

POCT for Haemostasis The Clinician's Point of View

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POCT Definitions

- Any test that is performed at or very near the patient delivering a quick result
- A supplement to conventional laboratory services
- Easy to operate devices

Desiderata

- Auxiliary staff can be trained to run the test
- Very short turn round time
- Quality control assured centrally
- Demonstrable benefit to patient care pathway
- Business case can be made to management that there are cost savings

Point of Care

History of poor management in the past has led to:-

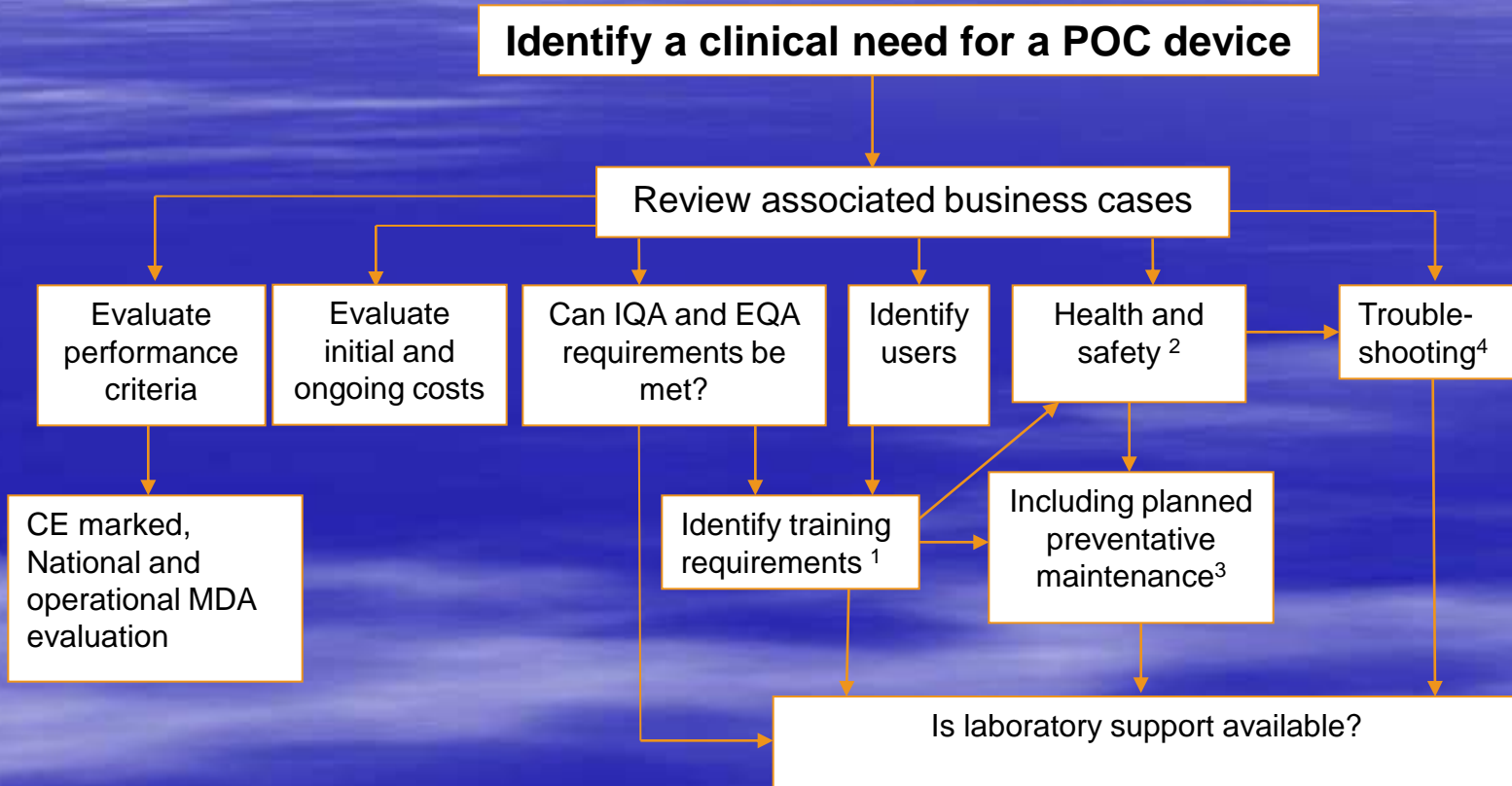
POCT guidelines being established by DOH (1989), JWGQA (1999), MDA (2002), IBMS, RCP (2004),

In the UK POCT must be under the auspices of an accredited laboratory (CPA)

Sources of Error

- Non-laboratory users
- Poor or non-existent documentation
- Pre-analytical issues
- Lack of or poor understanding of QC and maintenance requirements
- Under-researched acquisition of new tests/devices
- Lack of comparability of results with other devices or laboratory results

Establishing POC



A little history

- First point of care test in the modern era?
- Possibly Almroth Wright's capillary Ca.1880
- Blood drawn up directly into a glass capillary tube and observed to clot, then retract and separate
- First observation ex-vivo/in vitro of delayed clotting time in haemophilic blood

Perioperative POCT

- Easier monitoring of a patient's haemostatic function during surgery
- On site testing
- Testing available 24 / 7
- Reduction in perioperative transfusion (established by randomised controlled trial)

Royal Free Operating Theatre

POC Lab

- CPA accredited laboratory
- Fully documented
- Training for all users
- EQA participation
- Appropriate maintenance and QC
- BMS supervision and troubleshooting

Equipment in use at RFTPOCL

- Coagulometer - Sysmex
- Haematology analyser - XE2100
- TEG and ROTEM
- Platelet mapping

Hemochron® Signature Jnr +

- Rapid PT/INR analysis in 2 minutes
- Whole blood sample
- 15µl sample
- Minimal maintenance

Thromboelastography (TEG)

- Designed to monitor the coagulation state of a blood sample
- 8 channels
- Maintenance requirements
- Currently no formal EQA scheme available

TEG™ (Haemoscope, USA)

Torsion Wire

Pin

Whole Blood

Rotating Cup

Mechanical-Electrical
Transducer

4°

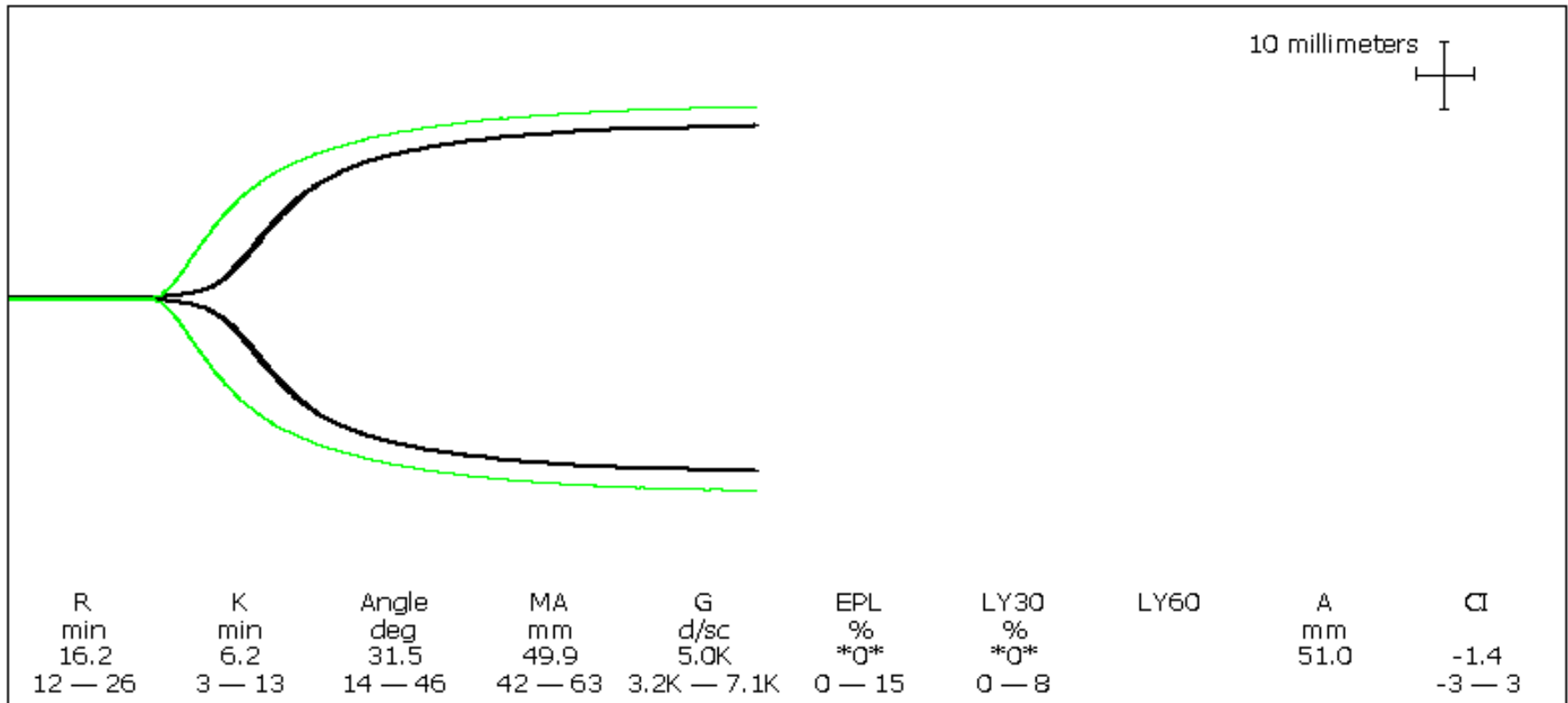


Liver Transplant

Reperfusion5

7 Native

Sample: 07/04/2008 05:26PM-06:31PM



But does everyone agree?

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BJA

Comparison of structured use of routine laboratory tests or near-patient assessment with clinical judgement in the management of bleeding after cardiac surgery

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Background. Using algorithms based on point of care coagulation tests can decrease blood loss and blood component transfusion after cardiac surgery. We wished to test the hypothesis that a management algorithm based on near-patient tests would reduce blood loss and blood component use after routine coronary artery surgery with cardiopulmonary bypass when compared with an algorithm based on routine laboratory assays or with clinical judgement.

Methods. Patients ($n=102$) undergoing elective coronary artery surgery with cardiac bypass were randomized into two groups. In the point of care group, the management algorithm was based on information provided by three devices, the Hepcon[®], thromboelastography and the PFA-100[®] platelet function analyser. Management in the laboratory test group depended on rapidly available laboratory clotting tests and transfusion of haemostatic blood components only if specific criteria were met. Blood loss and transfusion was compared between these two groups and with a retrospective case–control group ($n=108$), in which management of bleeding had been according to the clinician's discretion.

Results. All three groups had similar median blood losses. The transfusion of packed red blood cells (PRBCs) and blood components was greater in the clinician discretion group ($P<0.05$) but there was no difference in the transfusion of PRBCs and blood components between the two algorithm-guided groups.

Conclusion. Following algorithms based on point of care tests or on structured clinical practice with standard laboratory tests does not decrease blood loss, but reduces the transfusion of PRBCs and blood components after routine cardiac surgery, when compared with clinician discretion. Cardiac surgery services should use transfusion guidelines based on laboratory-guided algorithms, and the possible benefits of point of care testing should be tested against this standard.

The surgical application of point-of-care haemostasis and platelet function testing

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Methods: This article reviews situations in which POC tests may guide surgical practice. Their limitations and potential developments are discussed. The paper is based on a Medline and PubMed search for English language articles on POC haemostasis and platelet function testing in surgical practice.

Results: POC tests identifying perioperative bleeding tendency are already widely used in cardiovascular and hepatic surgery. They are associated with reduced blood loss and transfusion requirements. POC tests to identify thrombotic predisposition are able to determine antiplatelet resistance, predicting thromboembolic risk. So far, however, these tests remain research tools.

Conclusion: POC haemostasis testing is a growing field in surgical practice. Such testing can be correlated with improved clinical outcome.

The debate goes on

- Clinicians especially surgeons and anaesthetist like instant gratification
- When the situation is rapidly evolving as in theatre or ICU it seems common sense that the quicker the result, the quicker the decision and therefore the better the outcome
- Proving this could be difficult!