Can we measure the quality of perioperative care?

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Data showing that perioperative interventions can significantly improve postoperative outcomes have become commonplace. In the 21st century being unable to measure the quality of perioperative care and the consequent outcomes is unacceptable. Any organization that consumes such huge amounts of public resources as the NHS has an obligation to justify this expenditure and demonstrate quality service delivery.

However, the currently available published data are very limited. Raw mortality data for a few specific operations are available for the Hospital Episode Statistics in England and Wales (http://www.doh.gov.uk/hes/index.html). The Scottish Audit of Surgical Mortality (http://www.show.scot.nhs.uk/sasm/) has commenced systematic national data collection using methodology to adjust for individual patient risk. But can we meaningfully measure the quality of postoperative care?

Patients come to the operating theatre with a number of characteristics that can be assigned a level of risk for any particular event. Increasing age, presence of comorbid conditions and a reduced cardiorespiratory reserve are all associated with increased perioperative risk of adverse outcome.

Similarly components of the package of care that patient receives during the perioperative period can influence the risk of adverse outcomes, e.g. duration of surgery, postoperative critical care facilities. By use of simple scoring systems the risk of an adverse event can be calculated for individuals or populations of patients and observed adverse event rates can be compared with expected rates based on historical data. This approach has been used for some time in the critical care community (APACHE scores) and for cardiac surgery (Parsonnet and EuroScore).

The POSSUM scoring system (Physiologic and Operative Severity Score for the enUmeration of Mortality and morbidity) (Copeland et al, 1991) achieves the same aim for the general surgical population. Physiological data recorded preoperatively and 'operative severity' data recorded postoperatively are entered into a regression equation to predict the risk of mortality or morbidity. Observed event rates can be compared with expected rates (from large databases) and outcomes compared with a benchmark. Better outcomes can be explored to identify beneficial components of the care package and worse outcomes to explore where shortfalls in service provision might be improved.

This type of risk information should not be used to make clinical decisions for individuals – there are too many unmeasured variables and variations in individual patient response – but on a population basis (e.g. between hospitals) these scores have huge potential utility. However, comparing small samples in audit is prone to the same potential errors as in research (particularly where the event rate of an outcome is very low) and appropriate use of comparative statistics is essential. Data quality is very important: inaccurate or missing data in hospital database systems is common. Audit of data quality is essential to accurately measure care but contributes to the cost of producing meaningful data. A quality perioperative dataset is estimated to cost between £30–50 per patient episode when the costs of collection, quality control, analysis and presentation are included.

Finally, what outcomes can we compare? Death is easy to measure, but is happily an extremely rare event for the vast majority of operations. Length of hospital stay or critical care stay are commonly used as surrogates of patient outcome but are measures of process of care delivery as much as patient outcome. Morbidity or complications are obvious candidates but there is no consensus as to how or when these data should be collected. The development and validation of generic morbidity scoring systems has huge potential utility (Bennett-Guerrero et al, 1999). In the future we may well begin to concentrate on such patient-focused variables as time to return to work or normal life and quality of life scores (Jenkinson et al, 1993).

Meaningful measurement and comparison of the quality of perioperative care is in its infancy. However, the tools to achieve this goal are becoming available and could help improve provision of care and health outcomes. They will be used both by our profession, and against it. It is essential for us all to understand their strengths and weaknesses. HM

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