O.S. Miettinen. Up from Clinical Epidemiology and EBM. Springer, 2011

Up from clinical epidemiology and EBM: towards major improvements in clinical medicine

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While glancing through this book before deciding to buy it, it may not appeal immediately to the novice who is searching for insight in clinical epidemiology or evidence-based medicine (EBM), but is not familiar with the author's earlier work and reputation. Clearly this is not a textbook in the traditional sense. Neither does it serve as a source of reference on study design and data analysis. Textbooks on (clinical) epidemiology or EBM abound. Among these, Miettinen's earlier "Theoretical Epidemiology—Principles of Occurrence Research in Medicine" (Wiley 1985) still stands out.

This new book brings together much of Miettinen's recent publications. It is organized in an unusual manner. More than half of the text is presented in the form of propositions that express the author's judgements or opinions on a wide range of topics and issues. To illustrate, the second proposition on the first page of the text is "A genuine leader in a discipline ('specialty') of clinical medicine asks not how doctors think, as do, for example, Montgomery (ref. 1) and Groopman (ref. 2); (s)he asks how they *should* think." The references, in this case to two popular books on how a doctor's mind works, follow directly under each proposition.

Miettinen's propositions cover a wide range of topics. Part I has as title Philosophical Propedeutics and covers leadership in clinical medicine, medical academia at present, purported essence of clinical research, the study of 'clinical epidemiology', and up from 'clinical epidemiology' and EBM. Part II is titled Theory of Clinical Medicine and covers the essence, the necessary forms and the codification of the knowledge base of clinical medicine. With

as title Theory of Clinical Research, Part III deals with how to enhance practice by clinical research in general, and then deals with the three subtypes of clinical gnosis: diagnosis, etiognosis and prognosis. Part IV starts with propositions on EBM guidelines for assessment of evidence, and then gives eight narrative assessments of example studies. These cover diagnosis, etiognosis, prognosis including intervention-prognosis (clinical trials), and screening research. Some example studies have been discussed in the literature by Miettinen and coworkers before (e.g. the PIOPED study as discussed by Miettinen et al. J Clin Epidemiol 1998;51:1293–8). Part V is an epilogue on the predicates of major improvements in clinical medicine. Appendix 1 lists elementary concepts of medicine according to students. These are commented upon by the author in Appendix 2. Assignments to students may be found in Appendix 3, and the author's responses to these in Appendix 4. Appendix 5 has as title More on Garnering Experts' Tacit Knowledge, and previews Miettinen's current interest in how to summarize the valuation of diagnostic indicators by experienced clinicians as a diagnostic probability function, an endeavor that is currently ongoing in collaboration with J. Steurer and others at the Horten Center for Practice-oriented Research and Knowledge Transfer of the University of Zurich, Switzerland.

There are two ways to read this book. One is to start at page one and to read each proposition in sequence. Each proposition is worded with great care and precision of language. Many must be read several times for complete understanding, also because of frequent reference to propositions elsewhere in the book. This way of reading the book is therefore a challenging, although rewarding experience.

Another and perhaps easier way to read the book is to start by studying the narrative assessments of example studies given in part IV-2, preferably after first availing

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oneself of the references concerned. From within the text of each assessment of example studies, Miettinen refers by number to the relevant propositions stated earlier. This illustrates their relevance, and adds to their appeal. Each assessment is wide in scope, very detailed, and goes far beyond what is customary found in clinical textbooks or in reviews in the medical literature. This approach to reading this book also accords more with the author's intended use as suggested in the foreword: as a companion to a course. Miettinen is a compelling teacher. This book proves that.

What then are the major contributions made by this book? Each reader will have a personal opinion on this, depending on interest and experience. Two major contributions I have extracted are these.

While the purpose of medical school education is clear—to prepare students for a future career as medical practitioners—it is far from clear what the content of medical education should be. Traditionally, medical students are taught anatomy, (patho-)physiology, biochemistry, pharmacology etc.; and are then supposed to save lives based on what they have learnt while following the algorithms set by senior clinicians. These algorithms have little to do with the preclinical subjects taught in medical school. To quote Miettinen during one of his courses many years ago: “When you see a patient with chest pain, you don't think about the citric acid cycle in cardiac muscle cells”. Few have reflected scholarly on the essence of the theoretical basis of clinical practice, and on the relationship between research and practice. Miettinen's book fills in an authoritative manner an as yet almost entirely empty gap in

this regard. This is not a book on the philosophy of medicine. Miettinen does not describe how clinical research is done, how medicine is practiced, or how doctors think, but defines the conceptual essence thereof. In short, he doesn't describe, but prescribes. If he describes (as he does in the assessment of examples taken from the current practice of EBM), he does so to show where generally accepted notions fail, and to propose on that basis a more appropriate concept (such as replacing EBM by KBM, or knowledge-based medicine).

The other major contribution is embedded in Appendix 5. The development of expert systems for clinical medicine has not delivered much thus far. One reason may be that rule-based systems do not do justice to the probabilistic nature of diagnosis, etiognosis and prognosis. Another reason may be the limited relevance of ‘worship at the “evidence based” altar’ (as EBM has been called). A new and complimentary idea is needed here. In Appendix 5 Miettinen describes how the collective tacit knowledge of experienced clinicians can be captured, and be codified in Information-Age KBM that can be made accessible from a tablet computer. If this new approach can be shown to lead to better care, a major step forward will have been made.

This book needs to be read widely, and much more widely that the title suggests.

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