

Modernising Care for Patients Undergoing Major Surgery

Implementation Guide

A report by the Improving Surgical Outcomes Group

Executive Summary

Recent publication of a report into how improved surgical outcomes can benefit patients and hospital resource use led the Department of Health to alert all NHS Trusts and Strategic Health Authority Chief Executives to its contents.

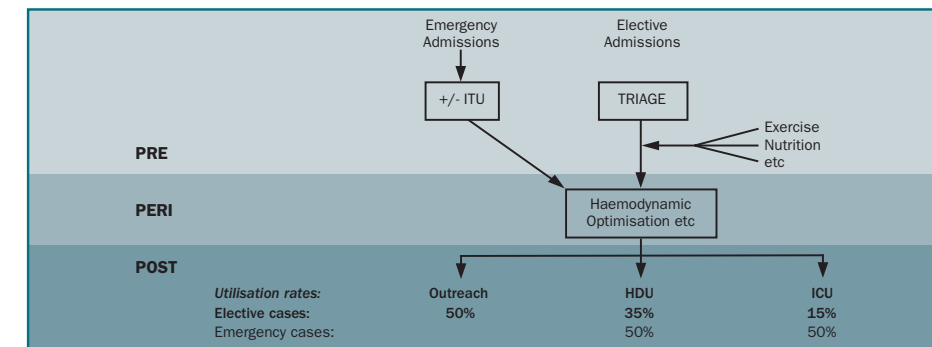
The report, *Modernising Care for Patients Undergoing Major Surgery* by the Improving Surgical Outcomes Group (ISOG), highlighted how significant results can be achieved through evidence based approaches. It demonstrated patients leaving hospital faster and fitter following surgery, with the corresponding financial savings and service capacity benefits.

Minister of State for Health, Jane Kennedy, said: "I welcome this report and I am sure that it will be welcomed by colleagues in the NHS and will be used as one of a range of tools to improve patient outcomes at a local level."

The report's conclusions are being implemented in a number of hospital Trusts to reshape services to meet new productivity and quality targets, without the expense and disruption of whole scale restructuring.

The report highlighted three key areas for improved outcomes:

1. Cardiovascular fitness is a far more accurate indicator of patient suitability for surgery than age or traditional subjective risk assessment. The use of cardio-pulmonary exercise - CPX - measurement allows the hospital to plan the post-operative pathway for the most efficient use of critical care facilities.
2. Accurate fluid intervention, through the use of monitors measuring blood flow during surgery, reduces by more than half both the number and severity of post operative complications. Patients on average leave hospital three days sooner, reducing average hospital stays by 20%.
3. Appropriate post-operative facilities can prevent unplanned critical care and lengthened hospital stays. Using critical care resources or 'step down' units for higher risk patients has been shown to provide appropriate monitoring and clinical intervention.



A recent epidemiological study which reviewed the data around four million surgical procedures between 1999 and 2004 found that a large high risk surgical population in the NHS accounts for 12.5% of surgical procedures, but for 80% of deaths. Only a small proportion of these patients are admitted to an ICU. Investigators recommend better pre-operative procedures and more effective use of critical care resources.¹

Some practical examples of how the ideas in the ISOG report have been implemented in today's NHS are contained within this pamphlet.

1. Pearse R et al. Identification and characterisation of the high-risk surgical population in the United Kingdom. *Critical Care* 2006.

Improved pre-operative assessment, triage and preparation

Objective evaluation prior to planned surgery can identify patients at increased risk and, for some, this may result in the decision not to proceed to major surgery. Decisions about appropriate treatment options and possible outcomes are best achieved through a multi-disciplinary team approach that carefully considers all the available information and plans peri and post-operative care. Interventions such as exercise and nutritional supplementation can improve the preparation for surgery of patients with particular needs. Better handling of planned surgery may also improve resource availability for urgent and emergency cases.



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Torbay Hospital, Devon

Although pre-operative CPX testing is now standard for certain high-risk elective surgical patients at Torbay, the doctors who introduced it believe the full value of the test will only be realised once the range of operative care facilities is in place to allow them to tailor care to the individual patient's needs.

A paper published recently in the British Journal of Surgery - J Carlisle, M Swart, 2007 - showed that CPX testing, combined with simple comorbidity scoring, identifies patients who have a worse prognosis, and who probably should not have abdominal aortic aneurysms (AAA) repair.

"CPX has given us a far better insight into the likely outcome for individual patients prior to elective major surgery. The hospital avoids the expense of operating on people who in all probability will not survive. If they do, they will often be in hospital for weeks, usually with prolonged spells in critical care."

Mike Swart, Consultant Anaesthetist



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York Hospital

CPX testing has been used at York since 2002 to help assess risk, plan management, and where appropriate, guide pre-operative interventions to improve patients' cardiovascular fitness for surgery.

Benefits occur from all three of the mechanisms described above. For instance, risk assessment may involve deciding that a patient is too unfit for open repair of an aortic aneurysm, and is better off with a lower risk alternative.

Benefits have also been noticed in reduced critical care usage by patients whose test result shows they are fit enough for ward care.

"I think the greatest potential for the CPX test is its ability to individualise a patient's peri-operative management needs, helping to guide therapeutic decisions in a tailor-made fashion."

Jonathan Wilson, Consultant Anaesthetist

Improved peri-operative care

Improvements in fluid administration and other interventions significantly reduce both the rates of post-operative complications and mortality, as well as significantly reducing the length of hospital stay and the overall number of ICU/HDU bed days used.



© The Medway NHS Trust

Medway Maritime Hospital, Gillingham, Kent

A collaboration between anaesthetists and surgeons using fluid optimisation during surgery resulted in savings of £1.1 million. Part of this money was used to finance a new 10-bed surgical HDU.

This was achieved through patients going home on average three days sooner, saving around £800 per patient.

The new HDU will be used to support those patients whose overall condition means they need a higher standard of care following surgery.

"We have had very good results using Oesophageal Doppler monitoring. It has improved the quality of care for patients as they are healthier when they leave theatre, need less post-operative care and get home quicker."

Graeme Sanders, Consultant Anaesthetist



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The Freeman Hospital, Newcastle

A study of patients undergoing major bowel surgery showed only 2% of patients that were fluid optimised during surgery suffered major complications post-operatively, compared to 15% in the control group.

Fluid optimised patients also had a lower average length of hospital stay of seven days, compared to nine days in the control group.

Department of Health data shows the average length of stay for major bowel surgery in England and Wales in 2004 was 13.5 days, nearly double that of optimised patients at the Freeman.

"Newcastle's fast track programme is believed to be achieving among the lowest mortality, lowest readmission rates, and shortest length of stays being delivered in the NHS today."

Alan Horgan, Consultant Colorectal Surgeon



© Worthing and Southlands Hospitals NHS Trust

Worthing Hospital, West Sussex

A Department of Health funded fluid optimisation trial for 128 patients undergoing bowel surgery saw patients go back onto a full diet one day sooner. They were ready for discharge one and a half days faster and represented savings of £24,000 in reduced bed stays.

According to the Association of Coloproctology, the average mortality within 28 days of major bowel surgery in England and Wales is 6%. There were no deaths among the 118 patients fluid optimised at Worthing or the Freeman hospitals.

"The costs of introducing this very safe and easy to use equipment are minimal. The benefits for patients and the NHS are enormous."

Howard Wakeling, Consultant Anaesthetist



© NHS Argyll and Clyde

Royal Alexandra Hospital, Paisley

Doctors at the Royal Alexandra Hospital reported that fluid optimisation during colorectal surgery reduced average length of stay by two and a half days. This resulted in a saving of £1,000 per patient.

The results of this audit are now being used to support the case for ongoing funding of fluid optimisation, to transfer use of the technique into other surgical areas and to encourage adoption across the health board.

"We are greatly encouraged by the results achieved. This has major benefits not only for patients, but for clinicians and hospitals throughout the country."

David Alcorn, Consultant Anaesthetist

Improved use of post-operative resources

The planned transfer of patients to ICU/HDU, or to receive outreach critical care, can lead to improved post-operative outcomes. This can reduce the overall number of total bed days, as well as care bed days used.



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St Thomas' Hospital, London

Most surgical patients at St Thomas' have straightforward critical care requirements of less than 24 hours after surgery. These are admitted to an Overnight Intensive Recovery Unit (OIR), which consists of beds developed within a theatre recovery unit. Most are discharged to a general ward or HDU the following day. The very sick or complicated cases with an anticipated critical care stay of more than 24 hours go directly to ICU.

The OIR provides a much more flexible critical care resource, reduces operative cancellation rates for elective surgery and alleviates a significant elective workload from the ICU.

An OIR provides patients with the level of care they need after major surgery. It means that the ICU is reserved for those critically ill patients who really need individual nursing care.

"Freeing up the ICU from this surgical workload allows for more appropriate admissions to the ICU, enhancing access and the treatment provided."

Chris Aps, Consultant Anaesthetist and Lead OIR



© York Hospitals NHS Trust

York Hospital

A combination of haemodynamic optimisation and post-operative critical care for surgical patients at the highest risk resulted in reduced mortality from 17% to 3%.

Contrary to expectations, putting patients through ICU was cost effective and resulted in fewer complications and reduced hospital stays.

Fluid optimisation was found to have mortality benefits in very sick patients, as well as reducing length of stay in less severe cases.

Today, 3% of patients undergoing equivalent surgery in York die, compared to an NHS average of 6% to 12%. The majority of high-risk patients are now intra-operatively optimised and all those who do not clinically need to go to ICU/HDU after surgery go to a dedicated intermediate care facility on the surgical ward.

"Routine fluid optimisation would require an initial investment but is likely to be cost effective by reducing complications and length of hospital stay."

Jonathan Wilson, Consultant Anaesthetist



© St George's Healthcare NHS Trust

St George's Hospital, London

A study into the effects of fluid management in seriously ill patients following major surgery found that patients who were treated under a nurse-led protocol for the first eight hours in ICU after surgery spent on average twelve days fewer in hospital than those given standard treatment during their time in intensive care.

Subsequently, haemodynamic optimisation has been made a standard protocol designed to save £2-3 million per year.

A major cause of the large reduction in bed occupancy was a 50% reduction in post operative infections.

"By spending a little bit more money on critical care for the very sickest patients immediately after their operations, we have been able to save the hospital far greater amounts from reducing bed occupancy back on the general wards."

David Bennett, Consultant



© University College London Hospitals NHS Trust

University College Hospital

The opening of a post-operative critical care facility within the main ICU at the new University College Hospital has made cancellation of surgery for lack of an ITU bed a thing of the past. The unit closes on Saturday allowing enhanced cleaning and ensuring that beds are free for the start of elective surgery on Monday mornings.

This model has proven to be very popular and cost effective. The number of high-risk patients benefiting from post-operative critical care has increased substantially with no increase in total number of ICU bed days.

"It was a bold step to make the use of critical care beds a priority for major surgical patients but the evidence was so compelling we felt we had to act. It has been an enormous success. Closing at weekends has led to a dramatic reduction in operations being cancelled because of the lack of an ICU bed, while no emergency patients have needed transfer out because of lack of beds. MRSA bacteraemia rates have fallen with the additional regular weekly deep cleaning."

Geoff Bellingan, Clinical Director

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