THROMBOELASTOGRAPHY (TEG) by Nick Mark MD

General Principle
- A small cuvette is rotated to simulate sluggish venous flow and stimulate clot formation.
- The resistance to rotation due to the mass of the clot is measured, which allows the kinetics of clot formation to be assessed.
- This provides information about clot formation and breakdown, and also reflects problems with coagulation cascade and platelet function.
- This is displayed graphically as time (min) versus thromboelasticity (in mm).

Explaining the numbers
- **R** - reaction time - latency until clot formation begins as (normal 3-9 min)
  defined by an amplitude of 2 mm
- **K** - K value - time from the end of R until the clot reaches (normal 0.5 to 3 min)
  20mm - reflects speed of initial clot formation
- **α** - alpha angle - the angle tangent to the curve at K (normal 54-80 degrees)
- **MA** - maximum amplitude - reflects total clot strength (normal 51-78 mm)
- **Lysis time (LY30)** - % lysis after 30 min - reflects the fibrinolysis stage of clot development

TEG guided resuscitation protocols

**Advantage**: Results available promptly: K, R within 5 minutes, MA and α-angle within 15 minutes, and LY30 within 45 minutes.

**What to do?**
- Increased R time => FFP
- Decreased α angle => cryoprecipitate
- Decreased MA => platelets (consider DDAVP)
- Fibrinolysis => tranexamic acid (or aminocaproic acid)

Specific Pathologies

**NORMAL**

**ANTICOAGULANTS**
- R prolonged
- α angle decreased
- MA decreased

**FACTOR DEFICIENCY**
- K prolonged
- α angle decreased
- MA decreased

**PLATELET BLOCKERS**
- R normal
- α angle normal
- MA decreased

**FIBRINOLYSIS**
- R normal
- α angle normal
- MA decreased

**HYPERCOAGULABLE STATE**
- R normal
- α angle increased
- MA increased

**DIC (early)**
- R decreased
- K shortened
- MA increased

**DIC (late)**
- R prolonged
- α angle decreased
- MA decreased

(N.B. these pictures are exaggerated for emphasis)