

Oesophageal Doppler monitoring saves lives

Consultant anaesthetists, Dr **HOWARD WAKELING** and Dr **CAROLINE JENKINS**, from the Western Sussex Hospitals NHS Trust, provide an update on the latest research on the use of oesophageal Doppler monitoring (ODM) to guide fluid management during surgery.

With the National Patient Safety Agency instructing all hospitals in England and Wales to use the World Health Organization's simple surgical checklist by February 2010, there has been a renewed focus on surgical patient safety and outcomes. Despite this, some interventions which offer positive effects on safety and outcomes remain underused despite having strong data to support them.

Recent research from the National Institute for Health Research (NIHR) Health Technology Assessment (HTA) Programme¹ showed that oesophageal Doppler monitoring (ODM) saves lives, reduces surgical complications, and shortens length of stay in hospital. The NIHR HTA published its review of the clinical and cost-effectiveness of ODM in high-risk surgical and critically ill patients in February 2009.

ODM directly measures blood-flow from the heart during surgery, allowing the clinical team to better manage the patient (ODM-guided fluid management). The report recognises that within the NHS, Deltex Medical's Cardio-Q-ODM device is the most widely used and that ODM is a simple and safe procedure.

Where clinical teams do not haemodynamically optimise their patients during surgery and critical care, there is a serious risk of cases of reduced circulating

blood volume, as changes in blood flow may not be monitored to the same accuracy. Reduced circulating blood volume is known as hypovolaemia, similar to dehydration, which leads to insufficient oxygen being delivered to the organs to meet their requirements.

This can result in medical complications which commonly include gut problems ranging from simple loss of appetite to ileus (gut standstill) requiring treatment with a nasogastric tube and intravenous fluid drips. More serious complications are less common but include kidney failure and multiple organ

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failure. All of these complications lead to longer hospital stays and the more serious may even result in patient death.

The HTA Programme, part of the NIHR, was set up in 1993 and produces high-quality research information on the effectiveness, costs and broader impact of health technologies for those who use, manage and provide care in the NHS. Health technologies are broadly defined as all interventions used to promote



health, prevent and treat disease, and improve rehabilitation and long-term care.

For the review of economic evaluations, the HTA compared ODM with standard care with and without central venous pressure monitoring. The report found no relevant evidence to compare ODM with Pulmonary Artery Catheters, pulse contour analysis monitoring and lithium or thermodilution cardiac monitoring. It reported that ODM is likely to be cost-effective since the initial cost of ODM is compensated by reduced complications and shorter length of stay in hospital.

The report assessed the potential economic impact of ODM for surgical patients under the Quality Adjusted Life Year (QALY) methodology used by the National Institute for Health and Clinical Excellence (NICE). The analysis showed ODM to be both more effective and less costly under virtually every scenario modelled and that the NHS would need to spend between £642 and £4,441 extra on each additional survivor of surgery before ODM would no longer be considered cost effective.

The review concluded that ODM probes are low-risk devices and that ODM can be considered safe in surgery. Evidence from five studies involving 453 high-risk surgical patients suggested the addition of ODM-guided fluid administration during surgery results in fewer major complications, a shorter length of hospital stay, and fewer deaths. The analyses included a study of patients undergoing cardiac surgery.

British Consensus Guidelines on Intravenous Fluid Therapy for Adult Surgical Patients (Giftasup) were recently completed and found similar benefits from modern approaches to managing patients' fluid levels during surgery. Giftasup has provided surgeons with detailed instructions on how to successfully manage patients' fluid levels. The guidelines indicate that the assessment and management of fluid status during surgery by minimally invasive means, such as ODM, can produce substantial benefits to a patient's recovery.

The guidelines also indicate that enhanced-recovery care programmes



deliver substantial benefits. A number of hospitals around the country are using ODM as part of these new standards of care aimed at reducing complications, improving patients' recovery times and shortening lengths of stay. Enhanced recovery care combines a number of measures before, during and after surgery:

- **Before the operation:** A comprehensive preparation of the patient prior to admission including a package of education to better inform them about their 'surgical journey' and an objective assessment of their fitness to undergo the required operation.
- **During the operation:** The use of minimally invasive surgical techniques (keyhole surgery) and precise anaesthetic care with specialist cardiac and fluid monitoring (i.e. ODM) during the operation.
- **After the operation:** A defined post-operative programme including rapid mobilisation and early return to eating and drinking that minimises surgical complications while encouraging patient recovery and discharge.

In Lord Darzi's report on the future of the NHS in London, *A Framework for Action*, ODM was identified as a "simple use of cheap technology to reduce length of stay" and it was recommended that "the evidence-base is clear here and

'ODM can save the NHS as much as £4,441 per patient.'

changes should be rapidly implemented across London". The NHS Purchasing and Supply Agency's Centre for Evidence Based Purchasing (CEP) has also recently published a report which gave ODM a rating of 'significant potential' – one of the highest ratings CEP has ever given to medical technology and found that ODM can save the NHS as much as £4,441 per patient.

The NIHR review has highlighted the evidence that ODM significantly improves outcomes for patients undergoing major surgery. This has provided the NHS with the clinical evidence base it needs to deliver the best care for patients undergoing surgery and it is time that ODM is now formally recognised as a standard of care for NHS patients undergoing major surgery.

Reference

- 1 The HTA's full report, *Systematic review of the clinical effectiveness and cost-effectiveness of oesophageal Doppler monitoring in critically ill and high-risk surgical patients*. Accessed at www.hta.ac.uk/project/1633.asp

Note

- Statement of interests: Dr Wakeling has received honoraria for lecturing from Deltex Medical and assistance with travel expenses to attend scientific meetings.

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