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Workload and surgeon's specialty for outcome after colorectal cancer surgery.

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Author information

Abstract

BACKGROUND: A large body of research has focused on investigating the effects of healthcare provider volume and specialization on patient outcomes including outcomes of **colorectal cancer surgery**. However there is conflicting evidence about the role of such healthcare provider characteristics in the management of **colorectal cancer**.

OBJECTIVES: To examine the available literature for the effects of hospital volume, surgeon caseload and specialization on the outcomes of **colorectal**, colon and rectal **cancer surgery**.

SEARCH METHODS: We searched **Cochrane** Central Register of Controlled Trials (CENTRAL), and LILACS using free text search words (as well as MESH-terms). We also searched Medline (January 1990-September 2011), Embase (January 1990-September 2011) and registers of clinical trials, abstracts of scientific meetings, reference lists of included studies and contacted experts in the field.

SELECTION CRITERIA: Non-randomised and observational studies that compared outcomes for **colorectal cancer**, colon **cancer** and rectal **cancer surgery** (overall 5-year survival, five year disease specific survival, **operative** mortality, 5-year local recurrence rate, anastomotic leak rate, permanent stoma rate and abdominoperineal excision of the rectum rate) between high volume/specialist hospitals and surgeons and low volume/specialist hospitals and surgeons.

DATA COLLECTION AND ANALYSIS: Two review authors independently abstracted data and assessed risk of bias in included studies. Results were pooled using the random effects model in unadjusted and case-mix adjusted meta-analyses.

MAIN RESULTS: Overall five year survival was significantly improved for patients with **colorectal cancer** treated in high-volume hospitals (HR=0.90, 95% CI 0.85 to 0.96), by high-volume surgeons (HR=0.88, 95% CI 0.83 to 0.93) and **colorectal** specialists (HR=0.81, 95% CI 0.71 to 0.94).

Operative mortality was significantly better for high-volume surgeons (OR=0.77, 95% CI 0.66 to

0.91) and specialists (OR=0.74, 95% CI 0.60 to 0.91), but there was no significant association with higher hospital caseload (OR=0.93, 95% CI 0.84 to 1.04) when only case-mix adjusted studies were included. There were differences in the effects of caseload depending on the level of case-mix adjustment and also whether the studies originated in the US or in other countries. For rectal **cancer**, there was a significant association between high-volume hospitals and improved 5-year survival (HR=0.85, 95% CI 0.77 to 0.93), but not with **operative** mortality (OR=0.97, 95% CI 0.70 to 1.33); surgeon caseload had no significant association with either 5-year survival (HR=0.99, 95% CI 0.86 to 1.14) or **operative** mortality (OR=0.86, 95% CI 0.62 to 1.19) when case-mix adjusted studies were reviewed. Higher hospital volume was associated with significantly lower rates of permanent stomas (OR=0.64, 95% CI 0.45 to 0.90) and APER (OR=0.55, 95% CI 0.42 to 0.72). High-volume surgeons and specialists also achieved lower rates of permanent stoma formation (0.75, 95% CI 0.64 to 0.88) and (0.70, 95% CI 0.53 to 0.94, respectively).

AUTHORS' CONCLUSIONS: The results confirm clearly the presence of a volume-**outcome** relationship in **colorectal cancer surgery**, based on hospital and surgeon caseload, and specialisation. The volume-**outcome** relationship appears somewhat stronger for the individual surgeon than for the hospital; particularly for overall 5-year survival and **operative** mortality, there were differences between US and non-US data, suggesting provider variability at hospital level between different countries, making it imperative that every country or healthcare system must establish audit systems to guide changes in the service provision based on local data, and facilitate centralisation of services as required. Overall quality of the evidence was low as all included studies were observational by design. In addition there were discrepancies in the definitions of caseload and **colorectal** specialist. However ethical challenges associated with the conception of randomised controlled trials addressing the volume **outcome** relationship makes this the best available evidence.

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