Introduction

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No one disputes that healthcare costs are increasing dramatically. At the same time, quality and value of healthcare services are being called into question. More and more, the attention of medical laboratory professions (MLP) is being directed toward assessment of quality of clinical laboratory information as correlated with patient outcomes, clinical decision-making, and cost. Emerging is the concept of "value-based healthcare" in which information regarding quality of services is made accessible to consumers, who generate demand for these products and services. Producers compete to increase the value of services which is defined as quality of patient outcomes relative to the cost.[1,2] For laboratory medicine (LM), the distillate of these developments is that the value of our services will be evaluated by how well they support positive medical outcomes and the extent to which they favorably influence medical decision-making.

The first question is: Can we as medical laboratory professionals, demonstrate the value of our services and information unequivocally, in data-driven terms, in language understood by the emerging value-based healthcare system providers and consumers? During this decade, there has been increasing focus on the lack of evidence-based laboratory medicine (EBLM) practices and guidelines published or benchmarked.[3] EBLM tenets are developing as the methodology required to establish and evaluate LM effectiveness and to standardize best practices to achieve efficiency and measure effectiveness. As in much of medicine, in general, LM diagnosis and treatment rules developed through expert consensus opinion are, currently, the basis of medical decision-making. EBLM promises to provide data on which to base decisions instead. In addition, there has been increasing recognition among MLP that evidence-based practice (EBP) is the vehicle through which these data-based, quality studies can be conducted, their recommendations implemented, and best practices benchmarked.[4] The logical extension of this (data-supported) reasoning is that evidence-based clinical outcomes and comparative effectiveness research should become a part of every MLP's position description.

The second question is: What is LM clinical research and what needs to be investigated? Our LM healthcare "universe" can be usefully divided into three primary areas impacting LM value: (1) coercive pressures like prospective payment and coding dictates and regulations; (2) normative pressures like requirements of institutional, program, and laboratory accrediting bodies; and (3) mimetic pressures like competitive marketing and disclosure of quality benchmarks.[5] Evidence-based clinical research studies should be conducted in each of these areas to address critical questions like how implementation of electronic health and laboratory records, or the new version of the International Classification of Disease (ICD-10), will impact test ordering patterns in the treatment of high cost diagnoses in your facility? Or how will The Joint Commission's requirements for medical outcomes studies impact typical laboratory quality studies like measurement of turn-around time and blood culture contamination rates? Or specifically, how do laboratory quality indicators vary with facility-selected medical outcomes measures? And have your laboratory's procedural practices been examined from an evidence-based perspective? For example, how are other laboratories addressing the ambiguity of computerized physician order entry, and are their practices better as

assessed by changes in specified quality indicators?

To lead an evidence-based clinical research agenda for the LM community, LMP practitioners and students must be educated to, first, internalize the mindset of clinical research inquiry, then design rigorous studies, implement findings, and evaluate impact on medical outcomes and costs. Articles in the *Clinical Laboratory Science 2010 Education Supplement* began to define an approach to education and EBP implementation with the presentation of a typology for categorization and instruction of EBP and clinical research concepts threaded through advancing degree levels of the MLS Profession. Other articles addressed concepts related to blending teaching and research, critically appraising research, and research productivity of both MLS faculty and students.

The Focus section of the *2011 Education Supplement* is shared with the *Clinical Laboratory Science* Fall issue and will, once again, speak to the critical area of MLS research. The four articles were selected to highlight "lessons learned" about faculty and practitioners' preparation for and involvement in teaching and conducting research (Fall issue), and model structures, both curricular and programmatic, for building progressively more complex concepts through advancing curriculum levels (Supplement).

The purpose of the Focus is to provide practical information to aid in research enculturation of faculty, students, and practitioners as we prepare to accept the quality challenges before us. Clearly, the advancement of LM and the medical laboratory professions depends on adapting, refining, and augmenting our scopes of knowledge through evidence-based clinical and educational research. It is my hope that these articles will encourage MLP educators and practitioners alike to actualize every opportunity to collect, analyze, and communicate information that supports evidence-based laboratory medicine best clinical and educational practices.

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