Preface

Pathology and laboratory medicine are currently experiencing paradigm shifts that are likely to influence how our specialty is practiced in the not-too-distant future. Technical innovations in immunohistochemistry, molecular pathology, and pathology informatics are driving the acquisition of many new and exciting data. That phenomenon may well increase the quality and scope of the diagnostic information being provided by laboratory assays. Simultaneously, however, as new technologies invariably increase the cost of medical testing, considerable pressure has accrued concerning financial containment. Thus far, advocates of "the most, the newest, and the best, regardless of cost" have largely prevailed. Nonetheless, it is likely that in the near future, there will be considerable movement toward a strict, cost-effective utilization of laboratory resources that is centered on clinical value and direct applicability of test results in regard to individual patient care.

As practicing pathologists, it has been our impression that there is a great interest in the generation of new data and the exploration of clinical applications for new technologies. At the same time, as a group, we do not often pause to consider how well we are performing certain tasks, and how well we fulfill our charges as members of clinical teams that care for individual patients. Residency education in pathology and laboratory medicine tends to emphasize the acquisition of morphology-based diagnostic skills and information on various laboratory tests. Nonetheless, interest has been limited in teaching future pathologists to understand the pros and cons of various diagnostic models; critically evaluate the contents of medical publications; sift through apparently conflicting information; integrate data from divergent sources; effectively combine the medical literature with personal experience; and practice pathology in a cost-effective manner that does not compromise quality or waste resources.

Internal medicine and other medical specialties have confronted similar issues. They have supported the development of an analytical approach to the evaluation and use of medical information, under the rubric of *evidence-based medicine* (EBM). That term is somewhat fustian, because it appears to imply that other modes of medical practice are not "evidence-based" or objective. Advocates of EBM have explored the advantages and disadvantages of differing study designs; emphasized the advantages of gathering data through randomized clinical trials; classified medical data in terms of evidence-levels; advocated the use of standardized guidelines for clinical care; and stressed the

use of a patient-centered approach to diagnosis and treatment. Some of those concepts have generated considerable resistance from the medical community at large, in part because EBM tends to deride case reports or small case series as anecdotal or inferior. Opponents of EBM have suggested that it leads to "cookbook medicine" and de-emphasizes clinical experience and the art of medicine. They have also pointed to the practical limitations of randomized clinical trials as a gold standard for the collection of medical information.

A debate continues between advocates of EBM and other physicians who favor more individualized case-based approaches to medical practice. However, regardless of that schism, the current trend toward EBM has provided a valuable service by emphasizing the importance of reliably produced data and suggesting how to best apply it to individual patient care.

In this volume, we explore the application of selected EBM concepts to anatomic pathology and laboratory medicine, embodied in a model that we have dubbed as *evidence-based pathology* (EBP). This book is unusual in the specialty of pathology, because it is not designed to provide readers with the means to diagnose specific lesions in biopsies or interpret particular laboratory tests. Rather, its intent is to discuss a variety of epistemological and practical issues, and to stimulate thoughts on how well we are doing in practicing truly scientific medicine as pathologists. Another focus is the contrast between rapidly accruing new technologies and health system-related pressures for cost containment.

This monograph addresses two general topics. One concerns a description of problems that occur in applying EBM to laboratory medicine, and the other considers available resources and possible modes of implementing EBP. The first section of the book includes chapters discussing evidence levels, best evidence, and other basic EBM concepts. This is followed by other material that concerns statistics. It does not attempt to teach the intricacies of various statistical tests, but instead is intended to familiarize readers with the basis of the probabilistic thinking that underlies the specific applications of such analyses. The use and misuse of pathological data for prognostication and prediction in anatomic pathology is discussed in detail, and the technique of meta-analysis is also summarized. The statistical discussion in this book is followed by three chapters that discuss the principles of classification and diagnosis in anatomic pathology, the general evaluation of oncopathological studies, and medical decision-making.

The second section of the book includes various solutions to problems in anatomic pathology and laboratory medicine that are offered by EBP. It includes chapters concerning evaluation of the medical literature; a discussion of how EBP might help advance histopathology in the future; an evaluation of diagnostic errors; the use of meta-analysis to investigate unusual diseases and select immunohistochemical tests; a consideration of the use of molecular tests in hospital practice, the application of tools for decision analysis in laboratory medicine; cost-benefit analysis in the hospital laboratory; and medicolegal aspects of EBP.

We sincerely thank all of our contributors for their willingness to participate in this project, and we hope that readers will be stimulated by the concepts that are discussed in this book. It is our wish that greater awareness of

the value of EBP will engender more comprehensive and explicit guidelines for publications in pathology. EBM also has the ability to improve education in pathology; stimulate the future development of objective and reproducible guidelines for the practice of pathology; and further the longstanding identity of pathologists as physicians who provide intellectual leadership for their colleagues.

Los Angeles, CA   Alberto M. Marchevsky, MD
Charlottesville, VA   Mark R. Wick, MD

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