CASE 3

Thanks to Dr Adam Eslick for sharing this case

Have a look at the following case and try to interprete the TEG first yourself using the TEG6s cheat sheet on the next two pages.

(* Thanks to the anonymous people who made this cheat sheet)

TEG

ALGORITHM

AIMS: CK R <9 mins; CK R = CKH R; CRT MA >52mm; CFF MA >15mm; CRT LY30<2%

RECHECK TEG

1) After products given
2) If bleeding continues

PHYSIOLOGICAL TARGETS

T >36.0
pH >7.2
Ca >1.0
Hb >70 or higher as indicated

THEORY

FOUR TRACES

CK – KAOLIN ACTIVATED
KAOLIN ALONE: traditional TEG trace showing total clotting profile

CRT – RAPID TEG
KAOLIN + TISSUE FACTOR: causes rapid clot formation shortening R time. Fastest to show MA & LY30

CKH – HEPARINASE
KAOLIN + HEPARINASE: removes heparin effect. Otherwise comparable to CK trace.

CFF – FUNCTIONAL FIBRINOGEN
KAOLIN + PLATELET INHIBITOR: shows fibrinogens specific contribution to MA, by inhibiting platelets.

STEP 1: MA Result in ~10-15 mins

CFF MA↓ <15mm

Low CRT MA <52mm &
Low CFF MA <15mm
→ Low fibrinogen definite
→ Low platelets possible
→ Check platelets on FBC
→ Recheck TEG after replacing fibrinogen

CFF MA Normal
CRT MA ↓ <52mm

↓FIBRINOGEN

Often first to deplete

		Cryoprecipitate OR	Fibrinogen Conc
CFF MA	<15mm	10u	2g
	<10mm	20u	4g
	< 5mm	20-30u + TXA	4-6g + TXA

~5u cryo OR ~1g fib conc may raise CFF MA ~2mm

↓PLATELETS

Deficit or Disorder (i.e. antiplatelet)

		Pooled Platelets
CRT MA	<50mm	1u
	<25mm	2u

MA = Maximum Amplitude
STRENGTH of clot formed by FIBRINOGEN crosslinking with PLATELETS

STEP 2 : R Result in ~10-15 mins

CK R >9 mins

CK & CKH R both prolonged to same extent
→ Coagulation defect, but not due to heparin

CKH R shorter than CK R

↓COAG FACTORS

Deficit or Disorder (i.e. anticoagulant)

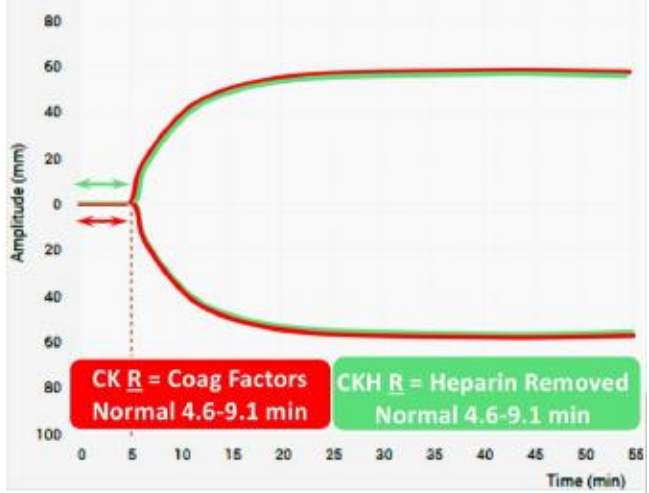
FFP	OR	Prothrombinex
2-4u		25-50u/kg

HEPARIN EFFECT

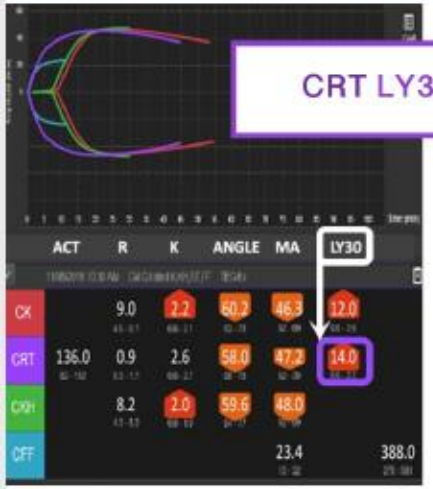
Protamine
~1mg /100u heparin

OR as per local cardiac/bypass protocols

R = Reaction Time
TIME taken for COAGULATION FACTORS to initiate clot formation



STEP 3 : LY30 Result in ~40 -45 mins



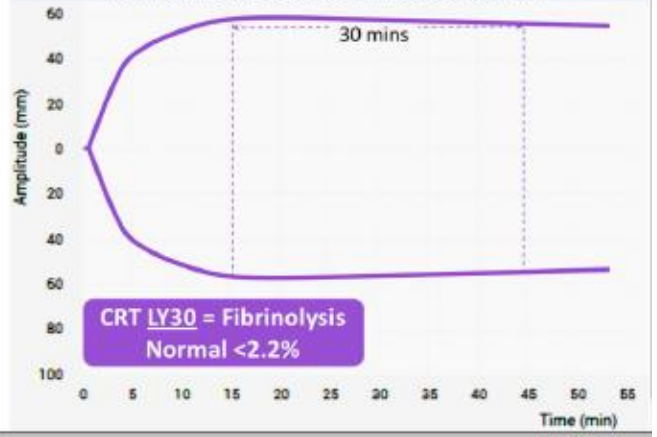
CRT LY30 >2.2%

HYPERFIBRINOLYSIS

Tranexamic Acid (TXA)
1g over 10 mins, followed by 1 g over 8hs

Preemptive Use:
Major trauma, give within 3 hours (CRASH 2)
Consider in surgery where major bleeding occurs or is anticipated

LY30 = Lysis % at 30 mins
STABILITY of clot. Amount of clot broken down by FIBRINOLYSIS at 30 minutes after MA

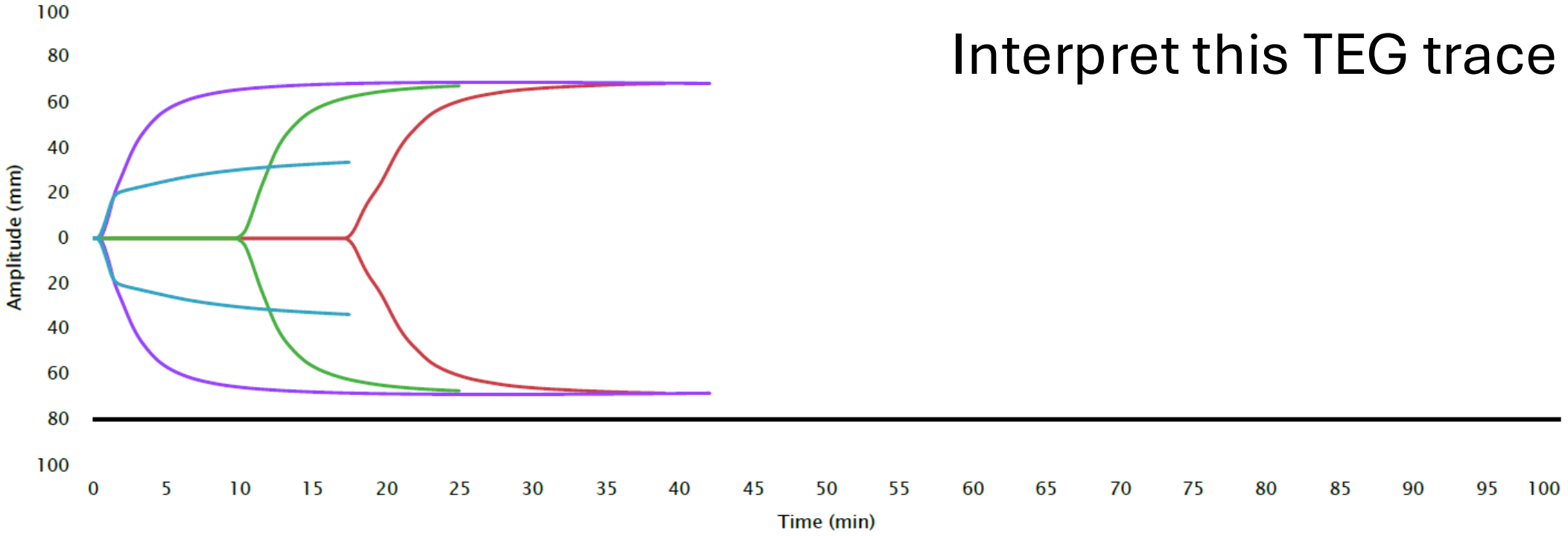


This algorithm is for educational purposes only and should not be used to interpret patient results in your hospital.

Case Study 3

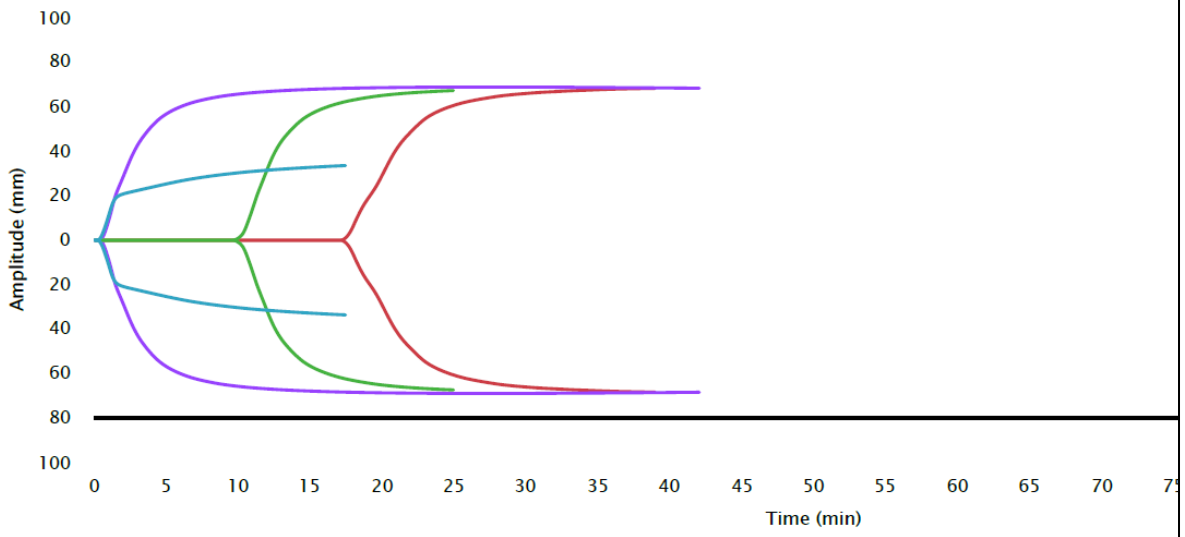
- 6 hours post elective CABG
- 650mL drain output in last 90 minutes
- Increasing noradrenaline requirements
- ACT 140 seconds
- A TEG is collected in ICU…

Interpret this TEG trace



	TEG-ACT (sec)	R (min)	K (min)	ANGLE (deg)	MA (mm)	LY30 (%)	FLEV (mg/dL)
CK		17.7	1.6	69.7	67.4	---	
		4.6 - 9.1	0.8 - 2.1	63 - 78	52 - 69	0.0 - 2.6	
CRT	116.0	0.7	0.8	78.4	67.8	---	
	82 - 152	0.3 - 1.1	0.8 - 2.7	60 - 78	52 - 70	0.0 - 2.2	
CKH		10.3	1.1	74.5	67.3		
		4.3 - 8.3	0.8 - 1.9	64 - 77	52 - 69		
CFF					33.6		613.1
					15 - 32		278 - 581

Interpret this TEG trace



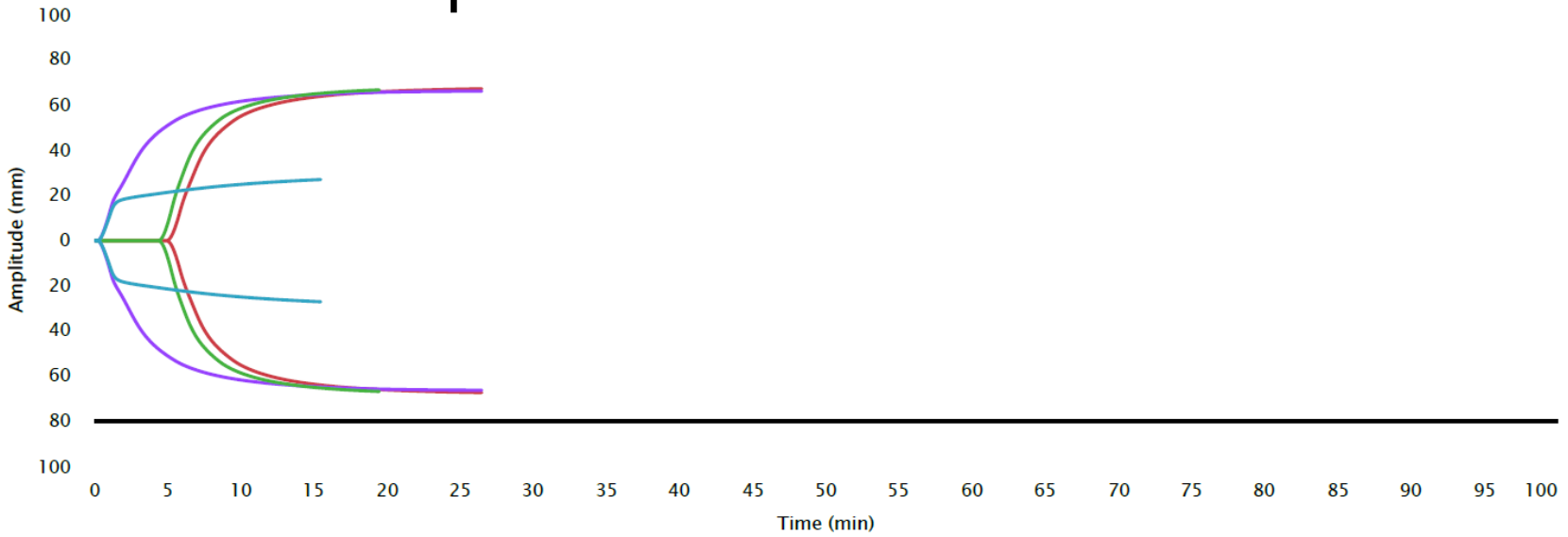
	TEG-ACT (sec)	R (min)	K (min)	ANGLE (deg)	MA (mm)	(%)	(mg/dL)
CK		17.7	1.6	69.7	67.4	---	
		4.6 - 9.1	0.8 - 2.1	63 - 78	52 - 69	0.0 - 2.6	
CRT	116.0	0.7	0.8	78.4	67.8	---	
	82 - 152	0.3 - 1.1	0.8 - 2.7	60 - 78	52 - 70	0.0 - 2.2	
CKH		10.3	1.1	74.5	67.3		
		4.3 - 8.3	0.8 - 1.9	64 - 77	52 - 69		
CFF					33.6		613.1
					15 - 32		278 - 581

Interpretation

1) CFF MA = 33.6 (above normal) - No need for fibrinogen
2) CRT MA = 67.8(normal) - No need for platelets
3) CK R time = 17.7min (prolonged) – Anticoagulants or need for coagulation factors
4) CKH R Time = 10.3min - Shorter than CK R time means evidence of heparin effect – give protamine
5) CRT LY30 = 0% No evidence of hyperfibrinolysis

Case Study 3: After 50mg Protamine

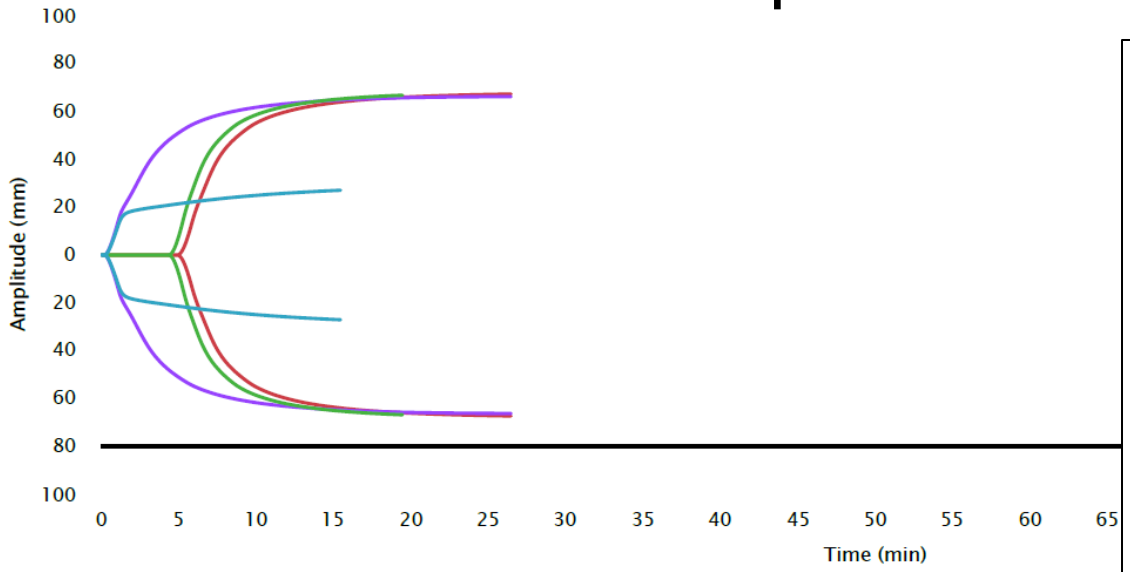
Interpret this TEG trace now



	TEG-ACT (sec)	R (min)	K (min)	ANGLE (deg)	MA (mm)	LY30 (%)	FLEV (mg/dL)
CK		5.3 4.6 - 9.1	0.9 0.8 - 2.1	76.3 63 - 78	66.4 52 - 69	--- 0.0 - 2.6	
CRT	106.6 82 - 152	0.6 0.3 - 1.1	0.9 0.8 - 2.7	77.4 60 - 78	65.2 52 - 70	--- 0.0 - 2.2	
CKH		4.7 4.3 - 8.3	0.8 0.8 - 1.9	78.0 64 - 77	66.8 52 - 69		
CFF					27.1 15 - 32		494.5 278 - 581

Case Study 3: After 50mg Protamine

Interpret this TEG trace now



Interpretation

1) CFF MA = 27.1 (normal) - No need for fibrinogen
2) CRT MA = 65.2(normal) - No need for platelets
3) CK R time = 5.3min (normal) – No coagulation defect. No heparin effect
4) CKH R Time = 4.7min - Same as CK R time no evidence of heparin effect
5) CRT LY30 = 0% No evidence of hyperfibrinolysis

	TEG-ACT (sec)	R (min)	K (min)	ANGLE (deg)	MA (mm)	LY30 (%)	FLEV (mg/dL)
CK		5.3 4.6 - 9.1	0.9 0.8 - 2.1	76.3 63 - 78	66.4 52 - 69	--- 0.0 - 2.6	
CRT	106.6 82 - 152	0.6 0.3 - 1.1	0.9 0.8 - 2.7	77.4 60 - 78	65.2 52 - 70	--- 0.0 - 2.2	
CKH		4.7 4.3 - 8.3	0.8 0.8 - 1.9	78.0 64 - 77	66.8 52 - 69		
CFF					27.1 15 - 32		494.5 278 - 581