

From Bench to Bedside: Experiencing the Transition from Scientist to Medical Student

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The Experience

At 8am on the morning after my PhD defense I registered for the graduate entry medicine (GEM) scheme in University College Cork and two days later I was standing over a 'fresh' cadaver in a sterile-looking dissection lab. The transition was swift for me, leaving me little time or space for internal reflection. Herein, I attempt to review the first steps of this experience and give general thoughts on the transition from scientist to medical student, a narrative which I found lacking in the literature in a time when I was searching for reassurance before making my decision.

Should you consider a medical degree after a PhD?

Although PhD schemes are now slowly evolving, the majority of programs facilitate training for the traditional academic career template. Yet I, like the majority of modern PhD graduates,¹ had opted not to pursue this path. The numbers of bioscience PhD graduates that eventually enter the career paths which fringe around the academic scientific community, such as pharmaceutical industry R&D/consultation, patent law, regulatory affairs, publishing and scientific outreach/communication, trebled in Ireland between 2001-2007.² For many of these professions one may require an additional degree – for example in Law, Marketing or indeed Medicine – yet more and more graduates are electing to pursue them, regardless of the additional training time and costs.²

The relatively untapped pool of trained basic scientists with a smoldering desire to enter the clinic is beginning to garner attention within the medical community. Now several top level medical schools, such as Columbia University and New York University, are taking note and designing targeted three-year programs specifically for their conversion. For me, the drive to transition lay in my desire to study and treat real patients, not simply a disease state. I grew more interested in the translational and clinical aspects of my research, while also becoming enamored by the idea of patient contact. Ultimately, I realized that a medical degree was my passport to this type of career.

What are the main challenges of this pathway?

While 'non-traditional' medical students are becoming more common and valued each year for the diversity of attitudes which they bring to the medical profession,³ it is not controversial to suggest that the PhD-to-MD route to physician-scientist is not the most efficient, nor is it the easiest. It is fair to say that this was not part of my ten (or rather twelve) year master plan, but instead the result of an ever-evolving mindset and shifting priorities. The central challenges are relatively simple: time and finances. Indeed, you will likely be >30 years old by the time you finally leave university to begin the first year of a decade of postgraduate medical training, likely with a sizeable loan to shoulder also. Undeniably, these are important issues which will have significant

impacts on your personal lifestyle and relationships, and therefore should be considered closely prior to embarking.

Depending largely on the style of your supervisor, when you are working through your PhD you could consider yourself self-employed. Indeed, you have a mandate from above and deadlines to meet, but much of the inspiration and motivation is solely yours to synthesize. This was perhaps one of the greatest challenges in my transition to medical student, as self-directed learning was swiftly replaced with a rigidly implemented timetable of didactic-style teachings and rote learning of concepts, pathways and mechanisms of action. The nearly 500 drugs whose applications, contraindications and interactions we were tasked with memorizing were staggering to me and forced me to install far more random-access memory in my brain than I previously considered feasible.

What advantages might a PhD to MD have over traditional route-takers?

With regards to grades, research output or careers, the literature indicates that there is no significant advantage or disadvantage to enrolling secondary or tertiary level graduates into medical school.⁴ However, literature specifically regarding GEM students carrying higher research degrees is currently lacking. Beyond the obvious aspects relating to maturity, PhDs 'know' research – they know how to design and implement study protocols, how to draft proposals and manuscripts, and how to analyze and present their findings to peers. These skills are traditionally important in the medical profession and should be developed and nurtured.

The central dogma of medical school is that hard work yields results and, as such, students spend months memorizing lists, tables and triads. In the case of a PhD, hard work does not invariably yield results, but it should develop the student into a critical thinking researcher, who can handle some of the inherent failures and rejections that accompany academic pursuit. Perseverance, coupled with this conditioned critical thinking, is perceived as an excellent tool within the clinic and should again be developed even further during medical training.

What are the main benefits from a year in preclinical medicine?

This preclinical year of medical education demonstrated to me that I knew much less than I had ever appreciated. During even the most integrative PhD, you are so focused on one particular aspect which is so significant to you that it can be quite challenging to see the broader implications of each individual piece of information. In this respect, the pre-clinical medical teachings have given me clarification of some concepts with which I struggled during my doctorate and, in turn, have provided me with inspiration in terms of future research prospects. For this alone the year has paid dividends.

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My father often preaches about the ‘in-between learning’ which we unwittingly accumulate each day, but often dismiss as inconsequential. I now try to reflect more closely and build upon these sorts of non-academic experiences, as we are encouraged to do in medical school. During the past college year, I had the opportunity to listen to the real stories of patients, personally interview sufferers of chronic disease and learn about the diversity of ways in which people deal with stress. I saw the collateral damage which an individual’s sickness can inflict on a family and this has quickly broadened my definition of patient care. I believe that biomedical researchers may benefit significantly from these types of experiences and interactions, inspiring the synthesis of unique ideas which may impact substantially on human health and disease. For this reason, I hope to see more PhD to MD students contributing to both biomedical research and medical practice in the coming decades.

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