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AI for robust decision support for multidisciplinary colorectal cancer team meetings

S. Ashraf[1], A. Khan[2], A.D. Beggs[1], R. Henbrey[3], M.R. Openshaw[4], V. Kunene[5], B. Allos[6], D. Snead[7], N. Rajpoot[7]

[1] Department of Colorectal Surgery, Queen Elizabeth Hospital - University Hospitals Birmingham NHS Foundation Trust, Edgbaston Birmingham, United Kingdom, [2] Histofy, Coventry, United Kingdom, [3] Department of Colorectal Nursing, Queen Elizabeth Hospital - University Hospitals Birmingham NHS Foundation Trust, Birmingham, United Kingdom, [4] Insitute of Cancer and Genomics science, Institute of Cancer and Genomic Sciences - University of Birmingham, Birmingham, United Kingdom, [5] Oncology, Queen Elizabeth Hospital - University Hospitals Birmingham NHS Foundation Trust, Birmingham, United Kingdom, [6] Department of Oncology, Queen Elizabeth Hospital - University Hospitals Birmingham NHS Foundation Trust, Birmingham, United Kingdom[7] Histofy, Coventry, United Kingdom

Background

Multidisciplinary team (MDT) decisions depend on the timely availability and synthesis of pathology, radiology, endoscopy, clinical and trial information. In an audit of 14,180 consecutive colorectal cancer MDT cases at University Hospitals Birmingham, 8.2% were deferred, with 60% of deferrals attributed to missing histology or radiology. Clinical trials were discussed in only 3.9% of cases, predominantly involving locally led studies. We evaluated BEAGLE®-MDT, an auditable multi-agent artificial intelligence (AI) platform designed to address these gaps systematically at the point of MDT decision-making.

Methods

BEAGLE®-MDT comprises four linked functions: pre-MDT completeness checking, evidence synthesis, systematic trial matching and generation of structured patient and referrer summaries. Outputs are linked to source records to support clinical review and auditability. An initial blinded pilot evaluated 15 synthetic colorectal cancer cases across disease sites and stages. Five expert clinicians independently rated patient summarisation, management recommendations and trial matching on a 5-point scale, including the proportion of ratings achieving the maximum score.

Results

Across clinicians, mean ratings for patient summarisation ranged from 4.50 to 5.00, with 73-100% of ratings achieving 5/5. Mean management ratings ranged from 4.07 to 4.87, with 40-87% achieving 5/5. Mean trial-matching ratings ranged from 4.33 to 4.93, with 67-93% achieving 5/5. Overall trial-matching ratings at 5/5 ranged from 67% to 93% across clinicians. These preliminary findings support technical feasibility and justify prospective clinical validation; they do not establish clinical effectiveness or equivalence to standard care.

Conclusions

In an initial synthetic-case pilot, BEAGLE®-MDT produced high clinician-rated performance across case summarisation, management support and trial matching. A prospective evaluation is required to determine whether the platform reduces avoidable MDT deferrals, improves access to relevant trials, standardises evidence integration and produces safe, acceptable patient communication.

Clinical trial identification

Local Institutional Registration with UHB.

Legal entity responsible for the study

The authors.

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Disclosure

S. Ashraf: Other, Personal, Other, Partner holds shares in Histofy: Histofy. A. Khan: Financial Interests, Personal, Full or part-time Employment: Histofy. M.R. Openshaw: Financial Interests, Advisory Board: Takeda. V. Kunene: Financial Interests, Personal, Other, Either Honorarium for presenting/advisory board/training/conference sponsorship/educational: Takeda, BMS, MSD, Servier, Amgen, Merck, Bayer,

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