

## Where is medical education going?

The training of medical practitioners, and here I am referring primarily to medical doctors (MD, MBBCh, MBBS etc degrees), is a major investment and focus of universities with great national importance. It is interesting to hear perceptions and opinions from colleagues both inside and outside the medical profession regarding the different training programmes. Here I convey some of these opinions as well as my own. I feel entitled to express my opinion because, although I work mostly as a researcher in evolutionary biology (I followed a typical route of BSc, MSc, PhD and postdoc in evolutionary biology), I have also been through the complete medical training (MBBCh and MMed). As an aside, I have been asked how this unusual path came about and how it was possible to do this almost concurrently. It is indeed an unusual story, perhaps for another time.

Medicine seems to hold a privileged place in education and as such receives enormous research funding when compared to non-medical biology. This is for historical reasons and of course, because human health is, well, important. It is also politicised with countries competing to train the 'best' doctors as a source of national pride. It seems, however, that medical training is going through a major self-examination. This is a good idea, except that I am not sure where the changes will take it. In many ways, it seems that the rapid gains in knowledge and technological changes, as well as the ways in which medicine is practised are outstripping the pace of change in training programmes. In my experience there are also great differences in the training modalities in different countries and comparisons are frequently drawn.

Before delving into some of the criticisms I must make two points. First, the abilities of some physicians are a marvel. One cannot help but be in awe when watching surgeons performing some intricate procedure or wonder at the life-saving treatments of trauma experts. I am myself a trauma survivor having suffered multiple limb and spinal fractures in an accident in 2018. The doctors and nurses were fantastic, I couldn't recommend them more highly. Clearly, their training was fantastic. The second point is that I don't have the answers to where medical education should go, just some broad ideas and I can point out some anecdotal observations.

Medicine has changed so much over the last 100 years. It is simply not possible to have even a general proficiency in all its subdisciplines. It makes me wonder then why the general medical degree attempts to do this. This is most obvious in general medical practice. There are exceptional generalist GPs. I have met many and they are truly amazing, but very early in one's career decisions must be made as to which areas one wishes to be competent in. Even keeping up with pharmacological advances and treatment recommendations in the most common diseases like hypertension, obesity, diabetes, common infections etc is a challenge for most people. Wouldn't it be more practical to separate individuals into different streams depending on their interests and goals? Or perhaps it is wise to specifically train generalists with competence in only the most uncomplicated of general conditions and a knowledge of which direction to channel their patients. This sort of training would fall somewhere above the training of an advanced primary healthcare provider and the current basic medical programme. Following that, individuals can enter into a specialised medical programme in an area that interests them. Or have compulsory internships to gain experience and identify their primary interests. I am not sure, but this strikes me as a more sensible approach, certainly with the looming and expected changes in the world's demographics and health policies. It would certainly be more appropriate for low- and middle-income countries. I am certainly not one to suggest that 'under-developed' (and I hate using this term) countries should aspire to be like 'developed' countries in every way.

In my field of pathology the training situation, in South Africa at least, is potentially more outdated. It is quite different to most other countries. For example, in SA pathologists are mostly laboratory bound while those in other countries are much more involved clinically. Of course, there are those who make an effort to be included in clinical decision making, but for the most part pathologists remain in laboratories. The knowledge gained during pathology training is immense, but in my mind seems rather unnecessary (I am referring to the non-histopathology disciplines in this

missive, the disciplines of microbiology, chemical pathology and haematology). But for specialised clinicians, the interpretation of results seldom requires a pathologist. They are performing pathology investigations to look for specific conditions. They are not fishing, hoping to find something, and don't need the routine list of potential conditions causing a particular abnormal pathology result. For general practitioners, consultation with a pathologist may be more appropriate, but in these instances, it is common to refer the patient anyway to a specialist physician.

Pathologists who enter the clinical sphere are much more common in other countries where they may practice clinically, attend ward rounds or be involved in specialist units. In these instances, it seems that their training should follow a more clinical route as opposed to a laboratory route.

On the laboratory side, it is really the technicians and, to a lesser degree, medical applied scientists who trouble shoot the technical problems. Quality assurance is of course a critical part of routine labs, and in this area the pathologist is, at the moment, perhaps filling a niche but there is no reason why this cannot be accomplished by senior technologists and applied scientists. In fact, this is already common in many countries, especially the USA and Canada. In academia in SA, pathologists tend to enter a particular niche or super-specialist area, something that they may have only superficially been exposed to during training. It is then worth asking what role do routine pathologists in South Africa actually fill? This is especially true of the discipline of clinical pathologists, which have less training in microbiology, haematology and chemical pathology than the mono-specialist disciplines. They are very valuable in the private sector because only one person needs to be employed instead of three, and they may have a more valuable role in peripheral, understaffed laboratories. But again, I would make the argument that the role is more administrative or to tick one of the legislative boxes.

There is one rather unflattering (or flattering depending on your point of view) feature of the medical profession that has been commented upon by many of my scientist and philosopher colleagues, and which I have noticed myself. Medical practitioners are stereotypically pretty sure of their opinions. Yes, I know, this is a generalisation. I understand that, but stereotypes do often emerge from kernels of truth. Just ask one medical specialist what he/she thinks of another discipline. They will be happy to pass comment about how another medical specialist conforms to a stereotype. Psychiatrists hate touching patients, surgeons have a god-complex, physicians are argumentative, paediatricians speak to everyone as though they are a child. Perhaps the confidence that all medical doctors seem to have in their opinions is necessary for making rapid decisions in emergency situations. Perhaps this is ingrained during training, I don't know. I doubt that existential philosophers will make good traumatologists, no matter how extensive the training. But the downside of this is that medical doctors and especially the specialists seem to have opinions about everything. From sport to cuisine. From philosophy to dramatic art. But worse, they seem utterly convinced of their own views. Quite annoying really. A philosopher friend of mine claimed that medical training is anti-intellectual. In many ways I agree. But gosh, I'm grateful for an expert, well-trained physician.

I do not know where medical training is going. But I do know that it is not sufficiently nuanced for modern needs.