



SYNOPTEC



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How to measure and track medical outcomes



What are medical outcomes and why are they so important?

At first glance, 'medical outcomes' may seem like an intuitive term, but delve a little deeper and it becomes much more complex. From the patient's perspective, the outcome may simply be whether they are 'cured' of their problem. However, from the clinician's point-of-view, does this mean the disease is eradicated, the symptoms are alleviated, function is restored or simply that the patient survives? Each of these outcomes may be relevant in different circumstances or for different conditions. Add into this the financial or efficiency-related outcomes relevant to healthcare managers and funding-bodies and defining outcomes becomes even more complex.

Clearly outcomes are important. They are important for patients who seek information, guidance and reassurance; doctors who want to identify areas for improvement and perhaps see how well they are performing relative to others; and for managers to track areas in need of investment and to plan for service provision.

Measuring outcomes

Measuring crude outcomes such as survival rates may be relatively easy. More detailed information is harder both to record and to standardise. Thinking about recording post-operative complications helps to highlight some of the problems. For example:



- What is an acceptable length of post-operative stay? When (if ever) does prolonged stay become a problem, and how is this recorded if the lengthened stay is due to comorbidity?
- What constitutes a wound infection, how long after the procedure should these be recorded, and how is the data captured when the infection happens outside the hospital setting?

Relying on personal recollection and paper-based systems makes all of this extremely challenging, time-consuming and inaccurate. Meaningfully measuring outcomes requires a huge amount of information to be collected; patient demographics, co-morbidities, procedure details, complications, blood results, pathology reports, hospital length of stay, use of additional services and even home situation may all be relevant to produce meaningful outcomes. Joined electronic systems are needed to ensure data capture is automatic and accurate.

Does monitoring medical outcomes improve performance?

Outcomes from hospitals, surgical teams and even individual surgeons are increasingly being monitored, reported and published. Among the stated aims of programs such as the American College of Surgeons' [National Surgical Quality Improvement Program \(NSQIP\)](#) is quality improvement [1].



But is there any evidence that gathering such large volumes of data really does improve outcomes? There is ongoing debate in the literature about this. An early report from Canada in 1994 gathered surgical site infection data from individual surgeons. Each person's performance was then confidentially shared, along with the mean of their peers. Over the period of the study, infection fell by 32% [2]. In light of this and similar studies, larger scale data has been gathered. Concerns about data quality and completeness mean conclusions are uncertain. However, although some believe reporting alone may not be sufficient to

improve outcomes [3,4], this information does give the opportunity for scrutiny, comparison and benchmarking. When coupled with targeted improvement initiatives (for example surgical site infection reduction bundles), significant outcome improvements are seen [5].

Of course, public availability of outcomes reporting needs to be handled with care. There is some evidence from the US that surgeons may avoid more complex cases because of fear of worsening outcome data [6]. In the UK, where reporting is mandatory in some specialties, this fear does not seem to have been realised. Careful adjustment for the complexity of caseload is crucial, as of course is ensuring data entry is accurate and verifiable.

Outcomes reporting in practice—coronary artery disease

Coronary artery disease and cardiovascular health are specific areas where outcomes reporting and tracking are being advanced. The importance of



tracking and benchmarking outcomes is well recognised, yet use of different outcome measures leads to difficulties in comparison. The [International Consortium for Health Outcomes Measurement \(ICHOM\)](#) put together a working group of experts from across the world to define a set of outcomes that could be universally applied and allow meaningful tracking of results. Their set of 13 outcomes include both immediate therapy goals, long-term results and patient-related outcome measures [7]. Their hope is that by defining the parameters, outcomes can be more meaningfully shared and benchmarked, and that over time results will improve.

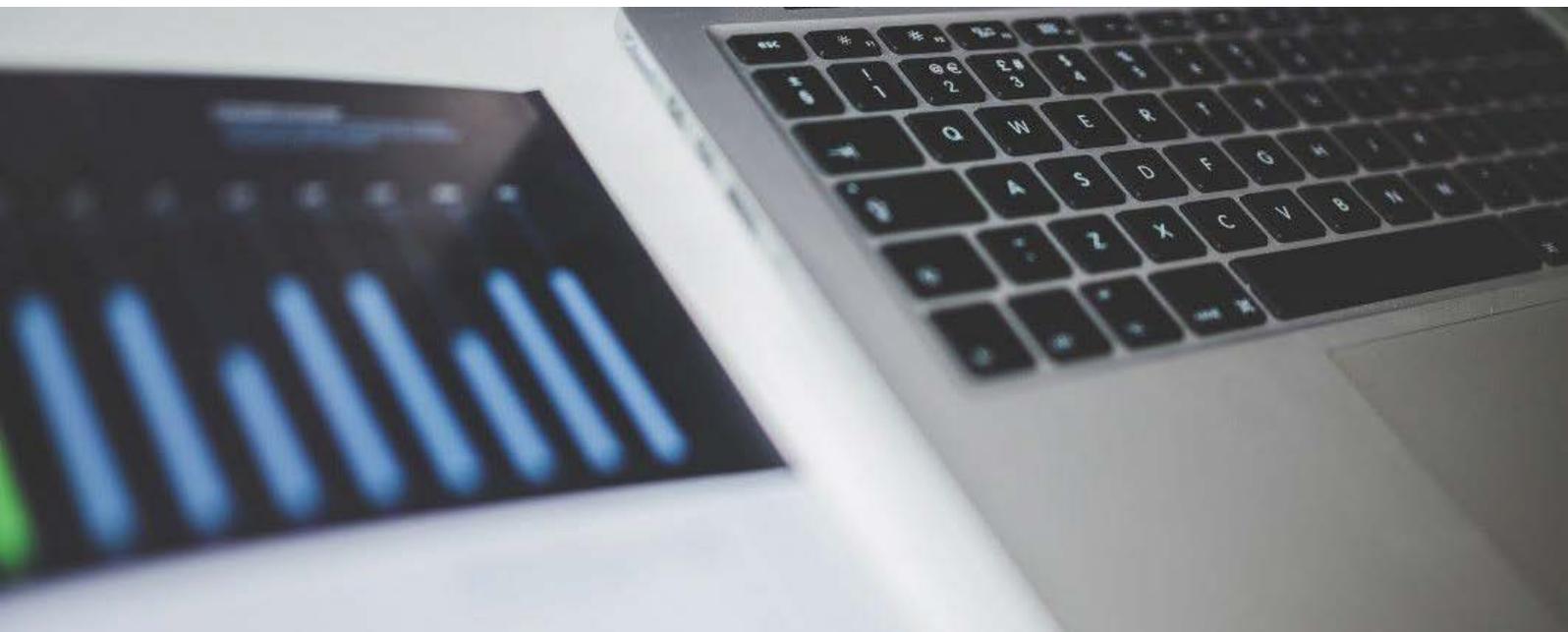
That such improvements can be achieved can be illustrated by work done in Sweden. There, cardiac researchers have developed a nationally available database for outcomes tracking. This database allows individual units to input data and receive real-time feedback on outcomes. Access to the database is coupled with a quality intervention—providing clinicians with both training on use of the system and an update on national best-practice guidelines. Using this combined approach, the Swedish Quality Improvement in Coronary Care Study Group demonstrated a 20% reduction in mortality in participating units

compared to matched control hospitals [8]. As the group point out, tracking and monitoring outcomes in this way is thus able to demonstrate similar improvements in outcome to many new cardiac therapies.

Outcomes reporting in practice—thoracic surgery

The [Society of Thoracic Surgeons](#) in the US has also recognised the importance of results reporting and the impact this can have on quality. Since 1989, they have had a national results database, allowing surgeons to voluntarily contribute their results. Since 2011 the database has facilitated international contributions. Currently, the database of adult cardiac surgery contains over 6 million surgical records.

In 2016, [The Annals of Thoracic Surgery](#) made the decision to begin a monthly series of articles based on information from this impressive database. The articles report on outcomes analysis, quality improvement, and patient safety, and are followed by an annual review of outcomes papers. Clearly results reporting and analysis is at the top of their agenda [9].



National and international outcomes databases

There is little doubt that at present Scandinavian countries lead the way in collating and reporting national health outcomes. National databases exist for a wide range of conditions from perinatal outcomes to melanoma, cholecystectomy

and circumcision [10-13]. Tracking data on such a huge scale has enabled effective benchmarking of outcomes at a national level—short-term cholecystectomy outcomes and long-term results of epilepsy surgery can be accurately reported [12,14]. Unexpected findings can also be uncovered, such as the relationship of ritual circumcision and the risk of autism spectrum disorder [13].



The surgical community in the United States is harnessing the power of nationalised reporting and benchmarking via its NSQIP program. The program helps hospitals with effective outcome recording, benchmarking and monitoring results. Simply through this intervention, they claim some impressive results, reducing both complications and

mortality in participating hospitals. A paper from 2009 found that 66% of participating hospitals showed a significant drop in mortality, and 82% improved their morbidity [15].

Challenges with traditional recording and reporting methods

Of course, participating in National and International databases requires accurate patient data to be readily available. Extracting and providing accurate outcome data has traditionally been extremely challenging. Narrative reporting techniques coupled with manual recording meant that extracting data involved trawling through a thick tome of medical notes often containing illegible handwriting and badly-filed information. This was a tedious and time-consuming task, where the outputs were completely dependent on the skill and diligence of the individual searching the notes. The result was that many clinicians had neither the time, resources or inclination to produce good quality comprehensive data.

Increasing focus on outcomes means that alternatives are needed. In some areas reporting is mandatory, in others it influences funding bodies or patient choice [16]. New reporting methods and technological solutions ensure

complete, accurate and verifiable data can be extracted with minimal effort, literally at the click of a mouse.

Benefits of synoptic reporting to outcome measuring

Data extraction depends entirely on data input. If the information is recorded during a clinical episode and stored in a standardised way, then producing summaries becomes easy. Increasing use of electronic systems means all this can be done with minimal additional input from the clinical team.



The most effective way to ensure data is complete and standardised is to use synoptic-based recording systems. Synoptic reporting has been convincingly demonstrated to improve the completeness of reports for each patient, and therefore improve the quality of later data extraction [17]. Synoptic systems rely on pre-formatted data entry, so individual style and narrative reporting is minimised. This not only makes creating the report faster [18], but also means the technology can extract information and produce averages or trends for a large number of patients.

Outcome trends in a single institution are interesting; outcomes over multiple institutions can produce extremely valuable information about the relative benefits of one technique over another, or simply add weight to local impressions. If multiple sites use compatible electronic systems, producing such data is entirely straightforward.

Which areas can benefit from synoptic reporting?

The first specialty to embrace synoptic reporting was pathology. Following the 2004 recommendations of the College of American Pathologists, checklist or synoptic reports became the gold-standard for cancer pathology reports [19]. Multiple investigations have shown that synoptic reports increase both the

completeness and accuracy of surgical pathology reports, and enhance the ability of clinical staff to extract and act-on the information they need [20].

Other specialties are increasingly looking at synoptic reporting in a bid to increase efficiency, reduce the time clinicians need to spend on report creation, and make reports available more quickly. For example, synoptic-based operation notes have been demonstrated to achieve all these outcomes [21].

Smaller specialties with low volume procedures have traditionally struggled to produce meaningful data on outcomes or relative performance. Small numbers of patients mean that identifying statistically significant differences is almost impossible. Using standardised data capture to allow pooling across multiple sites has the potential to alleviate this problem. A group of thyroid surgeons have identified this potential and are beginning to use synoptic-style reporting systems to allow comparison across sites and identify trends [22].

Driving forward change and introducing new procedures or patient-care pathways can all be helped by data documenting the effect of that change. Having accurate information immediately which shows that hospital length of stay is reduced by one day with a new surgical procedure may be all that is required to secure funding for the innovation.

Synoptic reports for medical outcomes

Using synoptic systems to record patient-related information at source makes data extraction simple and efficient. Interrogating outcomes and benchmarking against other practitioners allows clinicians to scrutinise their practise, focus on areas for improvement and share areas of excellence and expertise. Modern technology can make this process streamlined and straightforward, with little or no personal input needed. Using this technology to drive up standards for patients and identify areas in need of investment has the potential to help all involved in patient care.

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