PGR symposium 2024 poster

Title: Why do errors arise in artificial intelligence diagnostic tools in histopathology?

Abstract: Artificial intelligence (AI)-based diagnostic tools can offer numerous benefits to the field of histopathology, including improved diagnostic accuracy, efficiency and productivity. As a result, such tools are likely to have an increasing role in routine practice. However, all AI tools are prone to errors, and these AI associated errors have been identified as a major risk in the introduction of AI into healthcare. The errors made by AI tools are different, in terms of both cause and nature, to the errors made by human pathologists. As highlighted by the National Institute for Health and Care Excellence, it is imperative that practising pathologists understand the potential limitations of AI tools, including the errors made. Pathologists are in a unique position to be gatekeepers of AI tool use, maximizing patient benefit while minimizing harm. Furthermore, their pathological knowledge is essential to understanding when, and why, errors have occurred and so to developing safer future algorithms. This paper summarises the literature on errors made by AI diagnostic tools in histopathology. These include erroneous errors, data concerns (data bias, hidden stratification, data imbalances, distributional shift, and lack of generalisability), reinforcement of outdated practices, unsafe failure mode, automation bias, and insensitivity to impact. Methods to reduce errors in both tool design and clinical use are discussed, and the practical roles for pathologists in error minimisation are highlighted. This aims to inform and empower pathologists to move safely through this seismic change in practice and help ensure that novel AI tools are adopted safely.