

# Initiatives to reduce length of stay in acute hospital settings: a rapid synthesis of evidence relating to enhanced recovery programmes

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## Scientific summary

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# Scientific summary

## Background

Service redesign can save money and improve quality, but much depends on how care is co-ordinated and how services are implemented in the local setting. There has been growing interest in the NHS over recent years in the use of enhanced recovery programmes to deliver productivity gains through reduced length of stay, fewer postoperative complications, reduced readmissions and improved patient outcomes. Such programmes seek to design and implement an optimal pathway (covering the preoperative, intraoperative and postoperative periods) that is focused on rapid recovery and discharge for patients. The approach was pioneered in Denmark in the late 1990s for patients undergoing colorectal surgery and is now spreading to other surgical pathways such as musculoskeletal, urology and gynaecology.

The underlying aim of enhanced recovery programmes is to ensure that patients are in optimal condition for treatment, receive innovative care during surgery and experience optimal postsurgical rehabilitation. Programmes differ widely but share common elements such as patient education and involvement in preoperative planning processes, preoperative oral carbohydrates, improved anaesthetic and postoperative analgesic techniques to reduce the physical stress of the operation, early oral feeding and mobilisation. Uptake of enhanced recovery programmes has been increasing in the NHS, but implementation has to date been variable.

Before embarking on larger-scale adoption, NHS managers and clinicians need to be fully aware of the strength of the underlying evidence base to support use of such programmes. Managers and clinicians need to have a clear understanding of how best to implement enhanced recovery programmes and the likely implications for service delivery within finite budgets and considering the need for equity of access.

The rapid nature of this project means that we will focus on the best available evidence. Therefore, the primary sources of evidence about clinical effectiveness and cost-effectiveness will be derived from existing systematic reviews and economic evaluations. We have augmented this evidence with recent randomised trials and studies of implementation and patient experience of enhanced recovery programmes in NHS settings.

## Aims/objectives

To evaluate the clinical effectiveness and cost-effectiveness of enhanced recovery programmes designed to improve clinical pathways for patients undergoing elective surgery in acute hospital settings, including the impact on the organisation of care, configuration of workforce and resource utilisation in UK NHS settings.

To identify and critically describe key factors associated with successful adoption, implementation and sustainability of enhanced recovery programmes in UK settings.

To summarise existing knowledge about patient experience of enhanced recovery programmes in UK settings, including issues surrounding equity of access.

## Methods

Eight databases, including Database of Abstracts of Reviews and Effects, NHS Economic Evaluation Database and MEDLINE, were searched from 1990 to March 2013 without language restrictions. The International Prospective of Systematic Reviews (PROSPERO) database was searched to identify unpublished and ongoing systematic reviews. Relevant reports and guidelines were screened for further studies. Reference lists of retrieved articles, reviews and evaluations were scanned to identify additional studies.

Evidence from case studies on experiences of patients and clinical teams in implementing and delivering enhanced recovery programmes in UK settings was identified from various sources. Relevant individuals were contacted for additional evidence.

Systematic reviews, randomised controlled trials (RCTs), economic evaluations, and UK NHS cost analysis studies were included if they evaluated the impact of enhanced recovery programmes on any health- and cost-related outcomes. Eligible studies included patients undergoing elective surgery in an acute hospital in the UK NHS or a comparable health-care system. Case studies, impact assessments and surveys of patient experience that documented the experience of implementing enhanced recovery in a UK setting were also eligible.

Quality assessment of systematic reviews, RCTs and economic evaluations was based on existing critical appraisals. All stages of the review process were performed by one researcher and checked by a second.

The type and range of evidence precluded meta-analysis and we therefore performed a narrative synthesis, differentiating between clinical effectiveness and cost-effectiveness, implementation case studies and evidence on patient experience.

## Results

Seventeen systematic reviews of varying quality were included in this report. Twelve additional RCTs were included; all were considered at high risk of bias and 11 were single-centre trials. Most of the evidence focused on colorectal surgery. Twenty-nine case studies undertaken in NHS settings were identified and provide descriptions of factors critical to the success of an enhanced recovery programme. Ten relevant economic evaluations were identified, evaluating costs and outcomes over short time horizons.

Despite the plethora of studies, robust evidence was sparse. Evidence for colorectal surgery suggests that enhanced recovery programmes can reduce hospital stays by 0.5–3.5 days compared with conventional care. The mean length of stay in enhanced recovery ranged from 4.15 to 6.43 days. For conventional care, length of stay ranged from 6.6 to 11.7 days. There were no significant differences in reported readmission rates. Other surgical specialties showed greater variation in reported reductions in length of stay, but this greater uncertainty reflects the more limited evidence base for these specialties.

Deaths were rare and no significant differences between treatment groups were found in the systematic reviews and additional RCTs. Morbidity was defined differently across systematic reviews and RCTs; rates between treatment groups were sometimes inconsistent, but generally indicated no statistically significant differences.

Mobilisation rates as an outcome were inconsistent across systematic reviews, but most reviews reported no significant differences in time to mobilisation between treatment groups. Mobilisation as an outcome was rarely reported in the additional RCTs.

Where systematic reviews and additional RCTs assessed quality of life and patient experience/satisfaction, equivocal findings were reported. Evidence on reintervention rates, pain and resource use was lacking in both systematic reviews and RCTs.

Twenty-nine case studies in NHS settings, and key individuals from various NHS trusts, identified factors critical to the success of an enhanced recovery programme. Poor reporting reduced the usefulness of the evidence. Success factors highlighted included the need for a dedicated enhanced recovery project lead or nurse, and a multidisciplinary team approach. Other elements for success included a need for preoperative patient information and continual education. Barriers to the success of an enhanced recovery programme included resistance to change from health-care professionals or patients. Other challenges were lack of funding or support from management and resource issues.

Ten economic evaluations in adult populations evaluated costs and outcomes over short time horizons. All of the evaluations suggest that programmes that achieve a reduction in length of stay are cost saving, and are not to the detriment of patients in terms of complication rates, readmission and health-related quality of life. The generalisability of the results of these evaluations is limited and the disparity in standard protocols and what has been evaluated across the settings makes it unfeasible to select a cost-effective programme.

## Conclusions

Enhanced recovery programmes have been adopted with some enthusiasm by the NHS as a means to achieving productivity gains and cost-savings. The evidence base to support such widespread implementation is limited, but does suggest possible benefits in terms of reducing length of hospital stay by 0.5–3.5 days compared with conventional care, without compromising postoperative complications, readmissions or patient outcomes. Enhanced recovery programmes are complex interventions and the most effective combination of elements requires further clarification.

## Implications for health care

Optimal care is certainly the right thing to do, but the evidence does not identify which enhanced recovery programme elements and combinations of elements are most effective. As such, conclusions on which combinations provide greatest gains and how best to implement them cannot be made. The extent to which managers and clinicians considering implementing enhanced recovery programmes can realise reductions and cost savings will depend on length of stays achieved under their existing care pathway. Consideration of potential benefit also needs to take account of the costs of service redesign, the resource use associated with programmes of this nature, the potential for improvement in patient outcomes and the impact on equity of access.

Case studies (and any overarching synthesis) need to be written up in sufficient detail using standardised reporting methods to allow those not immediately involved to assess the extent to which the innovation programme has achieved its objectives. This may involve considering not only adherence to the requirements of the programme but also potential moderating factors such as strategies used to assist delivery of the intervention (e.g. programme facilitators), quality of delivery and participant responsiveness to new practices. This would ensure that the insights and contextual information which can inform the wider spread and adoption (or indeed discontinuation) would be systematically captured in a generalisable format.

Rigorous data on patients' experiences of enhanced recovery programmes are lacking. Validated tools should be used and administered independently of those providing the service. Efforts should be made to obtain data from representative samples of patients receiving conventional care as well as those treated with enhanced recovery protocols.

## Implications for research

Randomised controlled trials comparing an enhanced recovery programme with conventional care continue to be conducted and published. Further single-centre RCTs of this kind are not a priority. Rather, what is needed is improved collection and reporting of how enhanced recovery programmes are implemented, resourced and experienced in NHS settings. Further multicentre RCTs may provide additional insight into the clinical effectiveness and cost-effectiveness of enhanced recovery programmes. RCTs assessing the efficacy of different enhanced recovery programme elements and different combinations of elements may also be more beneficial.

The implementation case studies included in our synthesis provide very limited information on how enhanced recovery programmes have actually been implemented in NHS settings. Further research could involve small-scale local analyses of routinely collected data as well as larger, more ambitious case study initiatives.

Evidence relating to cost-effectiveness is lacking. Whereas enhanced recovery programmes have the potential to deliver cost savings, improved measurement of costs and benefits is crucial to help decision-makers decide how best to make optimal use of limited resources.

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