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The future of medicine lies with genomics, gene therapy, and a more personalised approach
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Q1 After qualifying as a doctor in 1983, who or what inspired you to pursue a career in obstetrics and gynaecology?

I started off with no particular direction in mind and began training to be a general practitioner (GP). Realising that I needed more stimulation, I decided to go to South Africa for a year in 1985, where I worked in an old Catholic missionary hospital in the middle of the homeland of Lebowa (now Limpopo Province) in the Northern Transvaal. There, I worked as one of three doctors, looking after approximately 350 patients. I was responsible for maternity, paediatrics, and women's health. In those dark days of apartheid, there was huge deprivation, malnutrition, and heartbreakingly high levels of infant and maternal mortality. Our clinics were huge, with long lines appearing in the early hours. Relatives slept on the floor by their sick family members. Children and babies slept in wooden boxes as there weren't enough beds.

The conditions were challenging; sometimes operating by torchlight at night when the electricity went out. I regularly performed a whole caesarean delivery as the only doctor present: giving the anaesthetic, doing the operation, delivering and resuscitating the baby, and then completing the surgery. Once, we saved a woman's life by performing a splenectomy for a ruptured spleen caused when the vehicle she was travelling in tumbled off the dirt track (we were 2 hours from the closest tarmac road). We used

an anatomy textbook in theatre to guide us! Sometimes I was either on my own looking after the hospital when my colleagues had a few days off, or I would drive 2–3 hours on dirt roads to 'babysit' another hospital in the group whilst its doctors took a break.

My experiences in the arid homelands of South Africa at St Rita's Hospital as a very junior doctor were incredible and gave me the confidence to develop pioneering treatments and surgery later in my career when developing my paediatric and adolescent gynaecology work.

In 1986, I returned to London to do 6 months of obstetrics & gynaecology in my GP rotation and realised this was my vocation. So, I stepped into the world of obstetrics and gynaecology and never looked back.

Q2 You worked with early pioneers of *in vitro* fertilisation (IVF), namely Bob Edwards and Howard Jacobs. How did this experience inspire you to create one of the UK's largest IVF units; Leeds Fertility?

I was very privileged to have spent 4 years working with one of the greatest endocrinologists of our era, Howard Jacobs; both my mentor and a great friend. He was helping develop the ovarian stimulation protocols for IVF in conjunction with the Bourn-Hallam clinics in Cambridge and London. Those were the very early years of IVF, with Louise Brown, the first IVF baby, having been born in 1978, which was the year I had started as a medical student

at St Bartholomew's Hospital in London, UK. Bob Edwards, Nobel Laureate, and the scientist behind the development of IVF, had initially commuted between Cambridge and Oldham, where the gynaecologist Patrick Steptoe had introduced laparoscopic surgery to the UK and enabled access to the human ovary for the first time. They then founded Bourn Hall, not far from Cambridge, after their successes in Oldham. The Hallam Medical Centre became the London arm of Bourn-Hallam and was a hotbed of research and the training ground for many of us who have developed successful careers in reproductive medicine. Real-time ultrasound was evolving by the time I started doing egg collections, and we were amongst the first to use transvaginal ultrasound, although I also learned to do laparoscopic egg collections in the beginning. Bob was a truly inspirational man, and we enjoyed many fruitful and entertaining conversations.

Howard was then leading the way in the management of polycystic ovary syndrome (PCOS), which is

when my interest evolved and has continued to this day. Therefore, I had a solid grounding in both gynaecology and endocrinology. Having completed my Doctor of Medicine thesis on 'The hypersecretion of luteinising hormone (LH) in PCOS', I then went on to complete my clinical training and actually wrote my first book, 'The CTG in Practice', on foetal monitoring in labour whilst still a registrar in London. I then went to Oxford to complete subspecialty training in reproductive medicine, where I continued research into the evolution of PCOS in adolescent girls and wrote my second book, 'Infertility in Practice', which has recently been revised in its 5th edition and sold worldwide with translations in Chinese and even Greek.

I was attracted to Leeds, which had developed a thriving IVF service and was leading the world with ground-breaking research on ovarian tissue and oocyte freezing, led by Roger Gosden and subsequently Helen Picton, a close friend and collaborator

of many years. I have been a consultant in Leeds since 1996, and with my colleagues, we have developed one of the largest and most comprehensive centres in the UK. I am very proud of all the doctors, nurses, and scientists who have trained with us and I am really pleased that, when I retire, I will be leaving the department in excellent hands.

Q3 Your work has focused on PCOS. Please can you shed light on how this condition affects the quality of life and long-term health of your patients?

PCOS is a multi-faceted condition that affects girls and women throughout their life course with a constellation of symptoms that may change over time and affect general health, reproductive health, and quality of life in a variety of ways. These range from struggling with weight gain, disordered eating patterns, body image issues relating to hirsutism, acne and alopecia, menstrual cycle disturbance, and infertility. And then, as time goes on, there



is an increasing risk of metabolic conditions associated with insulin resistance and diabetes.

I have always worked as a full-time National Health Service (NHS) clinician, and I have considered my research to have been the “icing on the cake,” usually performed out of hours and at weekends. I have looked at many aspects of PCOS, from its evolution in adolescence, its effect on quality of life (we developed a health-related quality of life tool, especially for those with PCOS), and the management of dermatological manifestations. I have been very interested in the ethnic variations, particularly the high prevalence of insulin resistance and PCOS in the South Asian population, and the greater symptomatology at a lower body weight than their White European counterparts, probably a reflection of the ‘thrifty genotype’ hypothesis.

We performed some of the earliest studies on the use of metformin both before and during fertility treatment. We also worked on a range of novel ovulation-induction protocols. The University of Leeds gave me a personal chair in 2004 in recognition of this research and I was awarded a Doctor of Science in 2011, which was also a great honour.

The gonadotrophin preparations we were using were extracted from the urine of menopausal women, and at one stage there was concern, proven later to be unfounded, that there might be a risk of transmission of variant Creutzfeldt–Jakob disease. For a few years, I found myself at meetings with neurologists and Creutzfeldt–Jakob disease specialists trying to ascertain whether there might be a risk; an example of how medicine can expand into so many different pathways.

Q4 You have been involved in several international guideline development groups for PCOS and infertility. How do these collaborations influence clinical practice globally, and what has been your most rewarding experience from these efforts?

Collaborations, whether national or international, are the best ways of achieving progress and at the same time learning from others’ experiences and research. I have been so fortunate to have made so many enduring friendships with colleagues from all over the world. I have also been lucky to have travelled the world and given lectures on every continent except Antarctica. I chaired the ESHRE Special Interest Group on Endocrinology for a few years and we took a training course around Europe and into Russia and Ukraine, which was a very rewarding exercise.

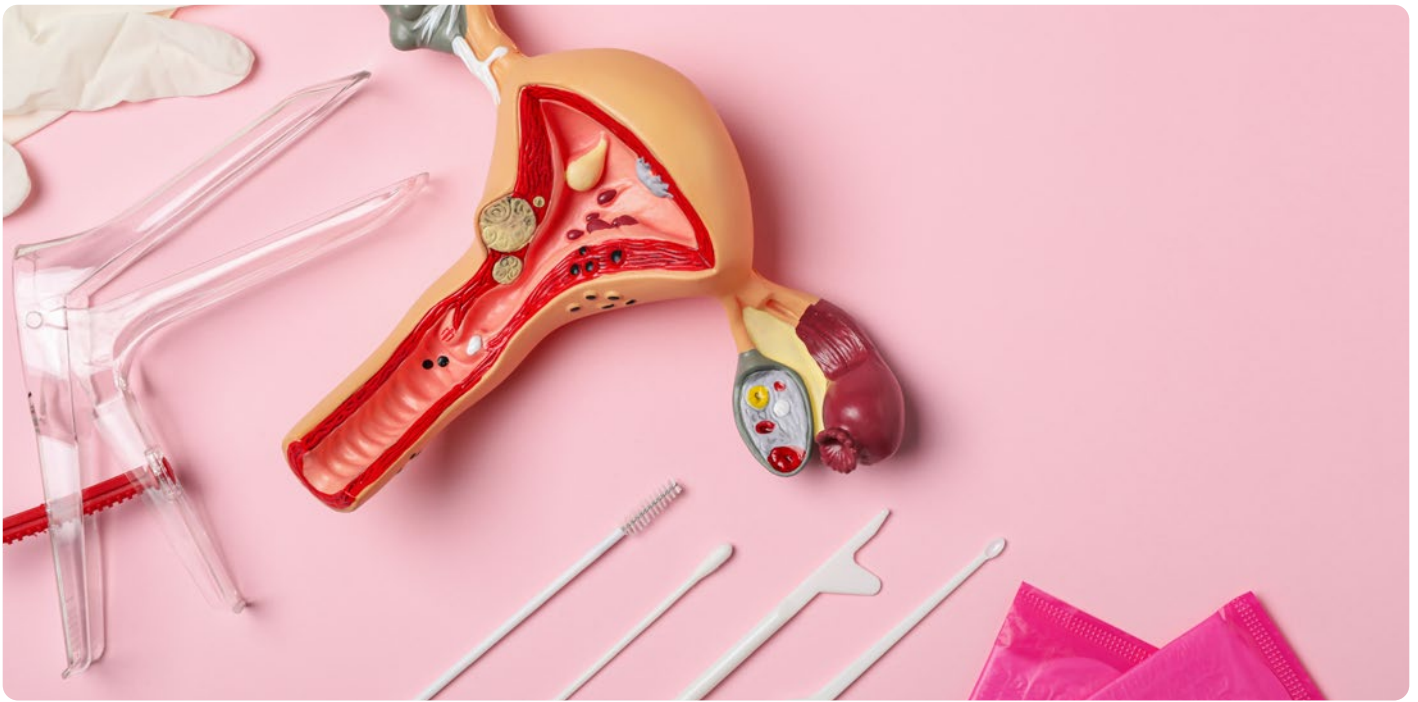
Guidelines have to be developed with consensus and an eye not only to the evidence but also a pragmatic approach to what’s achievable and cost-effective. It has been a great privilege to have collaborated with the world’s leading experts in the field of PCOS. I was, I believe, the youngest participant at the Rotterdam Consensus Meeting back in 2003, which gave us the modern definition of PCOS. Since then, some really great groups have evolved, culminating in the Global PCOS Alliance, led by Helena Teede and Rob Norman from Australia, which has produced first-class, evidence-based guidelines covering all aspects of PCOS. My role in this was predominantly in the management of infertility, having previously led the WHO guideline on ovulation induction for PCOS. My various roles in the Royal College of Obstetricians and

Gynaecologists (RCOG) have also enabled me to organise scientific study groups, consensus workshops, and large meetings for a worldwide audience.

I also devised the new International Federation of Gynecology and Obstetrics (FIGO) classification of disorders of ovulation and was the joint first author when we published it in 2022. This, I feel, was a truly important piece of work, replacing the former World Health Organization (WHO) classification, which has developed from a few people agreeing on a rough algorithm rather than a true international consensus process, which we achieved through FIGO. The Hypothalamic–Pituitary–Ovarian–PCOS (HyPO–P) classification provides a clear, logical, and comprehensive overview of every cause of ovulatory disturbance and should act as a learning tool and research aid for, hopefully, generations to come. The detailed review we published on this in *Human Reproduction Update* earlier this year is one of the longest papers I have written!

Q5 Are there any innovations on the horizon for the treatment of PCOS that you are excited about?

We need to get to the bottom of the genetic and ethnic variations and develop targeted treatments that are fine-tuned to an individual’s needs, whether inducing ovulation or managing the dermatological and metabolic manifestations. Tackling the obesity crisis is also key to managing the ever-increasing numbers of people with PCOS. Some of the newer innovations in weight reduction medicines are exciting but also challenging due to cost and potential



teratogenicity, so they may only be prescribed to people not wishing to conceive. The future of medicine lies with genomics, gene therapy, and a more personalised approach. We do, however, require a significant investment in resources and manpower to be able to deliver the care that we aspire to, and that our populations deserve. PCOS is very common, affecting at least 10% of women, and yet it is underdiagnosed and poorly managed. My work with patient support organisations, in particular Verity and The Fertility Alliance in the UK, brings into sharp focus the distress experienced by many millions of women worldwide with this lifelong and debilitating condition.

Q6 You have also developed a multidisciplinary clinic for the management of Paediatric and Adolescent Gynaecology (PAG) problems and congenital development conditions (also known as disorders or differences in sexual development [DSD]), can you please tell us more about that?

This has been another great privilege. When I started, PAG

was an emerging specialty. I co-founded the British Society in 1997 (BritSPAG) as a society representing a range of specialists from gynaecologists, paediatric urologists and surgeons, endocrinologists, psychologists, and specialist nurses, to name a few. We have written national and international guidelines and position papers, and I have edited two textbooks with global leaders in the field. Looking after children with their parents and families during adolescent years as they develop confidence as young adults, and then throughout their reproductive years, helping with their sexual function, fertility, and reconstructive surgery when required, has been one of the most rewarding aspects of my work. Many people I see in my clinic have extremely rare conditions and a range of complex co-morbidities. To help these patients through their life course is not only hugely rewarding but often a humbling experience.

One case that stands out is the case of a young woman aged 16 years who came to see me 25 years ago with pelvic pain and no

periods. She had been born with a uterus but no cervix or vagina, hence the pain as her menstrual blood had nowhere to go. Most specialists would have removed the uterus. But I attempted a reconstruction, creating a neo-vagina and cervix, thereby enabling menstruation and the potential for fertility. Several years later, she tried to conceive, but without success. We tried fertility treatments including IVF, which sadly didn't work, and both the NHS and her own funds ran out; many tears were shed. She then conceived naturally, and I helped deliver her baby by caesarean section on her 40th birthday; more tears all around.

Q7 In your role as Chair of the NHS England working group on funding for IVF, what strategies have you implemented to ensure equitable access to fertility treatments across the UK?

We did a huge amount of work developing a benchmark price over the course of about 5 years to form the basis for equitable funding across the UK. Sadly,

we didn't get where we would like to be. In the UK, we have led the world in the development of IVF and yet we cannot fund a service that provides for our population. Furthermore, we have a 'postcode lottery' with huge geographical variations in provision. Scotland is the best, providing three full cycles of IVF on the NHS, as recommended in the National Institute for Health and Care Excellence (NICE) guidance; whereas some areas of the UK provide no funding at all. Having a family is a human right, not a luxury. And, if you want to look at the harsh economics, the contribution to society of any child born as a result of IVF far outweighs the cost of the treatment. I did my best when I was Chair of the British Fertility Society (BFS) to raise these issues within the NHS. I hope to have further opportunities in the future to move this agenda forward.

Q8 Looking more broadly at women's health, what do you consider to be the most pressing issues, and how can the medical community address these?

Women's health is poorly served in the UK. GPs no longer have to spend time in obstetrics and gynaecology during their training, so girls and women often do not get the care they need. Many conditions, for example, PCOS and endometriosis, are left undiagnosed for years. The term 'benign gynaecology' is unhelpful as it almost makes light of the significant symptoms experienced by women with a whole variety of non-malignant conditions, which are nonetheless chronic and debilitating. Furthermore, the gynaecology ward is usually the first to be used for acute medical, surgical, or elderly care patients when hospitals become over-filled during the winter months and

even, these days, at other times of the year. The COVID-19 pandemic also had a disproportionate effect on waiting lists for both gynaecological outpatients and surgical procedures.

We need better prevention and health education rather than the reactive system we have now, which doesn't provide nearly enough time in GP or hospital appointments to truly get to the bottom of peoples' problems, encompassing both health, socioeconomic, and psychological needs. There is no doubt that, to coin a phrase, the 'NHS is broken' and needs a total overhaul. There are also natural concerns about maternity services; but that's a topic for another day.

Q9 Can you discuss the importance of preventative care in women's health and what strategies can be employed to encourage more women to engage in regular health screenings?

This is why I founded 'The Fertility Education Initiative' when I was Chair of the BFS, and we have managed to change the national curriculum in schools to ensure all young people have a better understanding of their reproductive health and are empowered with the knowledge to, hopefully, have the desired family they want at an appropriate time.

I have also written 'The Fertility Book' with my wife Grace Dugdale, who is a nutrition scientist and an expert in preconception health. The book guides people on their fertility journey, whether to conceive naturally or with assistance, and provides evidence-based advice about lifestyle, diet, supplements, and external factors that affect reproductive health.

Nutrition and lifestyle are key and should be learned by families so that children growing up are set on a good trajectory for life. It is a travesty that fresh, nutritious food is so expensive, whereas ready meals with their addictive ingredients are cheap. Far too many women embark on their fertility journey nutritionally depleted, being low in essential vitamins and minerals as well as being overweight, leading not only to problems conceiving but also increased risks for miscarriage, other problems in pregnancy, and importantly, worsened fetal outcomes and the increased risk of children to have health problems that can affect them for life.

Q10 Given your media and public speaking experience, how important is the role of media in raising awareness about reproductive health issues, and how do you ensure the information shared is accurate and helpful?

The 'media' is vitally important, if we have balanced and not sensationalist reporting. Reproductive medicine is exciting, and some aspects are ethically challenging. Articles need to be appropriately detailed rather than picking up on soundbites that can be misleading and sometimes even frightening to a lay audience. I have done my best to support journalists in their quest for balanced and informative articles.

Modern technology has allowed us to hold webinars and communicate with large audiences. I must confess, however, to not being very good myself at tweeting or using the various other online platforms. It has been an honour to have worked in the whole field of reproductive medicine. I have had some very humbling experiences looking after people who have come to me for help, many of whom have found me via media exposure and public engagement. I hope to be able to continue to communicate my ideas and knowledge for years to come.



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