Understanding Medical Education

EVIDENCE, THEORY, AND PRACTICE

THIRD EDITION

EDITED BY

Tim Swanwick | Kirsty Forrest | Bridget C. O'Brien

ASME

WILEY Blackwell

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Foreword to the Third Edition

What can one say about a book that within less than 10 years is its third edition? The need for this new edition reflects that *Understanding Medical Education* is the authoritative and comprehensive resource in modern medical education practice. To borrow from Parmenides, 'nothing comes from nothing' and so it is useful to reflect on both the origins of *Understanding Medical Education* and how it has evolved through its various iterations. During the early 'noughties', the Association for the Study of Medical Education (ASME) approached leading experts in the field of medical education to contribute to a series of standalone monographs on their topics of expertise. These monographs proved incredibly popular, so much so that it became clear that there was a need for a definitive guide to medical education presented, for the first time, in a single core textbook. Having commissioned and edited the original series, Tim Swanwick was invited to take on the gargantuan task of bringing everything together in one place, approaching authors to revise their contributions in light of new research evidence and emerging thinking, and sourcing other well-known figures and rising stars as contributors. *Understanding Medical Education* was a cutting-edge 'one-stop shop' presented in simple language and applicable across the entire spectrum of health professions education. It was an instant 'hit', adopted rapidly by medical educators across five continents with translations available in a number of different languages.

Yet nothing stands still. After many centuries of little change, medical education and medicine have shifted dramatically in recent years. Medical practice, society, health care systems, and expectations from patients are changing, and medical education has to also change to keep up. For example, ways of working with patients and colleagues are different. There are changes in how we deliver education and training linked to changing health care practices, particularly fewer opportunities to learn in the workplace because of system changes such as regulated hours for junior doctors. There have been major advances in research and treatments, and hence views of what is good clinical practice. These rapid changes mean that medical education must prepare today's medical students and doctors in training to work in very different ways from those of the past. Best practice in medical curricula, methods of instruction, assessment, and so on have to change and evolve in order to reflect the needs of contemporary medical practice. It is extremely challenging for educators to keep up with the literature, read journal articles and book chapters: the synthesis of the latest, most relevant, and essential material in medical education is if anything more necessary today than it was at the time of the first edition.

The second edition of *Understanding Medical Education* was published only four years after the first, reflecting the rapidity of change. This third edition, has kept pace with the continuing and hectic evolution of medical education. The content illustrates the journey that medical education has taken over recent years, and hints at the challenges that lie ahead. The content also reflects the responsiveness of the *Understanding Medical Education* project, a feature which will help those delivering medical education and training reflect on how things have changed since they were in the classroom and clinic, and help them break free of what Whitehead and colleagues have called the 'carousel of ponies'. This colourful analogy suggests that there are returning themes in medical education, circling round and round in the continual rediscovery of discursive 'truths'. Getting off this carousel requires both knowledge and reflection. *Understanding Medical Education*'s five sections of Foundations, Teaching and Learning, Assessment and Selection, Research and Evaluation, and Faculty and Learners focus ostensibly on knowledge. Yet running throughout the book is also a strong acknowledgement of the necessity of considered and scholarly reflection on the process of medical education. By this I mean the need to think not just about the 'what' or 'how' (to assess in the workplace, to introduce portfolios, design a curriculum, etc.) but also the 'why' (are we introducing something new, what can we learn from pedagogic shifts, and so on). *Understanding Medical Education* provides a resource which will help educators reflect on the complexity of medical education, to question discourses and practices in a way which will help them develop as professionals and move medical education ever forwards.

Long-term fans will also notice that *Understanding Medical Education* has extended its editorial team. As the current Chair of the Association for the Study of Medical Education (ASME), and the person responsible for commissioning the third edition of UME, I believed it was critically important to ensure that the book explicitly reflected ASME's explicit 'UK-based internationally facing' mission. This mission is reflected in editors, contributors, and readers of ASME's journals, *Medical Education* and *The Clinical Teacher*, and our other indispensable resource, *Researching Medical Education*. In support of this aim, I was delighted to invite Bridget C. O'Brien from the US and Kirsty Forrest from Australia to join Tim Swanwick as co-editors. Their international collaboration on this edition illustrates the great benefits of working together to share knowledge and networks.

Understanding Medical Education synthesises the latest knowledge, evidence, and best practices in the field. It provides a snapshot of how far we have come as a field. It is the essential resource for established educators and those new to the field. This extensively revised and extended third edition should be on the desk of every medical educator.

Professor Jennifer Cleland
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Chair of the Association for the Study of Medical Education

Preface

Understanding Medical Education was launched by the Association for the Study of Medical Education as a series of monographs in September 2006. In 2010 these monographs were brought together into a single textbook, providing a unique and comprehensive guide to the theoretical and academic bases to modern medical education practice.

As well as providing practical guidance for clinicians, teachers, and researchers, *Understanding Medical Education* is designed to meet the needs of all newcomers to medical education, including those studying at certificate, diploma, or masters level; *Understanding Medical Education* aims to be both accessible and useful to the reader. The intention is that after reading one of the chapters the reader will not only be better informed about their field of interest, but able to assimilate their new knowledge into their clinical teaching or academic activities.

Following a rigorous process of expert peer review, this third edition sees major updates of all existing chapters and some completely new ones, including contributions on the science of learning, knowledge synthesis, and learner support and well-being. The third edition also comes with a brand new foreword from Professor Jennifer Cleland, Chair of Medical Education Research at the University of Aberdeen and Chair of Council for the Association for the Study of Medical Education.

Understanding Medical Education remains the first port of call for anyone engaged in medical education as an academic discipline. The book is a unique resource which should prove invaluable for anyone involved in the development of health care professionals, in whatever discipline, wherever they are in the world.

An online edition of the complete book together with individual chapter downloads is available at http://onlinelibrary.wiley.com.

Editors

Tim Swanwick, MA, FRCGP, MA(Ed), FAcadMEd, has a broad range of experience in health care education and is based in London (UK), where he is Dean of Education and Leadership Development for Health Education England and the NHS Leadership Academy. Tim has a variety of academic interests including work-based learning, faculty development, professional support, academic careers and clinical leadership, and has taught, researched and published widely.

Kirsty Forrest, MBChB, BSc Hons, FRCA, MMEd, FAcadMEd, FANZCA, is based in Gold Coast, Queensland, Australia, as Dean of Medicine at Bond University. She is co-author and editor of a number of medical textbooks. Kirsty has been involved in educational research and management for many years both at the undergraduate and postgraduate levels and she continues to work clinically as a consultant anaesthetist.

Bridget C. O'Brien, PhD, is an associate professor and education researcher at the University of California, San Francisco, where she supervises doctoral students in the UCSF-University of Utrecht doctoral program and directs the San Francisco Veterans Affairs Fellowship in Health Professions Education Evaluation and Research. She co-authored *Educating Physicians: A Call for Reform of Medical School and Residency* (2010) and has published numerous peer-reviewed research papers and articles. Her research focuses on workplace learning across the continuum of health professions education.

Association for the Study of Medical Education

The Association for the Study of Medical Education (ASME) was established in 1957 by the UK General Medical Council to promote and conduct research into medical education. ASME's goals are to:
- Promote high-quality research into medical education.
- Provide opportunities for developing medical educators.
- Disseminate good evidence-based educational practice.
- Inform and advise Governmental and other organisations on medical education matters.
- Develop relationships with other organisations and groupings in health care education.

ASME's mission is to meet the needs of teachers, trainers, and learners in medical education by supporting research-informed best practice across the continuum of medical education.

Acknowledgements

Producing a textbook such as this is a team effort, and thanks must be extended to the ASME Executive and *Understanding Medical Education* editorial advisory board for their advice and guidance, to the ASME team for their administrative support, and to James Watson and the editorial team at Wiley for helping to make the third edition of *Understanding Medical Education* such an impressive and attractive volume.

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ICONS

Throughout the *Understanding Medical Education* series readers will come across a number of icons in the margin. These graphic devices serve to highlight certain insert boxes where the author wishes to take the reader off into a particular area in greater detail (Focus on), explore the evidence behind a particular concept (Where's the evidence), provide practical advice (How to) or summarise the main points of the paper (Key messages).

FOCUS ON

WHERE'S THE EVIDENCE?

HOW TO

KEY MESSAGES

Part 1
Foundations

1 Understanding Medical Education

Tim Swanwick

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It was the nuclear physicist and father of the hydrogen bomb, Edmund Teller, who wrote (perhaps rather alarmingly) 'Confusion is no bad thing; it is the first step towards understanding' [1, p. 79]. Newcomers to the field of medical education could be forgiven for being confused. Medical education is a busy, clamorous place, where a host of pedagogical practices, educational philosophies, and conceptual frameworks collide. It is a place where academic journals vie for attention, institutions and professional bodies compete for political leverage, and the wheel of reform and 'improvement' revolves faster than, and often independently of, the cycle of evaluation and research. And it is a place of increasing accountability and regulation because of its proximity to one of the prime socio-political concerns of government, that of the health of its people.

It was the desire to develop evidence-based policy and practice in this complex arena that led to the establishment of the Association for the Study of Medical Education (ASME) in 1957. The past 60 years have seen a burgeoning of literature in the field. This is both a help *and* a challenge to the clinician taking on responsibilities for teaching, assessment, and educational supervision. The range and diversity of relevant theory and research are now almost overwhelming, and in 2006 ASME recognised the need for a succinct yet comprehensive guide to the vast literature now underpinning best practice in medical education. *Understanding Medical Education* aims to be that guide.

What is Medical Education?

Medical education as we know it today spans three sectors: undergraduate, postgraduate, and the continuing professional development of established clinicians. However, it has not always been that way, and Abraham Flexner – the centenary of whose seminal report on the transformation of the American medical school system was celebrated earlier this decade [2] – would not have recognised the attention currently given to the design, management, and quality assurance of structured training in the postgraduate years, still less the need to instigate regulatory systems to ensure the ongoing personal and professional development of practising clinicians.

Medical education's ultimate aim is to supply society with a knowledgeable, skilled, and up-to-date cadre of health care professionals who put patient care above self-interest, and who undertake to maintain and develop their expertise over the course of a lifelong career. Medicine has a privileged position in society and, as a result, medical education is itself set apart from the main body of higher education. In many countries it luxuriates in separate funding streams and higher rates of remuneration for its clinical teachers; it is the beneficiary of status and patronage through its colleges, academies, and professional institutions; and it is a formidably powerful, and predominantly conservative, political lobby, more than occasionally a source of frustration for those who seek to modernise health services.

Within the confines of this academic and political preserve lies the discipline of medical education; although one could question whether medical education is a discipline in its own right, or an idiosyncratic collection of concepts appropriated from other educational fields and perfused with a technical rationality borne out of the dominance of bioscience within medicine [3, 4]. There are certainly a number of predominant educational assumptions, such as experiential learning and reflective practice, and favoured curricular approaches borrowed from other fields – witness the enthusiastic transplantation of competency-based education from vocational training [5]. But medical education is not just a 'magpie', taking ideas wherever they can be found, but has made, and continues to make, its own significant advances and contributions to the wider educational literature. Many of these unique and major developments are expounded within this book: problem-based learning, simulation, structured assessments of clinical competence, supervision, and the use of technology to enhance learning, to name but a few.

Challenges and Preoccupations

Another characteristic of medical education is that it is, as Cooke and her colleagues note, 'in a perpetual state of unrest' [6, p. 1339]. A constant stream of reports issues from regulators, commissions, inquiries, and task forces – all urging reform. This may just reflect the sluggish response to change and innate conservatism of the profession and its educational institutions. This is not, as it happens, a new phenomenon. In the UK, George Pickering, writing as far back as 1956, offers us the wry observation that 'no country

has produced so many excellent analyses of the present defects of medical education as has Britain, and no country has done less to implement them' [7]. Britain is not alone in this regard and from the other side of the Atlantic, Warren Anderson – in a special centenary 'Flexner' edition of *Medical Education* – questions 'whether the current proliferation of literature about reforms in medical education can lead to real change, or whether it constitutes a self-referential agitation that, in the aggregate, holds little promise' [8, p. 29]. Despite such reservations, the frequency of such reports increases, and the clarion calls to action grow ever louder. So what are the current preoccupations of medical education and society's expectations of it?

To 'begin at the beginning'; getting the right students and later on the right trainees training in the right specialty is crucial. In a competitive and litigious environment, the importance of having demonstrably fair selection processes is unarguable. A good person/job fit is essential to productivity, quality, and job satisfaction. In Chapter 26, Fiona Patterson and her colleagues identify just how difficult getting all this right can be. Predicting who will make a good doctor is critically dependent on what the role of the doctor will be 10–15 years into the future, something that is increasingly uncertain. So are there generic attributes that we can select for? What selection methods should we use? And to encourage the recruitment of well-rounded practitioners, should entry to medical school be graduate only?

Having selected the right students and, with luck, matched the right trainees to the most suitable postgraduate training programme, how and what are they to learn, and how can the *quality* of their education and training be ensured? An array of approaches to teaching and learning are described in the central section of this book framed by a discussion by Janet Grant on approaches to curriculum (Chapter 5) and Linda Snell and colleagues on the importance of good instructional design (Chapter 6). A concise summary of relevant, and guiding, educational theory is provided by David Kaufman in Chapter 4, preceded by a summary of the emerging insights, for medical education, of the relatively recent field of cognitive neuroscience (Chapter 3). And in Chapter 7, Diane Kenwright and Tim Wilkinson address the thorny concept of 'quality' – how do we know what we're doing is any good?

One of medical education's evolving 'special interests' has been assessment. Indeed it is often involvement in professional assessment, either formative or summative, that first draws clinicians into the world of medical education. Chapters 20–25 recount the increasing sophistication of assessment instruments in medical education, how validity is ensured and standards are set, the growing acceptance of the need for programmatic approaches, and the perennial challenge in professional education of balancing assessment for learning and assessment for accountability.

It was Flexner's mentor, William Osler, who brought students and patients closer together through his educational philosophy that medicine was 'learned by the bedside and not in the classroom' [9, p. 188] and through the practical introduction of residency programmes. Both are now threatened by concerns over patient safety, expansion of medical student numbers, regulatory requirements on working hours, and a staggeringly accelerated patient throughput. Patients undergoing gall bladder operations in Osler's day were in hospital for several weeks – the procedure now is carried out on a day-patient basis. At almost every stage of training, learners see fewer patients, do less to them, and, as a consequence, find themselves increasingly unprepared for practice [10]. This, as pointed out by Clare Morris in Chapter 12 and by John Launer in Chapter 13, requires new ways of thinking about work-based learning and the mediating role of the trainer or supervisor.

A related concern is patient safety. Medicine is not only faster-paced, it is also more hazardous. As Cyril Chantler has succinctly put it: 'Medicine used to be simple, ineffective and relatively safe. Now it is complex, effective and potentially dangerous' [11, p. 1178]. One of the responses to reduced opportunities for contact with patients and more hazardous interventions has been the widespread adoption of simulation across all fields and stages of medical education. The availability of sophisticated technologies now enables high-fidelity reproduction of complex patient scenarios. Students and doctors in training no longer need to carry out procedures for the first time on real patients – the skills of ophthalmoscopy, venepuncture, and catheterisation can all be learned in the skills laboratory. Full-immersion scenarios also offer the opportunity to work on non-technical areas such as team working, leadership, and situational awareness. However, questions remain about transfer to the authentic setting – an issue that is explored in depth by Alexis Battista and Debra Nestel in Chapter 11.

Growing concerns over patient safety have influenced not only the way medicine is practised – with the widespread introduction of protocols, checks, and audit – but also the degree to which doctors are now publicly accountable. In the UK, for instance, high-profile cases (such as Bristol [12], Alder Hey [13], Shipman [14], and, more recently, the Francis Inquiry [15]) have ushered in a new era of public accountability, while 2013 saw the introduction of relicensing for all medical practitioners in Britain, with regulators coming under increasing and critical pressure [16]. Patient safety issues also permeate undergraduate medicine. Protecting patients within a teaching and learning environment, while producing competent doctors who will maintain their knowledge, attitudes, and skills, is a major challenge for those who design undergraduate curricula.

Increasing accountability is just one facet of a new social compact with patients; a compact that is no longer based on blind and unquestioning trust but on true partnership [17]. As John Spencer, writing with Judy McKimm and Jools Symons, highlights in Chapter 15, we see increased patient involvement across the board in both teaching and learning, and also in decision-making about how medical education is organised, governed, and its resources allocated. Patients are now also intimately involved in the selection and assessment of both undergraduate students and postgraduate trainees, and feedback from patients is a routine feature of continuing professional development and reaccreditation processes.

One of the corollaries of the above is that there is a growing recognition of the need to professionalise clinical

teaching [18]. The pressures for this are channelled through professional bodies, but also arise from an increase in the expectations of students and doctors in training about the quality of the learning opportunities they are afforded. Clinical teachers and others with responsibilities for medical education increasingly look for academic support and accreditation of their expertise, and one of the target groups of *Understanding Medical Education* are newcomers to medical education, whether undergraduate or postgraduate, including those studying at certificate, diploma, and master's levels. As Yvonne Steinert describes in Chapter 36 – on faculty development – the professional credentialing of medical educators is a burgeoning industry in Europe and North America and reflects a more general trend of the 'professionalisation' of medical education. Professionalisation has produced a new breed of scholarly educators and, coming as they do from a bioscientific background, a desire for evidence-informed medical education practice.

This raises questions about the nature of medical education research and again, as is highlighted in the five chapters on research and evaluation (Chapters 27–31), we see worlds colliding. In a recent exchange in ASME's academic journal, *Medical Education*, a series of articles considered whether it is helpful to construe medical education as a medical or a social science [19, 20]. Monrouxe and Rees capture the essence of the debate:

> Medical education research has benefited from its association with 'hard' medical science in that this has encouraged the engagement of clinicians in research activities. However, this gain is offset by a particular loss represented by the failure (of some) to understand that medical education is about people, and the way we think, act and interact in the world. Medical education research is not a poor relation of medical research; it belongs to a different family altogether [20, p. 198].

Curricula at the undergraduate level continue to evolve. Postgraduate medical education too is also in the throes of perpetual curricular change, with many specialties previously taught to implicit and informal curricula now articulating explicit and public curriculum statements of intent for the first time. Curriculum delivery is also challenged by the emerging possibilities of technology, many of which are addressed in a new chapter by Rachel Ellaway in which she explores the relationship between technology and learning (Chapter 10).

There are macro-political concerns too, around the responsiveness of medical education to societal needs [21]. In Chapter 35, Nisha Dogra and Olivia Carter-Pokras consider medical education's engagement with increasing diversity – considering patients and citizens as well as students and the workforce. Changing demographics are also profoundly influencing patterns of demand, with developed countries already experiencing the effects of an ageing population with complex health care needs. And across the increasingly interdependent world, we see a health inequalities gap that shows no signs of narrowing, with both emerging and developed health care systems struggling to cope [22]. Rising patient expectations and an ease of access to information present challenges not only in how care is delivered, but where and by whom. There are nostradamic predictions of future global shortages of health care workers [23] – an 18 million shortfall by 2035 – with little sign of a reversal of the maldistributive trend of doctors eschewing remote and rural locations in favour of large conurbations, and an imbalance of education and training outputs causing shortages in generalist and community-based specialties [24]. Managers within all health care systems are also waking up to the fact that the majority of their future employees already work in their health services and that significant investment may need to be diverted from training new and inexperienced practitioners into developing and supporting their existing workforce. Chapter 19 examines the complex issues that surround continuing professional development and there is an acknowledgement of the need to retain and support learners and staff, and provide support for their career decisions, in Chapters 32–34.

In Chapter 17, a new addition to this volume, Sylvia and Richard Cruess explore a central concern in medical education – the development of professional identity. But, what is 'a doctor' (or any other health care professional, for that matter)? With significant overlaps in knowledge and skills developing, what unique features does a doctor bring to the bedside or office, and what do we mean by a professional in the twenty-first century? Friedson argues that the professions, societal groups based on expertise, altruism, and self-scrutiny, will never disappear, but will merely shrink in size, as much of their work is taken on by a deprofessionalised operating core of medical technicians [25]. Others, such as Donald Berwick, disagree and see 'the reinvention of professionalism in a world on new terms of engagement; complexity, interdependence, pervasive hazard, a changing distribution of power and control and borne on the back of technology, distributed, democratised capacities …' [26, p. 130].

What is certain is that at no point in the past has the medical profession had to engage so actively with these debates, and the question 'What are we educating for?' has never been so important, something that my co-editors, Bridget C. O'Brien and Kirsty Forrest, and their colleagues explore in Chapter 2.

Scholarship and the Pursuit of Excellence

Understanding Medical Education began life as a series of free-standing monographs. The aim of the series was to provide an authoritative, up-to-date, and comprehensive resource summarising the theoretical and academic bases to modern medical education practice. It is now a best-selling textbook worldwide and although the majority of its expert authors come from Europe, Australasia, and North America, it offers a global perspective on contemporary practice and scholarship.

Boyer's expanded definition of 'scholarship' takes us beyond the narrow confines of research to consider the need to recognise and reward not only the scholarship of 'discovery' but also to recognise and reward the integration of new knowledge, its application to social practice, and teaching and learning [27]. This is a hugely important distinction for medical education, as the vast majority of medical educators are not researchers, nor indeed do they have the opportunity

to work across disciplinary boundaries to integrate new knowledge. What they can be, and often are, are excellent teachers and scholarly agents of change and improvement within medical education (see Chapter 37). This highlights a perennial problem in medical education, namely that funding for academic institutions – despite recent attempts to redress the issue [28] – is linked strongly to research outputs. Similarly, teaching in clinical settings usually plays 'second fiddle' to clinical productivity. This has led to a situation where both academic and service institutions continue to emphasise staff involvement in activities other than teaching, such that teaching remains largely unrewarded and unrecognised. This is a challenge that professional bodies such as the UK's Academy of Medical Educators have set out to address [29].

Medical education is complicated, contested, and political. In a complex, uncertain, and networked world we need to make the best decisions about education, training, and development that we can and, as our final chapter outlines, engage in the leadership of change and improvement in an informed and intelligent way. For that, we need both scholarly medical educators *and* educational scholars. We hope that this book will continue to contribute to their development.

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2 A Global View of Structures and Trends in Medical Education

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KEY MESSAGES

- The educational pathway from secondary school to unrestricted medical practice shows roughly six structural routes worldwide.
- All pathways will likely be affected by educational system innovations, globalisation, health care systems, social and cultural values, and technology.
- Each of these forces pushes and pulls medical education in different directions, which results in disparate views and uncertainty about the purpose of medical education.
- Change is one constant feature of medical education that we can anticipate. The speed of developments in health care and education will require programmes, learners, and educators to adapt throughout the continuum of training and practice, as a core quality.

Introduction

This book, the third edition of *Understanding Medical Education*, aims to provide a more global perspective on medical education. This chapter provides context for subsequent chapters. In the first section we describe six structural models of medical education around the world. In the second section, we consider the purpose of medical education and the complexity of defining and working toward a shared sense of social accountability in an increasingly globalised world. In the third section, we discuss current trends in medical education, identified by thought leaders in the field. We speculate where these trends may take us in the next 10 years, and then conclude with some overarching reflections on the themes presented in the chapter and questions for further consideration.

Medical Education Pathways Worldwide

The training of medical doctors is well established in virtually every country around the globe; to the public, physicians are physicians, no matter where they train. Yet when we look in detail, the pathways students must follow to become licensed appear to vary considerably. In many industrialised societies, the current structure of medical training was established between 100 and 150 years ago, when university studies in medicine were combined with the guild-like models of barber-surgeon training. A theoretical training phase followed by a phase of practical apprenticeships became a dominant model in the first half of the twentieth century. After World War II a large expansion of postgraduate medical specialty training emerged, and in parallel newer educational models of undergraduate education were introduced. Several solutions to transition problems, from theory to practice, from undergraduate to postgraduate, and from training to unrestricted practice were created. As these innovations in the medical education pathway did not occur at the same time in all countries, international and even regional differences within countries became apparent, with possible differences in outcomes [1, 2].

Additionally, countries and international regions have their own views on how best to educate doctors to serve the needs of their populations. Influential models arose from: the British model, influencing predominantly the Commonwealth countries; the North American model, influencing several emerging countries; and the continental European model. In Europe, all European Union (EU) countries must comply with EU rules regulating the internal market, including the mutual recognition of professional diplomas, based on rules that prescribe some features of medical training [3].

Despite increasing international communications about medical education through dedicated medical education journals, conferences, associations, a World Federation for Medical Education (WFME) [4], and organisations and initiatives devoted to or impacting international development of education such as FAIMER [5–7], the pathways to

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medical practice remain distinctly different among countries. Information about these differences is important because of the growing mobility of students and graduates and the corresponding need to understand what level of performance and experience diplomas and qualifications signify [8–10].

To supply this much needed information, Wijnen-Meijer and colleagues carried out a qualitative questionnaire study among well-informed medical educators in several countries. This led to an overview of structures and terminologies in 40 countries, published in 2013 [11]. This chapter adds 10 more countries to the 2013 data set, for a total of 50 countries. Most questionnaire responses were collected by e-mail and supplemented with information obtained at international conferences. Well-informed respondents answered questions about the different stages of medical education in their country, the length of these stages, the point at which unrestricted practice is allowed, and any additional requirements such as exams.

Wijnen-Meijer and colleagues found six dominant pathways through medical education that they called 'routes' (see Figure 2.1). In most countries students enter medical school directly after finishing secondary school (Routes I though IV). Routes V and VI describe pathways for which a bachelor's degree is required. In many countries graduates can enter residency directly after finishing medical school (Route I and V), while in other countries graduates must first finish an internship or mandatory social service or both. Of note, the six pathways contain much variation within their general structures and within countries multiple routes may exist. For example, as shown in Figure 2.2, the length of postgraduate (residency) training varies

among specialties within one country as well as within the same specialty across countries. Also, the requirements for unrestricted practice can range from attainment of the MD degree to one year of specialty training to completion of specialty training and fellowship.

Similar to structure, terminology differs from country to country and can pose challenges for translation of educational levels across borders or comparison of curricula, instruction, and outcomes internationally. Box 2.1 describes some of the commonly used terminology in medical education worldwide. These terms are used variably throughout the book, reflecting the international perspective of individual chapter authors. Box 2.2 identifies the degrees awarded in medical education.

Though appealing on many levels, attempts to harmonise medical education across countries have had limited success. For example, in 1999, the governments of all EU countries and some surrounding countries agreed to harmonise all of higher education in three phases: bachelor, master, and doctorate [12]. This Bologna Process was well accepted by all of higher education in 48 countries with the exception of medical education in all but 7 countries. Those seven countries now organise 'undergraduate' medical education in two phases (bachelor and master), while all of the others in the agreement do not. The attempt created more disparity than harmony [13, 14]. The WFME takes a different approach. Rather than attempting to harmonise the structure of medical education, the WFME provides a consensus-based set of 106 basic standards and 90 standards for quality improvement that provide 'a template for medical schools and other providers of medical education, and the agencies which accredit them to define institutional, national and regional standards,
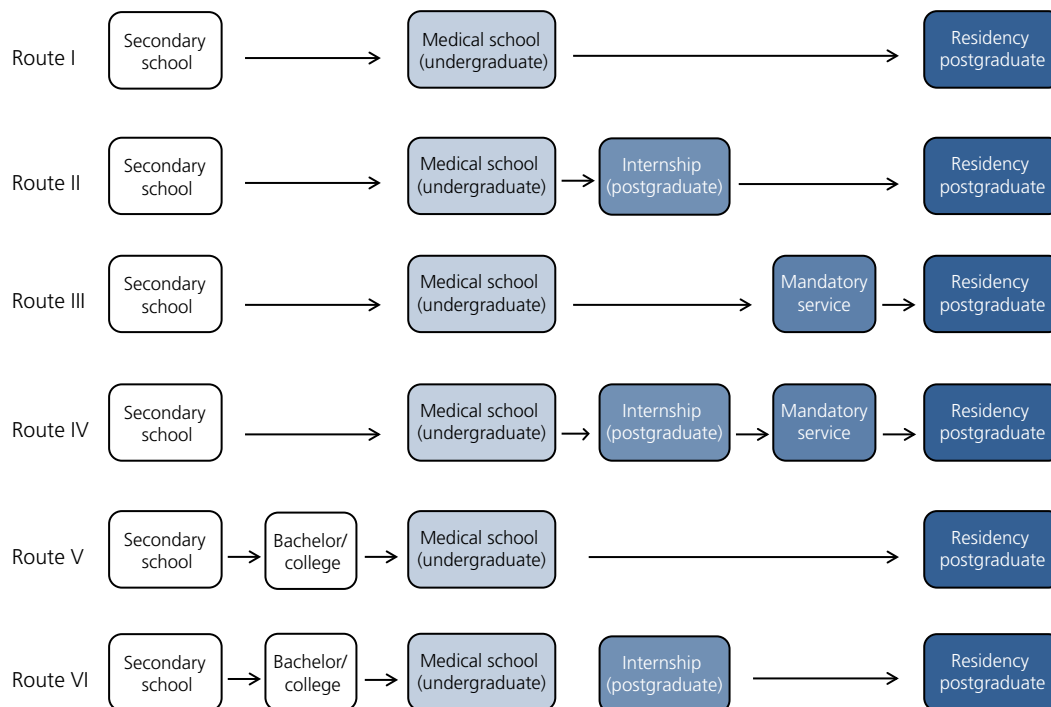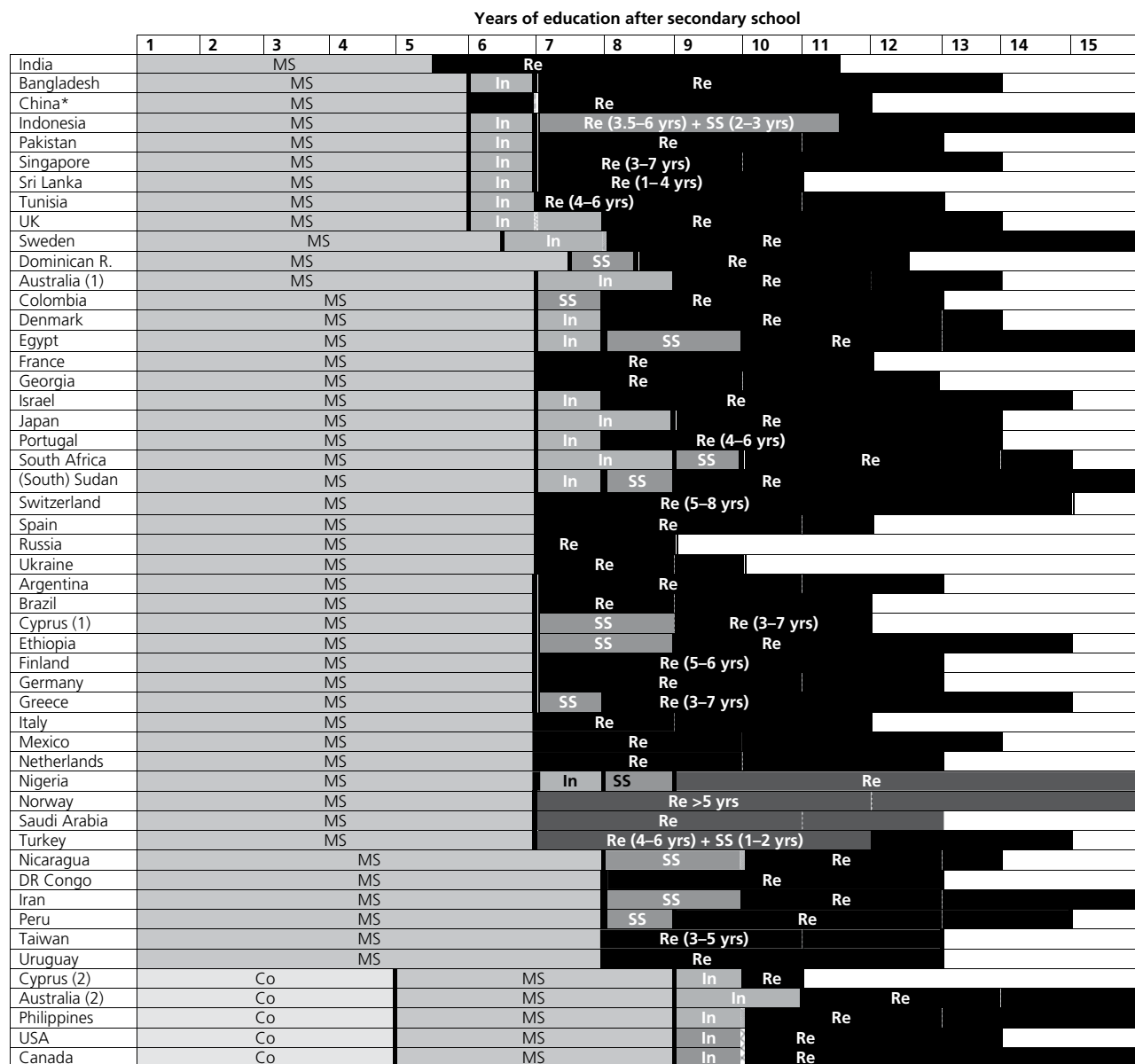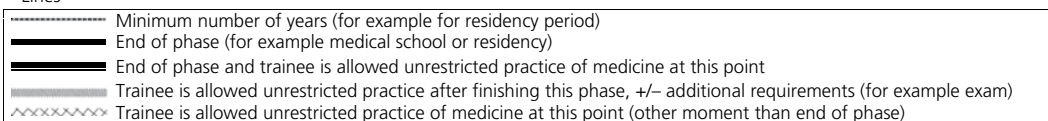

Figure 2.1 Six routes to unrestricted practice.

Years of education after secondary school

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
India	MS						Re								
Bangladesh	MS					In		Re							
China*	MS						Re								
Indonesia	MS					In	Re (3.5–6 yrs) + SS (2–3 yrs)								
Pakistan	MS					In		Re							
Singapore	MS					In	Re (3–7 yrs)								
Sri Lanka	MS					In	Re (1–4 yrs)								
Tunisia	MS					In	Re (4–6 yrs)								
UK	MS					In		Re							
Sweden	MS					In			Re						
Dominican R.	MS						SS	Re							
Australia (1)	MS						In	Re							
Colombia	MS						SS	Re							
Denmark	MS						In		Re						
Egypt	MS						In	SS		Re					
France	MS							Re							
Georgia	MS							Re							
Israel	MS						In		Re						
Japan	MS							In		Re					
Portugal	MS							In	Re (4–6 yrs)							
South Africa	MS							In	SS		Re				
(South) Sudan	MS							In	SS	Re					
Switzerland	MS							Re (5–8 yrs)							
Spain	MS							Re							
Russia	MS						Re								
Ukraine	MS							Re							
Argentina	MS							Re							
Brazil	MS						Re								
Cyprus (1)	MS						SS	Re (3–7 yrs)							
Ethiopia	MS						SS	Re							
Finland	MS							Re (5–6 yrs)							
Germany	MS							Re							
Greece	MS						SS	Re (3–7 yrs)							
Italy	MS						Re								
Mexico	MS							Re							
Netherlands	MS							Re							
Nigeria	MS						In	SS		Re					
Norway	MS						Re >5 yrs								
Saudi Arabia	MS						Re								
Turkey	MS						Re (4–6 yrs) + SS (1–2 yrs)								
Nicaragua	MS								SS	Re					
DR Congo	MS								Re						
Iran	MS								SS	Re					
Peru	MS								SS	Re					
Taiwan	MS								Re (3–5 yrs)							
Uruguay	MS								Re						
Cyprus (2)	Co			MS				In	Re						
Australia (2)	Co			MS					In	Re					
Philippines	Co			MS				In	Re						
USA	Co			MS				In	Re						
Canada	Co			MS				In	Re						

*after 1 year of residency and completion of the National Medical Examination, residents are allowed unrestricted practice

Lines

··············	Minimum number of years (for example for residency period)
———	End of phase (for example medical school or residency)
▬▬▬	End of phase and trainee is allowed unrestricted practice of medicine at this point
▓▓▓	Trainee is allowed unrestricted practice after finishing this phase, +/– additional requirements (for example exam)
⨯⨯⨯⨯	Trainee is allowed unrestricted practice of medicine at this point (other moment than end of phase)

Abbreviations

Co: College
MS: Medical school
In: Internship, also called 'Foundation programme', 'Medical officer', 'House officer training period' or 'Housemanship'
SS: Social Service, also called 'National Service', 'Service in rural areas' or 'Mandatory service'
Re: Residency

Figure 2.2 Medical education comparisons by country: phases and duration.

and to act as a lever for quality improvement' [15]. This approach aims to enable, or even foster, diversity so educational programmes across the continuum of medical education can accommodate economic, political, social, and cultural contexts while having an internationally recognised framework to guide curriculum development, learner assessment, faculty development, and programme evaluation.

There may not be a compelling reason or any chance of success in forcing countries to adopt similar structures or terminologies, if only because it cannot be determined

BOX 2.1 FOCUS ON: Common terminologies in medical education

Term	Description
Basic medical education	The portion of medical education that occurs in medical school; also called undergraduate medical education.
Chief resident	A selected senior resident with administrative and teaching responsibilities toward junior medical trainees.
Clerk	A medical student on a clinical rotation or in clerkship phase.
Clerkship	A period of one or more weeks of (clinical) experience in a medical specialty during medical school.
Consultant	Senior hospital-based physician who has completed residency.
Fellowship	A training period in a medical sub-specialty that occurs one or more years after completion of general specialty training.
Foundation doctor	A trainee in a Foundation Programme (UK).
Foundation programme	A two-year, clinical training programme after medical school and before postgraduate medical training in the UK.
Graduate medical education	Used in North America. Synonymous with postgraduate medical education.
House officer	Period of practice between medical school and full registration in several countries. Also called: medical officer or housemanship or a postgraduate medical trainee.
Intern	A trainee in a clinical training period directly after medical school, usually identical to the first year of residency training.
Medical bachelor	The first three years of medical school in countries that have signed the EU Bologna agreement and have included medical education in this structure.
Medical master	The second three years of medical school in countries that have signed the EU Bologna agreement and have included medical education in this structure.
Medical school	The institutional organisation that offers an undergraduate medical education programme, usually overlapping with the medical faculty of a university; sometimes used as undergraduate medical education phase.
Medical student	A person enrolled in an undergraduate medical education programme.
Physician	A graduate from a medical school who is formally licensed to practice medicine.
Placement	Synonymous with rotation.
Postgraduate medical education	Usually synonymous with residency training, but in Australia and New Zealand the phase after initial higher education.
Registrar	A medical trainee in a postgraduate education programme after registration as MBBS or MBChB.
Residency	A postgraduate training programme to become a medical specialist.
Resident	A medical trainee in a postgraduate education programme.
Rotation	A period or one or more weeks of experience with a medical specialty during medical school or residency.
Senior house officer	A year (or two) after house officer prior to specialist training.
Social service	A period of mandatory clinical service after medical school, usually as part of an agreement with the school or funding body, in a region in need of medical service (also called national service).
Specialist	Physician who has finished residency in a specific specialty of medicine.
Trainee	An individual who is in a formal educational or training programme at any level of medical education; often a term confined to the clinical phases of education.
Undergraduate education	Either initial higher education at bachelor level preceding undergraduate medical education, or medical school education.

which are better than others. But, as will become clear in the section on globalisation below, international interactions about medical education are naturally becoming much more intense. Schools and countries learn though publications, conferences, and student and faculty exchanges, and it may be expected that through natural processes of curriculum development, informed by what other countries do, that medical education will gradually converge to more similar models.

Purposes and Priorities in Medical Education

The pathways and terminologies described in the previous section reflect educational systems designed to meet societal needs for health care. These systems are steeped in cultural, historical, political, and economic contexts that have changed substantially since many of these systems were first established. Yet the basic systems of medical education