UK National Screening Committee

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Use of digital pathology in breast, bowel and cervical cancer screening

Background

In 2020, the UK National Screening Committee (UK NSC) was asked by the National Coordinating Committee for Breast Pathology and by the Royal College of Pathologists to consider the evidence regarding the use of whole slide imaging (WSI) for the preoperative diagnosis of tissue specimens from the NHS Breast Cancer Screening Programme. Digital pathology is a technology that allows glass histopathology slides to be reviewed digitally on a computer screen, rather than with a microscope. As a first step, a preliminary evidence map was commissioned to evaluate the volume and type of evidence since the 2017 systematic review on key issues related to the use of digital pathology in breast cancer screening. Following internal discussions with the Screening Programmes, it was agreed to extend the scope of the evidence map to include bowel and cervical cancer screening. Based on the conclusion of the evidence map, the Adult Reference Group (ARG) agreed that an evidence summary on the use of digital pathology in breast and cervical cancer screening only should be commissioned.

The 2021 evidence summary

The 2021 evidence summary was carried out by Solutions for Public Health. The review found that:

- the bulk of the available evidence regarding the accuracy of digital pathology relates to breast cancer, although evidence specifically relating to the accuracy of digital pathology in cases detected by screening was limited
- the interpretation of the evidence base is also limited by the small number of cases involved and differences in the designs, statistical parameters and process used in the studies
- similarly, the evidence on the use of digital pathology in cervical cancer screening was limited
- evidence relating to the acceptability of digital pathology among pathologists in the UK was mixed with both positive views and concerns identified
- no studies on the cost-effectiveness of digital pathology compared to light microscopy were identified
- a Health Technology Assessment (HTA) primary study was ongoing when the UK NSC examined the evidence on the use of digital pathology in breast, bowel and cervical cancer screening. There was expectation that this work,would produce useful evidence on the performance of digital pathology in cancer screening. The UK NSC agreed to consider this evidence when published.

The HTA multi-site study

The findings of the HTA multi-site study from the UK were discussed at the ARG meeting on 11 May 2023 and subsequently at the UK NSC meeting on 15 June 2023. In total, 6 NHS sites and 16 pathologists took part. The study recruited 2,024 cases (608 breast, 607 GI, 609 skin, 200 renal), including 207 breast screening and 250 bowel cancer screening samples.

This sample size was chosen to obtain precise estimates of percentage clinical management concordance (CMC), meaning identical diagnoses plus differences which do not affect patient management. Findings were interpreted with reference to 98.3% CMC. For overall light microscopy vs digital pathology comparisons, CMC rates were 99.95% (95%CI 99.90-99.97) for all groups and 98.96 (98.42-99.32) for cancer screening samples. The multi-site study concluded that comparing light microscopy and digital pathology CMC, overall rates exceed the reference 98.3%, showing that pathologists provide equivalent results for both routine and cancer screening samples irrespective of the modality used.

This public exercise

The results of this HTA and the expert opinions of the ARG led the committee to agree that digital pathology performs as well as light microscopy for histopathology. ARG was also confident that, while the work focussed on breast and bowel cancer, the findings and the current use in service were such that they were likely to be extended to cervix histopathology.

The UK NSC did not carry out a cost effectiveness exercise. Thus, the committee is consulting on the recommendation that commissioners and service providers can safely use digital pathology in place of light microscopy in the national screening programmes (excluding cytology) if they wish.

The UK NSC is seeking views on whether stakeholders:

- are aware of any studies/papers contradicting the findings of the UK HTA study
- fundamentally disagree with the use of digital pathology in existing cancer screening programmes, excluding cytology