Recovery from surgery: grappling with an elusive concept

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When we ask our patients 'How are you?', can we quantify the answer? There is no ideal measure for every circumstance. This article will discuss the issues in measuring postsurgical recovery, describe different approaches, and consider future research.

Science is the art of measurement and the application of the acquired knowledge. Because postsurgical recovery is a composite of many different psychological and physiological themes, there is no clear-cut way of measuring whether it has occurred or not. The reason we would want to measure this is because speeding up the process has benefits both to the individual and society.

Tools to assess postsurgical outcome are necessary to monitor and evaluate patients' progress and clinicians' therapy, and are additional to morbidity and mortality data. There are several problems, however:

- Currently, surrogate measures such as X-ray findings are frequently used as markers of recovery, but this does not measure whether the recovery of the patient as a whole has been improved
- Some outcome measures (such as analgesia requirements or duration of hospital stay) are so severely influenced by confounding issues that they are misleading as markers
- Only a few of the tools that may be applied to recovery have been constructed from patients' views, and these views may differ significantly from those of health-care professionals (Ware, 1993).

DEFINITIONS

Complete postsurgical recovery is a process that occurs over several months. The general view is that it is affected by some of the following:

- Receiving adequate information for psychological preparation
- The use of anaesthetic and surgical techniques that are effective at improving surgical outcome
- Adequate, timed and balanced analgesia
- Restoration of normal eating, drinking and toilet habits
- Loss of any anxiety, depression or fatigue related to the surgical process
- Mobilization and rehabilitation to full social functioning
- Changing from a state of illness to a state of health.

Although some of these may seem very similar at first glance, they have to be carefully defined before they are measured.

WHY MEASURE RECOVERY?

If you want to compare treatment options, monitor the quality of care, or aid policy decision making and resource allocation, objective and reliable outcome data from multiple sources are essential. Patients, clinicians, managers and the state all have different interests in the process:

Patients

The faster one recovers, then the faster one achieves that sense of 'wholeness' or 'satisfaction with one's inner self' that is necessary to function without limitation. The 'intrusive imposition' of illness is alleviated.

Clinicians

Patients who recover quicker are less likely to suffer the consequences of prolonged ill-health such as muscle wasting, thromboses, chest infections and depression.

Managers

Local managers are interested in both recovery from operations (because it affects the length of stay in hospital beds), and the quality of care that is being delivered. Measuring recovery is

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implicit in the critical examination of these processes. This will become more important as managers are required to ensure the quality of the services provided.

The state

If ill health prevents full functioning as a member of society, then there are financial implications because of sickness benefit payments and the non-payment of taxes.

PERIOPERATIVE PSYCHOLOGICAL FACTORS

Psychological factors affect people's response to the stress of surgery: however, results of studies that have attempted to manipulate the psychological preparation of patients in the pre-operative period have failed to show consistent results. It is difficult to identify all the sources of concern to patients and it is too simplistic a model to think that the operation itself is the only source of anxiety. Anxious mood has been shown to be heightened both pre- and postoperatively (Magni et al, 1987; Liu et al, 1994), especially during the initial period on returning home. Wellbeing and optimism have received little interest compared to more negative concepts, and these may play a role for improvements in the recovery period.

PERIOPERATIVE TECHNIQUES

Medical, nursing and paramedical care should always be of the highest quality achievable. In addition to this, it is possible to reduce or eliminate some of the neuroendocrine effects of the anaesthetic and surgical procedure by the use of opioids, local anaesthetic techniques and pharmacology. On balance, there is evidence of better outcomes when regional anaesthesia is used (Liu et al, 1995; Schug, 1999).

THE APPROACHES USED

The tools that are being discussed here are those for clinical outcome; these should be distinguished from economic evaluations of cost benefit, or cost-utility analyses, which are for population-based approaches (Finlayson and Birkmeyer, 1998). Notions such as 'burden of disease', premature mortality, DALYs and QALYs (disability- and quality-adjusted life years) are often cited, and are not discussed further.

Several approaches have been employed by clinicians for research into postsurgical recovery and outcome: these comprise disease- (or condition-) specific measures, generic measures and other tools. Essentially, they all simplify reality to a model of a situation. For a model to be useful, it must be an accurate representation of the issue under observation. The approaches need to be valid and reliable within a specific population and context so that their use gives meaningful results. They should also be acceptable to the subjects who are using them. These issues should not be underestimated: it is not possible to assume that a reported score can be re-used without re-validation, even though there are many examples of scores 'crossing the Atlantic' or 'travelling around Europe'. Using novel techniques, or using scores for situations other than those for which they were designed, can lead to misleading or erroneous conclusions caused by significant methodological, language, cultural and ethnic difficulties.

There are hundreds of scores that are available to assess disease states, in its widest sense. We have cited a cross-section of those available, and have included measures that are frequently quoted in clinical literature. To gain most benefit from any analysis of patient outcome, a mixture of generic, disease-specific, and other measures will obtain a range of responses from these different techniques.

Recently, there has been much attention focussed on the measurement of quality of life. These are usually generic, and provide a 'health index' (a unitary value of health status) such as the EuroQol (Williams, 1990), or measure a number of different dimensions of health status (so-called 'health profiles'), e.g. the Nottingham Health Profile (NHP; Hunt et al, 1981). They give an overall impression of the impact of disease, but do not enable identification of specific problems that are amenable to intervention.

It should be remembered that simple visual analogue pain and fatigue scales, or faces tools (line drawings of smiling faces graduating to unhappy ones) are very useful and straightforward assessments (Bowling, 1995, 1997). They tend to be used to assess general satisfaction with life, or with more specific concepts such as health or housing. Using an appropriate 'framing' question, they can be used as a global indicator of quality of life (McDowell and Newell, 1996).

DISEASE-SPECIFIC MEASURES

These are tailor-made to a given situation.

Arthritis

The arthritides are diseases that are amenable to surgery. The Disease Repercussion Profile is a tool assessing the impact of rheumatoid arthritis

on a patient without imposing a standardized model of functional disability (Carr, 1996). It does not focus on a clinical or laboratory value, but measures handicap in a patient-described disease-specific application.

WOMAC (Western Ontario and McMaster Universities Osteoarthritis Index) is a disease-specific instrument for measuring capacity in patients with lower limb osteoarthritis. It does not depend on mood or motivation (Bellamy et al, 1988), but its relevance to non-rheumatological disorders is unknown.

Urology

There has been a significant interest among urologists in their patients' symptoms and their state of mind, contrasted with urine flow rates and prostate sizes as measures of outcome. The American Urological Association Symptom Index has been widely used to measure symptoms in benign prostatic hypertrophy (Barry and O'Leary, 1995).

GLOBAL APPROACHES

Global health profiles and scores may be divided roughly into two categories: those that investigate a complex topic with a simple concept (such as a visual scale), or those that individually itemize the different aspects that constitute 'overall health' and then sum these as an evaluation of health status. Global scores may be less appropriate than disease-specific scores because inappropriate information is sought, or the instrument is not sufficiently sensitive to change (Bulpitt, 1997). However, a major benefit of using generic measures of health status is that they can be used to compare within a population and between populations.

SF-36

This short form of 36 questions was developed from a much longer medical outcome instrument (Ware and Sherbourne, 1992). It is a profile of health status and has been widely applied in many different countries and age groups. Those over the age of 65 years may need assistance in completing the questionnaire, and the lack of sleep assessment is a shortcoming. When comparing many of the frequently cited tools, the SF-36 has been shown to score measures of wellbeing, rather than only the absence of negative emotions (Essink-Bot et al, 1997).

Sickness Impact Profile

The Sickness Impact Profile (SIP) is a behaviourally-based measure of health status consisting of 136 items in 12 categories (Bergner et al, 1981). It is designed to detect changes that occur with time, or between groups, and has undergone extensive validity testing. It can be administered either by an interviewer (over 20–30 minutes) or self-administered, and was constructed from the statements of patients, their carers and health-care professionals.

EuroQol

Postal surveys in three countries were used to construct this score (Williams, 1990), which was modelled initially on existing health measures. It is easy and simple to answer, but is not as sensitive as the SF-36 for different levels of ill-health.

Nottingham Health Profile

The NHP (Hunt et al, 1981) has been validated in several countries, including the UK. The NHP has been criticized because it is possible to obtain both minimum and maximum scores. This 'floor and ceiling' effect makes the profile insensitive at its extremes (Bulpitt, 1997).

OTHER TOOLS

Satisfaction

Research into satisfaction with the doctor–patient interaction is not new, but its use as a measure of care is. There is a plethora of surveys tending to concentrate on service provision rather than clinical outcome. The most fruitful task would probably be to measure 'dissatisfaction' as it is here where problems should be addressed.

Fatigue scales

Visual analogue scales for fatigue have shown a relationship with the type of surgery performed (Christensen et al, 1982), but there are problems with lack of correlation between groups and different situations.

Hospital anxiety and depression scale

Designed as a present state scale, this has two separate evaluations for anxiety and depression for use in non-psychiatric hospital departments (Snaith and Zigmond, 1994).

Profile of mood states

This profile (McNair et al, 1992) is designed to measure multiple mood states and is useful in assessing psychiatric outpatients. It has been assessed for reliability and validity. A shortened form of the profile of mood states (POMS) may be used for an assessment accompanying other analyses: here, subjects are compared with 'college' norms, rather than psychiatric outpatients.

Physical scale

In a broad-based assessment of patients during the early postoperative phase, Wolfer and Davis (1970) devised a recovery inventory. This assesses patients' welfare in terms of their physical condition, including such factors as sleep, appetite and bowel condition.

Physiological measures

Physiological changes, such as palliation of the original disorder or measurements of wound healing, have not been studied in depth as markers of recovery. Endocrine changes have received far more attention. A single 'marker' of recovery has not been identified, even though patients consider that they are still recovering when the currently studied markers have long since returned to their baseline values.

THE FUTURE

There are some well-validated general tools that are of use in assessing health states, but these are probably too insensitive to capture the process of recovery from surgery. Combinations of global, disease specific and psychological assessments are the best current options. With this in mind, there is a large vacuum of patient-orientated research in the measurement of outcome. Anaesthetists, surgeons and social scientists need to collaborate with further qualitative work to define the issues, followed by quantitative analysis to confirm the concepts before the tools are applied. **HM**

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KEY POINTS

- Quantifying recovery allows individual and group comparisons for the benefit of patients, clinicians, and health-care managers.
- Measurement tools must undergo validity testing to ensure that they 'measure what they were intended to measure'.
- Useful measurement tools should be able to measure their effects in a repeatable fashion, both over time and in different populations.
- A measurement tool should be acceptable to its subjects.
- Combinations of disease-specific, global and psychological assessments are the best current options to quantify postsurgical recovery.
- Further qualitative and quantitative research is needed to explore and expand this area of measurement.