Clinical management of small (6- to 9-mm) polyps detected at screening CT colonography: a cost-effectiveness analysis

Record Status
This is a critical abstract of an economic evaluation that meets the criteria for inclusion on NHS EED. Each abstract contains a brief summary of the methods, the results and conclusions followed by a detailed critical assessment on the reliability of the study and the conclusions drawn.

CRD summary
The objective was to assess the cost-effectiveness of three-year computed tomography colonoscopy (CTC) surveillance, compared with immediate colonoscopy and polypectomy or no intervention, for the management of 6 to 9mm polyps detected at CTC screening for colorectal cancer. The authors concluded that three-year surveillance was the preferred option. The lack of transparent reporting and the limitations stated suggest that the authors’ conclusions should be considered with a degree of caution.

Type of economic evaluation
Cost-effectiveness analysis

Study objective
This study compared the cost-effectiveness of three management strategies for patients with small polyps (6 to 9mm) that had been detected with computed tomography colonography (CTC) screening. The population was a hypothetical cohort of 100,000 asymptomatic adults aged 60 years.

Interventions
The strategies were short-term three-year CTC surveillance, immediate colonoscopy and polypectomy, and no intervention.

Location/setting
USA/secondary care.

Methods
Analytical approach:
The analysis was based on a decision analytic model with a five-year time horizon. Further details and validation of the model were published elsewhere (Pickhardt, et al. 2008, see ‘Other Publications of Related Interest’ below for bibliographic details). The authors did not explicitly report the perspective.

Effectiveness data:
The effectiveness data were mainly derived from the published literature, national cancer databases, and an ongoing natural history trial. Some assumptions were required and were reported. The main parameters were the sensitivity and specificity of colonoscopy and CTC, the perforation and bleeding rate due to CTC and polypectomy, and the annual transition rates for colorectal cancer. The primary outcomes were life expectancy and the five-year stage-specific mortality for colorectal cancer.

Monetary benefit and utility valuations:
None.

Measure of benefit:
The authors used the life-year gained (LYG) as the measure of benefit.

Cost data:
The direct costs included those of CTC, colonoscopy (diagnostic, therapeutic, bleeding, and perforation), and colorectal...
cancer treatment (local, regional, and distant). The cost estimates were based on actual charges in the authors’ settings. A cost-to-charge ratio of 40% was applied to estimate the true cost of the strategies. All costs were in US dollars ($) and the price year was not reported.

Analysis of uncertainty:
The parameter uncertainty was investigated through probabilistic sensitivity analysis, using Monte-Carlo simulation. One-way sensitivity analyses for the prevalence of advanced adenomas and cancers in 6 to 9mm polyps, the cancer upstaging rate, CTC performance, population age, and cost estimates were also conducted.

Results
An incremental analysis was performed and the results were reported over a five-year horizon for the hypothetical cohort of 100,000 people.

The incremental cost-effectiveness ratio (ICER) of the three-year CTC strategy compared with no intervention was $50,418 per LYG. The ICER of immediate colonoscopy compared with three-year surveillance was $372,853 per LYG.

The sensitivity analysis showed that the results for the three-year CTC strategy compared with no intervention were robust to large variations in all parameters and the ICER ranged from $172,207 to $857,955 per LYG.

Authors’ conclusions
Using an incremental cost-effectiveness threshold of $100,000 per LYG, the authors concluded that immediate colonoscopy with polypectomy did not constitute a cost-effective strategy compared with the three-year CTC surveillance. Three-year CTC surveillance was the preferred option.

CRD commentary
Interventions:
The rationale for the selection of the comparators was clear. The proposed intervention was recommended by recent clinical guidelines and was compared against the usual practice in the authors’ setting.

Effectiveness/benefits:
The clinical analysis was based on data derived from selected sources, which were mainly published. No systematic search for data was reported. The authors did not provide a description of the design or other characteristics of the studies used to derive the clinical data, which makes it difficult to assess their quality. The selection of some key estimates was discussed and alternative estimates were considered in the sensitivity analysis. Given the detail reported it is not possible to ascertain if the best available evidence was used or if the evidence was of good quality.

Costs:
Although the perspective was not explicitly stated, it appears to have been that of the third-party payer. The costs were obtained from the authors’ setting by applying a cost-to-charge ratio to reflect the true costs. They were only presented as macro-categories and unit costs and resource quantities were not given. Discounting was not performed and the price year and probability distributions assigned to the costs were not reported. These limitations make any assessment difficult.

Analysis and results:
The costs and benefits were synthesised using incremental analysis. The issue of uncertainty was addressed in the sensitivity analyses, but the analyses and the results were not described in detail. The authors acknowledged the limitation to their study that they overestimated the number of cancers due to 6 to 9mm polyps, which may have had a big impact on the results. Overall, the reporting lacked transparency.

Concluding remarks:
The lack of transparent reporting and the limitations stated suggest that the authors’ conclusions should be considered with a degree of caution.
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