Utility and Limitations of Thromboelastography (TEG) Testing

The laboratories at Christiana and Wilmington hospitals offer Rapid and Kaolin Thromboelastrography (TEG) testing on the TEG® 5000 Thrombelastograph® Hemostasis Analyzer System. The TEG® 5000 Thrombelastograph® Hemostasis Analyzer System is a non-invasive diagnostic instrument designed to monitor and analyze the hematological state of a blood sample in order to assist in the assessment of patient clinical hemostasis conditions. The TEG Hemostasis System is indicated for use with adult patients where an evaluation of their blood hemostatic properties is desired. Hemostasis evaluations are commonly used to assess clinical conditions such as post-operative hemorrhage and/or thrombosis during and following cardiovascular surgery, organ transplantation, trauma, and cardiology procedures.

The Kaolin TEG serves as a screening test of clotting disorders pertaining to surface activation of the intrinsic pathways of coagulation (i.e., Factor XIII). Kaolin activity is similar to celite, but is less susceptible to the presence of Trasylol(aprotinin).

The RapidTEG™ TEG-ACT test is a quantitative in vitro diagnostic test intended to monitor heparin anticoagulation in adult patients. The Activated Clotting Time (ACT) test, first described by Hattersley in 1966 is the method of choice for monitoring heparin therapy. Heparin overdosing can result in dangerous bleeding, while heparin underdosing can lead to thrombosis. RapidTEG accelerates the clotting process by simultaneously stimulating the intrinsic and extrinsic coagulation pathways thus reflecting the physiological clotting process.

Limitations:

Sources of Reagent Error on the TEG Hemostasis System

- Reagents should be refrigerated when not in use.
- Reagents should be allowed to reach room temperature before reconstitution.
- Do not freeze reagents once reconstituted.

Sources of Procedural Error on the Kaolin TEG:

- Minimum sample required is 2 mL whole blood.
- A short draw is not an acceptable specimen. If blood is drawn into a citrated tube, tube must be completely filled by vacuum.
- Never check for clots in a blood sample by using a wooden stick. Always check for clots visually.
- Do not shake the kaolin vial.
- Non-citrated blood samples should be run within 4 minutes of blood draw to prevent sample clotting. Manufacturer's recommendation for citrated patient samples is to wait 10 - 120 minutes from blood draw to sample preparation.

- Kaolin-activated blood should be dispensed into cup IMMEDIATELY after mixing with Kaolin. Delay in transferring blood from Kaolin vial into sample cup and starting test immediately has the potential to affect the test results.
- Use heparinase cups and pins when running samples with heparin.

Sources of Procedural Error on the RapidTEG

Blood collection	• Do not collect blood for RapidTEG samples into a heparin tube, or any other non-recommended tube. • Minimum sample required is 1mL whole blood. • A short draw is not an acceptable specimen. If blood is drawn into a citrated tube, tube must be completely filled by vacuum. • Never check for clots in a blood sample using a wooden stick. Always check for clots visually.
Sample mixing	• Sample and reagent must be mixed 3 times in the cup with the pipette
Timing - non-citrated samples	• Non-citrated samples should be run within 4 minutes of blood draw to prevent sample clotting.
Timing - citrated samples	• Manufacturer's recommendation for citrated patient samples is to wait 10-120 minutes from blood draw to sample preparation.
TEG-ACT	• Do not run as an ACT in the heparinase (blue) cup and pin.

Results of Kaolin and Rapid TEG should always be interpreted by physicians in conjunction with the patient's medical history, clinical presentation, anticoagulant therapy and other findings.