



**SABM**<sup>®</sup>  
SOCIETY FOR THE ADVANCEMENT  
OF BLOOD MANAGEMENT

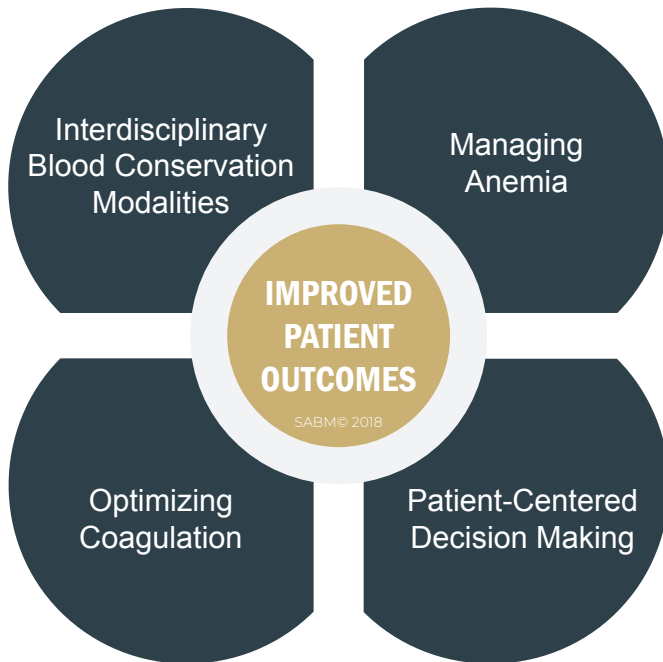
# **ROLE OF REAL-TIME / ACCURATE DIAGNOSTIC TESTING IN PATIENT BLOOD MANAGEMENT PROGRAMS**

## **POINT-OF-CARE TESTING**

“Diagnostic testing is an essential component of Patient Blood Management. The accurate assessment of the true causes of bleeding dysfunction facilitates the employment of evidence based, goal directed therapy to rapidly prevent and treat excess blood loss. “

Sherri Ozawa RN, Clinical Director,  
Institute of Patient Blood Management, Englewood Hospital Medical  
Center, Englewood, New Jersey.

# PATIENT BLOOD MANAGEMENT



“The timely application of evidence based medical and surgical concepts designed to manage anemia, optimize hemostasis, and minimize blood loss in order to improve patient outcomes.”

- Society for the Advancement of Blood Management (SABM.org)

Point-of-care testing forms an integral part of PBM, enabling accurate and real-time diagnosis of anemia and bleeding and facilitating precise and targeted hemostatic intervention. <sup>1</sup> Conventional coagulation tests are **unable** to provide needed **information on actual bleeding risk/defects** <sup>1</sup>, thus delaying appropriate and targeted treatment. **Slow turnaround times** for laboratory-based conventional coagulation tests are one of the major drivers of **empirical** treatment regimens, which inevitably result in some patients receiving **unnecessary, inappropriate and avoidable** transfusions, with associated **increased morbidity and mortality**, and **increased healthcare costs**. <sup>2</sup>

## WHY DOES IT MATTER?

- Up to 40% of trauma deaths are due to uncontrolled bleeding, however, many of these **fatalities** are potentially **preventable** with early, targeted hemostatic intervention. <sup>3</sup>
- In massive hemorrhage, although rapid provision of hemostatic support is crucial in managing bleeding patients, inevitably, **generic transfusion regimens** result in some patients being **over-treated**, and others **inadequately supported**. <sup>1</sup>

“Achieving hemostasis in surgical patients is finding that fine balance between perioperative bleeding and pathological thrombosis; the two extremes of preventing a patient from bleeding to death while also preventing them from clotting to death.” - SHERRI OZAWA, RN

# GOALS OF DIAGNOSTIC TESTING IN PATIENT BLOOD MANAGEMENT

**RAPID DIAGNOSIS AND ACCURATE ASSESSMENT OF THE TRUE CAUSES OF BLEEDING CAN AID IN ARRESTING BLOOD LOSS AND POTENTIALLY LIMIT THE NEED FOR TRANSFUSION.**

- Detect and monitor real-time trends of blood count.
- Use both quantitative and qualitative measures to assess true coagulation status.
- Recognize the major mechanism of a developing coagulopathy.
- Use goal directed diagnostic testing to direct and establish treatment goals.
- Rapidly diagnose and arrest blood loss by accurately assessing true causes of bleeding dysfunction.<sup>4</sup>

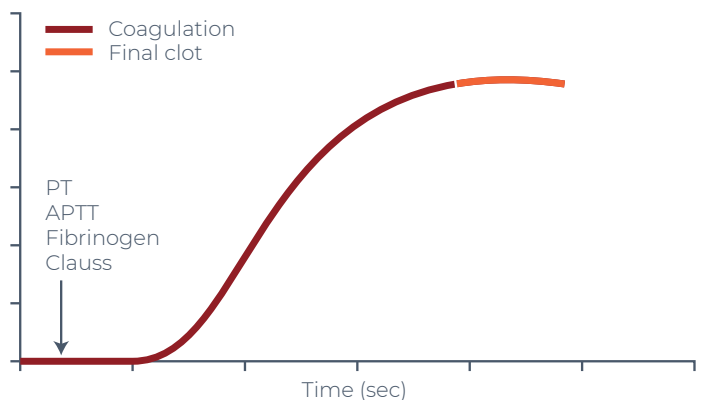
# RANGE OF POINT-OF-CARE TESTING IN PATIENT BLOOD MANAGEMENT

- Point-of-care testing (POCT) for blood counts.
- Visco-elastic testing (VET) of coagulation.

# CONVENTIONAL COAGULATION TESTING

• **BLOOD SAMPLE IS TESTED ALMOST ONE HOUR AFTER IT IS DRAWN.**

- Blood is drawn, transported to the laboratory, then centrifuged. Subsequently the cells are removed followed by addition of calcium and activators. Finally, clot initiation is measured.



- **ROUTINE PLASMA COAGULATION TESTS ONLY REFLECT 1-2% OF THE ENTIRE COAGULATION PROCESS.**

- Only 5% of total thrombin has been generated when the coagulometer stops.
- Only plasma is analyzed; thus only coagulation proteins are analyzed.
- Interaction of platelets (or any other cells) are not assessed.
- Interaction with the coagulation system, fibrinolysis or FXIII is not assessed.

## WHAT DOES POINT-OF-CARE TESTING ENABLE US TO SEE?

- **Real-time trends / patterns** in blood counts/ coagulation- which help us to provide **timely** and **appropriate** therapy.
- VET provides **rapid** information about **global clotting in whole blood**, with a **graphical display** of **clot development** and **ultimate stability**.<sup>1</sup>
- VET **evaluates** the **kinetics** of the **entire process of coagulation** from **initial clot formation** through to **fibrin polymerisation** and **final clot strength**.<sup>1</sup>
- VET is **dynamic**, providing a **composite picture** reflecting the **interaction** of **plasma, blood cells** and **platelets**, and more closely reflect the situation **in vivo**.<sup>1</sup>
- VET provides **valuable information** on the presence and **severity** of **fibrinolysis**, and also the **presence** of **hypercoagulability**.<sup>5</sup>

“Viscoelastic testing has the potential to guide us to the defect and allow the patient to receive only the appropriate blood component that will correct their defect.” - ARYEH SHANDER MD, CLINICAL PROFESSOR OF ANAESTHESIOLOGY, MEDICINE AND SURGERY, ICAHN SCHOOL OF MEDICINE AT MT SINAI, NEW YORK

## BENEFITS OF POINT-OF-CARE TESTING IN PATIENT BLOOD MANAGEMENT

- Even simple POCT can **improve hemostatic management** and **reduce overall transfusion rates** when compared with standard (empirical) management.<sup>2</sup>
- VET is versatile and has become **widely used** as a POC monitor in the setting of liver transplantation, cardiac surgery, trauma and obstetric hemorrhage.<sup>1</sup>

# SUMMARY

The **superior information** obtained with point-of-care testing viscoelastic testing is **critical** to better direct effective therapeutic interventions in patients with bleeding or coagulation issues. Optimizing coagulation is a fundamental principle of Patient Blood Management and along with other evidence based interventions, can positively impact patient outcome. Implementing organized PBM programs, which incorporate advanced capabilities such as viscoelastic testing result in better clinical decision making, cost savings, and optimal patient care.

# REFERENCES

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