

Cytopathology in focus: At the center of AI implementation in cytopathology

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August 2021—Recent advances in the deep learning area of artificial intelligence offer tantalizing opportunities to improve cytology practice. However, aside from the commercially available options for automated screening in gynecologic cytology, systems with applications in cytology have largely been used in research settings only. The article by authors McAlpine and Michelow reviews the approach to developing and validating artificial intelligence algorithms in cytology, from the generation of appropriate cytology data sets to clinical validation of the model (McAlpine ED, Michelow P. The cytopathologist's role in developing and evaluating artificial intelligence in cytopathology practice. *Cytopathology*. 2020;31[5]:385-392).

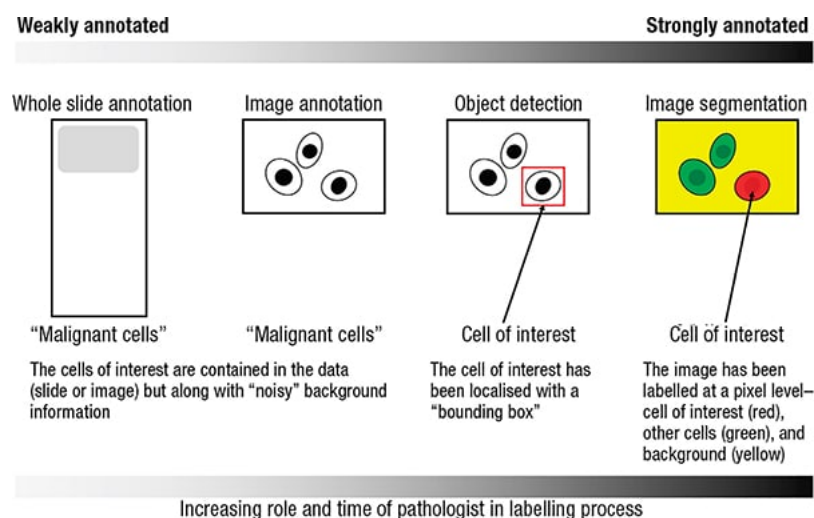


Figure 3 Levels of dataset annotation (from weakly annotated to strongly annotated). Increased levels of annotation require greater pathologist input and time. McAlpine ED, Michelow P. The cytopathologist's role in developing and evaluating artificial intelligence in cytopathology practice. *Cytopathology*. 2020;31(5):385-392.

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Most cytopathologists may not consider themselves experts in artificial intelligence, and this article seeks to clarify that a deep mechanistic knowledge of the inner workings of these computational approaches is not necessary to make crucial contributions to the development of these systems. The authors provide compelling arguments for proactive cytopathologist involvement in the development of these systems. First and foremost, cytopathologist guidance will help ensure patient safety as these new systems are implemented. With our diagnostic and clinical expertise, we can also help guide artificial intelligence advances to the areas of greatest clinical need. "Although the role of the cytopathologist and their level of involvement changes throughout the stages of development of AI algorithms," the authors write, "it is essential that they place themselves at the centre of this process to ensure the correct use and interpretation of these algorithms in practice."

This article provides a helpful overview of artificial intelligence terminology and approaches, as well as practical guidance for every step of the process. As an example, **Fig. 3** from the article is shown, demonstrating the spectrum of annotations used in development of artificial intelligence algorithms. Commonly used metrics in evaluating artificial intelligence algorithms are clearly defined. This recommended reading also provides the essential background necessary to evaluate artificial intelligence literature from a cytologic perspective.

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