**Enhanced recovery pathways optimize health outcomes and resource utilization: a meta-analysis of randomized controlled trials in colorectal surgery**

Adamina M, Kehlet H, Tomlinson GA, Senagore AJ, Delaney CP

---

**CRD summary**

This review concluded that use of enhanced recovery pathways reduced hospital stay and decreased morbidity with no increase in readmission. These conclusions are supported by the data, but should be interpreted with some caution due to the possibility of missing studies and lack of details on study quality and other study characteristics.

**Authors' objectives**

To review the evidence on implementing enhanced recovery pathway (ERP) in clinical practice.

**Searching**

MEDLINE, EMBASE and The Cochrane Library were searched from 1966 to June 2010. Search terms were reported. Reference lists of retrieved studies and relevant reviews were screened and experts in the area were contacted. The review was restricted to studies published in English, German, French, Spanish and Danish.

**Study selection**

Randomised controlled trials (RCTs) that compared enhanced recovery pathway with traditional care in adults regardless of indication for surgery were eligible for inclusion. Studies had to include a minimum follow-up of 30 days and demonstrate compliance with at least four out of five key enhanced recovery pathway components set out in the paper. Outcome measures were duration of stay, morbidity and readmission rates. All included studies took advantage of the five key elements of a successful enhanced recovery pathway; the focus on particular sub-components varied across studies.

The authors did not state how studies were selected for inclusion.

**Assessment of study quality**

Two reviewers independently assessed trial quality using the Jadad scale and CONSORT (Consolidated Standards of Reporting Trials) criteria. Disagreements were resolved through consensus.

**Data extraction**

Two reviewers independently extracted data to calculate differences in means and median differences (MDs) for continuous data and relative risks (RRs) for dichotomous data.

**Methods of synthesis**

A Bayesian random-effects meta-analysis was used to estimate summary relative risks and median differences together with 95% credible intervals (CrI). Continuous outcomes were pooled using a linear random-effects model and binary outcomes were modelled using a random-effects logistic model. Diffuse priors were used for the treatment effects.

**Results of the review**

Six RCTs were included in the meta-analysis (452 participants). Study quality was described as good.

Enhanced recovery pathway was associated with a shorter duration of hospital stay in patients who underwent major colorectal surgery (MD 2.5 days, 95% CrI -3.92 to -1.11) and reduced 30-day morbidity (RR 0.52, CrI 0.36 to 0.73). There was no effect on readmission (RR 0.59, 95% CrI 0.14 to 1.43) compared to traditional care.

**Cost information**

One study reported that average cost per patient including readmission costs decreased significantly from US$9,310 to $7,070 after implementation of an enhanced recovery pathway. A further study found that hospital direct costs and global resource utilisation within 30 days of surgery were significantly reduced by $980 per patient in favour of enhanced recovery pathway.
**Authors' conclusions**
Adherence to enhanced recovery pathway achieved a reproducible improvement in the quality of care by enabling standardisation of health care processes. Enhanced recovery pathways optimised utilisation of health care resources, accelerated recovery and safely reduced hospital stay.

**CRD commentary**
The review addressed a clear question. Inclusion criteria were defined. The literature search was adequate for published studies, but restriction of the review to studies published in certain language raised the possibility of language and publication biases. Appropriate steps were taken to minimise bias and errors when assessing study quality and extracting data; it was unclear whether such steps were also taken when assessing study eligibility.

A formal quality assessment was reported to have been undertaken, but results were reported simply as all studies being of good quality without details on how this summary rating was achieved. Individual study details were lacking and so it was not possible to determine the generalisability of the review findings. Methods used to pool data appeared appropriate.

The authors' conclusions are supported by the data but should be interpreted with some caution due to the possibility of publication bias and lack of details on study quality and other study characteristics.

**Implications of the review for practice and research**

**Practice:** The authors stated that enhanced recovery pathways can and should be routinely used in care after colorectal and other major gastrointestinal procedures.

**Research:** The authors did not state any implications for research.

**Funding**
Not stated.

**Bibliographic details**

**PubMedID**
21236454

**DOI**
10.1016/j.surg.2010.11.003

**Original Paper URL**

**Indexing Status**
Subject indexing assigned by NLM

**MeSH**
Bayes Theorem; Colorectal Surgery /standards; Delivery of Health Care /standards; Health Resources /standards; Humans; Outcome Assessment (Health Care) /standards; Quality of Health Care /standards; Randomized Controlled Trials as Topic; Treatment Outcome

**AccessionNumber**
12011003749

**Date bibliographic record published**
21/09/2011
Date abstract record published
23/11/2011

Record Status
This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.