



## **Point of Care Testing in Patient Blood Management**

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# Patient Blood Management: The Three Pillars

## 1st Pillar

- Pre-op anemia management
- Erythropoiesis stimulating agents
- Oral Iron/  
Intravenous Iron
- Nutritional support (Vitamin B12, Folate, Vitamin C)
- Anemia is a contraindication for elective surgery

## 2nd Pillar

- Tranexamic acid/  
Antifibrinolytics
- Meticulous surgical hemostasis
- Manage bleeding risk and anticoagulants
- Cell Salvage
- Tonic hemostatics
- Avoid secondary hemorrhage
- Minimize phlebotomy
- Lab guided coag management

## 3rd Pillar

- Low Hgb Transfusion threshold
- Optimize transfusion dosing
- Enhance hemodynamics
- Optimize ventilation and oxygenation
- Minimize oxygen consumption
- Avoid/treat infections promptly

# What is POCT?

**Point-of-care testing (POCT), or bedside testing** is defined as medical diagnostic testing **at or near** the point of care —that is, **at the time and place of patient care**



# Conventional Pattern of Testing



This contrasts with the historical pattern in which testing was confined to the laboratory, which entailed sending off specimens away from the point of care and then waiting hours or days to learn the results, during which time care must continue without the desired information

# Goals of POCT

- Small sample volume
- Reduction of pre & post analytical errors by eliminating sample transportation/degradation
- Clinical decision making in real time
- Saving time /Faster decision making/Earlier treatment
- Reduced length of stay
- Enhance quality of patient care
- Improved health outcome

# Point-of-Care Testing in PBM

## Less Blood Loss through Phlebotomy

- Frequent lab draws leads to **hospital-acquired anemia**
- Upon discharge, 43% of the female patients and 46% of male patients who were not anemic at the time of admission had hemoglobin that had dropped into the anemic range
- Studies show that an average of **blood loss of  $54 \pm 17$  mL/day** of blood is drawn solely for diagnostic purposes
- POCT Allows for smaller blood volumes

**More blood loss**



**More transfusion**



### 2nd Pillar

- Tranexamic acid/  
Antifibrinolytics
- Meticulous  
surgical  
hemostasis
- Manage bleeding  
risk and  
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- Cell Salvage
- Tonic  
hemostatics
- Avoid secondary  
hemorrhage
- Minimize  
phlebotomy  
Lab guided coag  
management

# Point-of-Care Testing in Hospitals (PBM)

- POCT Hemoglobin
- POCT Platelet Function
- Viscoelastic test (Thromboelastometry, Thromboelastography) for Coagulation Monitoring

## Single Unit of RBC Strategy

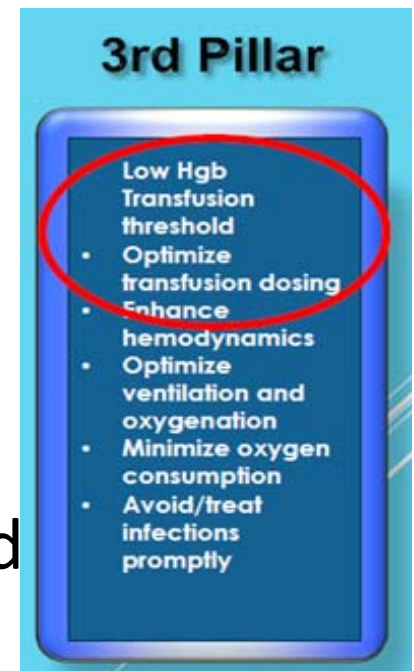
PP2

Where indicated, transfusion of a single unit of RBC, followed by clinical reassessment to determine the need for further transfusion, is appropriate. This reassessment will also guide the decision on whether to retest the Hb level.

Patient Blood Management Guidelines: Module 3 - Medical1



- Hemoglobin levels play a large role in the decision to transfuse
- SINGLE unit, followed by a re-assessment prior to administering additional units Prevent dose dependent harm from transfusion
- Availability of **POCT Hgb testing** results in rapid decision making for RBC transfusion
- Low volume of blood sample prevent iatrogenic anemia





# Thromboelastography

## Management of coagulopathy in surgery

- **Turn-around time** and **multifactorial coagulopathy**
- During significant hemorrhage, most anesthesiologists and surgeons will not tolerate turn-around-times typically associated with lab-based tests and will transfuse blood based on clinical observations only



# Kinetics of the clot

## Clot formation :

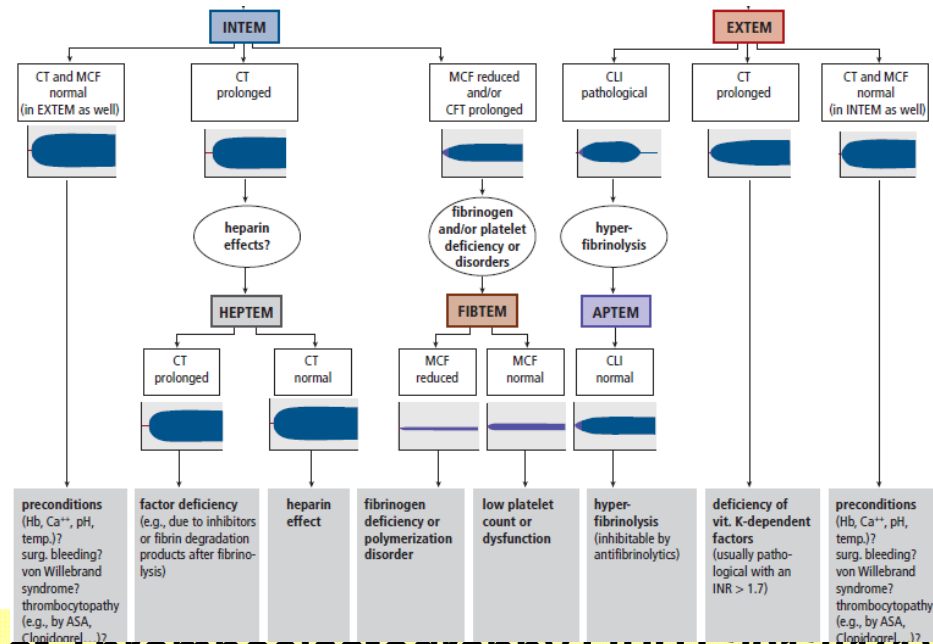
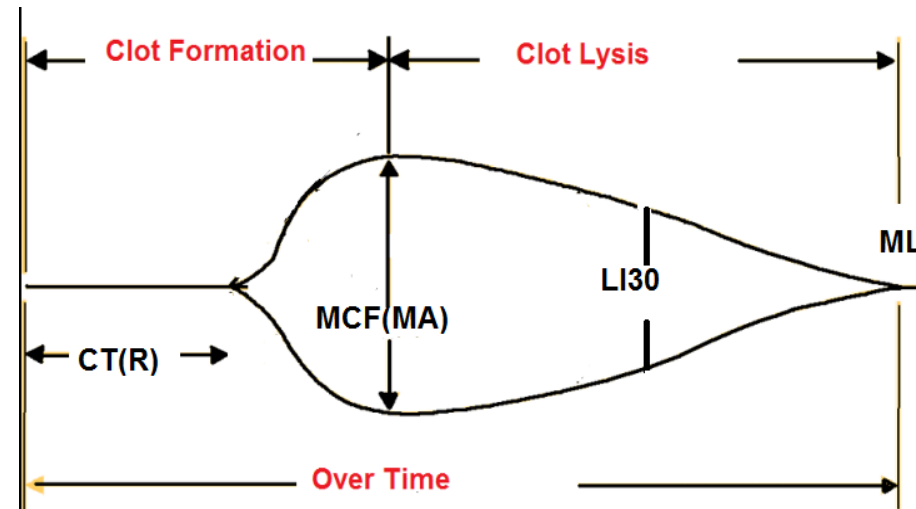
- Clotting factors
- Anticoagulant

## Clot strength/Stability

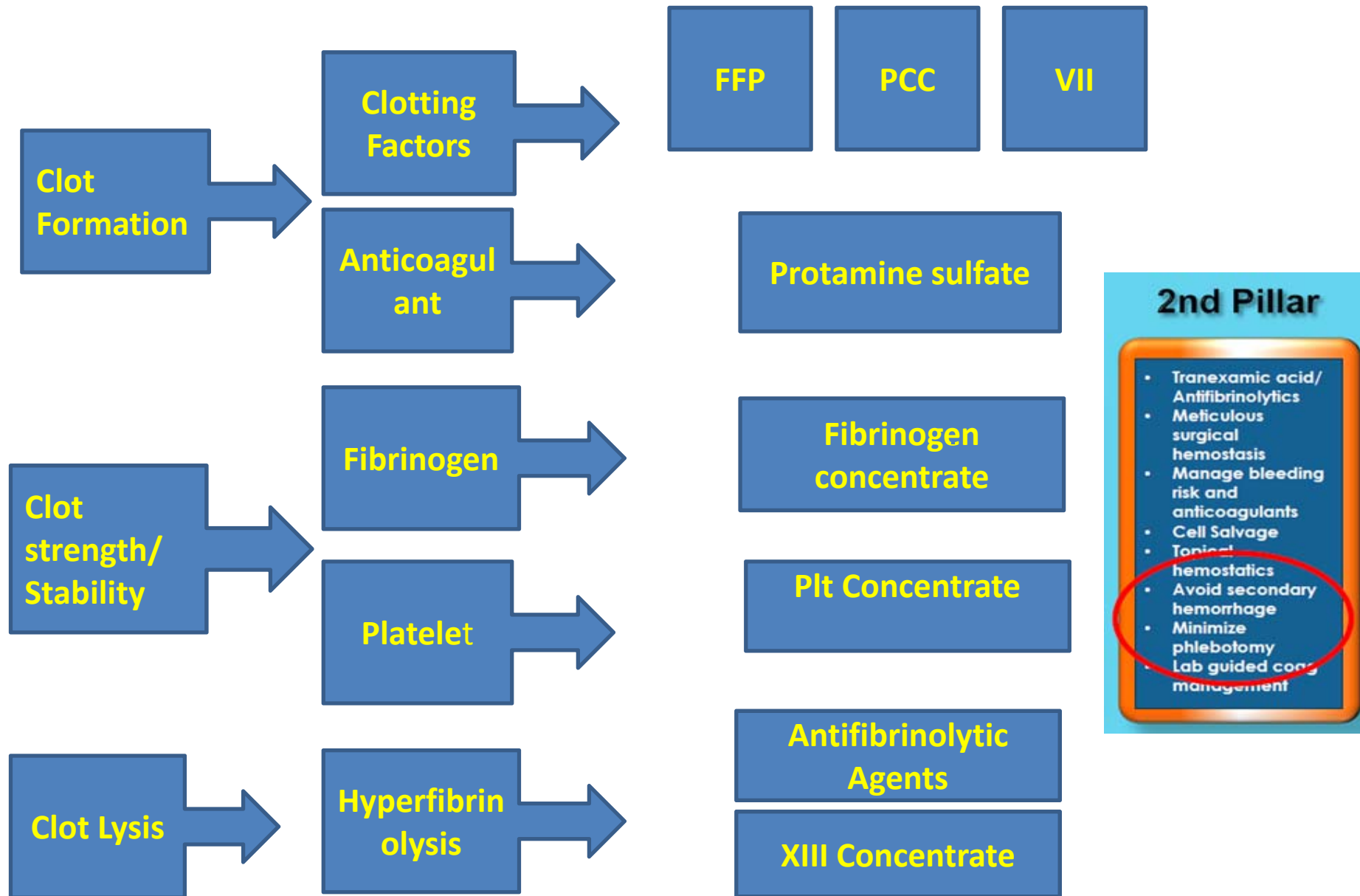
- Fibrinogen
- Platelets

## Clot Lysis

- Hyperfibrinolysis



# Rotem/TEG-Based Algorithm for Bleeding management/ Target therapy





## RECOMMENDATIONS – haemostasis management

R7

GRADE C

In patients undergoing CABG either with or without CPB (OPCAB), clopidogrel therapy should be stopped, where possible, at least 5 days before surgery (Grade C).

R8

GRADE C

In patients undergoing noncardiac surgery, it is reasonable to continue low dose aspirin therapy. This may require specific evaluation in neurosurgery and intraocular surgery (Grade C).

Antiplatelet agents, containing **mostly aspirin and clopidogrel**, has traditionally been used for patients with coronary artery disease (CAD) to essential components of the treatment reduce the risk of thrombotic events.

According to the recommendations, antiplatelet drugs **should be discontinued** between 5 to 10 days prior to the surgery **to ensure the recovery of platelet function**

## Monitoring of Anti-Platelet Treatment?

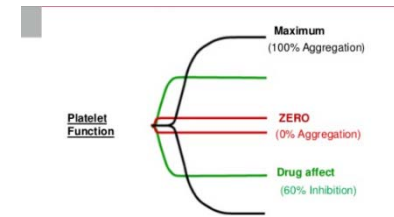
# POC Platelet function testing



**VerifyNow system**



**Plateletworks**



**TEG platelet mapping**



**PFA-100**



**ROTEM *platelet***

**In elective surgery patients, a POC system for platelet function testing can be useful for preoperatively monitoring reversal of antiplatelet therapy**



NATIONAL BLOOD AUTHORITY  
AUSTRALIA

## Implementation of POCCT Based protocol for Bleeding Management

Percentage Patients (no. of pts) Receiving Blood Products Pre and Post Bleeding Management Supported by POCCT

Blood Product	(n=1120) 12 Months Prior protocol	(n=1056) 12 Months after protocol
RBC	47%(524)	35%(370)
Platelets	34%(380)	14.5%(153)
FFP	26%(291)	9.4(99)

# Changing Clinical Practices



## Patient Blood Management



## Improved Patient Outcomes

