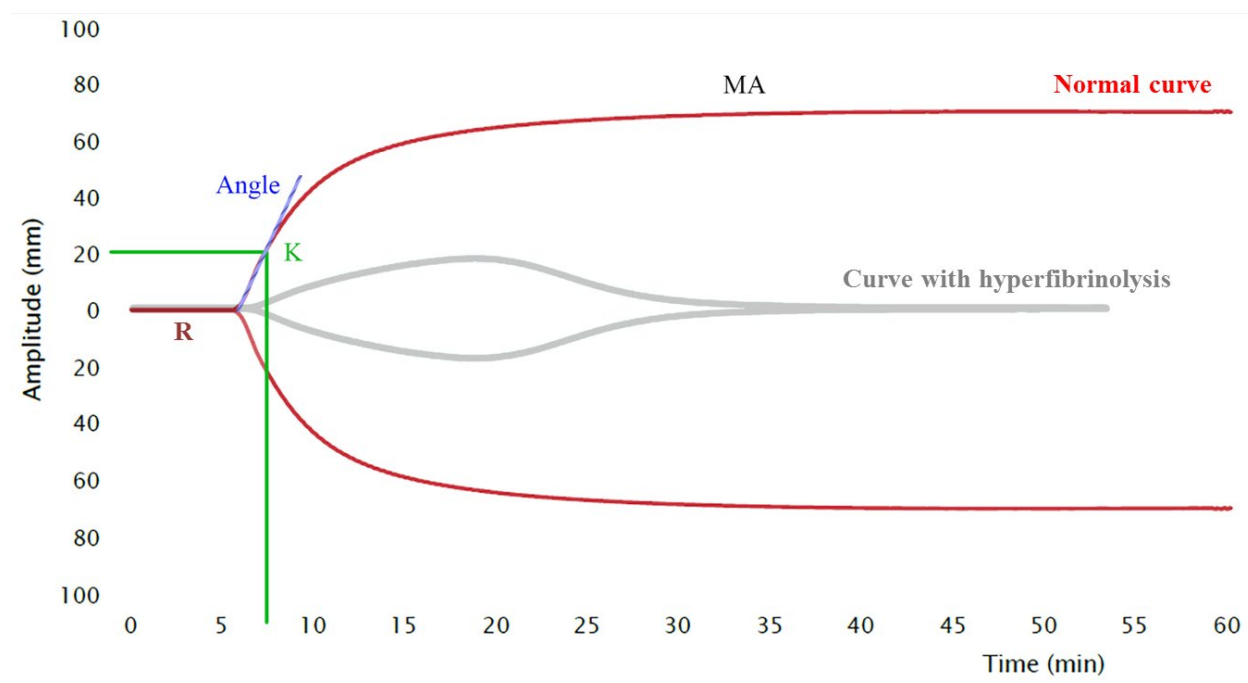


## Thromboelastography (TEG) is available 24/7 at UCM

### WHAT IS TEG?

The TEG system is useful to assess the kinetics and extent of viscoelastic changes in citrated whole blood as the sample clots and subsequently may undergo lysis. The resulting hemostasis profile is a measure of the time it takes for the first fibrin strands to be formed, the kinetics of clot formation, maximal elastic amplitude of the formed clot, and dissolution of clot. Parameters that will be reported from this testing include (see below) R, K,  $\alpha$ , MA, and LY30.



### WHAT TEG IS AVAILABLE AT UCM?

Two TEG instruments are available at UCM:

Multiple packages available:

- TEG1 Standard—If No Heparin or Massive Bleed (performed on TEG 5000). The package includes results with TEG Kaolin.  
Indications: for non-operative bleeding/clotting
- TEG2 Heparin—ECMO, Cardiopulmonary Bypass, etc. (performed on TEG 5000). The package includes results with both TEG Kaolin and TEG Heparinase.  
Indications: for patients receiving heparin therapy (cardiopulmonary bypass, ECMO, other complicated patients on heparin drips).
- TEG Transfusion Evaluation, including CK, CRT, CFF  
Indications: for patients being transfused or being considered for transfusion

Please further note that while the reference intervals obtained with the TEG 5000 and 6S instruments are in many instances similar, they are not identical. Accordingly, patient results in EPIC will always be displayed with reference to the specific testing platform employed on that specimen.

	TEG1 Standard	TEG2 Heparin	TEG Transfusion Evaluation
<b>Availability</b>	24/7		
<b>Pathologist Interpretation</b>	IF REQUESTED		
<b>Send to</b>	Coag Lab Tube Station 904		
<b>TEG Reagents and Parameters Reported</b>	<b>Kaolin</b>	R K Angle MA Ly30	R K Angle MA Ly30 Ly30
	<b>Kaolin with Heparinase</b>		R K Angle MA Ly30
	<b>Rapid TEG</b>		MA
	<b>Functional Fibrinogen</b>		FFMA

#### HOW CAN I OBTAIN TEG RESULTS AT UCM?

Numeric TEG results will be entered into EPIC. Remote viewing of real-time clot formation is available through Citrix-based TEG Manager system (UCM Citrix Workspace)

If the TEG Manager icon is not displayed in your UCM Citrix Workspace, you will need to fill out a SARF for access to the TEG Manager program:

<http://home.uchospitals.edu/tools/apps/sarf>

#### WHAT BLOOD SAMPLE SHOULD BE COLLECTED FOR TEG?

Type of Collection Container and Amount of Specimen Required:

- Whole blood collected in two light blue top vacutainer tubes containing 3.2% sodium citrate anticoagulant. The tubes must be filled to capacity  $\pm$  10%.

Specimen Collection:

- Venipuncture (with 21G or larger bore needle)
  - A first blue top tube should be collected and discarded, in keeping with standard blue top collection technique. Then collect two sample blue top tubes. Gently invert the sample tubes at least five times to ensure complete mixing of the contents.
- Whole blood samples that are obtained from an indwelling catheter should be collected after sufficient discard (approximately 5 mL) has been drawn to clear the line. Ensure indwelling catheter is free of clots.

Specimen Labeling:

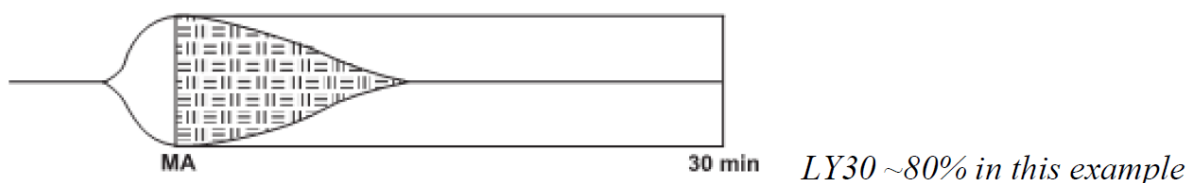
- Properly identify patient and label tubes (ideally with Sunquest labels)

Specimen Transportation:

- Samples must be packed appropriately and sent via pneumatic tube system. Sample testing must be performed within 2 hours of blood collection.
- TEG samples should be tubed directly to the Coagulation Lab (pneumatic tube station 904)

WHAT ARE THE TEG PARAMETERS?

- R Time (Reaction Time): The time in minutes from the start of a sample run until the first significant levels of detectable clot formation (amplitude of 2 mm in the TEG tracing). This represents the enzymatic portion of coagulation. This is the point at which most traditional coagulation assays reach their end points.
- K Time: A measure of the speed or clot kinetics to reach a certain level of clot strength (time in minutes to reach an amplitude of 20 mm).
- Angle ( $\alpha$ ) measures the rapidity of fibrinogen conversion to fibrin resulting from thrombin production, and is heavily influenced by the fibrinogen level. It is defined as the angle in degrees above the horizontal that is formed by a straight line passing through 2 specific points on the upper envelope of the patient's tracing: those corresponding to the R and to the K time points.
- MA (Maximum Amplitude). Measurement of maximum strength or stiffness (maximum shear modulus) of the developed clot in mm. Clot strength is the result of two components – the modest contribution of fibrin to clot strength and the much more significant contribution of the platelets.
- LY30: Comparing a hypothetical curve with no lysis to the actual TEG curve, this parameter measures the reduction of the area under the curve of the TEG tracing from the time MA is measured until 30 minutes after the MA, thus providing an index of fibrinolysis.



**Locally Determined Adult Reference Intervals for TEG 5000 Testing (TEG#1 and TEG#2):**

Normal Ranges for TEG 5000 Citrated Kaolin (CK):

R: 4.0 - 8.0 minutes

K: 1.0 – 2.1 minutes

Angle: 60.0 – 73.0 degrees

MA: 57.0 – 74.0 mm

LY30: 0.0 - 5.0%

Normal Range for TEG 5000 Citrated Kaolin with Heparinase (CKH):

R: 4.0 - 8.4 minutes

K: 1.0 – 2.4 minutes

Angle: 57.0 – 72.0 degrees

MA: 55.0 – 72.0 mm

LY30: 0.0 - 5.0%

**Locally Determined Adult Reference Intervals for TEG 6S Testing (TEG Transfusion Evaluation):**

Normal Ranges for TEG 6S Citrated Kaolin (CK):

R: 4.6 - 8.8 minutes

LY30: 0.0 - 3.2 %

Normal Range for TEG 6S Citrated Rapid TEG (CRT):

MA: 50.4 – 68.5 mm

Normal Ranges for TEG 6S Citrated Functional Fibrinogen (CFF):

MA: 13.3 – 25.0 mm

Please contact the Technical Director of the Coagulation Laboratory, Mr. Krzysztof Mikrut, or the Medical Director of the Coagulation Laboratory, Dr. Geoffrey Wool, at (773) 702-1315, with any questions.

INTRAOPERATIVE TEG AT UCM

Using the following lab slip and process will streamline sample ordering, transportation, and TEG testing performance.

**TEG Instructions**

- 1) Check box for appropriate lab below
- 2) Enter order in Epic
- 3) Obtain specimen
- 4) Page anesthesia tech for lab pick-up
- 5) **Call Coag lab with MRN**

Apply EPIC demographic label here

**Test:**

- TEG Transfusion Evaluation**  
**Use: OB hemorrhage, Trauma, Liver transplant**  
Result: CK R, CK LY30, CRT MA, CFF MA
  
- TEG #2 (Heparin)**  
**Use: On Cardiopulmonary Bypass, fully heparinized**  
Result: R K,  $\alpha$ , and MA (with and without heparinase)  
*R time without heparinase does not quantify heparin*  
**Requires separate plasma fibrinogen assay**
  
- Fibrinogen       PT/INR       aPTT

**Destinations:**

**Coag Lab**  
**Phone**  
2-1315 (05:30-midnight)  
2-1772 (midnight-05:30)  
**Station 904**  
*TEG, Fibrinogen, PT/INR, aPTT*

**Hematology Lab:**  
Phone 2-1314  
**Station 201**  
*Platelet count, CBC, H&H*

**Two Blue Tops:** TEG, Fibrinogen, aPTT, PT/INR    |    **One Purple Top:** CBC, Platelet count, H&H