Confident Care Starts with the Complete Picture

Introducing the TEG® 6s System

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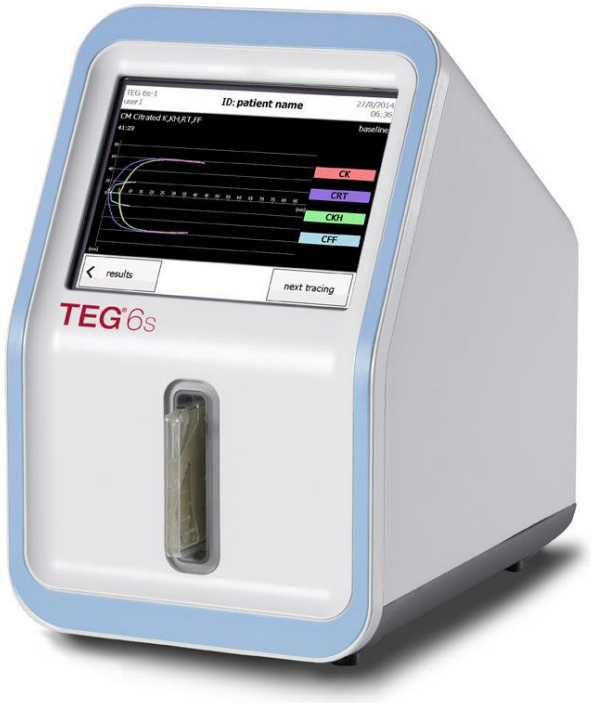
HAEMONETICS®

TEG® 6s Analyser Solution



- Evidence based value
- Innovation for you
- Value beyond technology

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Evidence based value

Innovation for you

Value beyond technology

Evidence based value

Complete testing
Improving patient outcomes
Evidence based

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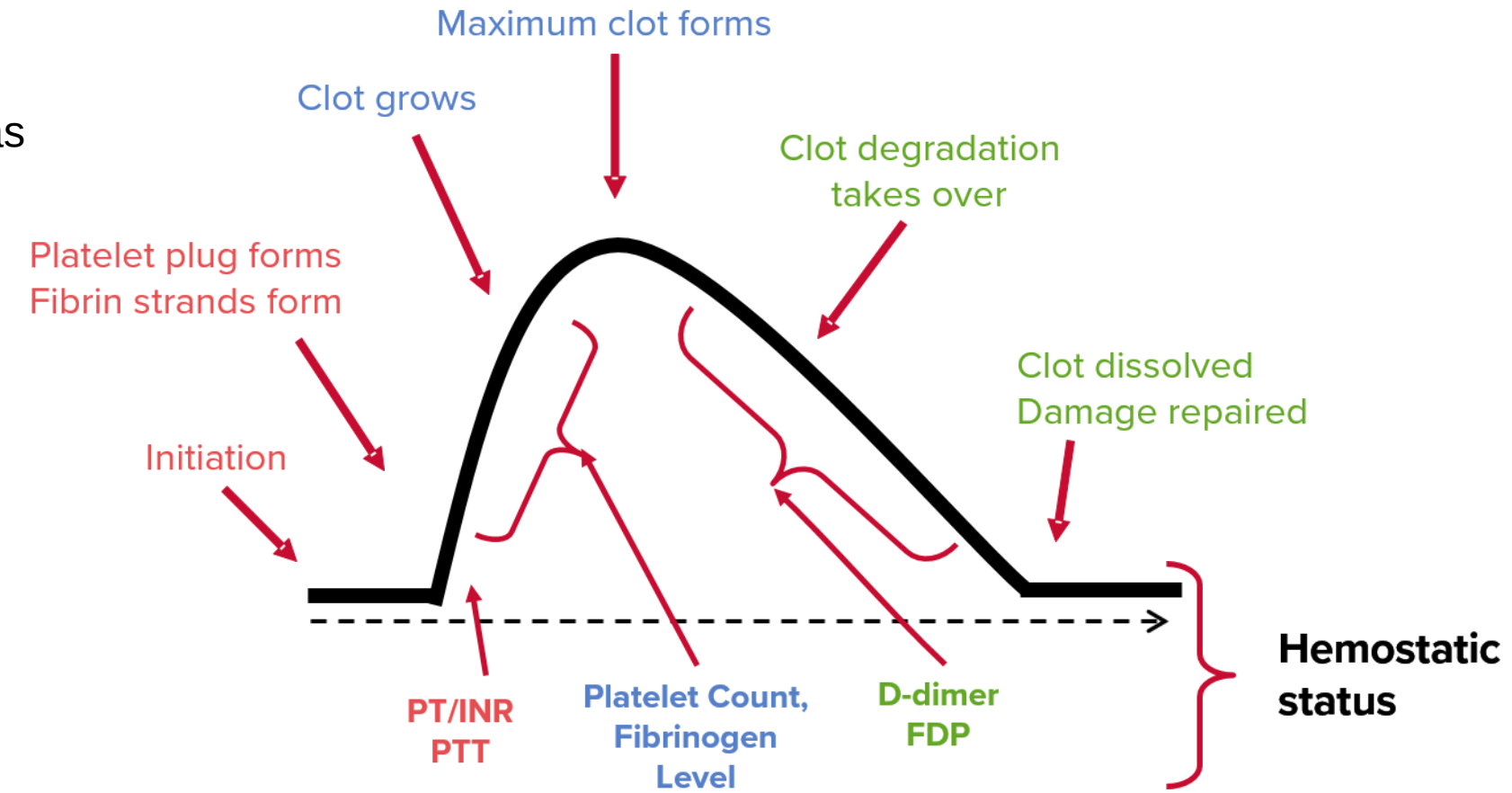
Traditional monitoring challenges

Complete testing

- Limited view of haemostasis
- 95% of the thrombin generation occurs after fibrin gel formation as detected in conventional tests
- No RCT support use in perioperative coagulopathy[1]
- Does not adequately explain the haemostatic process as it occurs in vivo
- May have significant time delays
- Complexity of isolated tests

Evidence based value

The life of a clot



CCT, conventional coagulation test; FDP, fibrin degradation product; INR, international normalised ratio; PT, prothrombin time; PTT, partial thromboplastin time

1. Haas T et al. British Journal of Anaesthesia 2015;114:217-24

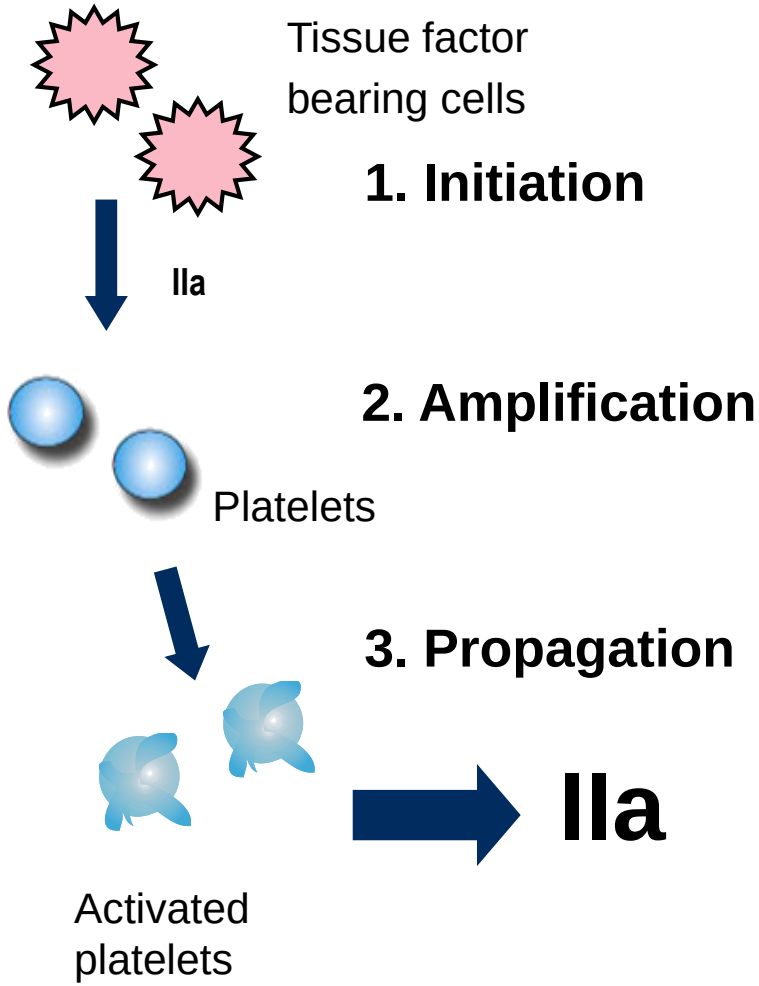
HAEMONETICS®

Cell-based coagulation

Complete testing

- Cell-based coagulation (proposed in 2001)
  - Most cohesive scientific framework on which we can understand and manage coagulation
- Builds on traditional coagulation model but which is cell-based incorporating interactions of membranes and protein[2]
  - **extrinsic pathway:** surface of tissue factor bearing cells
  - **intrinsic pathway:** surface of platelets
  - Includes
- Routine coagulation tests do not represent the cell-based model of haemostasis

Evidence based value



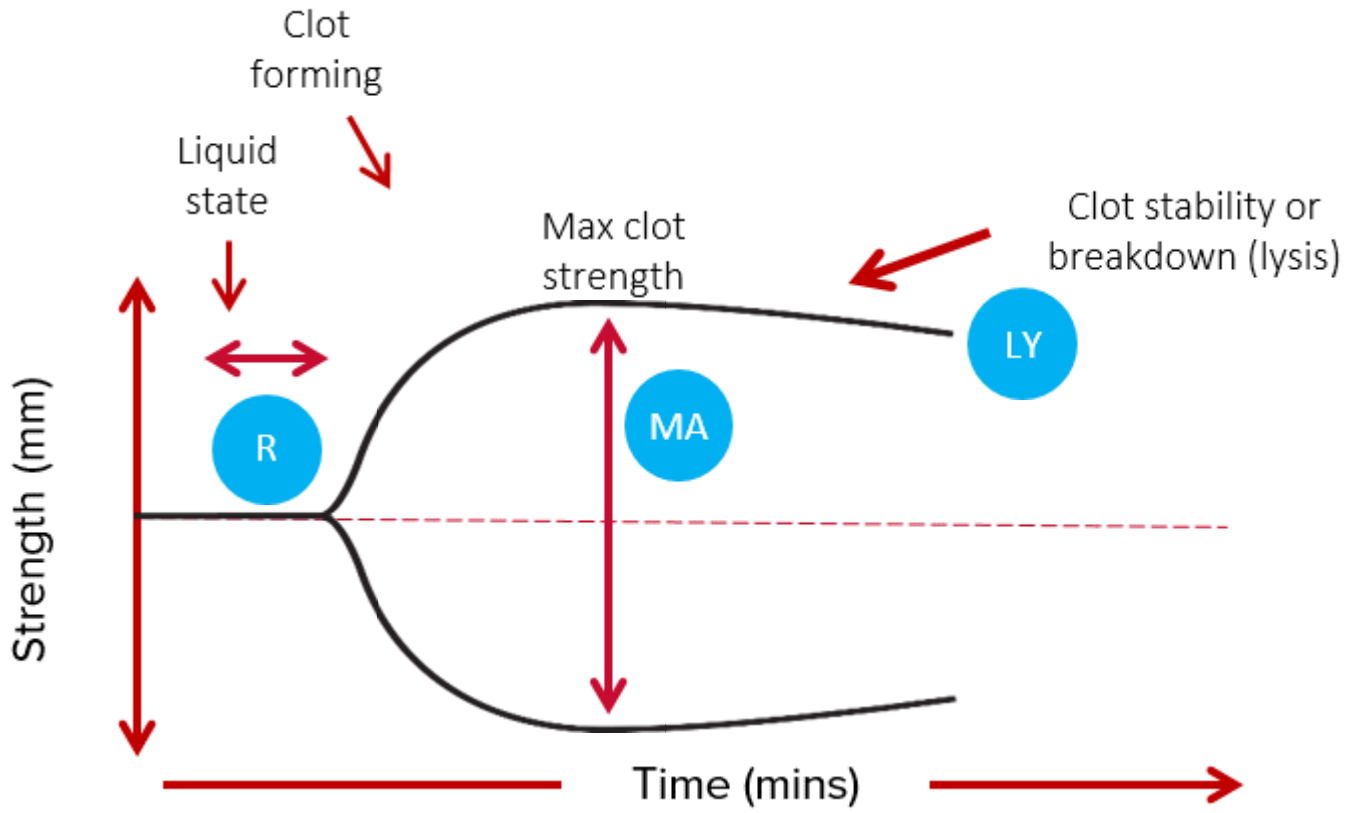
2. Monroe, DM. et al. Arterioscler Thromb Vasc Biol. 2002;22:1381]

HAEMONETICS®

Thromboelastography

Complete testing

- Comprehensive view of patient's haemostatic profile
- Measures **clot strength over time,** providing information relative to:
  - Clot rate (rate **R**, in mins)
  - Clot strength (max amplitude **MA**, in mins)
  - Clot stability (lysis **LY30**, as %)
- Functional parameters
- Numerical and graphical results



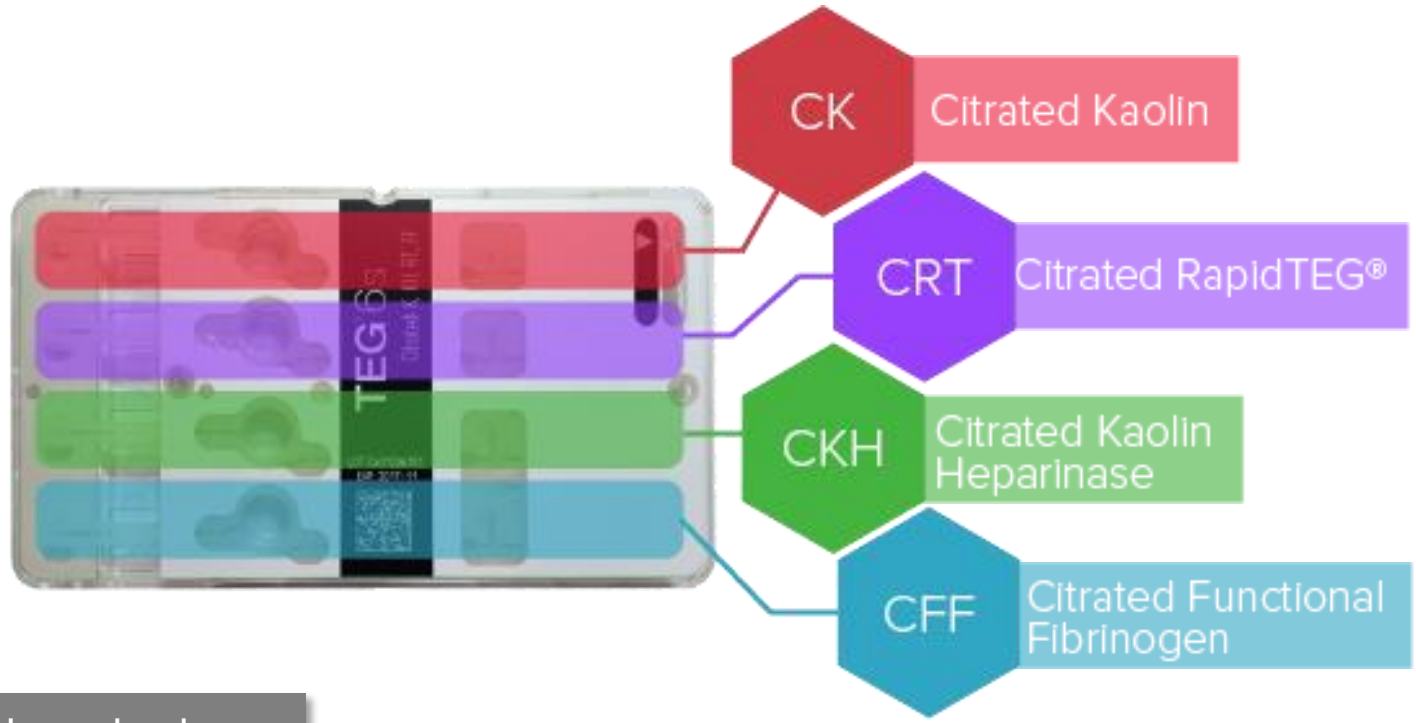
Evidence based value

HAEMONETICS®

Global Hemostasis Cartridge

Complete testing

TEG assays when used in combination provide the most comprehensive, timely and specific assessment of a patient's haemostasis.



Evidence based value

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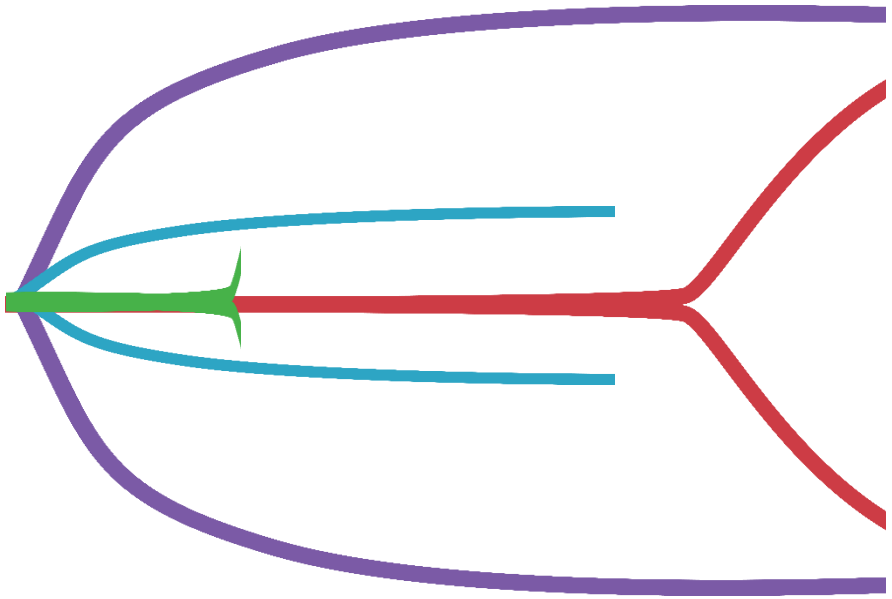


Test	Parameter	Deficiency
CK	↑ R	Clotting factors *
CKH	R < CK-R	Heparin effect
CFF	↓ MA	Fibrinogen
CRT	↓ MA	Platelets **
CRT	↑ LY30	Fibrinolysis

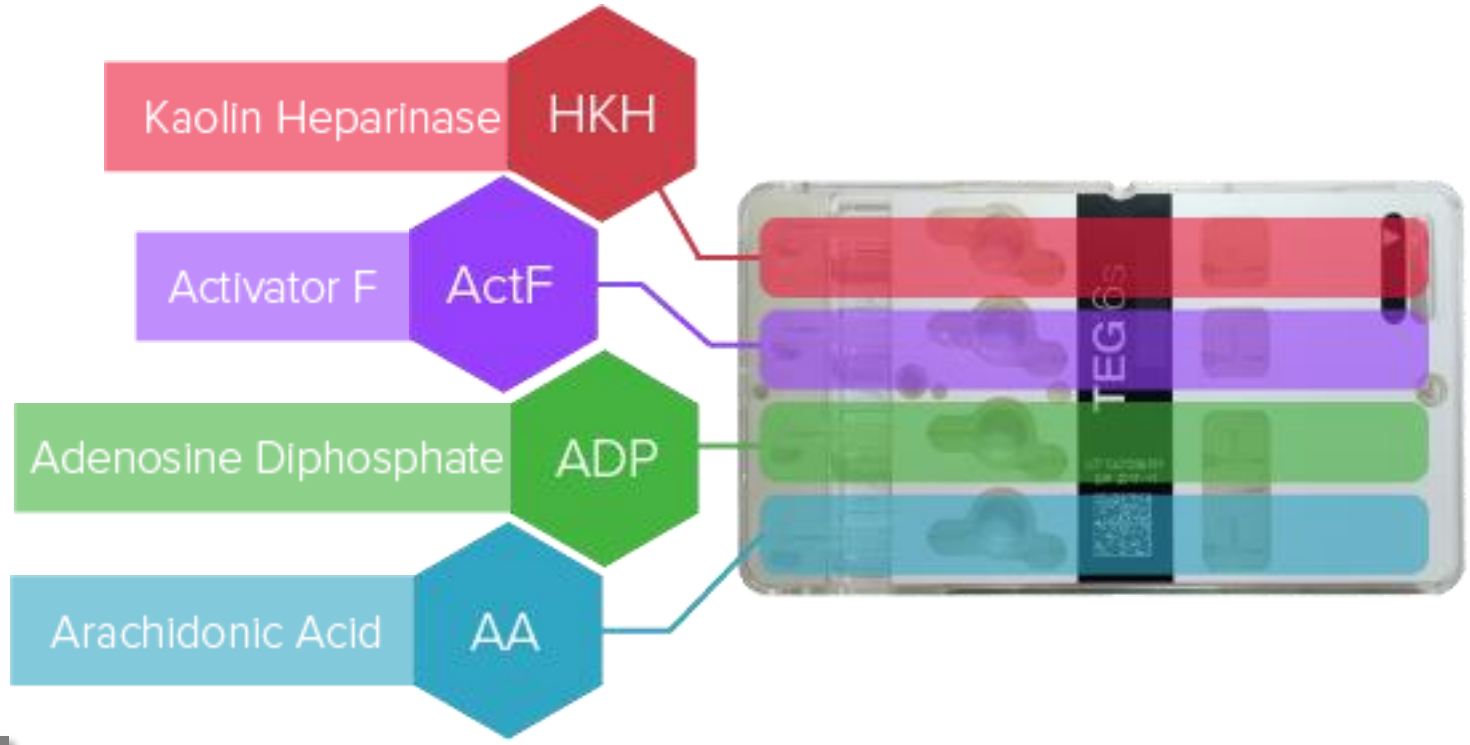
* In presence of heparin (CK-R > CKH-R) refer to CKH-R for adequacy of clotting factors
** If CFF-MA normal

Evidence based value

PlateletMapping® Cartridge

Complete testing

Measure ability of platelets to participate in clot formation with and without the effect of anti-platelet drugs, with out the need for additional equipment



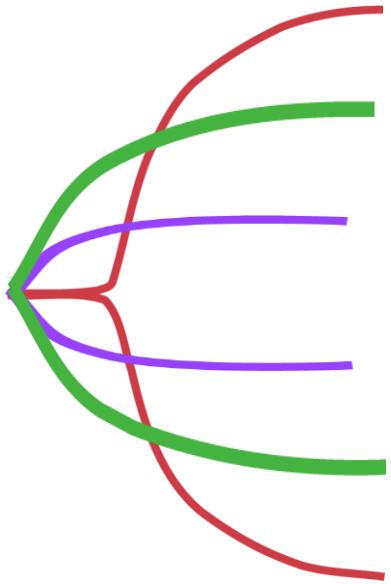
Evidence based value

HAEMONETICS®

PlateletMapping ® Assays

Complete testing

The TEG ® PlateletMapping assay uses the combination of assays to specifically determines the MA (Maximum Amplitude, a measure of clot strength) and the reduction in MA due to genetics and/or antiplatelet therapy.



Clot strength – baseline
Test HKH

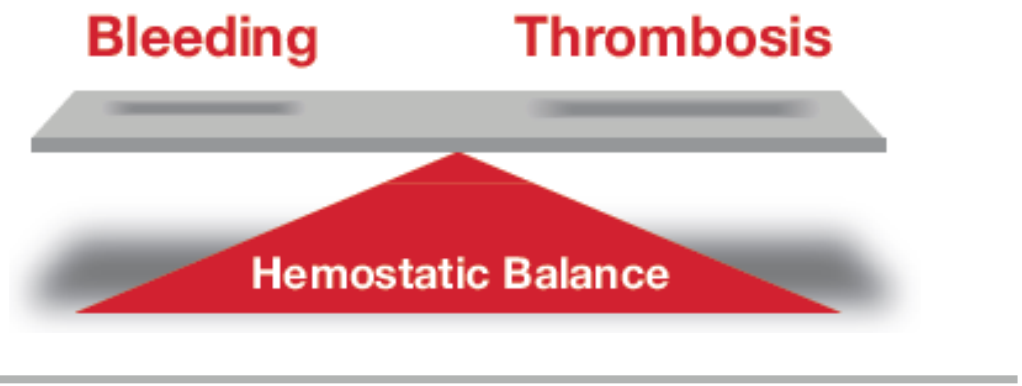
Clot strength – agonist activation
Test ADP or AA

Clot strength – fibrin only
Test ActF

Evidence based value

Identify suboptimal coagulative states

Improving patient outcomes



- Slow clot formation
- Weak clots
- Active fibrinolysis

- Fast clot formation
- Strong clots
- Absence of fibrinolysis

Bleeding and thrombosis can lead to:

- Increased use of pro/anti-coagulants (risks associated with inappropriate use)
- Morbidity & mortality
- Extended hospital stay
- Utilisation of resources
- Elevated costs

Evidence based value

Improving clinical outcomes

Improving patient outcomes

Reduce Blood Product Use[3-8]

- Specific blood products
- Re-operation
- Individualise coagulation management
- Cost savings

Stratify Thrombotic Risk[9-13]

- Anti-platelet agents – stratify risk
- Assess hypercoagulable states

Identify Platelet Function[6,9,10-12]

- Platelet function & inhibition post-op or after PCI
- Platelet function to assess bleeding & ischaemic events

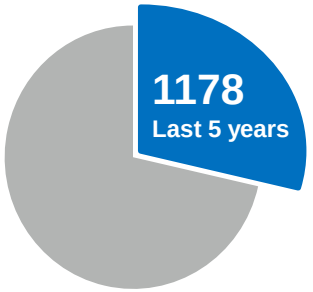
Evidence based value

HAEMONETICS®

Customer and patient focused

Evidence Base

Peer-reviewed human clinical study publications

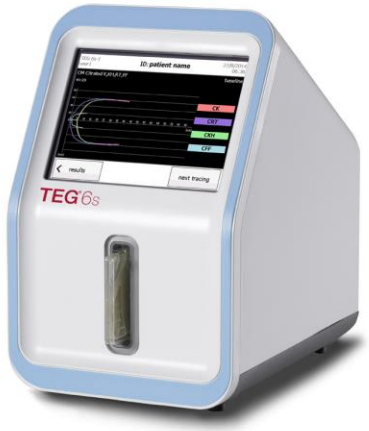


4460 TOTAL

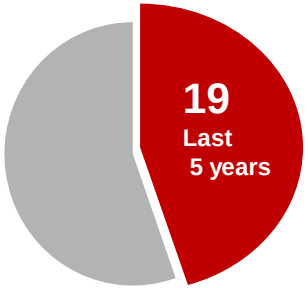
Hospitals in North America

>500
UTILIZING TEG® ANALYZER SYSTEMS

>50%
TOP 20 HOSPITALS



Clinical studies supported



> 50 TOTAL

Hospitals in Europe

>1000
UTILIZING TEG ANALYZER SYSTEMS

HAEMONETICS®

Guideline support for VHA

Perioperative & CVS

Evidence Base

NICE National Institute for Health and Care Excellence

- TEG systems are recommended to help monitor blood clotting during and after heart surgery[14]

European Society of Anaesthesiology ESA

- Recommend the use of standardised VHA-guided haemostatic algorithms with pre-defined intervention triggers[15]

American Society of Anesthesiologists®

- If coagulopathy is suspected (intra- or post-operatively), obtain standard coagulation tests or VHAs (e.g.,TEG and ROTEM analysis), if available[16]

NATIONAL BLOOD AUTHORITY AUSTRALIA

- In adult patients undergoing cardiac surgery, use of TEG analysis should be considered[17]

SFAR Société Française d'Anesthésie et de Réanimation

The French Working Group on Perioperative Haemostasis[18]

- VHAs should be used in the event of haemorrhage at the end of surgery and postoperatively
- VHAs should be included in algorithms

EACTS European Association For Cardio-Thoracic Surgery

eacta European Association of Cardiothoracic Anaesthesiology

- Perioperative treatment algorithms for the bleeding patient based on viscoelastic POC tests should be considered to reduce the number of transfusions[19]

Evidence based value

HAEMONETICS®

TEG® PlateletMapping®

Evidence Base

Cardiovascular Surgery

- **Some ACS-PCI patients** might require **cardiovascular surgery** during a period when they are on **DAPT,** exposing them to increased intra-op bleeding risk, especially for those with low platelet reactivity.
- These patients can **benefit from TEG** guided pre-op APT withdrawal

✓ APT patients deemed of low bleeding risk according to TEG PlateletMapping can **undergo surgery without increased complications & with reduced blood transfusions**

✓ Mahla et al. Circul. 2018[20]

✓ Kreutz et al. THO 2018[21]

✓ **Pre-op PFT** can help **identify patients at risk** & **guide tailored APT discontinuation before surgery**
(based on clinical evidence of association between platelet function, APT discontinuation, and surgery-related bleeding risks)

✓ Kasivisvanathan et al. BJS 2014[22]

✓ Mahla et al. CCI 2012[23]

Evidence based value

HAEMONETICS®

TEG® PlateletMapping®

Interventional cardiology

Evidence Base

- Growing clinical evidence supports the benefits of using TEG® to **facilitate risk stratification & personalized APT** in:

✓ Post-PCI long-term **event prediction & DAPT personalization** thanks to TEG-measured clotting	✓ Gurbel et al. AHJ 2010[11]
✓ **APT effectiveness** POC measurement, **treatment personalization** & **efficacy improvement**	✓ Sambu et al. Heart 2012[12]
✓ Identification of patients with **DAPT low responsiveness** & **adaptation of treatment** with improved outcomes (CREATIVE trial)	✓ Tang et al. Circul. 2018[24]

Evidence based value

HAEMONETICS®

Guideline support for VHA

Evidence Base

Trauma

Task Force for Advanced Bleeding Care in Trauma

ABC Advanced Bleeding Care

European guideline on management of major bleeding and coagulopathy following trauma (2016)[25]:

- Early and repeated coagulation monitoring using traditional coagulation tests (Grade 1A) and/or viscoelastic methods (Grade 1C)
- Treatment with fibrinogen concentrate or cryoprecipitate if significant bleeding is accompanied by viscoelastic signs of a functional fibrinogen deficit or a plasma fibrinogen level of less than 1.5–2.0 g/L (Grade 1C)
- Repeat doses of fibrinogen must be guided by viscoelastic monitoring and laboratory assessment of fibrinogen levels (Grade 2C)

Evidence based value

HAEMONETICS®

Guideline support for VHA

Evidence Base

Trauma

The ACS Massive Transfusions in Trauma Guidelines[26]:

- POC-based transfusion protocol once major bleeding has been controlled
- TEG cut-off values for ICU transfusion of plasma, cryoprecipitate, fibrinogen concentrate, platelets, and antifibrinolytics

The French Working Group on Perioperative Haemostasis[18]:

- Viscoelastic tests should be used to indicate haemostatic treatment and to make clinical staff more aware of the severity of trauma

Evidence based value

Evidence based value

Innovation for you

Value beyond technology

Innovation

Flexibility
Information
Interpretation

HAEMONETICS®

The TEG® 6s Analyser

Flexibility

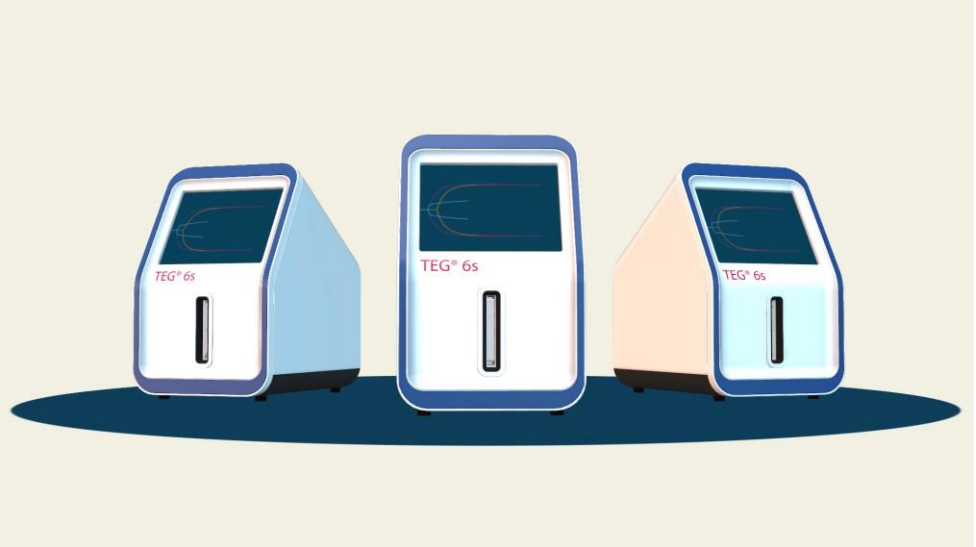
You decide…

Wherever
- Smallest footprint
- Light & portable
- Plug and play
- Vibration insensitive

Fast
- Quick to start up
- Quick to initiate test
- Mulitple assays simultaneously

Whoever
- Intuitive interface
- Cartridge based
- Minimal time
- Operator independent results

Precise
- Resonant frequency technology
- Automated
- Internal QC



Innovation for you

HAEMONETICS®

The TEG® 6s Analyser Cartridges

Flexibility

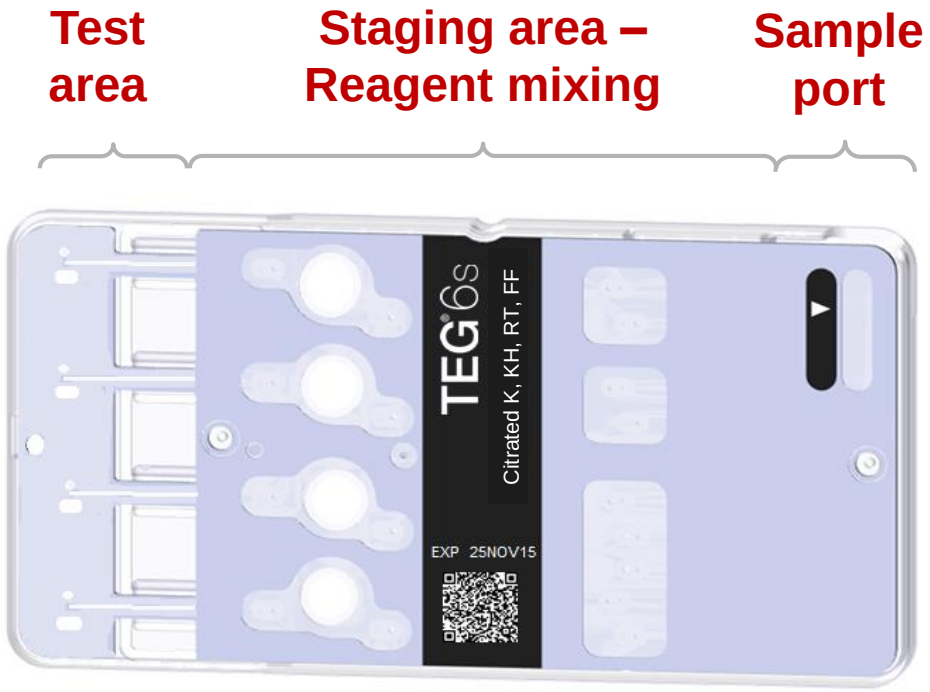
All the answers… without the complication

Cartridges
- Traditional VHA
- Includes: lysis, rapid TEG and fibrinogen
- PlateletMapping®

Fast
- Visible results within minutes
- Rapid initiation
- Up to 4 assays simultaneously

Simplicity
- Up to 4 simultaneous assays
- Microfluidics
- Rapid initiation

Precise
- Micro-spotting of reagents
- Computer controlled
  - Aliquoting
  - Mixing



Innovation for you

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What you need, where and when you need it

Information

TEG® Manager software is a fully integrated web based solution providing:

- On demand access for viewing of results throughout the hospital
- Viewing active and stored tests simultaneously
- View results from multiple analysers across hospital locations
- Improve safety through automated query of hospital admissions database
- Optimise device and user management through remote access to TEG analysers

Innovation for you

Speed to Information

Information

TEG® 6s in combination with TEG Manager software, enable faster clinical decision making through:

- Near patient testing and rapid test initiation
- On demand access via TEG Manager
- Real time graphical information and non final parameters
- A10 parameter
- Determination of normal clot rate and strength in approximately 10 mins

Innovation for you

HAEMONETICS®

Interpretation without complication

Interpretation

Interpretation Guidance module works with TEG® Manager to provide *customised* clinical alert messages triggered by specified TEG results.

Improve patient care by:

- Increasing clinical confidence and removing barriers to clinical use
- Standardise treatment recommendations, providing consistency of care to patients.
- Visually alerting clinicians
- Configuring alert message by analyser location

Innovation for you

HAEMONETICS®

Evidence based value

Innovation for you

Value beyond technology

Value beyond technology

Education and Best Practice Sharing

System Implementation and Support

HAEMONETICS®

Support to Make You Successful

Education & Best Practice

Experienced Clinical Specialists:

To support and optimize learning and clinical application.

- On-site Operator Training
- Validation Support
- On-site Clinical Go-live Support
- Classroom Training and Case Support

Best Practice Sharing

Learn and share with your peers.

- DocMatter Peer Collaboration Forum
- Clinician Expert Master Class Education Programs

Training Tools:

Educational materials to maximize consistency and operational efficiency.

- Free access to online College of TEG elearning
- Device and Software Quick Reference Guides (QRGs)
- Clinical Quick Reference Guides (QRGs)
- On-site Operator Training Programs

Value beyond technology

Elearning

Education & Best Practice

COLLEGE OF TEG®

Online learning supporting your learning and development needs.

- College of TEG is the e-learning component of our blended learning solution
- Consists of self-directed and self-paced educational modules
- Modules cover the practical, theoretical, application and management aspects of the TEG 6s system
- Assessments validate learning outcomes

Providing you with consistent, engaging and professional training materials

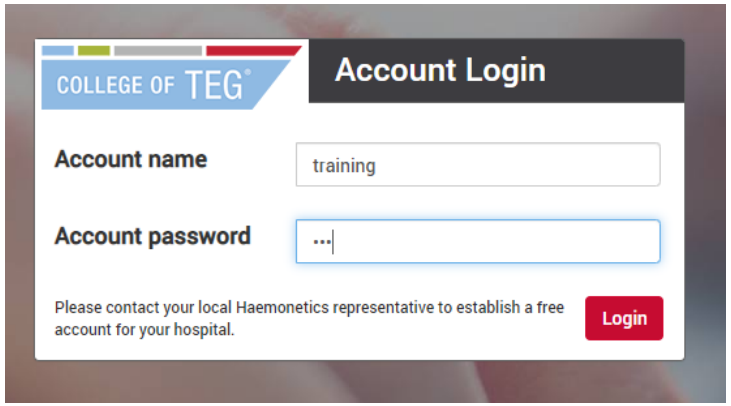
Value beyond technology

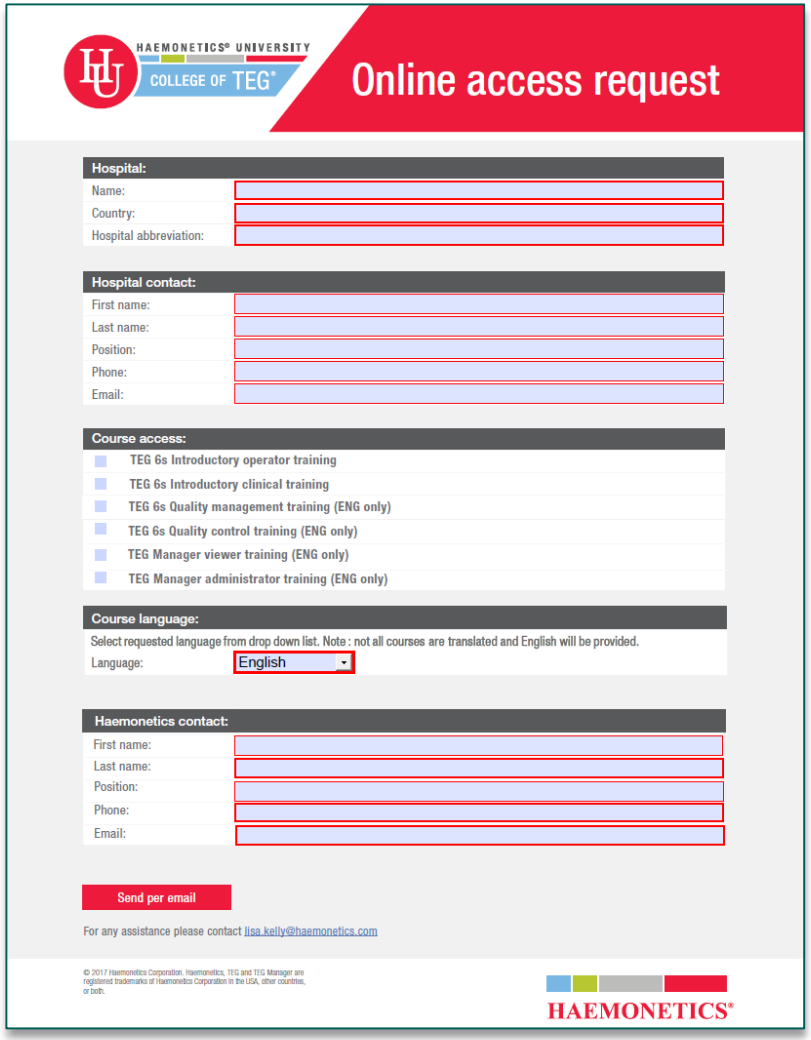
HAEMONETICS®

There are 2 ways to facilitate access

1. Online access via our TEG® microsite
2. Hosted on and deployed on your hospitals own Learning Management System (LMS)

https://tegtraining.haemonetics.com/





Value beyond technology

Peer-to-peer clinical dialogue

Education & Best Practice

Online community of thousands of clinicians using the TEG system

- Haemonetics partnered with independent third-party (DocMatter)
- Clinicians share experience, best practice, techniques and how to achieve the best patient outcomes
- More than 2600 clinicians in the community to share experiences from around the world

Doc Matter

Value beyond technology

HAEMONETICS®

TEG Reference Centre of Excellence

Education & Best Practice

Master Class Of Advanced Learning On Utility of TEG

Rigshospitalet – Copenhagen

Professor Par I Johansson, MD, DMSc, MPA
Professor of Transfusion Medicine

Jakob Stensballe, MD, PhD
Senior Consultant in Anaesthesia & Transfusion Medicine

- More than 12 years' experience with TEG
- Dedicated TEG program
- 24H / 7 Days a week TEG Monitoring & Diagnostic service
- Use of TEG 5000 and TEG 6s
- Dedicated Internal Education Program
- More than 1300 Tests/Month
- Specialities: Cardiac/Trauma/ICU/Obstetrics
- Reference center for 4 satelite Hospitals

Agenda

Clinical Lectures:

- Cell based model of hemostasis
- TEG traces and coagulopathy in bleeding patients – Case studies
- Copenhagen concept and algorithms for bleeding patients (trauma, post-partum, cardiac, liver, hematology)

Practical Implementation:

- How TEG was implemented (SOP's, Quality Control, Business case development)
- Strategy and approach to Training content and delivery

Hospital Tour:

- Visit to trauma center, cardiac OR, ICU (general and cardiac) and blood bank

Hands-On Session:

- Simulation of clinical cases with discussion of application and results

HAEMONETICS®

Support to Make You Successful

System Implementation & Support

System Implementation:

Comprehensive, coordinated and efficient processed and tools for seamless system integration.

- Implementation project management
- Quality assurance program support
- Policy and procedure development

Technical Product Support & Service

Technical product support and service to help reduce downtime.

- Technical service and Customer service hotline
- On-site preventative maintenance

Value beyond technology

TEG® 6s analyser and Haemonetics helping you manage haemostasis better

Evidence based value

Complete testing
Improving patient outcomes
Evidence based

Innovation for you

Flexibility
Information
Interpretation

Value beyond technology

Education & Best practice
System implementation & Support

References

1. T. Haas, D. Fries, K. A. Tanaka, L. Asmis, N. S. Curry, H. Schöchl, Usefulness of standard plasma coagulation tests in the management of perioperative coagulopathic bleeding: is there any evidence?, *BJA: British Journal of Anaesthesia*, Volume 114, Issue 2, February 2015, Pages 217–224
2. Dougald M. Monroe, Maureane Hoffman, Harold R. Roberts. Platelets and Thrombin Generation. Arteriosclerosis, Thrombosis, and Vascular Biology. 2002;22:1381–1389
3. Ak K, Isbir CS, Tetik S, Atalan N, Tekeli A, Aljodi M, Civelek A, Arsan S. Thromboelastography-based transfusion algorithm reduces blood product use after elective CABG: a prospective randomized study. Journal of Cardiac Surgery. 2009;24(4):404-10.
4. Shore-Lesserson L, Manspeizer HE, DePerio M, Francis S, Vela-Cantos F, Ergin MA. Thromboelastography-guided transfusion algorithm reduces transfusions in complex cardiac surgery. Anesthesia and Analgesia. 1999;88(2):312-9.
5. Nuttall GA, Oliver WC, Santrach PJ, Bryant S, Dearani JA, Schaff HV, Ereth MH. Efficacy of a simple intraoperative transfusion algorithm for nonerythrocyte component utilization after cardiopulmonary bypass. Anesthesiology. 2001;94(5):773-81; discussion 5A-6A.
6. Agarwal S, Johnson RI, Shaw M. Preoperative point-of-care platelet function testing in cardiac surgery. Journal of Cardiothoracic and Vascular Anesthesia. 2015;29(2):333-41.
7. Whiting P, Al M, Westwood M, Ramos IC, Ryder S, Armstrong N, Misso K, Ross J, Severens J, Kleijnen J. Viscoelastic point-of-care testing to assist with the diagnosis, management and monitoring of haemostasis: a systematic review and cost-effectiveness analysis. Health Technology Assessment. 2015;19(58):1-228, v-vi.
8. Wikkelso A, Wetterslev J, Moller AM, Afshari A. Thromboelastography (TEG) or thromboelastometry (ROTEM) to monitor haemostatic treatment versus usual care in adults or children with bleeding. Cochrane Database of Systematic Reviews. 2016(8):CD007871.
9. Sivapalan P, Back AC, Ostrowski SR, Ravn HB, Johansson PI. Transfusion requirements in elective cardiopulmonary bypass surgery patients: predictive value of Multiplate and Thromboelastography (TEG) Platelet Mapping Assay. Scandinavian Journal of Clinical and Laboratory Investigation. 2017:1-7.

References

10. Gurbel PA, Bliden KP, Guyer K, Cho PW, Zaman KA, Kreutz RP, Bassi AK, Tantry US. Platelet reactivity in patients and recurrent events post-stenting: results of the PREPARE POST-STENTING Study. Journal of the American College of Cardiology. 2005;46(10):1820-6.
11. Gurbel PA, Bliden KP, Navickas IA, Mahla E, Dichiara J, Suarez TA, Antonino MJ, Tantry US, Cohen E. Adenosine diphosphate-induced platelet-fibrin clot strength: a new thrombelastographic indicator of long-term poststenting ischemic events. American Heart Journal. 2010;160(2):346-54.
12. Sambu N, Radhakrishnan A, Dent H, Calver AL, Corbett S, Gray H, Simpson IA, Curzen N. Personalised antiplatelet therapy in stent thrombosis: observations from the Clopidogrel Resistance in Stent Thrombosis (CREST) registry. Heart. 2012;98(9):706-11.
13. Cotton BA, Minei KM, Radwan ZA, Matijevic N, Pivalizza E, Podbielski J, Wade CE, Kozar RA, Holcomb JB. Admission rapid thrombelastography predicts development of pulmonary embolism in trauma patients. Journal of Trauma and Acute Care Surgery. 2012;72(6):1470-5; discussion 5-7.
14. https://www.nice.org.uk/guidance/dg13 . Detecting, managing and monitoring haemostasis: viscoelastometric point-of-care testing (ROTEM, TEG and Sonoclot systems). Diagnostics guidance (DG13) August 2014
15. Kozek-Langenecker et al. Management of severe perioperative bleeding: guidelines from the European Society of Anaesthesiology: First update 2016. Eur J Anaesthesiol 2017;34:332–395
16. Practice guidelines for perioperative blood management: an updated report by the American Society of Anesthesiologists Task Force on Perioperative Blood Management. Anesthesiology 2015;122(2):241–275

References

17. https://www.blood.gov.au/pubs/pbm/module2/3-clinical-guidance/3.6.8-point-of-care-testing.html
18. Roullet S et al. Position of the French Working Group on Perioperative Haemostasis (GIHP) on viscoelastic tests: What role for which indication in bleeding situations? Anaesth Crit Care Pain Med. 2019 Oct;38(5):539-548.
19. Pagano D et al. 2017 EACTS/EACTA Guidelines on patient blood management for adult cardiac surgery. Eur J Cardiothorac Surg. 2018 Jan 1;53(1):79-111
20. Mahla E et al. Is There a Role for Preoperative Platelet Function Testing in Patients Undergoing Cardiac Surgery During Antiplatelet Therapy? Circulation. 2018;138:2145–2159
21. Kreutz RP, Schmeisser G, Schaffter A et al. Prediction of Ischemic Events after Percutaneous Coronary Intervention: Thrombelastography Profiles and Factor XIIIa Activity. TH Open. 2018;2(2):e173-e181
22. Kasivisvanathan R, Abbassi-Ghadi N, Kumar S et al. Risk of bleeding and adverse outcomes predicted by thromboelastography PlateletMapping in patients taking clopidogrel within 7 days of non-cardiac surgery. Br J Surg 2014; 101(11):1383-90
23. Mahla E, Suarez TA, Bliden KP et al. Platelet function measurement-based strategy to reduce bleeding and waiting time in clopidogrel-treated patients undergoing coronary artery bypass graft surgery: the timing based on platelet function strategy to reduce clopidogrel-associated bleeding related to CABG (TARGET-CABG) study. Circ Cardiovasc Interv 2012; 5(2):261-9
24. Tang YD, Wang W, Yang M et al. Randomized comparisons of double-dose Clopidogrel or adjunctive Cilostazol versus standard Dual Antiplatelet in patients with high posttreatment platelet reactivity. Results of the CREATIVE trial. Circulation 2018; 137(21):2231-2245.

References

25. Rossaint et al. The European guideline on management of major bleeding and coagulopathy following trauma: fourth edition Critical Care 2016;20:100
26. https://www.facs.org/-/media/files/quality-programs/trauma/tqip/transfusion_guildelines.ashx