

Preface

Artificial Intelligence in the Clinical Laboratory



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Editor

Artificial intelligence (AI) has become ubiquitous in many areas outside of health care with application so wide-ranging to include agricultural decision making, smartphone navigation, e-mail spam detection, predictive text, targeted marketing, environmental protection, criminal sentencing, employee hiring, and robotics among thousands of others. Clinical practice lags behind many other areas in terms of AI adoption, still relying primarily on manual human decision making. Nonetheless, clinical AI development and adoption are progressing and are poised to play a central role in many aspects of clinical practice in future decades, if not sooner. Indeed, AI is already integral to mission critical processes in some clinical laboratories. Thus, it is essential that pathologists, laboratorians, and others in health care gain at least a basic understanding of AI.

For example, clinical laboratory directors must make decisions about which tests to include on their laboratory's send-out test menus; in recent times, this responsibility has grown to include decisions about multianalyte assays with algorithmic analyses (MAAAs). MAAAs are often based on machine-learning algorithms, a subset of AI. Likewise, anatomic pathologists may be called upon to evaluate whether new digital histopathology image analysis systems and accompanying AI-based algorithms are well-suited to use in their clinical practices. While effectively evaluating these technologies may not require a detailed understanding of the machine learning algorithms underlying the MAAA or the image analysis system, having at least a basic understanding of machine learning and particularly well-known pitfalls may be vital. Moreover, pathologists and laboratorians can serve as invaluable collaborators and domain experts in developing and implementing new AI-based technologies; having at least a basic understanding of AI and the process of algorithm development will enable them to collaborate much more effectively.

A key goal of this issue is to provide pathologists, laboratorians, and others within health care with a background in AI to enable them to (i) strategically evaluate and adopt new technologies; (ii) effectively collaborate in algorithm development initiatives; and (iii) have a strong foundation for more in-depth study of the topic. While this issue alone will not maximally achieve all these objectives, I hope that it will offer a very useful starting point.

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