

## Interpretation of TEG/ROTEM – Factsheet 3

### Area of Application

The interpretation of the traces produced by the thromboelastography devices is vital for the management of coagulopathy and the corresponding appropriate use of blood components/therapies.

### Staff

All staff who have the responsibility for prescribing blood components/therapies.

### Procedure:

#### Clot Time (R)/Clotting Time (CT)

This is the first part of the trace and gives the time in minutes/seconds that the blood sample takes to start to clot. Its equivalent measure in traditional coagulation testing is the prothrombin time (PT) and/or activated partial thromboplastin time (APTT). Low or normal values indicate that sufficient clotting factors are available and so no fresh frozen plasma or factor concentrates are required. Conversely, prolonged values can indicate a lack of clotting factors or that the patient may be anticoagulated.

#### Clot Rate (K)/Clot Formation Time (CFT)

This is the first part of the divergent trace and is again measured in minutes/seconds. Its value gives an early indication as to the rate of clot formation/strength of the forming clot. Beyond this time the clot is deemed mechanically stable, its thickness set at 20mm. The smaller the value, the quicker the clot formation and the more likely the stronger resultant clot formed.

#### Angle ( $\alpha$ )/ $\alpha$ – angle

This parameter also gives an indication of the rate of clot formation and is measured in degrees ( $^{\circ}$ ) from the horizontal. A low value indicates slow clot formation and a high value indicates rapid clot formation.

#### Maximum Amplitude (MA) / Maximum Clot Firmness (MCF)

After the K time/CFT has been reached the trace continues to grow until a point where it is at its maximum size. This thickness, measured in millimetres, gives an indication as to the maximum strength of the clot formed. Beyond this point the clot should gradually break down and the measured thickness should diminish. If excessive/premature clot breakdown occurs this is a sign of fibrinolysis and should be treated by administering anti-fibrinolytic drugs e.g. tranexamic acid, in order to avoid DIC. The devices give a continual measurement from the K time/CFT until MA/MCF is reached, and so an early estimation of maximum clot strength can be predicted.

## Clot Stability (LY30/EPL)/Maximum Lysis (ML)

Once the clot achieves its maximum clot strength it then begins to break down over a few hours. The degree to which this occurs is measured by the LY30/EPL and ML. The parameter is given as a percentage of the maximum clot strength. High values can indicate fibrinolysis/DIC.

## 'Normal'/ Standard Overlay

Both devices are able to superimpose a 'normal' trace over the current one to give a visual indication of the result. Both devices can also display numerical and graphical data of several traces for comparison purposes.

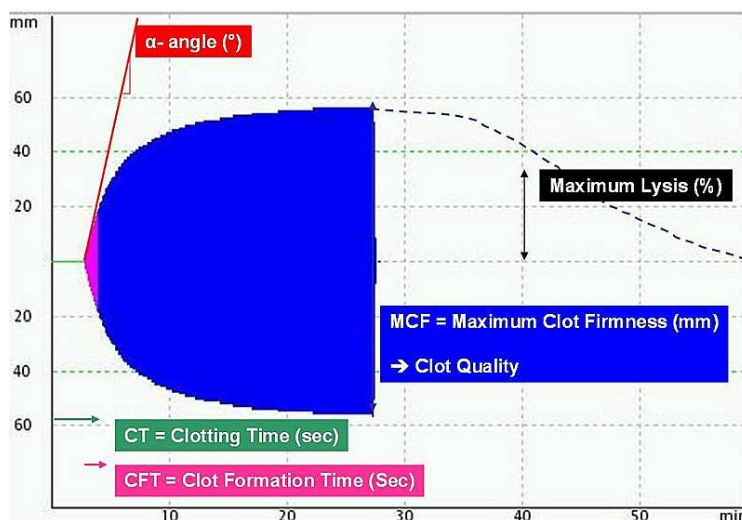
## Clot strength & rate of clot formation

K/CFT,  $\alpha$  angle and MA/MCF are all influenced by the presence/absence of sufficient circulating levels of fibrinogen and platelets. Lack of either/both of these blood components can cause poor clot formation and can exacerbate any existing coagulopathy. Specific testing can be undertaken on both devices to assess the blood's fibrinogen level and thus aid the prescription/administration of the appropriate blood component/s.

## Trace libraries

Both devices hold 'typical' traces of normal and abnormal coagulopathies and be used as comparisons to the current trace.

A normal ROTEM trace:



A normal TEG trace

The following measurements are shown: R (time of formation of the fibrin strand polymers); K (speed at which the clot forms);  $\alpha$  (the slope drawn from R to K) and MA (strength of the clot) measurements.

