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Expertise in cytopathology

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Summary

- When examining a sample of cells microscopically, cytologists are faced with a bewildering complexity of visual information. Intensive training and many years' experience are required before a cytologist can be declared an expert.
- In defining expertise we have focused on the importance of the three Ds—the need for cytologists to develop good *detection*, *discrimination*, and *decision*-making skills.
- Accurate and reliable detection of abnormal cells requires practised visual search skills.
- Expertise in cell discrimination is probably acquired via two learning streams: a slow but rigorous analytical pathway and a much faster and efficient non-analytical pathway. It is likely that both pathways contribute to the learning process.
- Discriminabilty index (d') is an objective measure of our ability to discriminate normal from abnormal cells.
- Criterion is a measure of the tendency of a cytologist to report the presence of an abnormality. It is a measure of decision bias.
- Both d' and criterion can be estimated from a cytologist's true positive and false positive response rate.
- Although research evidence is sparse, we have speculated that expert cytologists have a robust visual long-term memory and a high capacity for selective attention.
- The role of computer-aided detection in cytology is currently limited. The reasons for this are multifactorial but have something to do with the problems of emulating the complexity of the mental processes involved in cytological decision making.