Quality improvement in low resource settings: an Ethiopian experience

Improving surgical and anaesthetic mortality in the developing world is a global health priority. Quality improvement processes have a role to play in addressing this need and are applicable to low-resource settings despite difficulties in their implementation. International initiatives to reduce perioperative mortality can be focussed to support interventions at the level of individual departments, but this requires integration with existing local systems and an understanding of the specific needs of the institutions concerned. There is a small but growing evidence base for quality improvement in low resource settings, but this needs to be locally accessible to allow self-sustaining evidence-based quality improvement.

According to Bainbridge et al (2012): 'Global priority should be given to reducing total perioperative and anaesthetic-related mortality by evidence-based best practice in developing countries'. Despite chronic underfunding in both manpower and infrastructure, evidence-based quality improvement in low-resource settings is still possible.

Patient safety is a relatively young academic discipline, with an evidence base rooted predominantly in high-resource settings, yet many of its lessons can be brought to bear in the effort to improve surgical outcomes elsewhere. Consensus global guidelines on surgery (World Health Organization, 2009) and anaesthesia (Merry et al, 2010) exist and there is a small but growing evidence base for the efficacy of a range of quality improvement tools.

The World Health Organization Surgical Safety Checklist represents just such a tool, its original evidence base drawing on experience in both high and low resource settings (Haynes et al, 2009), with the greatest effect on surgical outcome seen in the latter group. Further work (De Vries et al, 2010) has shown that the benefit of perioperative checklists is increased when they are used at various points on the surgical pathway. While the later study looked exclusively at centres providing a high level of care, it may be reasonably expected that a similar benefit would be seen in low resource settings.

Dr Tom Bashford *is Clinical Research Fellow in the Department of Anaesthetics, University College Hospital, London NW1 2BU (tom.bashford@doctors.org.uk)*

Working in low resource settings

Estimation of surgical burden in the developing world is difficult but reviews of surgical need in Africa (Grimes et al, 2011; Lavy et al, 2011) demonstrate that although there is a huge unmet need, the volumes of surgery are still substantial. By this token, even small improvements in outcome through tools such as the World Health Organization Surgical Safety Checklist will positively affect vast numbers of patients.

The author's experience of quality improvement in low resource settings is centred on a 10-month placement through Voluntary Service Overseas in a large public hospital in Addis Ababa, Ethiopia, between September 2011 and June 2012. Working alongside local staff and other Voluntary Service Overseas volunteers, the goal of this placement was to improve the practice of the anaesthetic department through the introduction of a number of coordinated, evidence-based, patient safety interventions. These were based on a departmental audit against the existing standards for a safe practice of anaesthesia, with the resultant suite of interventions including the development of a pre-anaesthetic assessment and equipment checklist, the introduction of the World Health Organization Surgical Safety Checklist, improved monitoring and the use of an early warning scoring system in recovery areas (*Figure 1*), and the development of a small high dependency unit (*Figure 2*) (Bashford, 2012).

Both the initial audit and the experience implementing the World Health Organization Surgical Safety Checklist are currently being prepared for publication, and a video demonstrating some of the work on the Surgical Safety Checklist can be viewed online (www.youtube.com/watch?v=tJ4NrJJrP0Q).

What are the problems?

Many barriers may exist to quality improvement in low resource settings. Poor access to the existing literature can mean that there may be a widespread lack of appreciation of modern patient safety and quality improvement processes. While internet access in Ethiopia is improving, the costs of journal subscriptions are prohibitively high.

A specialized hospital serving a catchment population of 3 million people may have an operating budget of around £2.5 million; compare this to the UK where a district general hospital serving 750 000 people may run on a budget of £250 million. Added to this high clinical workloads, rigid institutional hierarchies and distant clinical leadership, often simply as a result of a lack of staff, can mean that patient safety champions are scarce, and those that exist can feel unsupported and isolated. A lack of funding to support new interventions can mean that those

Figure 1. Discussion of a patient's early warning score.

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departments trying to improve quality can be frustrated in their ability to drive even modest changes.

The corollary of these difficulties is that there is a paucity of 'home grown' publications from low resource settings in quality improvement. Entering the term 'Anaesthesia' and 'Ethiopia' into PubMed returns just 34 results. Those which can be accessed are often the result of large international initiatives or work by non-governmental organizations and can feel irrelevant to clinicians practising in very challenging environments. In addition, local record keeping may make quality improvements hard to assess as baseline data are often not available or unreliable. In the author's experience, the very act of planning a quality improvement exercise can highlight such an array of flaws in the health-care infrastructure that it can feel futile to even begin.

However, strategies are emerging from experience in both high and low resource settings to improve the uptake of interventions such as the World Health Organization Surgical Safety Checklist (Vats et al, 2010; Healy, 2012; Yuan et al, 2012), and this literature, along with the existing international guidelines on good practice, are important tools for those attempting to introduce quality improvement processes.

Figure 2. Management of diabetic ketoacidosis in the high dependency unit.

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Team working

In addition, there are a growing number of international bodies who are concerned with patient safety in low-resource settings and coordination of these bodies can support work in individual departments. In Ethiopia we worked closely with Voluntary Service Overseas, the Clinton Health Access Initiative, the Yale Global Health Leadership Institute and the Lifebox Foundation, to help align local improvements with existing national and international patient safety initiatives.

Voluntary Service Overseas, Clinton Health Access Initiative and the Yale Global Health Leadership Institute are working closely with the Ethiopian government to drive quality improvement across the country, while the Lifebox Foundation have a global vision to improve surgical safety through universal pulse oximetry and the World Health Organization Surgical Safety Checklist. Such agencies often have access to both human and material resources, as well as important governmental connections and the benefit of a long-term presence in a country. Working together to help deliver department-specific interventions not only pools resources and experience but also facilitates wider dissemination to encourage self-assessment and improvement in other centres.

Local engagement

An overseas volunteer working in concert with regional, national or international bodies is not sufficient, however. The author's experience is that the identification of local leaders, along with the full engagement of local clinicians, is essential for any meaningful change in practice. Many centres in resource-poor settings see a continual flux of visiting overseas clinicians and charities with differing goals, working styles and priorities. Short-term visits can achieve remarkable clinical outcomes but may struggle to support meaningful changes in their host departments. A longer-term presence to build trust, understand local challenges and support local ownership is, I would argue, a prerequisite for successful quality improvement delivery.

One of the senior theatre sisters, a key player in the implementation of the World Health Organization Surgical Safety Checklist, took me aside following the recent departure of a visiting clinical mission to make exactly this point: 'Dr Tom, why should we do what these people tell us? They come for 2 weeks and then leave. You have been working with us for months. You understand us, you are our friend. Anything you think is good for our department, we will try.' While this level of trust is humbling, it gives hope that any planned interventions may be sustained.

Sustaining change

The issue of sustainable change is not confined to the developing world. While junior doctors in the NHS are usually mandated to perform at least one audit each year for their annual appraisals, translating the outcome of these into changes in clinical practice can be difficult. The attendant challenges of communication, persuasion and trust may be similar in kind, if not in scale, for both the junior doctor working in a UK hospital and the volunteer working overseas. If a junior struggles to make lasting changes to practice at home during his/her 12-month rotation, how much longer should it be expected to take in an unfamiliar setting?

Furthermore, what is the human cost of failure to improve? In the NHS high-quality care is routine, and improvements are usually incremental. In low-resource settings, small changes may have large impacts on patient outcome, lending a strong moral dimension to the question of sustainability. My feeling regarding overseas aid is that it should be working to obviate the need for itself; building capacity and the possibility of self-sufficiency. If sustainability is not considered from the outset, then where does it leave the recipients when the aid agencies go home?

A further challenge in improving surgical outcomes is the widespread lack of medically trained anaesthetists in many low resource settings. Ethiopia has an estimated 17 medical anaesthetists to service a population of around 85 million people (Dr O Hervoy, Tikur Anbessa University Hospital, Addis Ababa, personal communication, 2012) with the bulk of anaesthetic provision undertaken by non-physician anaesthetic practitioners. Differences in training and culture mean that this population is not necessarily empowered to make autonomous, evidence-based, changes in practice or to adopt leadership roles within the


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Figure 3. Supporting clinical decision making in the high dependency unit.

clinical setting. My experience, however, is of enthusiastic, receptive and highly skilled individuals who are desperate to improve their practice and the quality of their anaesthetic service. Efforts to improve surgical outcomes need to harness this enthusiasm and encourage these individuals to become innovators and leaders, supporting them to develop their own brand of safe anaesthesia based on their skills, resources and surgical population.

It is important that planned quality improvement interventions are appropriate to the local situation and its limitations rather than adopting a 'one size fits all' approach. A significant development of the existing evidence base, and improved access to that information already available, is necessary to inform this. Publication of work is vital to allow others to learn from past experience and drive further improvements, but it is important that where possible this is not only the preserve of international visitors and closed-access journals. The team from Yekatit 12 Hospital is working to publish our experiences in Ethiopian, international and open access journals with the aim of encouraging other Ethiopian centres to initiate quality improvement processes. Ultimately, quality improvement needs to be driven, evaluated, published and developed at a local, as well as a national and international level.

Conclusions

While formal quality improvement processes are a relative newcomer to clinical practice in the UK, many of their central tenets are equally pertinent to low-resource settings, although significant barriers may exist to their implementation. While international non-governmental organizations and governments are starting to work towards introducing such processes, there remains a huge amount of work to be done at the clinical coalface.

Volunteer physicians in low-resource settings often concentrate their efforts on clinical provision and local teaching programmes to the end of improving patient outcomes. However, facilitating quality improvement and patient-safety initiatives may represent an alternative, effective and sustainable way to improve surgical mortality in the longer term, especially if done in coordination with interested partner agencies. Such facilitation needs to be based on understanding, communication and trust, requiring a long-term presence in a given department (*Figure 3*). It must be always borne in mind that the ultimate goal is a self-sustaining system of improvement which, while sitting within the context of an international effort to reduce perioperative mortality, is locally owned and based on a relevant and accessible evidence base.

On a personal level, working in low-resource settings has both the capacity for incredible challenge and unparalleled reward. For more information about Voluntary Service Overseas and its work in health care across the world, visit www.vso.org.uk. **BJHM**

LEARNING POINTS

- Improving surgical and anaesthetic outcomes in low-resource settings is a global health priority.
- Quality improvement processes represent an evidence-based approach to achieving this aim.
- The implementation of quality improvement processes in low-resource settings benefits from a collaborative approach.
- Sustainable and effective change requires local ownership and an appropriate, accessible evidence base.

Conflict of interest: none.

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