

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

قَالُوا سُبْحَانَكَ لَا عِلْمَ
لَنَا إِلَّا مَا عَلَّمْتَنَا إِنَّكَ
أَنْتَ الْعَلِيمُ الْحَكِيمُ

صدق الله العظيم

سورة

البقرة

أيه 32



بِسْمِ اللّٰهِ الرَّحْمٰنِ الرَّحِیْمِ

السَّلَامُ عَلَیْكُمْ

وَرَحْمَةُ اللّٰهِ وَبَرَكَاتُهُ





Enhanced Recovery Program after Surgery for Colorectal Cancer

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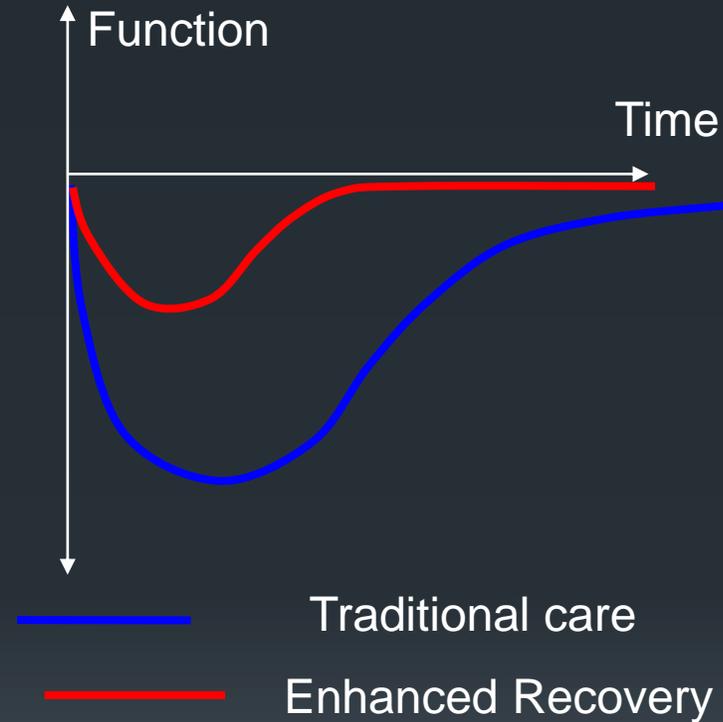
Zagazig university

A large, multi-tiered waterfall cascades down a rocky cliff face, surrounded by dense green forest. The water flows into a river below, creating white rapids. The scene is captured from a low angle, emphasizing the height of the waterfall. The word "Introduction" is overlaid in large, bold, orange letters across the center of the image.

Introduction

What is Enhanced Recovery?

- Minimise stress responses during & after surgery
- Optimise pre-operative condition
- Optimise intra-operative care
- Optimise post-op. rehabilitation



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- **Major colorectal surgery**, i.e., surgery that involves wide resection of the colon and anastomosis, generally involves a **prolonged hospital stay, on average 12–14 days.**
 - This prolonged hospital stay **is not usually due to problems of morbidity** but to the conventional care protocol followed.

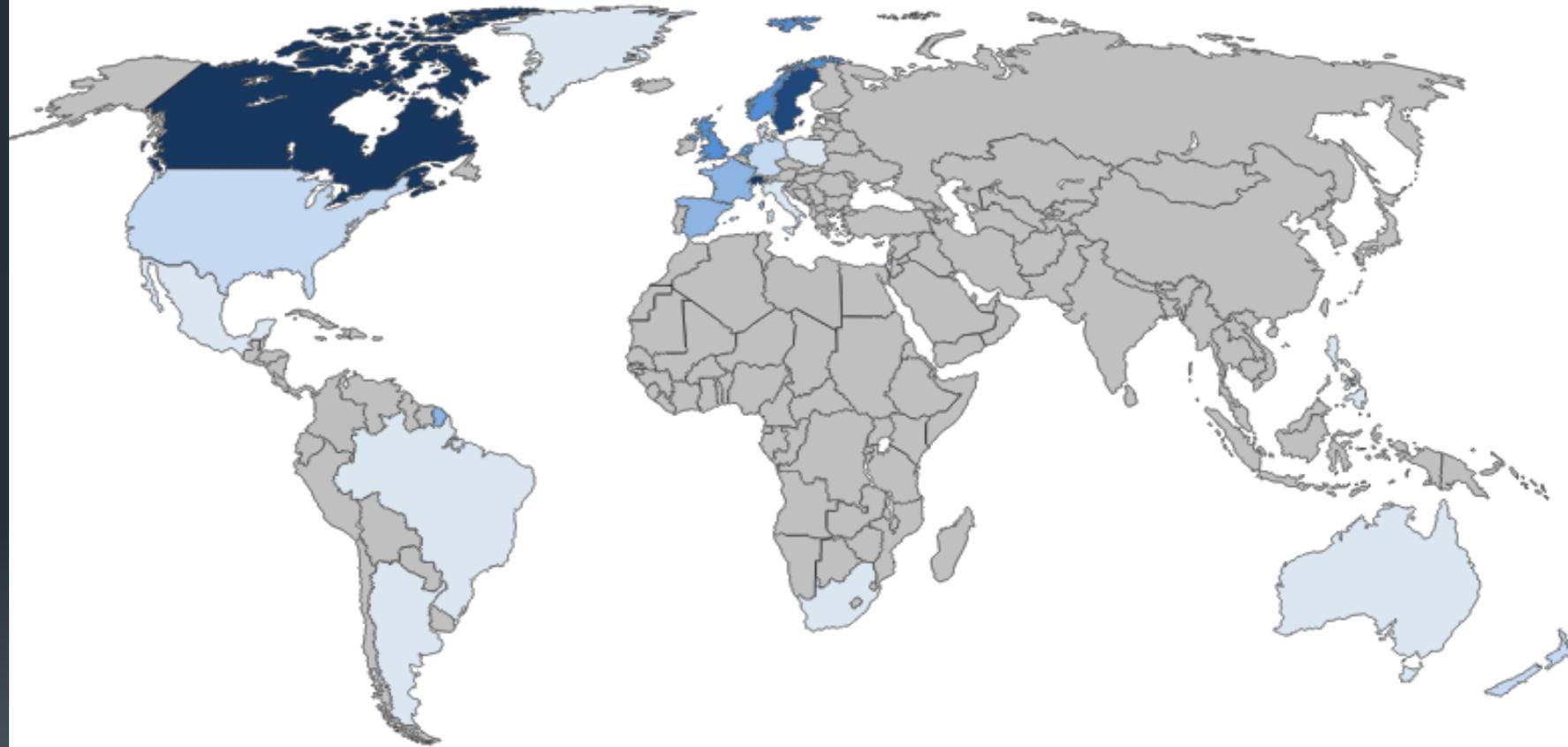
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- For decades this protocol has **hardly been modified**
 - Despite lack of evidence for preoperative bowel preparation in colorectal surgery, routine use of nasogastric tubes, and nil by mouth until bowel sounds are heard postoperatively, **all 3 are still widely practiced.**

- Inadequate pain management, intestinal dysfunction and immobilisation have been recognised among the main factors **delaying postoperative recovery** in patients subjected to major surgery.
- This led **Kehlet et al.,(1997)** to propose a series of measures designed to improve recovery following major colorectal surgery known as fast-track or better called Enhanced Recovery After Surgery (ERAS),



ERAS[®]Society 2014

Growing fast...



- More than one Implementation program
- Implementation program running/announced
- ERAS Center in place
- ERAS center established in 2014
- ERAS center discussions

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- **This presentation** investigated the **feasibility,** **clinical effectiveness,** **and cost savings** of ERAS for colorectal carcinoma,

Is there a difference?



Traditional Care Day 2



ERAS Day 2



COMPONENTS OF ERAS PROTOCOLS

AND

**CURRENT
RECOMMENDATIONS**



Pre-operative components

1) Pre-operative information and training:

Recommendation:

- All Patients should be provided **with both verbal as well as written information and education**
- What the patient should expect during the course of the hospital stay. **Clear and specific instructions should be given about mobilization, early introduction of diet and breathing exercises**
- This improve patient satisfaction, allay anxiety and pain and improve other outcomes

2- Preoperative fasting and carbohydrate loading

Recommendation:

- Patients should be **fasted for 6 hours to solids** but they should be allowed small amounts of **clear free fluids for up to 2 hours** before induction of general anaesthesia.
- In addition, a **clear carbohydrate rich drink** (e.g. Polycal Liquid ®) should be administered orally the night before surgery and **3 hours prior to induction of anaesthesia**

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- **Fasting for a minimum of 8 hours** before a general anaesthetic has been normal surgical practice for many years.
 - It aims to reduce the volume and acidity of stomach contents, thereby reducing the risk of regurgitation or aspiration.

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- **Recent studies**, however, have demonstrated that a short (3 hours) period of fasting after ingestion of clear fluids is safe and more acceptable to patients. This minimises patient thirst and improves post-operative well being.
 - A short fast in combination with pre-operative carbohydrate loading has been shown to **maintain nitrogen balance and reduce post-operative insulin resistance**

3) Avoidance of mechanical bowel preparation:

Recommendation:

- **Oral mechanical bowel preparation** should not be used routinely in patients undergoing colonic resection.
- If clearance of the rectum is required **for a left sided anastomosis**, a **single phosphate enema on the morning of the surgery** may be used to evacuate the rectum.

- **Oral mechanical bowel clearing** has traditionally been thought to reduce the severity of sepsis and anastomotic leak.
- However, a number of meta-analyses have suggested that, in patients undergoing colorectal procedures, the avoidance of mechanical bowel preparation is **safe** and **does not result in increased sepsis in the event of an anastomotic leak**
- Additionally, the use of mechanical bowel preparation can result in serious adverse events, such **as fluid imbalance**, specially in the elderly.

4) Deep vein thrombosis prophylaxis

Recommendation:

- All patients undergoing surgery should be started on a **once daily low molecular weight heparin** (clexan) **the night before surgery** and continued for the entire length of the patient's hospital stay.
- During the procedure, pneumatic mechanical compression stockings should be used.
- **Prophylaxis should be considered for up to one month** after discharge, especially in those at a higher risk of thromboembolic complications, such as those with residual malignancy or previous episodes of thrombosis.

5) Antibiotic prophylaxis

Recommendation:

- **A single dose of antibiotics**, covering both aerobic and anaerobic organisms, should be administered just prior to incising the skin. **In prolonged procedures (more than 4 hours) or if there is major blood loss** (greater than 1500 mls.) **a second dose** may be administered.
- Antibiotic prophylaxis is used to reduce the rates of wound infection after surgery. **Multiple doses have not been found to confer any additional advantages** and result in increased costs and risk of Clostridial , resistant strain and fungal infections.



Intra-operative components

1) High inspired oxygen concentrations

Recommendation:

- Eighty percent (80%) oxygen should be administered **during anaesthesia and then continued for at least 6 hours postoperatively.** A face mask may be required to deliver this high concentration of oxygen.
- Molecular oxygen is required by polymorphonuclear cells to produce free radicals which form an important line of defence against pathogens

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- Also, it plays an important role in the synthesis of collagen for wound healing and angiogenesis.
 - Higher tissue oxygenation levels in the immediate post-operative period have been shown to improve perfusion at the anastomotic site and reduce the risk of surgical site infections
 - In addition, there is some evidence that it may also reduce postoperative nausea and vomiting (PONV)

2) Prevention of hypothermia

- Hypothermia (core temperature less than 36°C) should be actively prevented. An oesophageal probe should be used during the procedure for measurement of core body temperature.
- **General anaesthesia** can disrupt the normal thermo-regulatory processes and result in hypothermia.
- In addition, **exposure of the patient to the cold theatre environment** also contributes.

Hypothermia, lead to

- An increase in the incidence of surgical site infections, due to peripheral vasoconstriction induced hypoxia and an altered immune response.
- **Other undesirable effects** of hypothermia include coagulopathy, increased cardiac morbidity and increased levels of circulating catecholamines with a resultant exaggerated catabolic response

Recommendation:

- Active prevention of hypothermia during the peri-operative period has been shown to reduce blood loss and prevent infective and cardiac complications
- For these reasons, hypothermia should be actively prevented using warm-air blankets.
- Warming should be continued for as long as the patient is in recovery.
- If the procedure is expected to last for more than an hour, then warmed intravenous fluids should be used

3) Goal directed intra-operative fluid therapy

- A degree of intra-operative splanchnic hypoperfusion may go undetected with conventional monitoring
 - this plays an important role in **post-operative delay of return of gut function**.
 - In addition, hypoperfusion can lead to **bacterial translocation across the gut wall** which can result in **sepsis syndrome**.
- On the other hand, the excessive amounts of fluid during surgery can also result in **delayed return of gut function and cardiac morbidity**.

Recommendation:

- An oesophageal Doppler probe is a minimally invasive method of determining the hemodynamic status in the peri-operative period and **allows guided fluid management** according to cardiac output.
- **This has been shown to accelerate the return of gut function**

4) Surgical approach and incisions

- Laparoscopic colorectal techniques have been shown to improve outcomes over similar open surgery techniques.
- These improvements include
 - an earlier return of organ function,
 - reduced post-operative analgesic requirement
 - and an earlier discharge from hospital

When undertaking open procedures

- ❑ A number of considerations need to be borne in mind.
- ❑ Short transverse incisions are thought to be **less painful, impair lung function to a lesser extent**, reduce subsequent post-operative **analgesic requirement**, and the incidence of **wound dehiscence may be reduced** when compared to vertical wounds.

5) Avoidance of nasogastric tubes

Routine nasogastric tubes should be avoided. If gastric decompression is required during surgery, an orogastric tube may be inserted temporarily and removed at the end of the procedure.

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- Nasogastric tubes may be **painful** and cause **considerable discomfort**. This can render post-operative mobilisation difficult.
 - There is good evidence that routine use of nasogastric decompression **delays the return of gut function**, leads to an **increase in pulmonary complication, fever and prolongs hospital stay**.

6) Avoidance of drains

- Abdominal drains have been traditionally placed to evacuate post operative collections at the site of surgery and drain any possible anastomotic leak. However, **similar to nasogastric tubes, they cause considerable discomfort and can hinder mobilisation.**
- Moreover, at least **three meta-analyses have revealed that routine prophylactic drainage of the abdominal cavity does not confer any advantages**

7) Epidural analgesia

Recommendation:

- **All patients undergoing open colorectal surgery should receive epidural analgesia.** It should be initiated at the beginning of the procedure and continued for a maximum of 48 hours. Weaning from epidural analgesia should start 12 hours post-operatively. Care should be taken that the equipment does not interfere with mobilization.
- **Patients undergoing laparoscopic resection may or may not be administered epidural analgesia** depending upon the preference of the operating surgeon and anaesthetist.



Post-operative Components

1) Avoidance of opiates

Recommendation:

- Post-operatively, patients should be prescribed **regular Paracetamol and NSAIDS** such as Ibuprofen or **Diclofenac** if there are no contraindications to their use
- **Opiates**, including Codeine preparations and Tramadol, should only be **reserved for breakthrough pain**. Whenever opiates are used, attention should be paid to prevent **nausea and vomiting** and regular anti-emetics prescribed.

2) Early postoperative diet

Recommendation:

- Patients should be **allowed oral fluids as tolerated on the day of the surgery** and built up to an **oral diet over the next 24 hours**.
- **Traditionally**, oral diet and fluid has been reintroduced cautiously and gradually after bowel surgery, often rendering the patients nil by mouth or on oral sips only for many days in the post-operative period. This was thought necessary for adequate healing of bowel anastomoses.

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- However, recently, early introduction of diet and fluids (within 24 hours post-operatively) has been shown to be safe
 - In addition, there is some evidence that early feeding may be beneficial in reducing the risks of anastomotic dehiscence, infections and reducing the length of hospital stay.

3) Early postoperative mobilization

Recommendation:

- Patients should be helped to **sit out in a chair on the evening of surgery** and definitely by the first post-operative day.
- **Even short periods of immobilisation** can lead to bad consequences such as **thromboembolism, loss of muscle strength, pulmonary atelectasis** and worsening of pulmonary function.
- **Continuous patient education** regarding the benefits of mobilization is recommended.

4) Restricted amounts of I.V fluid

Recommendation:

- In the majority of patients, **stopped IV fluids should be possible by the second post-operative day**, by which time adequate oral fluids should be tolerated and indwelling epidural catheters removed.
- However, **excessive amounts of intravenous fluid** should be avoided. **A daily regime of 1.5 to 2.5 L / day should suffice for most patients.**

5) Audit

Recommendation:

- Clinical outcomes, including readmission rates and compliance to the various ERAS strategies, should be regularly audited.
- Readmission rates after ERAS implementation should not exceed 10%.
- Audit findings should be discussed in regular audit meetings attended by medical, nursing and other ancillary staff.
- Results should also be disseminated



Thank You

The
DreamWitch
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