Editorial

More on the Science of Health Care

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On pages 231–232 of this issue, Mark Scheid skillfully reviews a provocative book that challenges the theory and practice of population medicine (PM).[1] The book's author—Michel Accad, a practicing cardiologist—uses an imaginative title, intriguing format, compelling dialogue, and vibrant writing to produce an incisive, reader-friendly, and easy-to-grasp analysis of his subject matter. Both the book and its review merit attention from physicians responsible for patient care.

Accad attributes the healthcare community's widespread embrace of PM to 3 factors: the economics, the science, and the ethics of health care. This editorial focuses on the science of health care, highlighting the intimate ties between PM and evidence-based medicine (EBM).

Although much has been written about EBM, little has been said about its relation to PM. As a result, the striking similarities between the two entities are not widely appreciated. In fact, as I will show, PM and EBM can be identical.

Population medicine (variably called population health) evaluates the healthcare needs of a specific population and makes decisions for that population as a whole. The recipient of care is the "population" itself, and the approach does not necessarily benefit any specific individual within that population.[1,2]

Evidence-based medicine emphasizes the use of external evidence derived from randomized controlled trials (RCTs), meta-analyses, and systematic reviews—integrated with clinical expertise—to make decisions about the care of individual patients.[3]

Historical Snippets

Gordon Guyatt, a Canadian physician–scientist, coined the term "evidence-based" medicine in 1991.[4] Many others before him, however, had worked for years to lay its foundation.[5] Furthermore, the philosophical origins of EBM allegedly go back to mid-19th-century Paris, and earlier.[3]

The concept of evidence-based medical practice arose in response to the perception that standards of clinical practice were weak and that clinical decision-making needed more certainty.[5,6] To achieve that certainty, proponents believed that the best external evidence on which to base medical practice would come from well-designed and well-conducted clinical research—RCTs, in particular.[3-6] That research, in turn, would often require complex statistical analysis.

After its startup, EBM rapidly gained widespread support from academic leaders and journal editors. Hence, RCT reports and systematic reviews are now ubiquitous in the medical literature. Because of their aura of authority,[7] these scientific investigations can have a mesmerizing effect, lulling many practitioners into uncritical acceptance of EBM [8,9] while leaving them oblivious to its limitations.[6,7]

Differing Views

Advocates of EBM have contended that reliance on systematic research studies makes medical practice more scientific and promotes better outcomes.[3,6] Indeed, the appeal of RCTs is their ability to isolate the effect of an intervention from potentially confounding variables. The results, therefore, enable a more objective evaluation of the intervention's worth. Consequently, RCTs have a powerful impact on health care; they are frequently used to formulate practice guidelines and standards for third-party reimbursement and malpractice litigation.[10-12]

Opponents argue that RCTs are limited in their scope.[7,13] For example, RCTs seldom include in their databases important factors such as types and severity of

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symptoms; rates of progression of the illnesses; effects of comorbid conditions; and patients' social support, genomic profiles, psychological states, preferences, expectations, and willingness or ability to cooperate.[7,13] In addition, RCTs are inappropriate or unethical in certain situations and are neither possible nor pertinent in making many clinical decisions.[13-15]

More important, the primary outcome of an RCT is always an aggregate: the results represent the average effect in the treatment group, in contrast to that in the control group. Therein lies the problem: *applying aggregate measures to an individual patient*.[1,11] Although EBM does enable better predictability in the management of disease, it can do so only at the aggregate, that is, the "population," level. In that sense, EBM is no different from PM.

Old Ways Are Still Valid

Good doctors have always practiced medicine on the basis of the best available evidence. Those of us whose professional careers predated the current version of EBM faithfully pursued the best external evidence that we could find, albeit typically from sources other than RCTs. We were ever mindful of the lessons that our patients taught us, lessons that helped shape our clinical decisions. We regularly supplemented our knowledge by reading pertinent journals, attending educational conferences, frequenting the medical library, studying the latest textbooks, seeking advice from recognized experts, and discussing problem cases with colleagues. In caring for the individual patient, that approach was—and still is—a valid practice model.

Parting Thoughts

The role of science in today's health care is a complex issue influenced by a broad range of elements. Precisely how and to what extent it should govern patient care remains unsettled. In that light, Béla Schick (1877–1967), renowned Hungarian pediatrician and bacteriologist, offered this:

> *First, the patient, second the patient, third the patient, fourth the patient, fifth the patient, and then maybe comes science.*[16]

Need I say more?

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