



Where there's flow,
there's life

**CardioQ-ODM – cornerstone of your
Enhanced Recovery Protocol**



Enhanced Recovery

The concept of enhanced recovery after surgery was pioneered by Danish colorectal surgeon Henrik Kehlet over a decade ago and results in improved outcomes and shorter hospital stays in many surgical specialties.

Enhanced recovery protocols are a managed care process based on best practices delivered by a multi-disciplinary healthcare team. The objective is the quicker recovery of patients following surgery.

The benefits of a comprehensive Enhanced Recovery programme have been demonstrated in colorectal, endocrine, gynaecological, urological, vascular and orthopaedic surgeries.

Several detailed guides are available to surgical teams wishing to implement an Enhanced Recovery programme.

6 steps have been identified:

1. Referral
2. Pre-operative care by the hospital team
3. Admission to hospital
4. Operative care
5. Post-operative care in the hospital
6. Follow-up – rehabilitation and discharge

Evidence-based care modalities are combined to create a protocol to markedly decrease postoperative morbidity (such as hospital acquired infections and venous thromboembolism), decrease length of hospital stay and decrease time to resumption of normal daily life.

Operative Care

Evidence-based operative care by the surgical team centres on a series of proven **key elements**:

Minimally invasive surgery: Shorter incisions and laparoscopic surgical techniques reduce the stress of surgery.

Intraoperative fluid management: Oesophageal Doppler guided fluid management has been shown to reduce complications, reduce intensive care admissions and reduce length of hospital stay.

Modern anaesthesia and pain relief: Modern anaesthetics allowing faster recovery, improved local anaesthesia and pain relief.

These individual interventions are more effective when implemented together than alone – ‘the sum is greater than the parts’.

Doppler Guided Fluid Management

Untreated hypovolaemia is detrimental to patient outcome and has been identified as the primary cause of non-surgical postoperative complications. Fluid overload can also be hazardous for the patient. The key is individualised fluid management, giving the right amount of fluid at the right time to meet each patient's needs.



Individualised fluid management using Oesophageal Doppler Monitoring (ODM) and a 10% change stroke volume optimisation algorithm has been widely used in Enhanced Recovery programmes.

National programmes continue to evolve in a number of countries. In the UK the Enhanced Recovery Partnership (ERP) has published a guide which includes evidence of widespread adoption of Enhanced Recovery in the NHS and achievement of stated goals i.e. reduced length of hospital stay after surgery resulting in more operations being performed despite fewer bed days, no increase in readmissions and high levels of patient satisfaction.

Intraoperative fluid management is a cornerstone of Enhanced Recovery and the use of ODM guided fluid management is supported by the UK ERP in line with the National Institute of Clinical Excellence (NICE) Guidance (MTG3), the NHS Operating Framework 2012/13 and the Department of Health Innovation Health and Wealth Review 2011.

“The Enhanced Recovery Partnership fully supports the use of intra-operative fluid management technologies to deliver individualised goal directed fluid therapy.”

Only Doppler is recommended

Randomised, controlled trials using the CardioQ-ODM have demonstrated that early fluid management intervention will reduce post-operative complications, reduce intensive care admissions, and reduce the length of hospital stay.

The evidence in support of individually guided fluid management during surgery is centred on the implementation of oesophageal Doppler monitoring (ODM), using the CardioQ-ODM. The device has established an incomparable evidence base that is today acknowledged and endorsed by the National Institute for Health and Clinical Excellence (NICE MTG3).

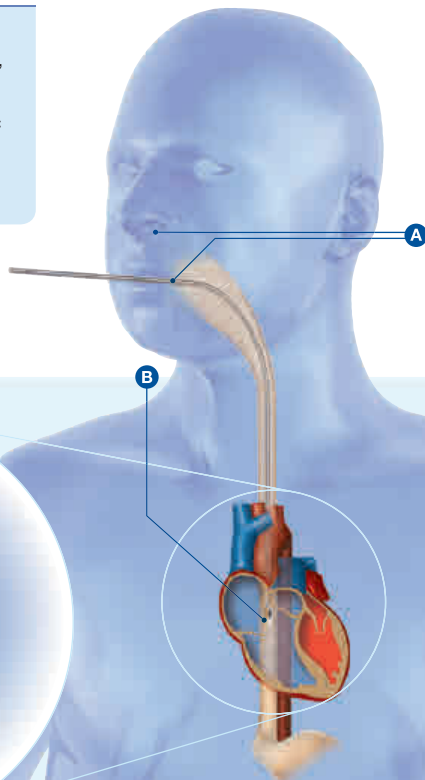
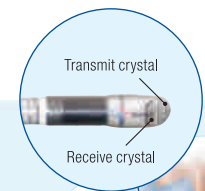
Direct flow measurement

Placing a single-use probe in the oesophagus, the CardioQ-ODM monitor uses Doppler ultrasound technology to determine directly a patient's central vascular blood flow and fluid status during the intraoperative period.

Easy to use and quick to focus, the device generates a low-frequency ultrasound signal, which is highly sensitive to changes in flow and measures them immediately.

FIGURE 1

- A** An oesophageal Doppler probe is inserted into the patient's oesophagus, either nasally or orally.
- B** The transmit and receive piezo electric crystals at the tip of the probe measure velocity of blood flow in the descending aorta.



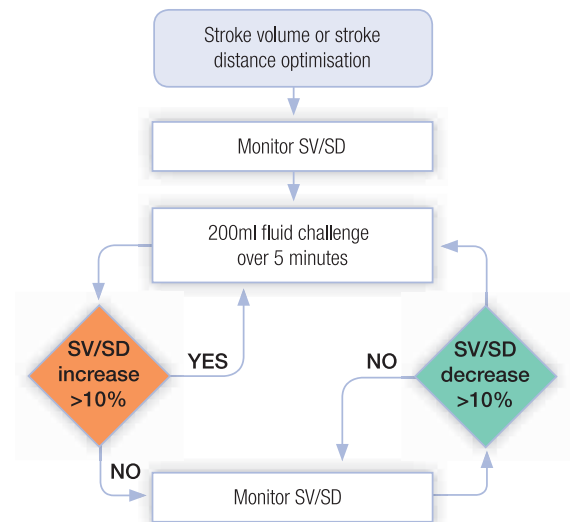
Only Doppler works

Widely proven and suitable for use across the surgical population, oesophageal Doppler monitoring (ODM) using the CardioQ-ODM, is the only minimally invasive therapy to measure blood flow directly in the central circulation.

Only the CardioQ-ODM has the precision necessary to guide successfully a 10% Stroke Volume Optimisation (SVO) protocol. Its considerable evidence base is testimony to the unique ability of the CardioQ-ODM to recognise and monitor 10% changes in Stroke Volume.

Doppler 10% stroke volume change algorithm

The 10% change algorithm was originally developed based on the precision of ODM to detect small changes in blood flow. It is this level of precision which allows ODM to successfully identify hypovolaemia and guide the administration of fluids to correct it.





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NHS Operating Framework 2012/13:

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Product Description

CardioQ-ODM Monitor (Product Code: 9051-7103)

For adult and paediatric use (down to 3kg with KDP72) in operating theatre and critical care. Managed care service and rental option available upon request.

Surgical Probes

DP6 Doppler Probe (Product Code: 9070-7001)

6-hour oral/nasal Doppler probe for patients under anaesthesia or full sedation.

DP12 Doppler Probe (Product Code: 9070-7003)

12-hour oral/nasal Doppler probe for patients under anaesthesia or full sedation.

I2S Doppler Probe (Product Code: 9090-7012)

6-hour oral/nasal Doppler probe for anaesthetised, sedated and awake patients.

I2P Doppler Probe (Product Code: 9090-7013)

24-hour oral/nasal Doppler probe for anaesthetised, sedated and awake patients.

Critical Care Probes

I2C Doppler Probe (Product Code: 9090-7014)

72-hour oral/nasal Doppler probe for anaesthetised, sedated and awake patients.

DP240 Doppler Probe (Product Code: 9070-7005)

10-day oral/nasal Doppler probe for patients under anaesthesia or full sedation.

Paediatric Probes

KDP72 Doppler Probe (Product Code: 9081-7001)

72-hour paediatric oral Doppler probe 3kg and above.



When fluid management really matters, think Doppler

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