

Delivering enhanced recovery

Helping patients
to get better sooner
after surgery

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Contents

Foreword	4
Introduction	6
What is enhanced recovery?	7
The benefits of enhanced recovery	8
The enhanced recovery pathway	10
Getting the patient in the best possible condition for surgery	12
Managing patients' expectations	12
Pre/referral from primary care	13
Pre-operative assessment and preparation	15
Admission	17
Ensuring the patient has the best possible management during their operation	19
Anaesthetic factors	19
Surgical factors	20
Ensuring the patient has the best post-operative rehabilitation	23
Post-operative training and support	24
Discharge	24
Follow-up	25
How do you implement an enhanced recovery pathway?	27
Key questions to consider prior to implementation of enhanced recovery	28
Stakeholder analysis	28
Stakeholder engagement	30
Engaging with Commissioners	31
Team working	32
Understanding your current service	33
Understanding the risks	35
Understanding the investment required	36
Maintaining momentum	36
Testing and making the changes to your pathway	38
Sustaining the change	39
Resources	41
Acknowledgements	42

Foreword

Enhanced recovery is a new approach to the preoperative, intraoperative and postoperative care of patients undergoing surgery. Originally pioneered in Denmark it is now being championed in England by a growing number of surgeons, anaesthetists, nurses, allied health professionals and NHS managers. It has already been shown to benefit patients undergoing colorectal, urological, gynaecological and orthopaedic surgery. There may well be wider applications in the future.



What does enhanced recovery have to offer patients and the NHS? In simple terms it does two things. It improves quality of care by helping patients to get better sooner after major surgery. Secondly, it reduces length of stay with obvious benefits to the NHS. The Enhanced Recovery Programme is therefore fully aligned with Lord Darzi's High Quality Care for All with quality as the organising principle for the NHS. It also amply fulfils the quality and productivity criteria of the Quality and Productivity Challenge (QIPP).

I have been hugely impressed by the enthusiasm and commitment of clinicians who have introduced enhanced recovery into their own clinical practice and who now want to see the benefits being spread to patients across the whole country. In response to this, an Enhanced Recovery Partnership Programme has been established at a national level. This

brings together the expertise and experience of clinical champions and NHS managers who have previously helped to deliver major change programmes in the NHS. Our aim is to support organisations across the NHS to deliver these quality and productivity gains as rapidly as possible.

This guide will act as a starting point for individuals, teams or organisations committed to providing the highest quality of care to adopt and implement enhanced recovery as best clinical practice for patients undergoing major surgical procedures. Around 90 experienced clinicians across a range of specialties and disciplines have worked together at national workshops to share their experiences and outcomes in delivering enhanced recovery pathways (also known as fast track surgery or rapid or accelerated recovery), and have agreed an approach and reached consensus on the key elements that will ensure best practice. The guide is designed to give an overview, and while it is not prescriptive, it will point you in the right direction to find out more information if you need it.

The patient is at the heart of all we do, and it is with their best interests at heart that I commend the information in this guide to you. I would ask you to consider how you could implement enhanced recovery pathways locally.

Professor Sir Mike Richards
National Clinical Director for Cancer
Chair – Enhanced Recovery Partnership
Programme Steering Group

As clinicians, we know that sometimes you can get so locked into protocol – it's hard to think differently. But by approaching the surgical process a little differently, you can improve clinical outcomes as well as patient experience.



The concept of “Enhanced Recovery” has been of interest to both of us for some time. Having approached it from different starting points, we have over the years, helped to develop the concepts in each of our Trusts and helped to provide evidence which would convince clinicians in the UK to take forward the principles of enhanced recovery.



The overriding message behind the development of an “Enhanced Recovery Programme” in any Trust involves the building of an enhanced recovery multidisciplinary team, agreeing the basic principles, improving efficiency around the surgical pathway,

increasing the awareness of patients about the process and early discharge planning using agreed criteria.

But the most radical challenge was convincing our colleagues and staff to break from surgical tradition. Challenging the status quo on factors such as the use of drains and tubes, what sort of anaesthetic and painkillers are used, and fluid optimisation can be difficult, but we – and plenty of others like us – have seen that it is not only possible, but also brings benefits to the patient and the Clinical Team.

Minimising the stress a patient goes through when facing major surgery – both mentally and physically – is the key to enhanced recovery, and enhanced recovery is the future of elective care. We ask that you seriously consider the ideas in this guide; they may change the way you think about surgery.

Monty Mythen
Professor of Anaesthesia and Critical Care
National Clinical Lead

Alan Horgan
Consultant Colorectal Surgeon
National Clinical Lead

Introduction

Enhanced recovery also known as fast track, rapid or accelerated surgery is transforming elective and cancer care pathways across the NHS and improving both patient experience and clinical outcomes. It has been delivered in the UK since the early 2000s, building on experience and research studies carried out in Europe and the UK.

There is increasing evidence, expertise and enthusiasm in the UK for implementing this approach as it has also demonstrated a number of operational and efficiency benefits for teams managing patient pathways.

The key to ensuring successful implementation of enhanced recovery is engagement, commitment and involvement of the multidisciplinary team across the local health community.

This guide was developed using the learning from a number of centres across the UK who, together, have created a wealth of experience and expertise. The aim is to spread this learning and, as such, this guide provides a starting point to support implementation of enhanced recovery. Although expertise to date has centred largely around colorectal, musculoskeletal and, more recently, gynaecology and urology specialties, it is anticipated that the general principles of the enhanced recovery pathway can be transferred to any specialty.

The guide contains:

- **an overview of enhanced recovery**, including the approach, the principles and the key elements of the pathway with case studies to highlight the benefits
- **practical examples** obtained from hospital test sites of national programmes, such as the NHS Institute for Innovation and Improvement's Rapid Improvement Programme for Orthopaedics¹, and NHS Improvement's Transforming Inpatient Care: Implementing the Winning Principles²; and sites that have forged ahead with enhanced recovery independently of a national programme. Full versions of all practical examples included, plus others, are available at www.dh.gov.uk/enhancedrecovery
- **key areas you will need to address in preparing for implementing enhanced recovery**, such as:
 - local health community engagement to ensure effective implementation (i.e. working as a team and not individuals)
 - critical success factors and barriers, and how to overcome them
 - sustainability
 - measuring success.

Further information

A wealth of information is available to help you address the areas above, including recognised research and a variety of useful tools and techniques that have been demonstrated to support such change management. You can access this information by following the links provided.

This document is not intended to be an evidenced based set of guidelines, but is a collection of learning from sites with experience of enhanced recovery across the UK.

1 http://www.institute.nhs.uk/quality_and_value/high_volume_care/rapid_improvement_programme.html

2 http://system.improvement.nhs.uk/ImprovementSystem/ViewDocument.aspx?path=Cardiac%2fNational%2fWebsite%2fCancer%2ftransforming_care_for_cancer_patients.pdf

What is enhanced recovery?

Enhanced recovery of patients undergoing surgery is a relatively new concept in the UK. It is an evidence-based approach involving a selected number of individual interventions which, when implemented as a group, demonstrate a greater impact on outcomes than when implemented as individual interventions. Enhanced recovery empowers the patient to be a partner in their own care and have greater choice through shared and informed decision making. This starts at the point of referral when assessing the individual needs of patients prior to surgery and continues where an enhanced recovery pathway is chosen, with the management of personalised patient care during and after surgery.

The underlying principle is to enable patients to recover from surgery and leave hospital sooner by minimising the stress responses on the body during surgery.

It is essential that:

- **The patient is in the best possible condition for surgery** – for example, identify co-morbidities; improve anaemia, address hypertension and stabilise diabetes. Ideally, this is undertaken by the GP prior to referral, or, at the latest, at pre-operative assessment. At this stage it is essential that the patient is well informed and understands all the treatment options, has realistic expectations about the risks and benefits of surgery and the processes involved. It is on this basis, having had the time and support to consider, that the patient can make a decision to proceed with surgery.
- **The patient has the best possible management during and after his/her operation** to reduce pain, gut dysfunction and immobilisation – for example, using the appropriate anaesthetic, fluids and pain relief and minimally invasive techniques where appropriate.
- **The patient experiences the best post-operative rehabilitation** – this means rehabilitation services are available 7 days a week for 365 days a year, enabling early recovery and discharge from hospital, as well as a return to their normal activities sooner – for example, planned nutrition and early mobilisation after surgery.

Hillingdon's approach to enhanced recovery

By standardising pathways and emphasising teamwork, as part of the rapid recovery programme (RRP) **Hillingdon Hospitals Trust** experienced reduced length of stay (LOS) for total hip and knee replacements, as well as saving 638 bed days.

The trust standardised the MDT pathway, used local infiltration for pain management, had pre-admission discharge planning and employed less invasive surgical techniques with avoidance of drains.

Informed patients are key, and Hillingdon introduced education classes through a joint replacement school (including group and one-to-one sessions) and patient information brochures to change expectations.

These resulted in: improved patient satisfaction, efficiency and staff motivation, and reduced length of stay. Pre-RRP, 15 per cent of patients went home within 5 days; post RRP, 25 per cent of patients went home within 3 days (mean LOS 4.98) In addition, the trust attracted more patients from outside its catchment area. Financial savings are estimated at £223,300, taking into account reduced medical costs, higher turnover (annual surgical activity increased from 326 to 625 cases, increasing revenue by approx £511,000), and reduced waiting lists.

Go to www.dh.gov.uk/enhancedrecovery to see full version.

The benefits of enhanced recovery

Where enhanced recovery is embedded, sites report significantly improved:

- patient experience
- clinical outcomes, and
- multi-disciplinary team working.

The enhanced recovery pathway can also lead to a significant reduction in length of stay and potentially shorter waiting times. This will also result in a reduced risk of hospital acquired infections,³ increasing patients' confidence in the organisation.

Reported benefits of enhanced recovery



3 Delgado-Rodriguez M, Bueno-Cavanillas A, Lopez-Gigosos R et al. Hospital stay length as an effect modifier of other risk factors for nosocomial infections. Eur J Epidemiol 1990; 6: 34-9

4 Better Care Better Value Indicates – www.productivity.nhs.uk

Releasing bed capacity

If enhanced recovery was implemented nationally in colorectal, gynaecology, urology and musculoskeletal surgical specialties, bed day savings of between 140,000 to 200,000 could potentially be made.

The potential impact is based on improvement in elective lengths of stay across most providers to a level already achieved by other trusts. The level may be defined as the length of stay for each procedure group for which 10% or 20% of providers currently have a similar or lower average length of stay.

The potential bed day saving excludes a minority of providers with the longest lengths of stay, which may not be able to achieve such reductions due to local factors such as high underlying levels of comorbidities, or socio-economic factors.

Impact of potential improvements in length of stay assessed using 2008-09 HES data

Procedure group	Current mean LOS	Current median LOS	No. major providers	Total no. patients	Potential mean LOS (1)	Potential mean LOS (2)	Potential median LOS (3)	Potential bed days saved (4)
Colectomy	10.2	8	152	10,300	7.9	8.4	6	17,900
Excision of rectum	12.4	9	148	9,500	9.1	10.0	7	23,600
Primary hip replacement	6.3	5	157	55,100	5.1	5.6	4	58,900
Primary knee replacement	6.1	5	156	64,500	5.0	5.5	4	63,200
Bladder resection	16.5	14	56	1,200	12.5	13.7	11	4,000
Prostatectomy	4.7	4	71	3,000	3.1	3.6	2	3,800
Hysterectomy	4.3	4	153	36,500	3.1	3.5	3	34,800
								206,200

(1) Ten per cent of providers currently have this LOS or better.

(2) Twenty per cent of providers currently have this LOS or better.

(3) Ten per cent of providers currently have this median LOS or better.

(4) Based on improvement of the majority of providers to potential mean LOS (1).

Just think, what might the potential bed day savings be in your trust and how could you use the released capacity? For example, **North West London Hospitals NHS Trust** reduced its length of stay for colorectal surgery patients after implementing enhanced recovery and used released bed capacity to create a dining area for patients. This encouraged mobility and improved patient experience.

The enhanced recovery pathway

Enhanced recovery needs a local health community approach. The pathway starts in primary care with the GP referral to the specialist and continues through to follow-up of the patient at home after discharge from hospital. Some teams have chosen to adapt existing surgical pathways or protocols, where they exist.

Experienced clinicians reached a consensus (at a national event in June 2009) on the essential elements for an enhanced recovery pathway, some of which need to be adapted according to the specialty. These are listed within the pathway stages over the page.

Prior to starting on the enhanced recovery pathway, it is important that the patient has made the decision to have surgery and understands all the options, including non-operative, available. Managing the patient's expectations and informed decision-making⁵ needs to start in primary care. The GP can help to support the patient in making the right decision on whether or not to proceed with surgery.

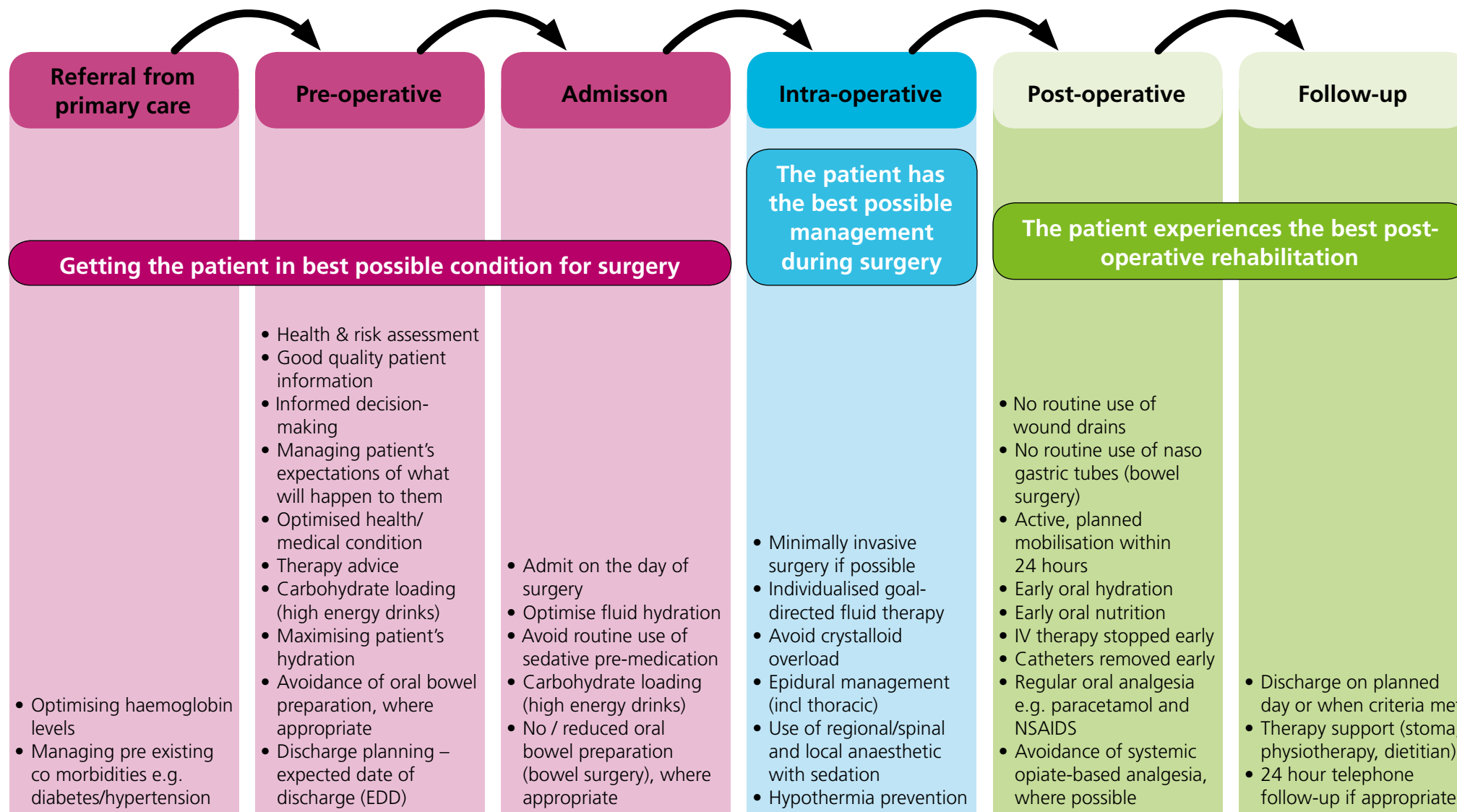
Age is no barrier

Patients should not be ruled out of an enhanced recovery programme because of age. Annie, an 80 year old lady, underwent a bowel resection and was managed according to the **Scarborough and North East Yorkshire Healthcare NHS Trust's** enhanced recovery programme. By day 2 after surgery, all tubes (epidural, IV access and catheter) had been removed, she was walking independently by day 3, and was discharged home (self-caring) on the morning of day 5. Telephone contact the following week confirmed she was well; she was discharged following a review in-clinic six weeks later. Go to **www.dh.gov.uk/enhancedrecovery** to see full version.

⁵ www.informeddecisionmaking.org.uk

The enhanced recovery pathway

Active patient involvement



Whole team involvement

Getting the patient in the best possible condition for surgery

Managing patients' expectations

This is particularly challenging, but crucial in achieving success and is a major factor in determining patient satisfaction.

Explore the patient's preconceived ideas about care, and then present them with a consistent but flexible plan of care. Patients need certainty but also need to feel that their care is individualised.

Knowledge about the evidence base for enhanced recovery needs to be conveyed to the patients with enthusiasm and belief by the health care professional. This should be communicated on a basis of a two-way healthcare professional/patient relationship based on mutual trust and respect.

When a patient has a full understanding of what to expect and what is expected of them they are more likely to feel as if they are entering into a 'contract of care'.

Once patients fully understand the procedures and when certain elements of care will and should be happening, they can become a key partner in driving the pace and quality of care delivered.

A partnership between clinician and patient involving open, honest communication and the timely provision of good quality information is essential to enhanced recovery.

Ensure the patient not only has the information but also understands it, including their choices.

Patient access to a variety of information or decision aids is key.

Relevant pre-operative education ensures fully informed patients who are able to participate in their own recovery.

This includes preparation for post-operative changes such as joint replacement school and stoma care education.

Decision-making

Informed decision-making (IDM) is a process which helps the patient to be fully informed about the potential benefits, risks, alternatives and recovery paths of treatment options. The patient participates in decision-making at a level they are comfortable with and that is consistent with their own preferences and values.

Being fully informed will help the patient to decide whether or not to undergo surgery based on a good understanding of the risks and benefits of surgery and other non-surgical treatment options. If the patient does decide to proceed with a surgical treatment option it will help them have more realistic expectations.

Patient feedback

Colchester University Hospital NHS Foundation

Trust has conducted two surveys to assess the effectiveness of its enhanced recovery programme, put in place by the gastrointestinal surgical team. Feedback from these surveys suggests a significantly improved patient experience. 'Every conceivable situation relating to my operation and subsequent treatment was explained in full detail,' said one patient of the pre-admission clinic. Another said of the process: 'If I have to undergo surgery again in the future I now feel that I would worry a lot less as it wasn't bad after all.' Go to www.dh.gov.uk/enhancedrecovery to see questionnaire

Shared decision-making (SDM) develops IDM further in that it is a process where the clinician and the patient share information. The clinician helps to support the patient to be fully informed taking into account not only the patient's clinical need but also actively considers their values and preferences, which will enable the patient to decide the form of treatment they wish to undertake, be it surgery or more conservative measures.

SDM has been shown to improve experience and satisfaction through more realistic expectations and also to ensure decisions match individual values and preferences.

International evidence shows that shared decision-making reduces the up-take of discretionary surgery (surgery where there is a clear choice of alternative treatment).⁶

A variety of decision aids can be used as appropriate for the patient, for example, written materials, verbal, DVDs.

Implementing the Good Practice in Consent Implementation Guide: Consent to Examination or Treatment will help to ensure patients are fully informed about the planned procedure.⁷

Pre/referral from primary care

For patients to achieve the best results from enhanced recovery, it is vital that assessment and preparation of the patient referred for possible elective surgery starts in primary care, bringing care closer to home.⁸

The GP can play a major part by performing a 'fit for list' health screening prior to referral to identify causes of increased morbidity – such as anaemia, sub-optimal diabetic control, hypertension, reduced renal function, obesity,

smoking and general low levels of physical fitness. Based on these results, the GP will either continue with the referral or instigate management plans to optimise the patient's condition.

The GP can play a role in encouraging self-management through the appropriate diet and exercise while awaiting the hospital appointment and, if appropriate, referring the patient onto primary care based-programmes such as smoking cessation, weight reduction and/or exercise programmes. This is important as identifying and treating or optimising a patient's condition may take a number of weeks.

As soon as surgery becomes a definite option, further elements of preparation can take place and a pre-operative assessment should be performed immediately in the specialist setting.

Optimising a patient's condition

Example 1: anaemia

It is now recognised that correcting even minor degrees of anaemia (Hb <12g/l in females, <13g/l in males) significantly reduces the need for transfusion and the resultant increase in morbidity and mortality following major surgery. It is essential that the clinical team (primary and secondary care) are aware of these thresholds and treat accordingly.^{9 10 11}

Example 2: diabetes¹²

Patients who have diabetes are a high-risk group for surgery with the likelihood of increased late cancellation at pre-operative assessment or upon admission as well as increased length of stay, morbidity, mortality, use of HDU/ITU, and re-admissions. Reducing these risks by improving control of diabetes, and blood pressure and cholesterol, is known to improve outcomes and help to ensure diabetic patients can benefit from enhanced recovery pathways.

6 <http://www.cochrane.org/reviews/en/ab001431.html>

7 www.dh.gov.uk/consent

8 http://www.dh.gov.uk/en/Healthcare/Primarycare/Practitionerswithspecialinterests/DH_074419

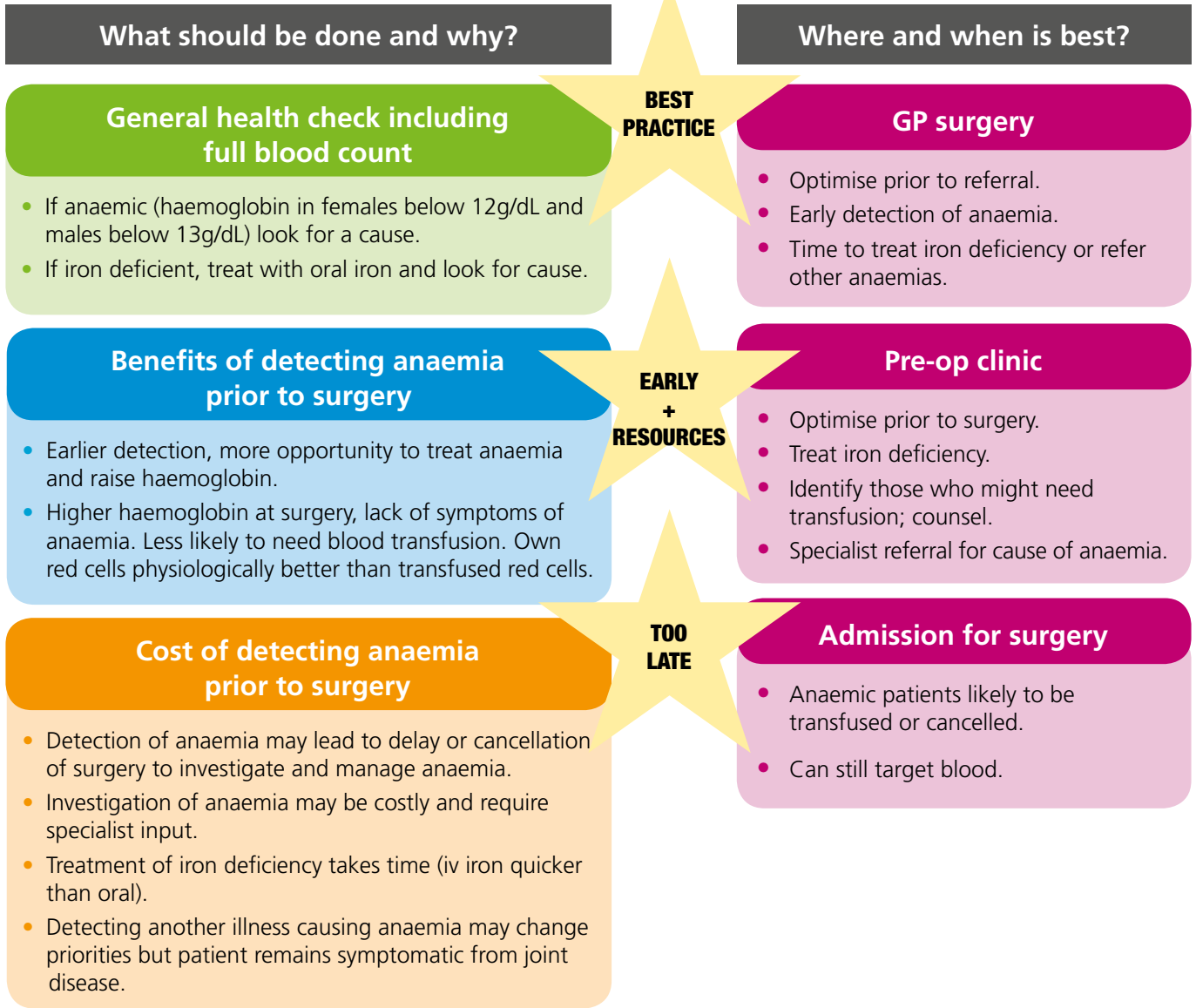
9 http://hospital.blood.co.uk/library/pdf/INF_PCS_HL_011_01_Iron_leaflet.pdf

10 <http://www.transfusinguidelines.org.uk/>

11 <http://www.nhs.uk/Conditions/Anaemia-iron-deficiency-/Pages/MapofMedicinepage.aspx>

12 UKPDS UK prospective diabetes study, DCCT (Diabetes Control and Complications Trial)
http://www.dtu.ox.ac.uk/index.php?maindoc=ukpds_trial/faq.php

Optimising patients with anaemia prior to surgery



Pre-habilitation
 A 'pre-habilitation' model to improve the patient's diabetes control prior to surgery was developed at **Worthing Hospital, Western Sussex Hospital NHS Trust**.

- A pre-habilitation plan can start in primary care in conjunction with a specialist team, following a diabetic review, and includes practical lifestyle advice and education with clear goals to improve their post-operative outcomes.
- The focus of this advice would be on patients increasing their activity and, if they are obese, losing weight.

Identifying peri-operative risk

It is possible by using simple tools (like South Devon Healthcare NHS Trust on page 16) to give a patient an estimate of their individualised risk for hip or knee replacement surgery based on knowledge of the patient's past medical history. The only additional test needed is a serum creatinine.

Knowing this risk peri-operatively may help the GP support patient choice – for example, if a patient is a high risk, the GP will not want to refer the patient to a facility without HDU or ITU support.

Other areas that can be addressed in primary care include support for the patient in decision making (as described on pages 11-12) and early screening for social problems/needs prior to admission that may cause delays in post-operative discharge.

Using a simple risk-based tool, such as the Risk Assessment and Prediction Tool (RAPT), it is possible to identify those at highest risk of delayed discharge due to the need for extended post-operative rehabilitation. The tool was validated on hip and knee arthroplasty surgery patients, but may be valid across elective surgery.¹³

Pre-operative assessment and preparation^{14 15 16}

All patients undergoing elective surgery should undergo pre-operative assessment. Ideally, this should be carried out on the same day the decision for surgery is made and a date for admission agreed with the patient.

A coherent pre-operative service is fundamental to delivery of enhanced recovery, and the patient's pre-operative assessment appointment

plays an extremely important role in how they will understand, consider and ultimately participate in the enhanced recovery pathway.

The structure for the pre-operative assessment service should be designed to provide both a generic and procedure-specific service.

Ideally, the location and physical place of pre-operative assessment will be convenient for the patient and will appropriately accommodate all relevant assessments from the wider multi-disciplinary team in addition to the pre-operative assessment staff.

Patients should have access to all the necessary information and be involved in the decision-making and informed consent process.

The "traffic light" tool (see page 16) triage system is an example of a tool that can be used to determine who should conduct the pre-operative preparation process and the level of a patient's risk of mortality and morbidity following surgery. It is based on the peri-operative risks for patients undergoing hip and knee replacement procedures.

Clinical assessment and treatment service

An Orthopaedic Clinical Assessment and Treatment Service (CATS) is established at **Bolton PCT**. The function of CATS is to assess and plan treatment for any patient with an orthopaedic condition. Patients are referred from the GP into the Primary Care Service, where they are seen by an advanced orthopaedic practitioner, consultant physiotherapist or consultant surgeon employed by the PCT. If a surgical opinion is required, the clinical assessment nurse will carry out a patient assessment to identify health issues which could delay or prevent surgery at secondary care.

Audit has demonstrated that of the 158 patients assessed per month (on average), 9 patients (5.6%) were referred back to their GP for modifiable health conditions (e.g. hypertension, cardiology investigations, obesity) and 8 patients (5.1%) were treated by CATS staff (e.g. for UTI, MRSA positive); this means that 10.7% of patients would have encountered health issues at presentation in secondary care.

Moving this assessment forward in the pathway to primary care could have significant benefits for the delivery of 18 Weeks and enhancing patient recovery for all orthopaedic surgical procedures.

Furthermore, by applying additional enhanced recovery strategies at this stage – such as haemoglobin correction and carbohydrate loading – the outcomes of major orthopaedic operations could be significantly improved. Go to www.dh.gov.uk/enhancedrecovery to see full version.

13 Predicting Risk of Extended Inpatient Rehabilitation after hip or knee arthroplasty. Leonie B. et al. The Journal of Arthroplasty Vol 18 No 2 2003 p775

14 <http://www.aagbi.org/publications/guidelines/docs/preoperativeass01.pdf>

15 http://www.transfusionguidelines.org.uk/docs/pdfs/rct-wmids_edu_anaemia_guide_preop_07_11.pdf

16 National Good Practice Guidance on Pre-operative Assessment for Inpatient and Day Case Surgery: <http://www.nodelaysachiever.nhs.uk/NR/rdonlyres/809B107E-A78C-4556-8619-EA283903D218/O/R90024Preoperativeassessmentguidanceforinpatients.com>

Triage for pre-operative assessment – elective hip and knee replacement

Preoperative assessment: Triage			
Risk	1	2	3
Age	<78	78–82	>82
IHD		Angina (no MI)	MI/NSTEMI
Heart failure			Heart failure
Creatinine	<90 µmol/L	91-149 µmol/L	>150 µmol/L
TIA/stroke		One TIA	Two TIAs or one stroke
Diabetes		NIDDM	IDDM
Short of breath		SOB	
Confusion		Confusion	
CABG or Stents		CABG or Stents	
PE		PE	
Previous problem		Previous problem	
Malignancy		Malignancy	
Patient request		Patient request	
Worried		Worried	
Falls		Falls	
Revision surgery		Revision surgery	
Bilateral surgery		Bilateral surgery	
Assessment by	Nurse	Nurse + Anaesthetist	Anaesthetist – CPX

Creatinine Look for current and previous blood results. If raised in past use highest measurement

TIA/CVA Transient ischaemic attack or cerebrovascular accident

Diabetes Consider duration of diabetes, control of blood sugar and other organ damage

Short of breath Shortness at breath at rest or minimal exercise

Confusion Currently confused or history of confusion or dementia

Previous problem During previous admission that may recur

Worried Any concern that needs discussion

CPX Cardiopulmonary exercise

Source: South Devon Healthcare NHS Trust – model based on the peri-operative risk for elective hip and knee replacement

The assessment outcome is:

- **Green:** risk of mortality less than 1:200, risk of serious morbidity less than 1:100 with no need for HDU facility for elective surgery
- **Orange:** risk or mortality 1:200 and serious morbidity 1:100
- **Red:** risk of mortality 1:100 and serious morbidity 1:50
- **Orange and red:** potentially need HDU facilities post operatively

The pre-operative assessment should be performed by trained and competent pre-operative assessors who should be able to order and perform basic investigations and make referrals according to guidelines agreed locally by anaesthetists.¹⁷

Objective assessment of functional (or exercise) capacity using cardiopulmonary exercise testing

(CPET) is increasingly being used to assess peri-operative risk.¹⁸ There is most experience in the area of colorectal surgery.

Gathering information and ordering tests is the simplest part of the process; decision-making after the findings and addressing the detail of organisation of the admission is much more difficult. The pre-operative assessment pathway should ensure speedy access to a consultant anaesthetist or the appropriate health care professional to review findings and expedite a management plan in order to optimise the patient's condition.

At **Heart of England NHS Foundation Trust** relatives/carers are invited to attend the elective orthopaedic pre admission information sessions with the patient in order to support the patient and reinforce the messages from the session later. This approach is valued by the patient, carer and physiotherapist. www.dh.gov.uk/enhancedrecovery to see full version.

17 BVSMurthy. Improving the Patient's Journey: The role of pre-operative assessment team. The Royal College of Anaesthetists, Bulletin May 2006, 37: 1885-1887 <http://www.rcoa.ac.uk/docs/Bulletin37.pdf>

18 Smith TB et al. Cardiopulmonary exercise testing as a risk assessment method in non cardiopulmonary surgery: a systematic review. Anaesthesia. 2009. Aug; 64(8): 883-93.

Further pre-operative preparation

Joint schools have been set up in a number of organisations to improve the pathway for patients undergoing total hip and knee replacements. These typically consist of a group session with other patients, although individual one to one sessions with a “coach” may also be included. The patient will be talked through the pathway and the different aspects described by the nurse, physiotherapist, occupational therapist, surgeon and/or anaesthetist.

Patients get the opportunity to see and hold a replacement joint, are shown the exercises they will need to carry out and how to mobilise with their new joint post-operatively with a full explanation of the importance of mobility to recovery.

Attendance at joint school has proved to be very popular with patients in enabling them to get the most out of their post-operative recovery. Feedback about the joint school at **Wrexham Maelor Hospital, North Wales NHS Trust** includes reference to a ‘truly excellent’ service. One patient said: ‘The NHS talks about empowering patients, but the joint school involved me in my care to a far greater degree than any previous operations at WMH.’ Go to www.dh.gov.uk/enhancedrecovery to see full version.

Admission

Day of surgery admission

Admitting 95% of colorectal cases on the day of surgery has been an integral part of **Colchester Hospital University Trust's** success in enhanced recovery. Crucial to this is a watertight pre-operative assessment, which includes giving the patient information to take home and beginning the consent process. The patient is admitted to the elective care centre, rather than the ward where they will recover, and is transferred to theatre from this area. The elective care centre was set up to allow patients to be admitted early in the day when normally the ward beds would not yet be vacated, giving the bed managers time to identify and allocate a ward bed without holding up the patient's surgery. Following surgery, the patient may stay in extended recovery for two to four hours prior to transfer to the ward bed. To ensure a smooth functioning process is in place sign-up from hospital matrons and bed managers is essential. Go to www.dh.gov.uk/enhancedrecovery to see full version.

Day of surgery admission

Unless contraindicated, patients should be admitted on the day of surgery. This relies on having a watertight pre-operative assessment service.

A robust bed management process will help ensure a stress-free admission on the day for patients and staff – for example, some organisations utilise an admissions lounge, and where a patient is physically able to, they should walk to theatre.

Sedative pre-medication

Avoid routine use of pre-medication.

Nutrition

Efforts can be made to reduce the length of the ‘nil-by-mouth’ period.

Patients are generally encouraged to eat normally up until six hours before the operation.

Clear oral fluids should be allowed until two hours before surgery.

Use carbohydrate (CHO) loading¹⁹ – this is the use of specially formulated oral fluids (complex carbohydrates) that are rapidly emptied from the stomach as they have a relatively low osmolality. CHO loading has been shown to reduce patient anxiety, improve hydration, reduce the body's resistance to insulin and inflammatory response and improve outcome from surgery.

A suitable carbohydrate drink may be given 12 hours prior to surgery and up to two hours before going to the operating theatre, provided gastric emptying is not impaired.

Avoid bowel preparation (where relevant)²⁰

There is less risk of dehydration in colorectal and urological surgery when oral bowel preparation is not routinely used, and it also means that patients can normally eat on the day before the operation.

19 Noblett, S.E., et al., *Pre-operative oral carbohydrate loading in colorectal surgery: a randomized controlled trial*. *Colorectal Dis*, 2006. 8(7): p. 563-9.

20 Jung B, Pahlman L, Nyström P-O et al (2007) Mechanical bowel preparation study group. Multicentre randomized clinical trial of mechanical bowel preparation in elective colonic resection. *British Journal of Surgery*. 94(6): 689-695

Summary – Getting the patient in the best possible condition for surgery

Pre-referral

Managing the patients' expectations

- ✓ Decision-making

Pre-referral from primary care

- ✓ Optimising a patient's condition
- ✓ Identify peri-operative risk

Pre-operative assessment and preparation

- ✓ Robust pre-operative assessment
- ✓ Pre-operative assessment service

Admission

- ✓ Day of surgery admission
- ✓ Avoidance of pre-medication
- ✓ Nutrition
- ✓ Avoidance of oral bowel preparation where appropriate

Ensuring the patient has the best possible management during their operation

Anaesthetic factors

Individualised goal-directed fluid therapy²¹

When intravenous fluid is given, the benefits of maintaining circulatory filling and organ perfusion must be weighed against the risk of excess fluid accumulation in the lungs causing hypoxia, and, in the gut, causing nausea and delayed return of gut motility (ileus).

When there is not enough fluid in the bloodstream, the stroke volume falls – that is, there is a fall in the volume of blood ejected by the heart each heartbeat.

New monitors (such as the oesophageal Doppler) allow just enough intravenous fluid to be given to maximise the amount of blood ejected by the heart each heartbeat, without giving excess fluid which can accumulate in the tissues and slow recovery from surgery.

In a typical regime enough colloid is given to maintain the stroke volume, but no more. This allows circulatory volume and organ perfusion to be maintained with the minimum of administered fluid, which minimises fluid accumulation in the tissues.

Eight studies have shown that when fluid administration is guided by a Doppler there is a reduction in complications and a typical reduction of two days in the length of stay after major colorectal²², trauma²³, gynaecological and urological surgery²⁴.

Optimising fluid

The use of intra-operative fluid optimisation for major surgery at **Medway NHS Foundation Trust** has been shown to have a positive impact on length of stay. Medway purchased oesophageal Doppler monitors for its 10 inpatient operating theatres, and made flow-directed optimisation mandatory for colorectal surgery (it is encouraged for all other major surgery).

The trust found that patients who have intra-operative fluid optimisation using the oesophageal Doppler go home earlier, tolerate feeding earlier, and have fewer post-operative complications. There was a 3.1 reduction in mean length of stay in this group of patients; this equates to a saving of more than £1,000 per patient. Go to www.dh.gov.uk/enhancedrecovery to see full version.

Use of anaesthetic agents

- Quick offset agents should be used to allow a quick recovery from anaesthesia.
- Use agents with good recovery characteristics.

21 <http://www.technologyadoptionhub.nhs.uk/perioperative-fluid-management.html>

22 Noblett, S.E., et al., Randomized clinical trial assessing the effect of Doppler-optimized fluid management on outcome after elective colorectal resection. *Br J Surg*, 2006. 93(9): p. 1069-76.

23 Venn, R., et al., Randomized controlled trial to investigate influence of the fluid challenge on duration of hospital stay and perioperative morbidity in patients with hip fractures. *Br. J. Anaesth.*, 2002. 88(1): p. 65-71.

24 Gan, T.J., et al., Goal-directed intraoperative fluid administration reduces length of hospital stay after major surgery. *Anesthesiology*, 2002. 97(4): p. 820-6.

Prevent hypothermia

Hypothermia can be prevented by routinely monitoring the patient's temperature in theatre and utilising an air-warming system, along with intravenous fluid warmers, as per NICE guidance.²⁵

Effective opiate sparing analgesia

Analgesia must be effective to allow early mobilisation.

Where possible, regional anaesthetic techniques or nerve blocks should be used and long-acting opiates should be avoided. Regular paracetamol and a non-steroidal anti-inflammatory agent (NSAID) will reduce opiate requirements.

In open abdominal surgery, epidural analgesia can provide optimal post-operative analgesia, providing there are no contraindications to it. Ideally, the epidural should be sited in the thoracic region of the spine maximising pain relief to the abdominal area.

The use of Transversus Abdominus Plane (TAP) blocks is increasingly popular, particularly with laparoscopic surgery.

If regional analgesia cannot be instigated the alternative of patient controlled analgesia (PCA) using intravenous morphine with a combination analgesia regime, for example paracetamol and ibuprofen (if not contraindicated), can be very effective and leads to less morphine usage than "as required" opioids by other routes

Minimising the risk of post-operative nausea and vomiting (PONV)

- Avoid use of nitrous oxide.
- Consider the use of intra-operative anti-emetics, as appropriate.
- Appropriate first-line and "as required" anti-emetics should be prescribed routinely, so they can be given at the first indication of symptoms.

Surgical factors

Surgical technique

Where possible, carry out minimally invasive surgery with meticulous technique. This reduces the surgical trauma on the patients, thereby aiding a faster recovery.

Transverse incisions are favoured by some surgeons, and in some conditions for those patients undergoing open surgery, as this approach causes less pain and also achieves a good cosmetic result.

Urological surgery – in cystectomy, incision length is minimised and exenterative steps are performed with extra-peritoneal approach. A laparoscopic approach can also be used for suitable cases.

Gynaecological surgery – Laparoscopic surgery can be carried out for all cases if appropriate. Where open surgery is necessary transverse incisions are the norm for most procedures except for ovarian cancer, suspected ovarian cancer and difficult surgery where wider access is needed and therefore mid-line incisions are used. The length of the incision depends upon size of the mass and the extent of the disease, which may often result in the incision being made up to the xiphisternum.²⁶

Orthopaedic surgery – the use of low morbidity incisions, separating rather than cutting and detaching muscles is advised. The use of minimal access incisions is not advocated to the detriment of prosthetic placement which is crucial to long-term prosthetic survival and function.

Laparoscopic surgery

Laparoscopic surgical techniques have developed and continue to advance in colorectal, urological and gynaecological surgery. This is particularly relevant in colorectal cancer surgery, with the drive by NICE (2006)²⁷ that recommends laparoscopic resections as an alternative to open resection for suitable individuals with colorectal cancer.

25 National Institute for Health and Clinical Excellence, Inadvertent perioperative hypothermia, The management of inadvertent perioperative hypothermia in adults

26 EORTC–GCG process quality indicators for ovarian cancer surgery, L. Verleyea,*, P.B. Ottevangerb, W. van der Graafb, N.S. Reedc, I. Vergoted, on behalf of the Gynaecological Cancer Group (GCG) of the European Organisation for Research and Treatment of Cancer (EORTC) EUROPEAN JOURNAL OF CANCER 45 (2009) 517–526

27 <http://guidance.nice.org.uk/TA105>

To accelerate the adoption of this technique, The National Training Programme for Laparoscopic Colorectal surgery (LAPCO)²⁸ has been developed. Surgical robots may contribute to further development of laparoscopic technique in the future.

Laparoscopy has the benefit of smaller incisions and less surgical trauma. Patients undergoing laparoscopic surgery are known to develop fewer complications, have shorter hospital stays and return to normal activities sooner than those undergoing open surgery, without an enhanced recovery programme. The principles of laparoscopic surgery require meticulous demonstration of anatomical structures and planes, rendering most operations relatively bloodless, minimising the trauma to the patient.

Minimise complications

To help prevent wound infection, antibiotics should be given 60 minutes or less before 'knife to skin' as per the WHO Safer Surgery checklist.²⁹

Minimise the use of drains³⁰

Drains have not been shown to reduce complications and can actually cause problems such as infection; consequently, many surgeons recommend minimising their use.

Some surgeons believe that there may be occasional clinical indications for using drains, such as in colorectal surgery for a total mesorectal excision.

Specific urological operations may require the use of drains for example, cystectomy and prostatectomy; following cystectomy, these drains will be removed between 24 and 48 hours, or on day one following prostatectomy.

Minimise the use of nasogastric tubes in abdominal surgery

Nasogastric tubes delay gastric emptying and trigger nausea and vomiting, thus should be removed at the end of surgery unless there is a specific reason to keep them in.³¹

Along with drains and other devices, nasogastric tubes can affect a patient's ability to mobilise easily and can, therefore, raise a psychological barrier to patients' active participation in their rehabilitation. Their use should be dictated by clinical need rather than as routine.³²

Remember...

To implement enhanced recovery it is essential that a local pathway is agreed and standardised between the surgeons, anaesthetists and pain team in a way that reflects local skills and practicalities.

This standardisation allows predictable patient pathways to be implemented, for example, mobilisation at a particular time post-operatively.

A standardised agreed pathway facilitates the essential audit process, which supports efforts to increase compliance, and enable innovations to be evaluated systematically to see if they further improve analgesia.

28 <http://www.lapco.nhs.uk/>

29 National Patient Safety Agency, WHO Safety Surgical Checklist 2009

30 Karliczek A, Jesus EC, Matos D et al (2006) Drainage or nondrainage in elective colorectal anastomosis: a systematic review and meta-analysis. *Colorectal Disease*. 8(4): 259-265

31 Nelson, R., S. Edwards, and B. Tse, Prophylactic nasogastric decompression after abdominal surgery. *Cochrane Database Syst Rev*, 2007(3): p. CD004929.

32 The Surgeons' Lounge: No Pain, No Need for Hospitalization? Major surgical procedures require hospitalization as a routine part of postoperative care.

Ensuring the patient has the best possible management during their operation – summary

Anaesthetic factors

- ✓ Individualised goal-directed fluid therapy
- ✓ Use of anaesthetic agents
- ✓ Prevent hypothermia
- ✓ Effective opiate-sparing analgesia
- ✓ Minimise the risk of post-operative nausea and vomiting

Surgical factors

- ✓ Surgical techniques
- ✓ Laparoscopic surgery
- ✓ Minimise complications
- ✓ Minimise the use of drains
- ✓ Minimise use of nasogastric tubes in abdominal surgery

Ensuring the patient has the best post-operative rehabilitation

The aim of post-operative rehabilitation in enhanced recovery is to ensure the recovery period is optimised and that the patient remains empowered to follow the care plan defined pre-operatively.

Less time in HDU

Colchester Hospital University Trust's enhanced recovery programme includes day of surgery admission for all patients undergoing laparoscopic colorectal surgery and implementation of extended recovery where patients could stay for two to four hours prior to transferring to the ward. This innovation can remove the need to transfer patients to the high dependency unit (HDU). Colchester more than halved the number of patients transferred to HDU from 73 (2005–06) to 32 (2007–08).

Early nutrition

Patients are encouraged to commence drinking as soon as possible after surgery and build up to a full diet progressively as soon as tolerated.³³

For some patients, such as following cystectomy, this may be delayed until the first post-operative day, if the patient is able.

To provide further nutrition in the immediate post-operative period, two or three energy drinks are encouraged daily.

The creation of an eating area on the ward where patients can eat at a table with others is very helpful.

Early rehabilitation

Optimum management pre and intra-operatively will eliminate a number of barriers to early mobilisation and self-care such as pain, nausea and vomiting. Encouragement and reminding the patient of pre-determined goals are key to assisting the patient's independence.

To help prevent complications such as a deep vein thrombosis or chest infection, and to promote gut function, patients are encouraged to mobilise after surgery. This approach is much earlier than with traditional care.

To enable mobilisation, adequate analgesia is necessary. A combination regime as described (p.19) is preferred and, for the first 24-48 hours either a thoracic epidural, spinal or PCA route. Mobile delivery systems are helpful.

A number of advantages of using spinal analgesia have been highlighted. These include lower insertion failure rate and lower rate of complications and patients mobility is not limited the following morning.

The plan for mobilisation depends upon the nature of the surgery and the condition of the patient, and expectations are fully discussed with the patient pre-operatively.

Patients are also encouraged to dress in their usual clothes and to mobilise to the dining room (if available) for meals.

³³ Lewis, S.J., H.K. Andersen, and S. Thomas, Early enteral nutrition within 24 h of intestinal surgery versus later commencement of feeding: a systematic review and meta-analysis. *J Gastrointest Surg*, 2009. 13(3): p. 569-75.

Catheters

To assist mobilisation and help reduce the risk of a urinary tract infection, urinary catheters are removed as early as possible after surgery. This will vary dependent on patient need and the type of surgery carried out.

Post-operative training and support

Proactive training in stoma care is required to facilitate early discharge with confidence.

Discharge

The expected length of stay will have been discussed at the pre-operative assessment appointment and, if the date of surgery is known, a planned discharge date should also be known.

Discharge planning at pre-operative assessment will highlight any specific needs that can then be proactively planned and managed to avoid unnecessary delays in discharge.

This enables the patient to plan for going home. It is important that there is an agreed patient-focused discharge criteria, that patients are discharged when it is appropriate and that the patient shares in the decision.

Specialty	When to remove catheter
Colorectal <ul style="list-style-type: none"> Colonic surgery Rectal surgery 	Day 1 Day 2 or 3
Gynaecology – catheters commonly used <ul style="list-style-type: none"> Inpatient laparoscopic surgery Epidural insitu 	Day 1 Following removal of epidural
Urology <ul style="list-style-type: none"> Radical prostatectomy Bladder reconstruction 	} Patients go home with catheter insitu. } Community care required
Orthopaedics – catheters not routinely used	If used, remove catheter as soon as clinically possible

Examples of typical expectations for mobilisation in abdominal surgery and orthopaedic surgery

Abdominal surgery (St Mark’s Hospital, North West London Hospitals NHS Trust)

Day 0

Assisted out of bed, encouraged to sit in the chair for up to two hours once sufficiently awake and comfortable.

Day 1 to discharge

- Sit in a chair for six hours, interspersed by rests on the bed or walking.
- Walk 60 metres four times per day – the first walk is usually supervised by a physiotherapist, rehabilitation assistant or nurse (may be more dependent upon patient’s condition).

Total knee replacement (Hillingdon Hospital NHS Trust)

Day 0

Nurse-assisted exercises in recovery.

Day 1

Practice exercises with physiotherapist and by self. Sit out and walk with physiotherapist.

Day 2 to discharge (usually day 3)

Practice exercise by self, increase walking distance – with appropriate walking aids.

See also³⁴

34 Focus on Primary Hip and Knee Replacement www.institute.nhs.uk/hipandknee

Patients are encouraged to participate in their care and to enable the planned discharge to go ahead. Criteria may vary slightly between hospital sites but, in general, it is expected that patients would:

- be able to tolerate diet and oral fluids
- be able to mobilise
- have pain adequately controlled on oral analgesia
- have bowels functioning or flatus passed
- be confident and agree to go home.

Follow-up

It is important to consider who needs to be informed prior to discharge including the GP, district and community nurses.

Ensure primary care colleagues are aware of how to fast track patients into hospital, if necessary, or who to contact for advice and guidance.

Centres vary in their follow-up advice and support. For example, a 24-hour helpline staffed by ward nurses may be set up. Other centres may offer phone calls to patients at one, three or seven days post-discharge.

Early discharge from hospital means that continuing care, education and support, where needed, must be seamless to maintain patient confidence. For example, a patient with a new stoma may still need support from the stoma therapist.

Telephone follow-up

Establishing an enhanced recovery programme in colorectal surgery resulted in improved patient experience at **Guy's and St Thomas' NHS Foundation Trust**. A small 30 patient study was undertaken to see if patients found the post-discharge phone calls useful; of 21 responses, 17 thought the calls were useful. 17 said that if the enhanced recovery nurse had not called them, they would have called her. When asked 'If you did not feel daily calls were necessary, how often do you feel the calls should have been?', 11 responded calls should be daily for the first week only. Only one patient thought no calls were necessary. Go to www.dh.gov.uk/enhancedrecovery to see full version.

Ensuring the patient has the best post-operative rehabilitation – summary

- ✓ Early nutrition
- ✓ Early mobilisation
- ✓ Removal of catheters as soon as possible following surgery
- ✓ Post-operative training and support
- ✓ Early planned discharge
- ✓ Follow-up advice and support

How do you implement an enhanced recovery pathway?

Key questions and areas to be addressed when implementing enhanced recovery are presented in this section.

Making the decision to adopt enhanced recovery will challenge current traditional practice for all members of the multi-disciplinary team across the whole local health community from primary care through to post-discharge. Integral to this will be the development of joined-up working, bringing together all disciplines to work as one team across the whole enhanced recovery pathway.

Learning from enhanced recovery sites have reported a number of success factors that helped to ensure successful implementation in their organisation. These include:

Critical success factors

- Executive and clinical champions and leaders
- Surgeon, anaesthetist, nurse, executive management and primary care are essential
- Patients must be partners in their care
- Consensus-building during introduction of the programme
- Continual, rolling education of ward staff, junior doctors and other members of the MDT
- Value of feedback to clinical team; will help improving enhanced recovery uptake
- Confidence of healthcare professionals in enhanced recovery
- Testing on a small scale
- Enhanced recovery will fail without team work
- Effective transfers of care requires collaboration with social services, ambulance services and primary care
- Measurement and audit are essential

Barriers to successful implementation

- Managerial team not seeing this as a priority
- Failures of communication and/or consensus building
- Can be challenging getting 'late adopters' on board
- Changing ward protocols
- Extra physiotherapy session had impact on other non-orthopaedic sessions in the gym
- Compliance to protocols/completing documentation
- May be seen as length of stay initiatives
- Ward staff lacking confidence in early feeding and removal of urinary catheter on day one

Key questions to consider prior to implementation of enhanced recovery

Below are some questions with suggested areas for consideration. Links are provided to a wealth of supporting literature; guidance, tools and techniques and case studies.^{35 36} Collective experience to date in the UK has resulted in practical learning with a wide range of critical success factors and barriers to successful implementation and many of these have been highlighted here.

1 Stakeholder analysis³⁷

Q. Do you know who your stakeholders are?

Identify all your stakeholders:

- This includes clinical and non-clinical staff, executive, operational and administrative staff. Consider not only those involved directly in patient care, but also those who will need to support and make the changes.
- As **Mr Steve Atkinson of Gateshead Health NHS Foundation Trust** said: “It is crucial to get buy-in from ALL stakeholders; any one component missed out and the programme would fail”.

Clinical

Think widely and go outside your immediate team: who is involved along the patient pathway?

Consider the whole pathway, including primary care, surgeon, anaesthetist, pre-operative assessment, ward nurse, physiotherapist, stoma nurse, dietician, pharmacist, GP, community teams, patient representation and commissioner.

Executive

The executive sponsor is needed to provide organisational drive.

The sponsor and champion for enhanced recovery will influence both internal and external stakeholders to give formal backing to your programme.

An executive sponsor is essential to the successful delivery of the programme.

Consider the implications for development – short and longer term.

By reducing LoS, throughput can be improved and therefore either undertake more activity or release staff, facilities for other procedures/utilisation.

35 http://www.institute.nhs.uk/option,com_quality_and_service_improvement_tools/Itemid,5015.html

36 http://www.institute.nhs.uk/building_capability/building_improvement_capability/improvement_leaders'_general_improvement_skills.html

37 http://www.institute.nhs.uk/index.php?option=com_joomcart&Itemid=194&main_page=document_product_info&products_id=290

Operational

Includes service and general managers who will need to provide support for changes to patient pathways. Consider the impact on budgets, and changes to where budget is used.

Managerial teams need to influence other managers outside their control and outside their organisation.

Managerial teams can ensure the agenda is aligned with local and national priorities such as quality, productivity, patient safety and patient experience.

Patients

Patient/user involvement can provide valuable direction to ensure suitability and compliance with pathways. It can help with pathways and ensure the pathway is truly patient-focused. To ensure continued involvement of patients, have a user representative on your implementation team.

At **Wirral University Teaching Hospital NHS Foundation Trust**, **Sr Wendy Lewis** held a patient party and invited former patients to debate what should be included in the enhanced recovery pathway.

Involvement of patients and users is growing. Experience Based Design (EBD)³⁸ is a model which enables patients to be involved in the actual design of services leading to real patient-focused pathways. The delivery of these pathways has benefits for the patients – they feel safer, happier and more valued – and for the staff, who feel more positive, rewarded and empowered.

External

Consider who else needs to be part of the local health community team, for example:

- health and social care partnership, ambulance services are critical in ensuring timely discharge as planned
- commissioners need to understand enhanced recovery and the benefits and risks of implementation
- a Cancer network who can provide service improvement support and influence the wider network to implement enhanced recovery; Cancer networks can also play a role in influencing commissioners to include support for enhanced recovery in commissioning plans
- Strategic Health Authorities can also be a good source of support.

³⁸ NHS Institute for Innovation and Improvement Experience Based Decisions http://www.institute.nhs.uk/quality_and_value/introduction/experience_based_design.html

Q. What is the level of influence and interest of each stakeholder?

Is there a clear, natural leader?

Can you identify your champions?

Use the five-pronged approach: anaesthetist, surgeon, nurse, primary care, executive support. These people are essential in targeting key stakeholders to help garner support and commitment.

Professor John MacFie from Scarborough and North East Yorkshire Healthcare NHS Trust said: "A local 'champion' is vital. Such a person is essential to coordinate the various aspects of enhanced recovery packages from pre-assessment until discharge. For example, at our trust there was an established MDT nutrition team led by a surgeon, which included specialist nutrition nurse, biochemists, intensivists and dieticians. All these individuals 'signed up' to the concept of enhanced recovery, which greatly facilitated its introduction and adoption as routine practice".

Can you identify the team, including consultants, who want to be involved?

Consider who needs to be informed, who can make sure changes will happen, who needs to make the changes?^{39 40 41}

Miss Helen Chave, of Salisbury NHS Foundation Trust said: "It is hard work. If you do not feel fully committed then please do not enter your patients into the pilot!"

2 Stakeholder engagement

Q. What can you do to engage the stakeholders and secure commitment?

- Use champions to engender stakeholder engagement, including surgeon, anaesthetist, lead nurse, executive lead, primary care lead.
- Organise a visit to a centre with recognised expertise.
- Ensure multi-disciplinary team attendance at an appropriate training course or learning event.
- Supporting development of laparoscopic skills.
- Provide evidence of benefits to help gain commitment.
- Consider 'What's in it for me?' (WIFM).
- A clear implementation plan will increase confidence in the programme and enable commitment from all necessary groups.
- Understand what your goals are, what is your vision, what is realistic?
- Have an approach that is not prescriptive. The approach will depend upon current practice in your organisation, for example, Lean methodology, Breakthrough approach.
- You may choose a whole specialty or start smaller with one or two teams.

39 NHS Improvement – Meeting the challenge together... delivering care in the most appropriate setting, supporting delivery http://www.improvement.nhs.uk/cancer/documents/inpatients/Inpatients_Meeting_the_Challenges.pdf

40 NHS Improvement – Leaders Improvement Guides- http://www.institute.nhs.uk/building_capability/building_improvement_capability/improvement_leaders_guides:_general_improvement_skills.html

41 <http://www.library.nhs.uk/Improvement/SearchResults.aspx?catID=14373>

Understand what it may cost but demonstrate the longer-term gains.

Mr Robert Middleton, Consultant Orthopaedic Surgeon, NHS Institute Rapid Improvement Programme, said: “The trusts that made the quickest and best progress have all had engagement by the chief executive, or at least a board level manager. It is key to the success that the senior managers are involved at the very start of the project and their support is required to drive through the necessary changes... success cannot be achieved without clinical engagement and the best results seen are with a manager and clinician working together, empowering a team”.

3 Engaging with Commissioners

Q. Have you met with your commissioners to discuss the benefits of ER and why the PCT should commission your pathway?

Engaging with your commissioners means you will be able to:

- ensure commissioners understand aims and expectations for delivering ER
- develop a shared understanding of their role in the implementation of ER
- build commissioner support for the widespread implementation and rollout of enhanced recovery across your Trust
- ensure a dialogue and closer working to discuss how benefits will be realised without risk to either the provider or the commissioner but with maximum benefit to patients

Q. Can you demonstrate to your commissioner that your pathway provides:

- a high quality service for all patients
- good patient experience e.g. through good pain management
- innovation by using the most up-to-date techniques and technology
- a reduction in excess bed LoS
- a reduction in use of HDU/ITU beds.

The benefits of ER are closely aligned to the World Class Commissioning (WCC)⁴² competencies that have been developed to help PCTs demonstrate better outcomes for patients. ER benefits help support the delivery of the following WCC competencies:

WCC competency 3 – Engage with public and patients.

ER benefits demonstrate:

- empowerment of patients (through patient information, informed decision-making, managing expectations).

⁴² <http://wcc.networks.nhs.uk/competencies>

Improved patient experience by:

- returning to normal sooner after surgery
- improved patient clinical outcomes
- reduced complications thereby reducing HDU/ITU bed use
- reduced LoS which in turn can reduce risk of hospital acquired infections
- a reduction, or no increase, in readmission rates.

WCC competency 4 – Collaborate with clinicians

The ER pathway is clinically led putting clinicians at the forefront of patient care using innovative techniques and technology to improve quality and clinical outcomes thereby reducing complications

Understanding the clinical pathway and it's benefits will help ensure that the most appropriate services are commissioned for the local population.

WCC competency 6 – Prioritise investment

Implementation of ER as a model of care will result in:

- less risk of excess bed days
- good return on investment
- reduced LoS.

WCC competency 8 – Promote improvement and innovation

- ER eliminates variation in the pathway
- utilises the most up-to-date techniques and technology
- is evidence based.

4 Team working

Q. Do you currently have a team that works together to manage patients along the whole current pathway?

If yes, consider – do you really work together as a team, or is it in separate smaller teams working in silos at different parts along the pathway?

Does that team extend across the whole enhanced recovery pathway?

If no – do the stakeholders you have identified extend across the whole enhanced recovery pathway?

Consider how you will develop a team, sharing a common goal and working together to achieve it.

Review whole pathway working examples, developed to help meet the 18 Weeks referral to treatment target, including commissioning pathways.^{43 44} These pathways were developed with

43 <http://www.dh.gov.uk/enhancedrecovery/content.aspx?path=/achieve-and-sustain/Commissioning-pathways>

44 <http://www.dh.gov.uk/enhancedrecovery/Content.aspx?path=/achieve-and-sustain/Specialty-focussed-areas/Orthopaedics/pathways>

health professionals across the whole pathway, together rather than as individuals, which proved crucial to their success.

Mr Neil Windsor, Wrexham Maelor Hospital, North Wales NHS Trust East, said: “Critical to the success of redesigning the existing total knee replacement pathway was the development of a cohesive orthopaedic multidisciplinary team which enabled them to shift away from pre-existing silo working” .

5 Understanding your current service

Q. Do you understand your current pathway?

Choose from the number of available tools (see footnotes 32 and 37) to help create a clear picture of what your pathway looks like, for example:

As a MDT, walk through the whole pathway, using process mapping, value stream mapping (Lean methodology), capacity and demand; understand your patients’ length of stay, current roles and responsibilities.

Consider the gaps in your current service delivery against the enhanced recovery pathway.

Mr Alex Tan of Dartford and Gravesham NHS Trust emphasised the need to “Recognise the successes of the current care pathway and keep them”.

Q. Do you already have an enhanced recovery pathway that is sustainable?

Consider bringing the MDT together to carry out an honest appraisal of your pathway.

Challenge:

- Are you really incorporating all the elements all the time?
- Is it embedded?
- Do you have an integrated approach?
- Does every member of the MDT understand their roles and responsibilities and when these need to be executed?
- Is your pathway integrated?
- Do you have audits to show the benefits?
- Do the outcomes match the reported benefits?
- Is your model sustainable?

Consider baseline measures:

- How will success be measured?
- How will you know you are making a difference?

32 http://www.institute.nhs.uk/option,com_quality_and_service_improvement_tools/Itemid,5015.html

37 NHS Improvement – Leaders Improvement Guides- http://www.institute.nhs.uk/building_capability/building_improvement_capability/improvement_leaders'_guides:_general_improvement_skills.html

- Consider its importance in providing evidence for future support and backing.
- What do your patients say about your current service? (focus groups, surveys).
- What measures will you use? Consider length of stay, re-admission and re-operation rates, patient experience, compliance with the pathway elements.

Consider the role of audit data and other measures:

- Supporting continuous improvement.
- **Ms Marie Morris and Mr Andrew Williams of Guys and St Thomas’ Hospitals NHS Trust**, firmly believe that “data collection from the start with comparison baseline data is important”.

Consider dissemination of results to raise awareness and profile of enhanced recovery.

When comparing outcomes between centres or practitioners, it is important to take into account the effect of differences in case-mix on risk and therefore observed outcomes. The use of specific risk adjustment metrics is advised for these types of comparison (e.g. POSSUM: Physiological and Operative Severity Score for the enumeration of Mortality and Morbidity).⁴⁵

Some general and specialist compliance measures	Tick box
Do you invite patients to attend a pre-operative assessment/clinic appointment?	
Do you record a patient as assessed and fit for surgery?	
Was the patient given written and verbal explanation of the enhanced recovery pathway?	
Do you provide pre-operative therapy education e.g. physiotherapy/occupational therapy?	
Do you provide pre-operative stoma education given until patient is considered competent (where applicable)?	
Do you avoid use of oral bowel preparation?	
Do you admit patients on the day of surgery?	
Do you administer carbohydrate drinks pre-operatively?	
Do you avoid long acting sedative pre-medication?	
Do you administer the appropriate antibiotics prior to skin incision?	
Do you use epidural or regional analgesia?	
Do you initiate individualised goal-directed fluid therapy?	
Do you initiate hypothermia prevention (intra-operative warming)?	
Do you avoid the use of abdominal drains as routine?	
Do you remove the NG tube before exit from theatre?	
Do you avoid post-operative crystalloid overload?	
Do you avoid systemic opiates used post-operatively?	
Do you initiate early post-operative nutrition/solid food intake?	
Do you initiate targeted individualised nausea and vomiting control?	
Do you initiate early planned mobilisation within 24 hours?	

45 Copeland GP et al. POSSUM : a scoring system for surgical audit. British Journal of Surgery. 1991;78: 356-60.

6 Understanding the risks

Q. What will stop you successfully implementing enhanced recovery for your patients?

Who needs to be involved and how long is needed to plan for implementation?

- Ensure adequate time to plan
- **Ms Jennie Burch of St Mark's Hospital, The North West London Hospitals NHS Trust** said: "It is important to involve all members of the MDT when planning change. If you don't, it will be hard to engage them later on".
- **Dr Mike Grocott, University College Hospital London**, said: "Consensus building during the introduction of a programme is important".

Do you have organisational approval for change provided by executive support?

Does the MDT have a real understanding of the benefits and a commitment to the changes to be made? Are they able to allow patients to be empowered?

- **Ms Lallita Carballo, North London Cancer Network**, said: "It is important that health professionals are confident, have a belief in the new processes, and project this to the patients."

The important messages to be presented:

- focus on improved quality of patient care as the driver for change
- ensure consistent communication to all stakeholders
- ensure no patient sub-groups will be disadvantaged or have an increased risk of complications because of earlier discharge
- the gains through effective implementation such as bed days saved – will need to be discussed and arrangements made with commissioning and understand if there may be any resulting change
- could this result in bed closures or reductions inappropriately? How can you release savings?
- discussions with executive and management leads during the planning stage
- plan potential use for space, e.g. dining room or released bed capacity.

7 Understanding the investment required

Q. Do you understand the potential investment required to implement an enhanced recovery pathway?

The costs and level of investment required for implementing enhanced recovery will vary depending upon what current infrastructure you have in place (see diagram on next page).

All the elements described are, in fact, good practice for a good quality outcome for patients and not necessarily unique to enhanced recovery.

Close working with your management team is necessary to understand the cost and resource impact and shift in how, and which, budgets are used – consider new ways of working, for example 7-day stoma therapy or physiotherapy.

You will need to include potential investments and return on it in your submission to the executive board when seeking engagement and support.

Implementing enhanced recovery will require investment in terms of time and capacity from staff:

- How will you resource this?
- Many trusts use a facilitator or co-ordinator to ensure the programme's smooth running and high compliance among patients.
- Consider the use of existing staff. For example, **Sr. Wendy Lewis from Wirral University Teaching Hospital NHS Foundation Trust** developed an enhanced recovery role within ward establishment, who then worked between pre-operative assessment clinic and the ward.

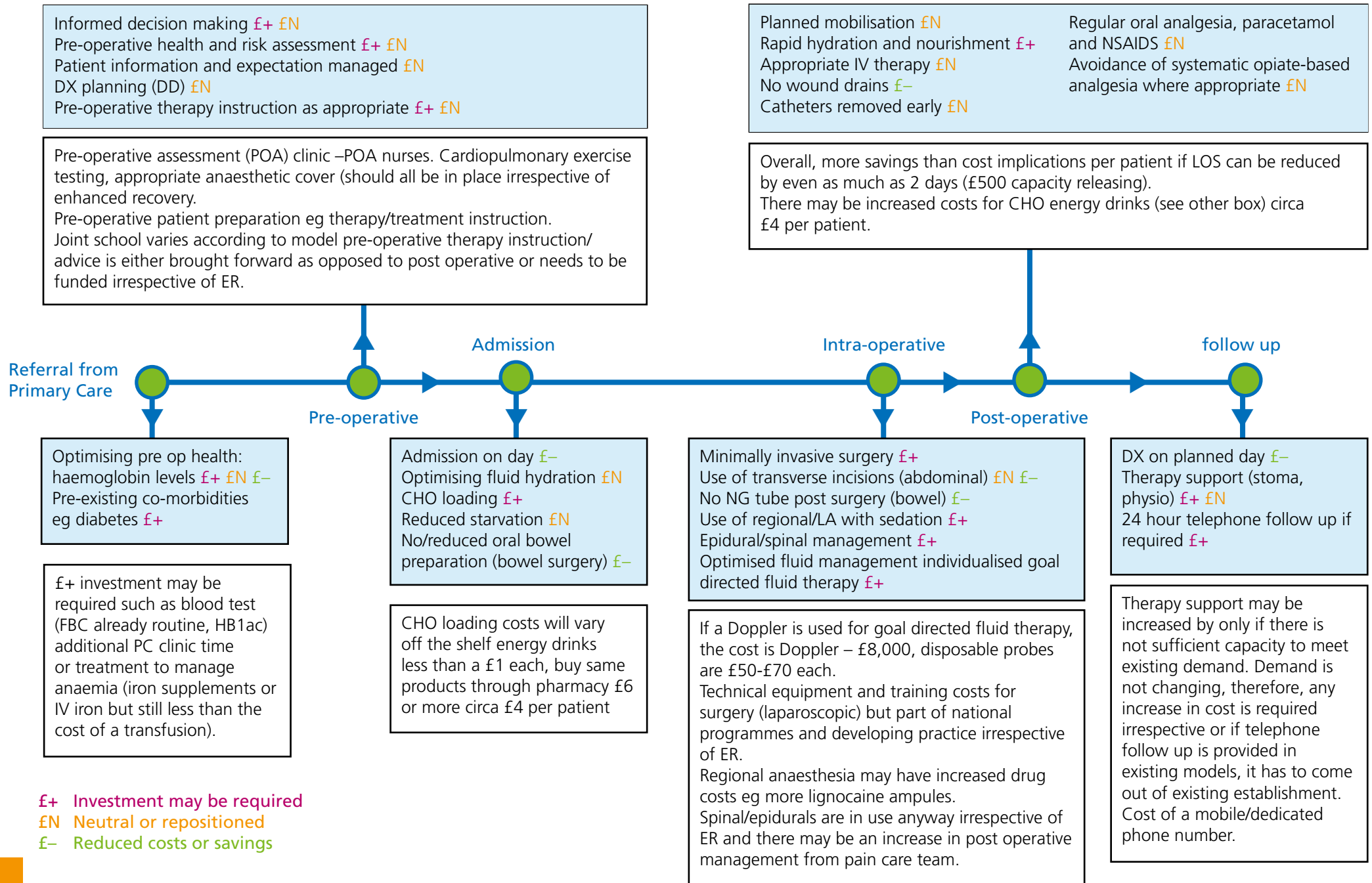
Consider the return on investment – length of stay reduction with potential release of bed capacity.

8 Maintaining momentum

Q. How do you maintain momentum and confidence as you introduce enhanced recovery?

- Meet with the team regularly, ensure continued input of MDT.
- Ensure roles and responsibilities remain clear for all MDT.
- Attend training events run by centres experienced in enhanced recovery.
- Delivery of an in-house rolling training programme for staff and junior doctors training.
- Use another, more experienced, centre as a possible mentor.
- Communicate results throughout the trust to raise awareness, inspire confidence and positive feedback.
- **Dr Mike Grocott, UCLH:** "Dissemination and interpretation of results related to clinical outcomes and knowledge of service is essential".

Enhanced recovery pathway illustrating which elements may/may not require investment and examples of potential investment and savings



- **Dr Andrew Kitching and Mr Simon Middleton, Royal Berkshire Hospital NHS Foundation Trust:** “Awareness raising is important; not all specialties will be familiar with ideas behind enhanced recovery” .
- **Mr A Norden, Consultant Gynaecological Oncologist at East Kent Gynaecology Oncology Centre:** “The major factor responsible for the resulting reduction in length of stay was a patient and staff awareness programme of early post-operative mobilisation and discharge, leading to an expected hospital stay” .

9 Testing and making the changes to your pathway

Q. How will you change what you do?⁴⁶

Consider:

- The infrastructure in your organisation – do you have a department that supports service development/improvement? Do you have an implementation team?
- The implementation lead (this is not necessarily the champion as identified in stakeholder engagement).
- The implementation team – do they have the knowledge and skills?

Agree the approach with the implementation team, for example Lean, breakthrough methodology and action learning may all facilitate implementation

Is the implementation plan realistic?

- Do you understand the pathway?
- Do you understand your current status, that is what elements of enhanced recovery you are already implementing?
- Does it address changes to the current pathway in order of priority?
- How many teams will be implementing changes – consider starting small.
- Test on a smaller scale.
- Learn from the testing phases and make appropriate changes.

Ensure roles and responsibilities remain clear for all the MDT.

How you will communicate the changes/improvements?

Ms Sharon Boyne and Mr David DeFriend at Torbay Hospital, South Devon Healthcare NHS Foundation Trust, believe a “clear, inclusive induction programme and launch date” is a critical success factor in implementing enhanced recovery.

⁴⁶ NHS Institute for Innovation and Improvement – Inspiring change in the NHS and the five frames – http://www.institute.nhs.uk/nhs_alert/guest_editorials/September_2009_guest_editorial.html

10 Sustaining the change

Q. How will you sustain the enhanced recovery pathway? ^{47 48}

How will you hold the gains of the new enhanced recovery pathway?

- Assess this at all stages of the implementation.
- How will you review the benefits of all changes made?
- How will you continue communicating this at all stages?
- Undertake the NHS Institutes Sustainability Assessment which will give you an indication of where you require support, further engagement or communication.

At **Yeovil District Hospital (YDH) NHS Foundation Trust** enhanced recovery has been well established since 2002, and there is experience of more than 600 colorectal patients having been entered into the programme. The median length of stay is 5 days with a control 10 days prior to ER. Over the past 7 years the ER has been consolidated at YDH through:

- regular meetings of ER team
- regular update of the pathway
- audit performance and discuss success and failure
- study compliance and failure in ER.

In a recent study at YDH examining compliance with enhanced recovery, 200 colorectal patients were analysed. A significant correlation of 0.854 was found between patients who failed to comply and the prolonged length of stay excluding surgical complications. The standard POSSUM scoring system for prediction of morbidity and mortality were used in this study to identify factors behind failure in enhanced recovery and predict prolonged length of stay. The standard physiological POSSUM did not predict compliance or failure but pre-operative low albumen level and intra-operative blood loss were predictive factors of failure and prolonged length of stay in a multi variant analysis.⁴⁹

Good luck implementing enhanced recovery in your organisation. Remember, further examples and information are available in the enhanced recovery section at www.dh.gov.uk, where you can also find information about enhanced recovery events.

47 Sustainability scorecard http://www.institute.nhs.uk/quality_and_service_improvement_tools/quality_and_service_improvement_tools/balanced_scorecard.html

48 NHS Institute of Innovation and Improvement's Sustainability Guide – http://www.institute.nhs.uk/index.php?option=com_joomcart&itemid=194&main_page=document_product_info&products_id=290

49 Burkill C, Will A, Boulind, C, Ewing, P, Allison, A, Nobel H, Ockrim J, Kennedy R*, Francis N. Factors to predict outcome in Enhanced Recovery Programme after Laparoscopic colorectal resection- an erp-POSSUM. The 17th International Congress of the EAES, Prague, 2009.

Implementing enhanced recovery – summary

- ✓ Stakeholder analysis
- ✓ Stakeholder engagement
- ✓ Team working
- ✓ Understanding your current service
- ✓ Understanding the risks
- ✓ Understanding the investment required
- ✓ Maintaining momentum
- ✓ Testing and making the changes to your pathway
- ✓ Sustaining the change

Resources

NHS Improvement – Transforming Inpatient Care Programme, Transforming Care for Cancer Patients, Spreading the Winning Principles and good practice

http://system.improvement.nhs.uk/ImprovementSystem/ViewDocument.aspx?path=Cardiac%2fNational%2fWebsite%2fCancer%2ftransforming_care_for_cancer_patients.pdf

NHS and Improvement – Meeting the challenge together... delivering care in the most appropriate setting, supporting delivery www.improvement.nhs.uk/cancer/documents/inpatients/Inpatients_Meeting_the_Challenges.pdf

NHS Institute of Innovation and Improvement – Leaders Improvement Guides – www.institute.nhs.uk

NHS Institute of Innovation and Improvement – Focus on Primary Hip and Knee Replacement
www.institute.nhs.uk/hipandknee

NHS Institute of Innovation and Improvement – Focus on MRI and lower back pain
www.institute.nhs.uk/quality_and_value/high_volume_care/focus_on%3a_mri_and_back_pain.html

NHS Institute of Innovation and Improvement – Focus on Musculoskeletal Interface Services
www.institute.nhs/msk

NHS Institute of Innovation and Improvement – Sustainability Guide
www.institute.nhs.uk/index.php?option=com_joomcart&Itemid=194&main_page=document_product_info&products_id=290

NHS Institute of Innovation and Improvement – Sustainability Scorecard
www.institute.nhs.uk/quality_and_service_improvement_tools/quality_and_service_improvement_tools/balanced_scorecard.html

NHS Institute of Innovation and Improvement – Rapid Improvement Orthopaedic programme
www.institute.nhs.uk/orthorip

Better Care Better Value Indicators – www.productivity.nhs.uk

NHS Institute for Innovation and Improvement – Think Glucose, Executive Leaders Guide

NHS Institute for Innovation and Improvement – Think Glucose, Implementation Guide

Anaesthesiology 2009;110:574-581 Risk associated with preoperative anaemia in noncardiac surgery

National Technology Adoption Centre: perioperative fluid management project –
www.technologyadoptionhub.nhs.uk/perioperative-fluid-management.html

Day surgery

Better by the day? Day surgery in Scotland, Accounts Commission for Scotland, 1997, www.audit-scotland.org.uk

Day Surgery: Operational guide, Department of Health, August 2002, www.dh.gov.uk

Day Surgery Follow-up – Progress against indicators from A Short Cut to Better Services, Audit Commission, 2001, www.audit-commission.gov.uk

British Association of Day Surgery, www.bads.co.uk

Operating theatres

Step Guide to Improving Operating Theatre Performance, NHS Modernisation Agency, June 2002 – found at www.institute.nhs.uk/option,com_joomcart/Itemid,26/main_page,document_product_info/products_id,241.html

Pre-operative assessment

Handbook of Preoperative Assessment & Management, Bobbie Jean Sweitzer (ed), 2000, Lippincott Williams & Wilkins, Philadelphia, PA, USA

Pre-operative Assessment – The Role of the Anaesthetist, The Association of Anaesthetists of Great Britain and Ireland, November 2001, www.aagbi.org

BVSMurthy. Improving the patient's journey: The role of Pre-operative Assessment Team. The Royal College of Anaesthetists, Bulletin May 2006; 37: 1885-1887

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