on the academic and intellectual side of practice. I'm sure that was quite appropriate for those patients with the academic attributes to keep up with him, but I don't know if it appealed to those with less mental agility. Dr Williams was a very pragmatic, 'just get on and fix it' sort of chap. And he would have been really quite supportive of his patients; although, again, you know, it's difficult with the whole array of problems that patients present. I don't know if they would have seen him as being to the touchy-feely end of the spectrum. Where they had, you know, complicated problems that may not have been so related to their diabetes, Dr Williams would have been trying to solve their diabetic problems for them. But, whatever, it was very interesting for me to see how they handled a wide array of patients, because we had lots of people coming through the unit, and I was able to watch, at close hand, how they dealt with general medicine and diabetic patients. And that, again, was another great part

of my education and learning.

(13) Did you see how Professor Stowers managed his own diabetes?

I think it'll be of no great surprise to anyone who's heard of Professor Stowers to know that there are a number of legendary tales around his management of his diabetes, and his work ethic. When he retired, I remember Dr Williams saying that the electricity bill for night-time burning of light bulbs would now be halved in the NHS in Grampian, because Professor Stowers would no longer be burning midnight oil, which, I suppose, is a mixed metaphor. Professor Stowers very much kept his diabetes to himself. It was not something that he ever discussed with us. It sometimes became apparent that he had diabetes when he overdid it, and went too long between snacks and ran his blood glucose too low. He sometimes had minor problems in the ward or the unit. Sometimes he had more major problems, where he sustained injuries, and whatever. But he always bounced back, and there he was at his work, the next morning, and just getting on with it. So, it was quite interesting, really, that someone who, at that stage, I suppose, had about forty odd years' experience of his diabetes - of living with diabetes - never ever discussed anything about what it was like to live with diabetes. He was quite interested in some of the newer technical aspects. And I remember that - again, I've alluded to his adoptive Aberdonian trait of thrift - that he was quite fascinated as to blood glucose monitoring strips. BM strips were the first widely commercially used. We'd had Dextrostix before that, but BM were the ones that were first used by patients. And he made it something of a virtue to cut his strips into two, and then maybe three pieces, longitudinally, because he claimed that you could get several tests out of the same strip, and that was saving a lot of money. And I remember a contemporary, Hamish Tyler, who's now an ophthalmologist, must have been one of his junior staff, round about that time. And Hamish, as an experiment, managed, with a razor blade, to cut one BM strip into eleven pieces, and he presented this to Professor Stowers. And I don't know if it's an apocryphal tale or not, but we were told that Professor Stowers used every one of the eleven strips to do eleven separate blood glucose tests.

(14) The whole issue of blood testing, of course, is still a vexed question, as to who should and who shouldn't do it. Back in those days, some people were beginning to show interest in measuring their blood glucose, and that, I guess, overall, has progressively increased. I don't remember when the next debate came in about whether people should just use visually read strips, or should use meters. There were quite a variety of different techniques that were developed commercially, and still are, and, you know, they keep updating the meters very frequently, presumably so they can keep selling new ones, or perhaps I shouldn't be so cynical and say it's to improve the services to patients. I don't know if Professor Stowers ever had a glucose testing meter. He was quite happy that he could read his blood sugar visually. Another experience from maybe shortly after that time, with Professor Stowers and home glucose testing, was when I had

given him a lift to a meeting, and on the way back was invited in for a cup of tea, so we sat and chatted for a while. He asked me about my brother, who had worked with him. He was a couple of years behind me at medical school. And then his sentences began to become a little bit disjointed, and his wife, who was always attentive to these things, arrived with some orange juice with glucose in it, suggesting to him it was time he took something. But he wasn't to be persuaded without doing a test, so she knew full well that he had become hypoglycaemic. And clearly he had drifted into this gradually, which she had had years of observing this phenomenon. He insisted that he would test his blood glucose before he would take any remedial action. He pricked his finger and put a blood spot on a BM strip, and he looked at his watch, and he looked at his watch. And the minute he was meant to leave the blood on went past, and he looked at his watch, and he looked at it again. And anyone who didn't know about diabetes or hypoglycaemia would have every confidence that this was someone at the height of his game doing an important self-monitoring test accurately. And he eventually looked at his watch, and somewhere around three and a half minutes, I think, he wiped the blood off the strip. And then he waited for another long time - longer than he was meant to - before he agreed that the strip didn't come up with much colour, and that he was hypoglycaemic, and he should do something about it. And this, I suppose, was a very interesting insight, not just into the character of his, you know, rugged determination, but also the fact that you could quite easily imagine that someone with diabetes knew what they were doing, when they weren't really fully in control of what they were doing. And that's, you know, something that's stayed with me till this day, especially when we have these perioperative and acute illness problems, when you don't really know to what extent patients may be fully in control of what they're doing. And also, I guess, when they have psychological illnesses that make it difficult for their mood to help them cope and concentrate on what they're doing. Anyway, the denouement is, as I was leaving the house, shortly after he had been restored, he asked me on the doorstep "oh, and by the way, how's your brother getting on?", which I found astonishing, because I thought we had discussed that ten or fifteen minutes before he started going funny. So, that gave me another lasting insight into the potential ravages of hypoglycaemia.

Can you tell me about the syringes you were using?

Well, I suppose, if we're now round about the mid eighties, we would have been increasingly using plastic syringes. But I don't remember the date that they became available on prescription; perhaps it was later in the eighties. And I do remember there were a number of years when, at the diabetic clinic, we could get a limited supply of plastic syringes. And we gave the patients some of these away with them, as long as they didn't tell anyone, because they would have to buy them, if they wished to use them. And part of the costing story was that the glass syringes could be kept in a spirit-proof container, and boiled up, and all

the rest of it, to be sterilised, and would last for a long, long time, whereas the plastic syringes were officially for single use. I know for certain that Professor Stowers didn't approve of wasting anything, like a high-quality plastic syringe, with a single use, and I'm quite sure that he would have advised people to use them till the marks wore off. And whenever he changed from glass to plastic syringes, as he presumably did at some stage, I'm sure that he used his plastic syringes until the marks were worn off, which might have been considerably more than a week, or even a month.

(15) What did you do after being a medical registrar? What did you do in 1984?

In October 1984, I went to work in the Rowett Research Institute, in the outskirts of Aberdeen. This was, and still is, a major nutrition research institute, that had varied the emphasis of its work between animal and human nutrition over much of last century. I went there to work on a project looking at the role of feeding and fasting, and insulin as a metabolic regulator of the change. And that was a severe culture shock, going just a few miles away from a clinical environment, where I had worked for six years, into an alien environment of science and scientists. But it was interesting, nonetheless. And I, over, I think, the following six years, continued to work with the people at the Rowett, eventually completing my MD project. Right from the start, however, at the Rowett, I was still involved in out of hours clinical cover for diabetic patients, so I continued my experience there. And I resumed regular diabetic outpatient clinics in 1986, and have continued to work in the diabetic clinic ever since that time. Following my full-time research year at the Rowett Institute, I became a lecturer - the post, I think, was called Human Nutrition and Metabolism - in the Department of Medicine and Therapeutics at Aberdeen University, and, at that time, I was an honorary senior registrar. And that was the period when I continued to do research into a variety of diabetic and endocrine subjects, and also completed my clinical training in general medicine, diabetes and endocrinology. So, as mentioned, I had ongoing diabetic involvement throughout that time, and, I suppose, I was becoming increasingly aware of the interaction that we had with other units. I had described how, as registrar, I was going to see patients in units to advise on perioperative management. I guess now I was more involved in constructive shared management of patients with a variety of diabetic complications, for example; so would have had increasing involvement with ophthalmology, as I did some training in that, the renal unit and vascular surgery. And it was also becoming clear that diabetes was a major contributor to the cardiovascular disease epidemic, in general.

(16) You had nutrition as part of your job title. How concerned were you with nutrition?

Nutrition has always been a bit of a Cinderella subject within medicine. I guess that my involvement primarily related, at that time, to the work at the Rowett Institute. Professor Philip James was the director, and, shortly before becoming the director, he had been involved in the preparation of national guidelines for

public health in relation to nutrition. My research subject was more specifically related to insulin and nutrient metabolism, but, clearly, the opportunities I had to explore nutrition further, at that stage, stood me in good stead for diabetes, because nutrition has always been a major part of diabetic management. And particularly issues around carbohydrates and whether they should be included or not included, and whether fat's good or bad for you, and how much protein damages your kidneys, and so on. So, I certainly studied nutrition, to some extent, in the eighties, during my involvement with the Rowett. And it was interesting, in many of the discussions I had with patients, even to this day, there is this overwhelming obsession, in many quarters, including clinicians as well as patients, that blood sugar is all about what you eat, and it's all about not eating sweets, and it's all about this and that. And it's perhaps a bit overrated, as seen by some of the... I wouldn't say, necessarily, newer ideas, although the things like the DAFNE project, where people are adjusting insulin doses to compensate for... cope with normal eating, is something that I'm sure has come and gone in and out of fashion in the past. When I started in diabetes, there were still some people who knew about red lines and black lines that had been someone's system of counting nutrition. When I was working in the eighties, it was carbohydrate exchanges that were used, but the patients weren't very much in independent control of what they were eating or not eating: they were meant to match their diet to their insulin. Hopefully, now, we're a bit more enlightened, and we accept the truth that the patients - or many of the patients - have always known, is that they adapt their insulin dose to their eating.

Can you explain a bit more about carbohydrate exchanges?

I think that the idea really stems from the fact that diabetes is commonly perceived as a disorder of carbohydrate metabolism. Diabetes is, in fact, a disorder of fat, carbohydrate and protein metabolism. But, because glucose in the urine is how diabetes is detected, most of the focus has always been on the level of blood sugar, and how much carbohydrate people are and are not eating. And there have been various views on whether small amounts of refined carbohydrate are damaging, or whether high amounts of complex carbohydrates, such as starchy materials, is a good idea or a bad idea. And fashions have waxed and waned, over the years. I think, currently, people are of the belief that whatever you believe is a healthy mixed diet is round about the right way, and if you're trying to match insulin to cope with diabetes, that should be the order in which it's done: the insulin is coping with the diet, rather than the diet coping with the insulin. But, as in all things, there has to be some sort of compromise. But I think, certainly, there's a tendency for many people to obsess about diet, and particularly about carbohydrate content of diet, which is, perhaps, overrated in some interpretations of diabetes and its management. Clearly, since I first started working in the diabetic clinic, I have had regular contact with dietitians. We've always had dietitians present within the diabetic clinic, where we're consulting, and they also have hospital-related duties. So, right from my earliest days in diabetes, there were discussions where... what was the best way to manage patients, and hopefully some consensus views on

how things should be taken forward, and how best they should be managed. And clearly, the dietitians are now taking a lead role in developing the resurgence, I guess, of carbohydrate counting, and of things like the DAFNE project, where patients are being encouraged to take more charge of having the diet that's nearer to what they want, and making their insulin suit that, rather than vice versa.

(17) Shall we move on, now, to when you became a consultant, in 1993?

Yeah, that was at a stage, I suppose, when I first had some formal involvement in postgraduate medical education, which is still a major part of my work. And the first appointment I had, in 1993, was when I did part of the job of Donald Pearson, who, by that time, had been appointed consultant diabetologist. Well, he succeeded John Stowers, so he would have been in post for around nine years, by that time. And I did some of his clinical duties, while he did a temporary managerial post for the clinical unit, at the time; the general medical management side of things. And, subsequent to that, Mike Williams decided to retire a little early, and he left in 1994. And so, I was successful in my application to become his replacement as a full-time consultant, with responsibilities in general medicine and diabetes, thereafter. And, in fact, I actually moved into that post late in 1994.

What have been the major changes since you became a consultant in 1993?

I think it's difficult to be particularly precise about this, because when you live in a continuously evolving environment, it's not always obvious what the biggest changes have been, and how exactly they occurred in chronological order. I think some of the issues that have changed: there's a much greater use of meters to test blood sugar. More patients are interested in monitoring their own blood sugar, or perhaps more clinicians believe more patients are interested in monitoring their blood sugar. Which takes me on to the next issue, which is about the clinician's insight into what patients really do, as opposed to what clinicians think they do. And I had thought, I suppose somewhat smugly, that I was gaining an insight into this issue, so that I could really understand what the patients did, and understand the limitations of what I could do. And it was perhaps round about ten years ago, when I was looking at RD Lawrence's book, The Diabetic Life, in preparation for a course I was doing, that I read the preface to the first edition, in which Dr Lawrence says something like: he makes no apology to writing a book for both patients and clinicians, because patients will soon come to know more about their disease than their carers. This enlightened view was written in 1925, which was something like seventy or eighty years ahead of me thinking I was becoming enlightened in believing that patients perhaps knew more about their disease than I did.

(18) Other things that have changed: that there is a lot more pharmaceutical interest in diabetes; also public health interest in diabetes, in terms of its impact on overall mortality and morbidity. And, therefore, via cardiovascular risk factors and lipids, and so on, the pharmaceutical industry has

been marketing hard on diabetes for quite a number of years, and trying to minimise diabetic complications. There are even a number of newer medications that have come on stream, and there are some more just about to do so. Time will tell whether they make a big difference, or not, to the clinical management of patients with diabetes. There has also, perhaps, been increased and welcome emphasis on team-working, where diabetic teams, I think, are progressively becoming less hierarchical, and all of the different parties involved in the diabetes team see themselves as having different and complementary roles. And I think that's certainly a very important and rewarding aspect of my work, as I enjoy working in a team, and I don't really appreciate any hierarchical elements, because we are very much co-dependent. I think that the enhancement of the status and the importance of diabetes specialist nursing has been the most important single aspect of this change in team-working. Certainly in the hospital that I work in, we have two hospital-based diabetes specialist nurses who work part-time, and they are a huge boon in terms of patient management, and indeed clinical staff management, into how we can support diabetes care in the perioperative patients, who I used to see as a single-handed registrar, trudging around the site in Wellington boots in the winter of 1981, '82. We've also got a long history of having nurse involvement in management of outpatient diabetes, and that's another service that has developed greatly, during my time as a consultant. We are really very dependent on the support that our diabetes specialist nurses give patients and health care practitioners outside of hospital inpatient environments.

(19) And can you talk more about primary care in the community?

Well, that's been another very central topic to how our diabetic service has developed. I think it's, perhaps, something like fifteen years ago now that we published some economic data - economic analysis and clinical data - on an experiment that looked at the management of patients exclusively in hospital clinics and shared with primary care clinics. And that publication really led on to enhanced development of what we now call integrated care services for diabetes management. I guess that I was first brought up in a situation where, at any mention of sugar in the blood, patients were Hoovered up by the hospital clinic. And the GPs only saw them to write prescriptions, or for other unrelated problems, and weren't really involved in diabetes management. And, as we've spent a long time increasing patient involvement in diabetes management and self-care by patients, it's certainly a problem that we have, to some extent, cut out primary care for many years from that equation. I'm pleased to say that we have been working very hard at this, for the last fifteen years or so, and now the majority of primary care venues within the Grampian region do have diabetic clinics. And we're continually trying to improve services, whereby the role of primary and secondary care in supporting diabetes can be less separate, and seen as providing good, comprehensive care that's the best available for what the patients need. That has meant some major issues around re-education of those working in primary care, who had, to a large extent, lost diabetes experience,

since all the patients used to come to be seen by my predecessors in the hospital clinic. It's been a major interest of mine is professional education for diabetes care. And one of the most rewarding things I've done in my career is I've run an annual scholarship course for about nine or ten GPs, which is currently in its ninth year. And this goes on over about a nine month period each year, and is geared at supporting GPs, and increasing their skills and confidence in managing patients with diabetes. We've also had a number of similar initiatives in supporting practice nurse development, in relation to providing diabetes care in primary care locations. And, of course, it's very important that we have increased our overall capabilities for managing diabetes, because of the great increase in the number of patients known to have diabetes. The first diabetic register, as such, I guess, that we actually had in Grampian was when we established digital retinal screening, in May 2002. And, at that stage, the predictions were around an indicative number of ten and a half thousand patients with diabetes. Just earlier this year, we've topped the twenty thousand mark, of patients currently registered with diabetes. So, that means we're approaching a doubling in known cases of diabetes in around five years.

And how would that compare, do you think, with the incidence when you first encountered diabetes?

I think, probably, the lecture slides were fairly constant for quite some time, that it was 1½% to 2% of the population had diabetes, and maybe a third of those were on insulin. Round about the year 2000, I think it was, Diabetes UK mounted this campaign to find the missing million, suggesting that we only knew about half the patients with diabetes in the country. Certainly, proactive screening and GP contracts, and so on, which have encouraged this, has led to an increase in the number of people detected early in the course of diabetes, but there are, of course, demographic changes, such as an ageing population, much lower levels of overall physical activity, higher levels of obesity, that also contribute to the rising incidence. And so, I think that, currently, we're at a prevalence approaching 4% of the population. And this is one of the slides that we've had to change almost every year, when you do a general talk on diabetes. The slide on the number of patients and the prevalence has been rising year upon year. I can only hope there's not another missing million there, waiting to be found in the next year or so.

(20) How are you coping with these increased numbers?

Well, clearly it's a huge challenge for the service. The diabetes service that I worked in, in the early eighties, wouldn't recognise what things are like currently, and couldn't possibly cope with the numbers of patients in the way that we did then, when, as I mentioned, the hospital staff basically did virtually all of the medical input for diabetic management. So, the changes in integrated care, and the up-scaling of practices, and certainly the great enthusiasm of our GP colleagues, and their practice nurses, for diabetes management has been an extremely important part of what's not just saved diabetes care in Grampian, but has allowed us to maintain, I think, a reasonably good standard of care and

access for patients. It is, however, part of that whole story that the more people that are involved in managing a condition, the harder it is for them to be at particular levels of awareness, specialisation and experience. I think, sometimes, primary care has rather a lot landed upon it, and the general practitioners, well... they do as well as they can, but they can't possibly take on all of the things that are being passed out of hospital, repeatedly. So, I've been very keen in trying to develop diabetes integrated care along lines where we support primary care colleagues, to increase their confidence and competence in managing diabetes, and, in turn, so that we can pass that on to patients. Because, I firmly believe that one of the biggest resources available to us are the patients themselves, and always have been. But, I think the so-called caring professions haven't always been fully aware of this, and haven't, therefore, given the patient enough say in how they manage themselves. One aspect of this, of course, that interests me too, is the establishment of so many targets and guidelines. And, while it's fine to write a target for glycosylated haemoglobin, or the proportion of people who will have this or that measurement made, it's not always easy to deliver these things, and particularly in terms of diabetic control. If we accept that we live in a significantly free society, where patients make most of their own choices, then there's a lot of serious strategic errors been made in the past, where I'm sure a lot of practitioners feel severely oppressed and inadequate and depressed by the fact that they can't make their patients achieve good levels of control. And I think it's an unhealthy pursuit of an unattainable target, in many circumstances, and it'll stress the staff, as well as stressing the patients.

(21) So, tell me about stress among health professionals involved in diabetes.

Well, I think that, as I was alluding to, one of the major sources of stress will be where people are given apparent responsibility to make things happen, but they don't really have the power to achieve those results. And that happens when someone sets up a particular guideline or a target, as I indicated for glycosylated haemoglobin, that is not attainable. And often these targets, while maybe ideally good, cannot be achieved by patients without, for example, an intolerable risk of hypoglycaemia. And I think that one of the areas that I have tried to particularly champion, in developing integrated care, is to encourage all of us involved in managing diabetes -patients and staff - to realise that some things are attainable, and some things are less attainable, and some things are unrealistic. We, interestingly, did a small survey of what stressed staff, at the diabetic clinic, a year or so ago. And it was quite interesting that some of the highest scoring causes of stress were that patients, apparently, didn't do what the clinician told them, and the other one was that patients wanted to talk about things other than their diabetes. And I can just imagine that some would say "well, yes, of course, these are the stressful things, and how terrible that they happen". And I think I would be inclined to take a different view that says, the reason patients talk about other things is that they want to talk about other things, and they've got another life that's not just diabetes. And if diabetic carers don't understand that, then we're not going to help patients to have the right approach to their diabetes that achieves the best that they can. And similarly, to be upset because

patients don't do what you tell them, is again rather missing the point. I think our job is to inform and enlighten patients about the various choices that are there for them to make, and to support them the best we can in making the best set of choices we can. But if they choose not to make the best choices, then that's not really the ultimate responsibility of the diabetes carer. And I think it's quite important that we try to stop the oppression of patients, and indeed diabetes carers, by over ambitious targets and guidelines.

(22) And what about stress for non-specialists, who find themselves managing diabetes?

Yeah, well, I've alluded to the need for us to support general practitioners, to allow them to achieve the level of specialism that is required, and, very often, it's the practice nurses who are really specialising in the subject and doing well with it. We also have to remember that, another part of my work is still dealing with acute emergency admissions. And often we see diabetic patients, who have acute problems, come into hospital, who are, to some extent, over-managed. Clearly, it's a potentially dangerous condition, diabetic ketoacidosis, and there are some people still who succumb every year to this condition. However, if people are over-zealous in interpreting and applying guidelines for management that they're not terribly familiar with, they can sometimes escalate situations out of all proportion. And it's still the case that, you know, we'll come across someone who has recently developed diabetes - they may well be in the process of developing Type 1 diabetes, they may have thirst, they may have polyuria, they may have weight loss, they may have some ketones in their urine - but they're not necessarily unwell. But someone, in finding these things, will, on occasion, refer them directly to the acute admissions unit. And the patients are admitted, and they'll have arterial samples, and they may have blood or catheter, and they'll have a drip, and they'll be pouring lots and lots of fluid into them, when, in fact, maybe a bit of sympathy and three cups of tea with no sugar would have been a more appropriate approach to introducing them to the topic of diabetes. And, you know, there's always a balance, because, on the one hand, you can't say that what is a potential fatal emergency is dealt with too rigidly. But, on the other hand, I worry about the people who their very first introduction to diabetes is a very high intensity, high anxiety situation, both for staff and patients, and it maybe doesn't need to be like that. And there's a great issue of primacy: what you meet first sometimes colours how you view everything from then on.

(23) So, how are you trying to address these issues of education?

I think that I've already alluded to a number of areas of education that I've been involved in, and I very much believe in enhanced patient education will enhance self-care. However, my particular take on that is that we really need to begin by educating the professionals, because, regardless of what resources you make available to anyone, there's nothing like a bit of understanding and experience and intuition to help people interpret such information. And our patients are regularly turning to healthcare professionals to ask for advice and

support, even if they have read various documents or leaflets, or whatever. And so, I think we really need to concentrate on getting the healthcare staff at ease with what we can and what we maybe can't achieve, in diabetes management, so that we can take a reasonable and measured view of what, for any individual, are reasonable and potentially unreasonable targets. And I think that's really quite an important part of how we take things forward. And there are a number of different educational initiatives on the go. One, that I've alluded to already, that's got a lot of popularity, currently, is DAFNE: Dose Adjustment For Normal Eating. And I can understand why so many patients and staff are so excited about this week-long course. Patients spend a week together - a small group of about eight patients - with, usually, a dietitian, specialist nursing and some medical input. And they've got a whole week to discuss various aspects of their diabetes, how they manage it, how they change things. And they are given instructions on how to adjust insulin doses in relation to the carbohydrate content of their meals, so they can see some early results. I think I've got some ambivalence about this, because the DAFNE programme is clearly excellent, in that it raises awareness of education, it gives people time to think about educational issues, and to reflect on the impact it could have on their life and well-being. And perhaps, above all, it gives patients a lot of insight into peer support. I think they get a great deal of support by having this facilitated opportunity to hear how it is for other people. The downside of it, perhaps, is that we are substituting for one system of operation, another system of potentially relatively rigid algorithms, which I think some people will have difficulty doing the sums and motivating themself to do the calculations. And others will be very disappointed by the fact that these calculations don't always yield perfect results, as they had been led to believe. And I think that there is, therefore, a potential downside in suggesting that this whole investment of a week is about devising a relatively complex numerical algorithm system that will produce perfect results, when, in fact, patients being patients, I don't know anything that will produce perfect results. But I think there's a lot to be said for the educational opportunity, and facilitating people's understanding and constructive reflection on living with diabetes.

(24) Over the course of your career, what changes have you seen in the management of complications?

All of the different related disciplines that deal with complications have made considerable progress in how they manage individual patients. This means, for example, that diabetes is now one of the leading causes of renal failure, requiring renal support therapy. That certainly wouldn't have been the case before. There's more patients now having renal transplantation, and even some having pancreatic transplantation. Cardiovascular intervention, which for a long time was primarily surgical, is becoming increasingly medical, again, with balloons and stenting. That's, you know, a great alteration to the prospects for patients with diabetes getting ischaemic heart disease. Ophthalmology: a number of interesting developments there, as well, in terms of surgical - and now medical - management of diabetic eye disease. And so, I think that all specialties have been able to, you know, 'up their game', quite a bit, in terms of dealing

with the complications that we used to see. There is, however, the problem that we are going to have an increased number of patients - higher prevalence within our diabetic profile - of older patients with, perhaps, multi-system disorders, who are going to be quite difficult to manage. And there will be a limit to the extent to which all of these complications can ultimately be dealt with, partly in terms of the overall fitness of the patient. And that's also an issue in relation to diabetes management, because, while certain targets may be achievable at one stage in someone's life, as people become less fit, less independent, less capable, then these targets will need to be revised. And I guess we've to learn a new discipline of managing diabetes, not at the induction of therapy, but at the other... nearer the other end of life, where we've got to find a realistic course to manage diabetes on, in patients who have got a number of other limitations on their life and lifestyle.

(25) And do you have any overall reflections on the time that you've spent working with people with diabetes?

It was a great career choice for me. It's definitely addictive; it's still enjoyable. For all the stress of the numbers and the targets, and the things that you can't achieve and the work you have to do, it's still a field I like. And I think I like it most because I deal in a relatively close way with patients, and also have this ongoing relationship, in terms of chronic disease management. I sometimes have said that I may be a frustrated general practitioner among hospital specialists, looking for this ongoing continuity of care with certain patients. I think it's interesting to reflect on how I got here. I am quite sure that, as a medical student or young postgraduate, I was interested in biochemistry and physiology and pharmacology, and that's why I thought I would study metabolic medicine. Fortunately, for me, I was probably quite wrong in my interpretation of what diabetes management was about, but it suits me nonetheless. It's mainly involved in education and negotiation and motivation, and that, I think, is why it turned out to be a good career choice for me, even although I one day thought that understanding the molecular weight of pyruvate was a really important asset for a budding diabetologist.

And you said that RD Lawrence recognised the importance of motivating patients, and the patient's role, a long time before you did.

Yeah, he certainly did, and that's back to the Aberdeen Grammar School connection, I guess. A little bit ahead of RD Lawrence, JJR McLeod was a pupil at Aberdeen Grammar School. He graduated in medicine in Aberdeen, and he went off to various parts. But while Professor of Physiology in Toronto, in the early 1920s, he was, of course, instrumental in the discovery of insulin, for which he shared the Nobel prize, in 1923, with Frederick Banting. McLeod's biography was written, in the early nineties, by my predecessor in post, Michael Williams, who also, as it happens, was an Aberdeen Grammar School boy. And Lawrence was sandwiched somewhere in between us; perhaps a bit nearer McLeod's end of the spectrum than Mike Williams' end. And Lawrence, of course - again born and brought up in Aberdeen, went to the medical school here - I think planned

to pursue a career in surgery, but developed diabetes. And this was at a time prior to the discovery of insulin, so he went off to Florence, allegedly to do a bit of painting, maybe to do a bit of medical practice to fund himself, and really expected to die. And it was in early 1923 that he was wired to come back to the UK at once to start insulin, because it had become available. And he returned to the UK, and, you know, he founded the first diabetic clinic at King's College Hospital. And instead of dying of diabetes in the early 1920s, died, I think, of a stroke in 1968, having been one of the most distinguished diabetologists of the twentieth century. And all from one school.