



# Comparison of fast track protocol and standard care in patients undergoing elective open colorectal resection: a meta-analysis update



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## ABSTRACT

**Objective:** We conducted a systematic review of randomized controlled trials assessing the clinical results of fast track protocol (FTP) and standard care (SC) in patients undergoing elective open colorectal resection using meta-analysis.

**Method:** A literature search for electronic databases and references for eligible studies was conducted through Medline, Embase and Cochrane library between 1966 and 2013.

**Result:** A total of 9 randomized controlled trials (n = 947 patients) were included. From the pooled results, we obtained: FTP showed significantly better results compared to SC in terms of postoperative complications, total hospital stay as well as time for flatus, defecation, and soft diet. However, no difference in the incidence of readmission was observed. Postoperative rate of death within 4 weeks did not differ significantly between two groups.

**Conclusion:** The current evidence of this meta-analysis suggested that fast track protocol after colorectal surgery pathways might be able to reduce postoperative complication rates, length of hospital stay as well as time for gut function recovery without affecting readmission rate or mortality compared to standard care.

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## 1. Introduction

Fast track protocol also known as (“enhanced recovery”, “multimodal rehabilitation”) was first described by Professor Wilmore and Kehlet (2001) in 2001. Compared with the standard care, fast track protocol takes into account the perioperative changes of psychology and pathophysiology and eliminates unfavorable factors that are not justified (Sosada, Wiewiora, Piecuch, & Zurawinski, 2013). The intention of carrying fast track protocol is to reduce the surgical stress response, improve postoperative recovery, decrease complications and morbidity, shorten hospital stay and reduce health costs, yet maintaining an uncompromised patient safety (Anderson et al., 2003; Basse, Thorbol, Lossel, & Kehlet, 2004; Gatt et al., 2005; Khoo, Vickery, Forsyth, Vinall, & Eyre-Brook, 2007). This fast track protocol is a multidisciplinary approach which consists of dieticians, nurses,

surgeons, and anesthesiologists (Fearon et al., 2005; Kehlet & Wilmore, 2002). FTP consists of various elements including preoperative counseling, no preoperative fasting, no bowel preparation, fluid restriction, high O<sub>2</sub> concentration, prevention of hypothermia, epidural analgesia, short/transverse incisions, no routine use of nasogastric tubes, no routine use of drain, enforced mobilization, early oral feeding, no systemic morphine use, standard laxatives, early removal of bladder catheter and so on. It mostly focuses on limited perioperative fluid management, optimized analgesia, early oral nutrition, and early mobilization.

Previous studies including clinical trials and meta-analyses have proven positive effect of fast track protocol. However, a large number of surgical departments continue to apply standard procedures (Lassen et al., 2005). This can partly be explained by the fact that it is not easy to break with long-standing traditions, such as preoperative fasting, slow postoperative advancement of oral feeding, and delayed mobilization.

There are many studies reported by small number of surgical departments about fast track protocol which cannot provide strong evidence. Meta-analysis is an important tool for revealing trends that might not be apparent in a single study. Pooling of independent but similar studies stands to increase precision thereby improving the confidence level of the study at large. The aim of our meta-analysis was to identify if fast-track protocol was safe, reduced hospital stay time, ensured faster recovery of gastrointestinal functions, and improved postoperative results compared with the standard care for patients with open colorectal surgery.

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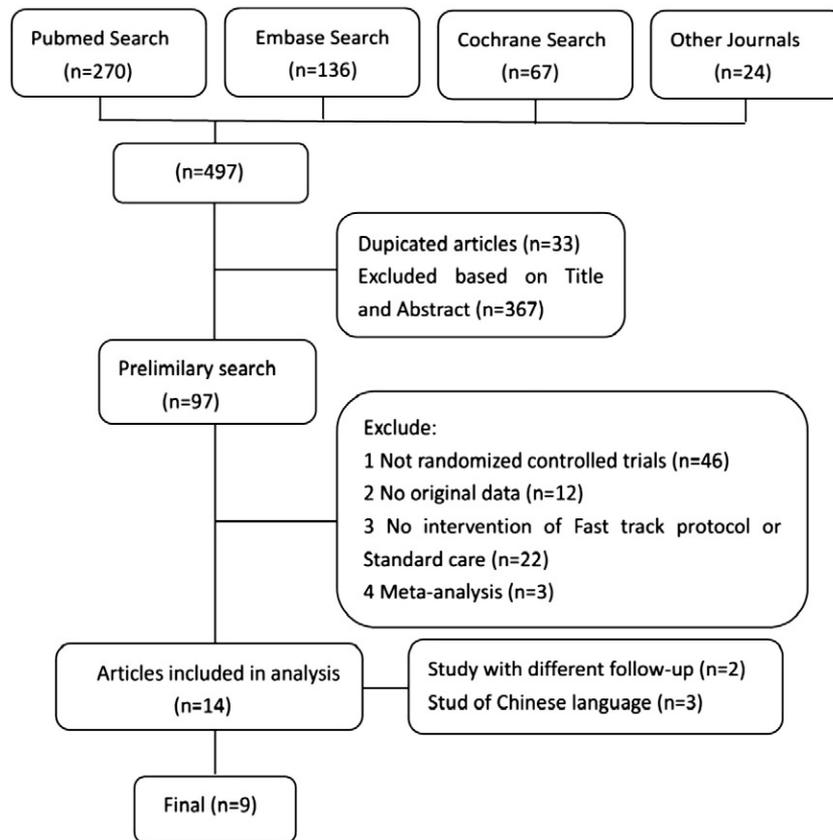


Fig. 1. Flow chart of the studies recruited in this meta-analysis.

## 2. Materials and methods

### 2.1. Identification and selection of studies

We carried out a literature search using Medline, Embase and Cochrane databases to identify all articles published between 1966 and 2013 that evaluated the outcome of patients undertaking either fast track protocol or standard care after elective colorectal surgery. Moreover, we searched for the keywords in headers and abstracts in related journals (e.g. Int J Colorectal Dis, Clinical Nutrition). Randomized

controlled trials (RCT) relating to both FTP and SC were included. Randomized controlled trials which were made of four separated groups ((1) FTP + laparoscopyassisted surgery, (2) SC + laparoscopyassisted surgery, (3) FTP + open surgery, (4) SC + open surgery) were used. The following Medical Subject Headings (MeSH) and terms were used in searching: “multimodal”, “fast track”, “enhanced recovery”, “perioperative care”, “multimodal” and “colorectal”. The reference list of each comparative study and previous reviews were manually examined to find additional relevant information relative to previous studies conducted on the subject. We did contacted each author of the included

Table 1

Details on all of the studies included in the meta-analysis.

Author year	Type of study	Group	No(P)	Female Male	Age	Follow-up	Complication	Hospital stay	Flatus time	Defecation time	Soft diet time	Readmission	Death
Yang et al., 2012	RCT	FTP	32	20/12	57.2y	4w	6	6.0 ± 1.0	2 ± 1	3.84 ± 1.63	3.84 ± 1.63	0	NG
		SC	30	22/8	59.5y		12	11.7 ± 3.8	4 ± 2	6.44 ± 2.53	6.44 ± 2.53	0	
Wang et al., 2011	RCT	FTP	106	65/41	57y	4w	20	5.1 ± 3.1	2.1 ± 2.0	NG	NG	4	2
		SC	104	60/44	55y		39	7.6 ± 4.8	3.2 ± 2.5			9	1
Vlug et al., 2011	RCT	FTP	93	54/39	66y	4w	43	7 (5–11)	1 (1–3)	3 (2–4)	NG	7	4
		SC	98	59/39	66y		41	7 (6–13)	2 (1–3)	4 (3–6)		7	2
Muller et al., 2009	RCT	FTP	76	37/39	62y	4w	16	6.7 ± 4.84	NG	NG	NG	2	NG
		SC	75	35/40	59y		35	10.3 ± 4.97				3	
Ionescu et al., 2009	RCT	FTP	48	30/18	60.9y	4w	6	6.43 ± 3.41	1.82 ± 0.62	NG	NG	0	NG
		SC	48	31/17	63.1y		11	9.16 ± 2.67	2.2 ± 1.0			0	
Serclova et al., 2009	RCT	FTP	51	20/31	35.1y	4w	11	7.4 ± 1.3	1.3 ± 0.8	2.1 ± 1.1	2.1 ± 1.1	NG	NG
		SC	52	32/20	37.6y		27	10.4 ± 3.1	3.1 ± 1.0	3.9 ± 1.1	3.9 ± 1.1		
Khoo et al., 2007	RCT	FTP	35	12/23	69.3y	2w	9	5 ± 8.5	NG	NG	NG	3	0
		SC	35	15/20	73y		18	7 ± 14.75				1	2
Gatt et al., 2005	RCT	FTP	19	9/10	67y	4w	9	6.6 ± 4.4	NG	NG	NG	1	1
		SC	20	14/6	67y		15	9 ± 4.6				4	0
Anderson et al., 2003	RCT	FTP	14	6/8	64y	4w	4	4 ± 1.8	NG	NG	NG	0	0
		SC	11	5/6	68y		5	7 ± 2.1				0	1

Abbreviations: year = year of publication; RCT = randomized clinical trials; FTP = fast track protocol; SC = standard care; NG = not given.

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