TITLE: **Open Heart TEG**

**PRINCIPLE:**

Kaolin is a standardized reagent consisting of kaolin, buffered stabilizers and a blend of phospholipids. It 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)

**CLINICAL SIGNIFICANCE:**

The Thrombelastograph® (TEG®) Hemostasis Analyzer TEG-5000 series 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 homeostasis conditions. The TEG is indicated for use with adult patients where an evaluation of their blood haemostatic properties is desired. Homeostasis 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.

### SPECIMEN COLLECTION

No special preparation of the patient is required prior to specimen collection. Blood should be drawn by an aseptic technique and the serum or plasma should be tested as soon as possible.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Teg Sample Type | CKCitrated Kaolin | CKHCitrated KaolinHeparinase | K Kaolin(most likely from surgery) | KHKaolin Heparinase(most likely from surgery) |
| Blood Draw | Citrate Tube2-5mL | Citrate Tube2-5mL | Syringe Blood(in polypropylene tube) 3-5 mL | Syringe Blood(in polypropylene tube) 3-5 mL |
| Time to Test | 15 min – 2 hours | 15 min – 2 hours | <4 min | <4 min |
| Cup and Pin | Clear | Blue | Clear | Blue |
| Kaolin Vial | 1 mL | 1 mL | 1mL | 1mL |
| Additional Reagents | 20µL of0.2 CaCl₂ | 20µL of0.2 CaCl₂ | \_\_ | \_\_ |
| Blood | 340µLfrom kaolin vial | 340µLfrom kaolin vial | 360µLfrom kaolin vial | 360µLfrom kaolin vial |

DONE IN SURGERY:

Specimen Drawing

Draw blood by venipuncture using a two-syringe technique. Discard the first 2-3 mL to prevent contamination with tissue. Attach a clean plastic syringe and draw an additional 3-5mL.

For drawing blood during surgery, use the side port of the central venous catheter to approximate results obtained with peripheral blood.

It is acceptable to obtain specimen from an Arterial Line Draw (A-line); it is recommended that the line is cleared with at least 10mL (or 3x the dead space if it is a long line) discard prior to obtaining the TEG sample. The line should not be smaller than 20G in diameter.

Specimen Processing

Carefully transfer blood from the syringe to the small non-wettable surface (e.g., polypropylene test tube). Avoid air bubbles and frothing. Do not shake.

DONE IN LAB

Pipette 360 µL into a disposable TEG® cup. You can also use a pretreated TEG® cup containing specific reagents (e.g., heparin neutralizers, activators, platelet blockers, etc).

For accurate results, samples must be tested at 37º C and within 4 minutes from blood draw unless treated with heparin or sodium citrate.

**REAGENTS AND EQUIPMENT:**

1. TEG Analyzer attached to a computer running the TEG Analytical software (haemoscope Corporation)
2. Cups and pins containing 2.0 IU of Heparinase I.

 These cups and pins are color-coded blue and reverse the effects of 6 international units

 of heparin per mL of blood. Samples from patients that are on heparin therapy will need

 to be tested using Heparinase cups and pins in order to reverse the heparin effect and

 show the patient’s underlying state of hemostasis.

3. Plain cups and pins

1. Kaolin: When not in use, store kaolin vials in closed original container at 2-10ºC.
2. 360 mL pipette

### CALIBRATION

###### E-testing is done each day the TEG Instrument is used.

See procedure 4840-TEG-100, Preventative Maintenance for TEG, for more information.

### QUALITY CONTROL

Controls should be run to check on the performance of all testing and on the instrument operation. Controls are run every eight (8) hours when testing is performed and/or per manufacturer’s recommendation in the same manner and by the same personnel as the patient testing.

Testing controls provides confidence that all reagents are reacting and being read properly. Errors resulting from user techniques can also be detected.

**STEPWISE PROCEDURE:**

1. Enter patient information under case icon
2. Go to the case icon

Chose patient by name

Click on the edit case button

Click done

Enter:

 Patient ID (medical records number)

 Patient Name

 Gender

 Age

(if not already entered)

1. Under the “ other” tab, enter date of birth
2. Under “clinicians” tab, enter surgeon, pathologist and perfusionist, if known
3. Click done
4. Warm kaolin vials to room temperature
5. Tap the vial to ensure all the liquid is at the bottom of the vial
6. Remove the cap
7. Pipette 1.0 mL blood sample into the vial, letting it run down the side
8. Replace the cap and mix 5 times by gentle inversion. **Do not shake the sample.**
9. Pipette 360 µL of native blood from Kaolin Vial into the pre-warmed TEG analyzer cup.

Run plain cup and heparinase cup for baseline

Run heparinase cup for CPB (CardioPulmonary Bypass) rewarming (if requested)

Run plain and heparinase cup for post protamine

Run plain and heparinase cup for post surgery (if requested)

1. Raise the carrier until it is flush with the bottom of the TEG column.
2. Move the lever to the right into the test position. Select F10 on the computer.
3. Allow the sample to run until the MA parameter is defined.
4. Select F11 on the computer or the STOP button on the TEG toolbar to end the sample
5. You will be prompted to end or continue running the sample. If you have not entered the patient and sample information, you are prompted now to do so.

For additional information on running a TEG sample, see Procedure No 4840-TEG-103

**REPORTING AND INTERPRETING RESULTS:**

All results will be interpreted by the heart team as the tracing is running.

After the case is completed, report results in the follow manner:

 1. If case not entered before testing

 Click on the patient’s tracing

 Go to the case icon

Chose patient by name

Click on the edit case button

Click done

Enter:

 Patient ID (medical records number)

 Patient Name

 Gender

 Age

(if not already entered)

Enter Procedure Name as Open Heart

Enter Procedure Type as Open Heart Teg

Enter beginning of case as time of first sample

Enter end of case as completion time of last sample

1. Under “clinicians” tab, enter surgeon, pathologist and perfusionist, if known
2. Click done
3. Go to detail icon, sample tab:

 Enter:

Description as Post Protamine

Accession Number- Leave blank

Site-Leave blank

Ordered By-Leave Blank

Leave Bleeding State and Patient Temperature Blank

Reported: Enter accession number, date of birth and comment “Interpreted during case by MD “

Reported By: Your name or initials

Report Date: Today’s date

1. Print Report

Go to Case Icon

Chose Edit

Chose Patient

Click Done

Chose Report

Highlight all samples

Click continue

On next screen, check that ASC is chosen, click done

When report appears, click the print icon

 Print on HP deskjet 6940 series

 Dispose of page 2

1. Enter “See SCM” and verify the LIS order
2. Scan Graph into SoftMedia. See Soft Procedure Book for more information

**PROCEDURAL NOTES:**

**Sample Notes**

Notes about the sample need to be added in the interpretation box for the particular sample to appear on the printed report

**Sources of Reagent Error**

Reagents should be stored between 2 – 10ºC when not in use. Under certain conditions cups and pins my stick together when removed from packaging. This is due to a combination of humidity and the sugar-based suspension containing the lyophilized Heparinase I. This occasional stickiness has not been shown to affect functionality of the product.

### Sources of Procedural Error

Do not shake the kaolin vial.

Non-citrated blood samples should be run within 4 minutes of blood draw to prevent sample clotting.

Use heparinase cups and pins (6212) when running samples with heparinized samples.

### REFERENCE:

Haemoscope Corporation

6231 West Howard Street

Niles, Il 60714 USA