IS PAN-ENTERIC VIDEO CAPSULE ENDOSCOPY A COST-EFFECTIVE OPTION FOR OPTIMISATION OF CROHN'S DISEASE THERAPY IN ENGLAND?

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INTRODUCTION.

Video capsule endoscopy (VCE) is a well recognised imaging technology with application in Crohn's Disease (CD) monitoring

- Pan-enteric VCE (pVCE) evaluates the small bowel & colon mucosae for evidence of CD
- This may support treat-to-target strategies, which are more relevant in recent years
- The **AIM** of this study was to identify whether standard use of pVCE (Figure 1) in CD monitoring would be cost effective in England, when compared with colonoscopy

Figure 1. A pan-enteric video capsule

METHODOLOGY

Development of a patient-level, care-pathway model specific to CD management in England

- Pathway details are based on NICE guidance[1], supplemented by a survey of English physicians with CD expertise
- Local parameters included: pricing, NHS tariffs, incidence rates, step-up treatment, and the use of faecal calprotectin testing to inform the need for endoscopic monitoring
- Data for pVCE (Table 1) are derived from a published study in a CD population
- 4,000 simulated patients were tracked over 20 years
- Cost of care and quality of life (QoL) were compared between pVCE and colonoscopy
- Cost of care and QoL were calculated with a 3.5% discount rate
- The willingness to pay (WTP) threshold was set at £10,000 per QALY gained (conservative estimate)
- Significance (95%) was calculated through probabilistic sensitivity analysis (PSA) of 2,000 bootstrapped simulations of 100 patients

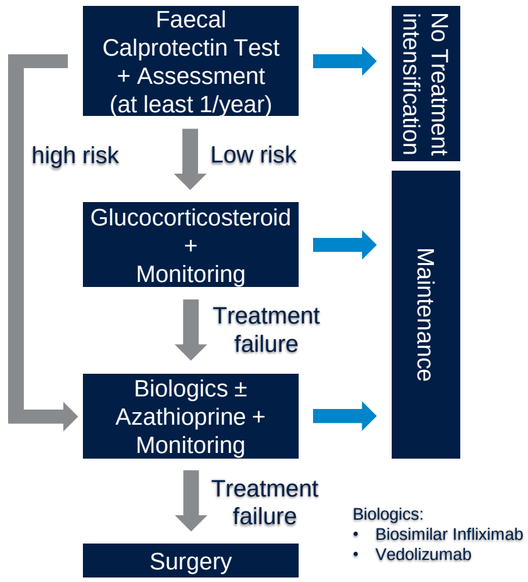
Table 1. Sensitivity and Specificity

Monitoring	Colon		Small bowel	
	Sensitivity	Specificity	Sensitivity	Specificity
pVCE	93%[2]	84%[2]	100%[2]	91%[2]
Colonoscopy	90%[3]	100%[3]	/	/

CROHN'S DISEASE CARE PATHWAY

All experts agreed that NICE guidance[1] needs to be individualised based on patient needs. However, there was sufficient consensus to define a protocolised pathway (Figure 2):

Figure 2. Protocolised care pathway



RESULTS

- The analysis suggested that standard use of pVCE for CD monitoring would reduce costs and increase QoL for patients in England (Table 2)

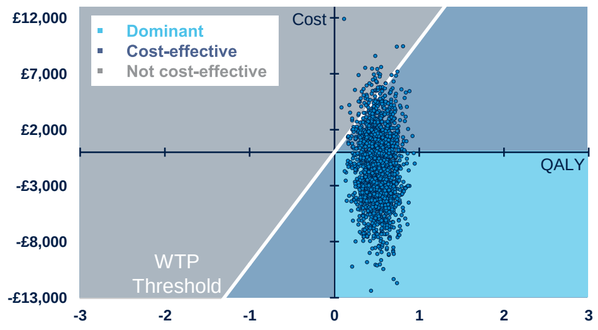
Table 2. Cost and Quality of Life outcomes

Outcomes	pVCE	Colonoscopy	Difference
20 year costs	£67,806	£69,747	-£1,941
QALYs gained	7.8	7.3	0.5
Cost per QALY	£8,693	£9,554	-£861

QALY: Quality adjusted life year. All costs and QALYs were calculated as per patient over 20 years. The difference is calculated as pVCE - Colonoscopy.

- The estimated annual costs are: £3,390 (pVCE) and £3,487 (colonoscopy) within the 3,000[4] to 6,156[5] cost range in published literature
- The cost per QALY was lower for pVCE (£8,693) than for colonoscopy (£9,554)
- Incremental cost-effectiveness ratio (ICER) was dominant with pVCE saving money per QALY gained
- PSA showed cost effectiveness for pVCE in 96.9% of simulations (Figure 3)
- The 95% credible interval was - £17,279 to £10,913 per QALY gained

Figure 3. Cost-effectiveness plane



- pVCE's higher sensitivity likely led to earlier biologic treatment initiation (Figure 4)
  ➡ short term cost increase
- Optimised treatment may have avoided some costly bowel resections (Figure 5)
  ➡ long term savings

CONCLUSIONS

- **Pan-enteric video capsule endoscopy monitoring of Crohn's Disease activity is likely to be cost-effective in England**
- **The spread of cheaper biosimilars may increase cost-effectiveness over time**
- **Improved patient quality of life, including the reduced need for bowel resections, is an additional benefit**

Figure 4. Biologics onset

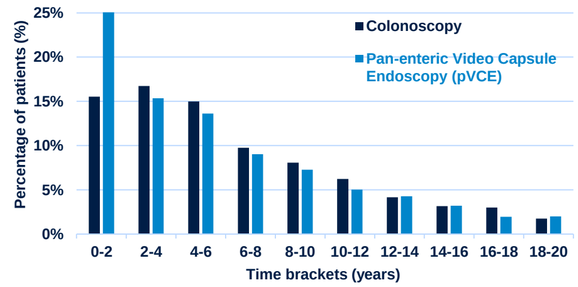
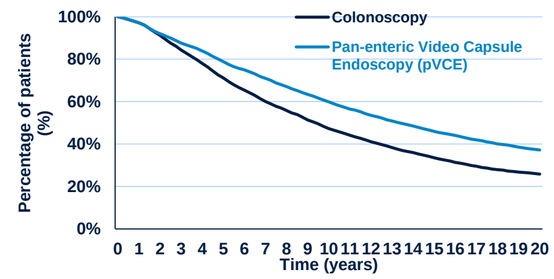


Figure 5. Percentage of patients avoiding bowel resection



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