

CASE 9

Thanks to Dr Gareth Ansell for sharing this case!

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

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

Disclaimer: These cases are provided for educational purposes only, they do not constitute medical advice. You should follow your local institutional policies and use your own clinical judgement.

ALGORITHM

	STEP 2	STEP 1	STEP 3			
	ACT	R	K	ANGLE	MA	LY30
CK		7.6 4.6-9.1	1.3 0.5-2.1	73.0 63-79	58.3 52-69	0.0 0.0-2.6
CRT	83.0 82-152	0.3 0.3-1.1	1.4 0.5-2.7	74.0 66-79	60.2 52-76	0.0 0.0-2.2
CKH		7.3 4.3-8.3	1.2 0.5-1.9	74.0 64-77	59.0 52-69	
CFF					22.0	420.0 276-581

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

TEG



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

CFF MA Normal
CRT MA < 52mm

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

↓ 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

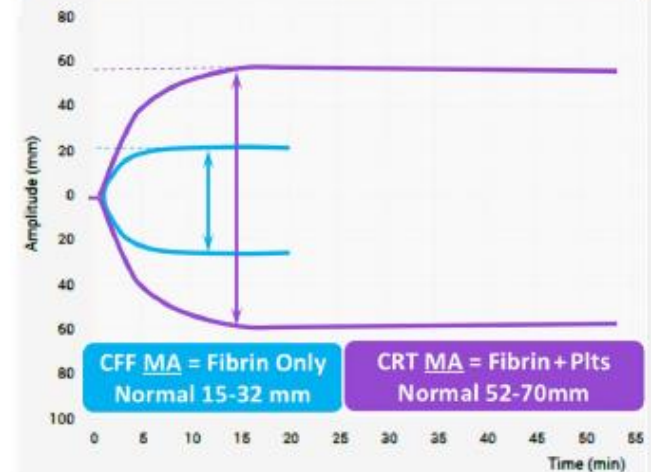
Deficit or Disorder (i.e. antiplatelet)

Pooled Platelets

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

MA = Maximum Amplitude

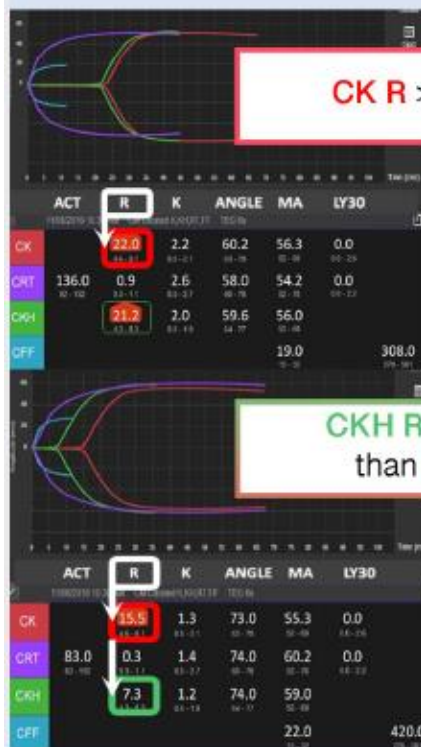
STRENGTH of clot formed by FIBRINOGEN crosslinking with PLATELETS



CFF MA = Fibrin Only
Normal 15-32 mm

CRT MA = Fibrin + Plts
Normal 52-70mm

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)

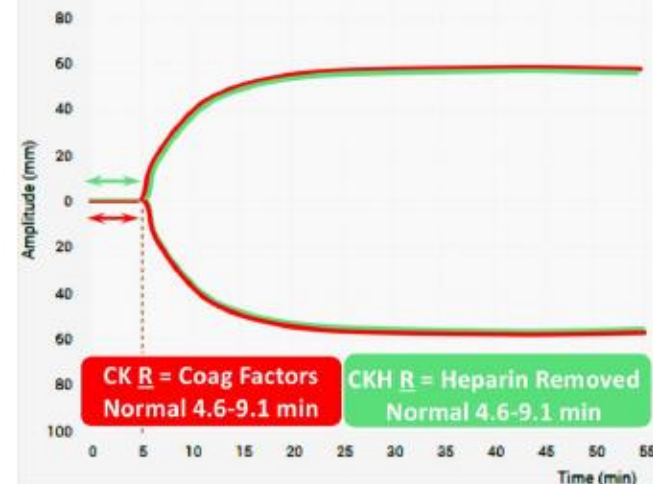
FFP OR Prothrombinex
2-4u 25-50u/kg

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



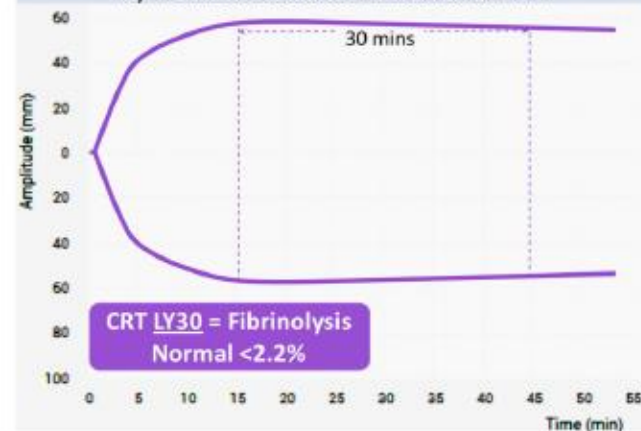
CRT LY30 >2.2%

HYPERFIBRINOLYSIS

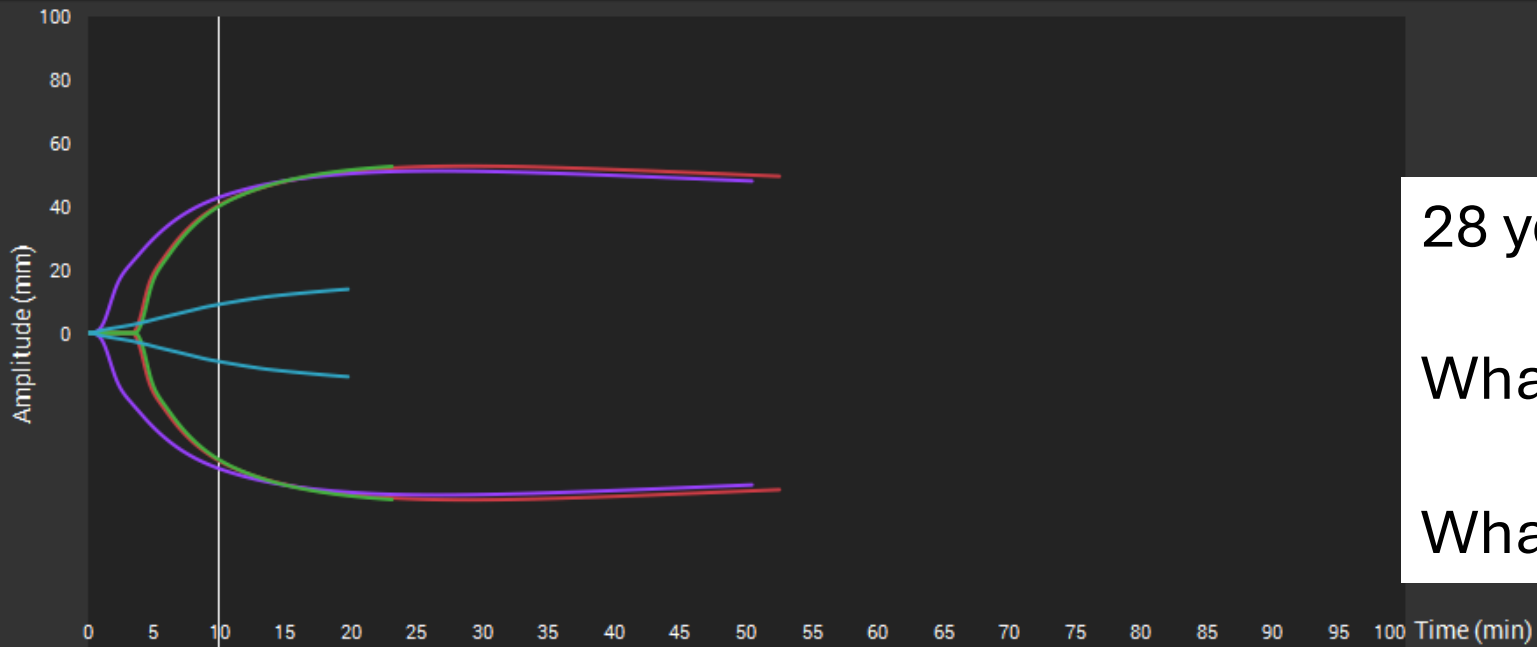
Tranexamic Acid (TXA)
1g over 10 mins, followed by 1g over 8hs

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



Case 9



28 year old 2.5 litre PPH

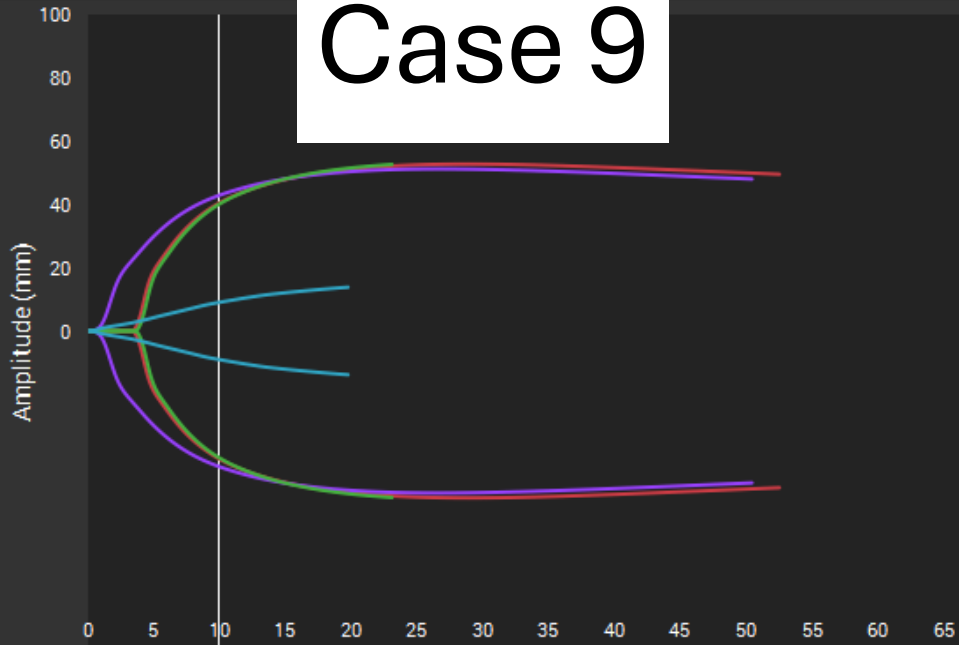
What does the TEG show?

What products will you give?

CM Citrated K,KH,RT,FF	TEG-ACT (sec)	R (min)	K (min)	ANGLE (deg)	MA (mm)	LY30 (%)	FLEV (mg/dL)
CK		3.7 4.6 - 9.1	1.4 0.8 - 2.1	72.5 63 - 78	52.0 52 - 69	1.2 0.0 - 2.6	
CRT	153.4 82 - 152	1.1 0.3 - 1.1	1.8 0.8 - 2.7	65.9 60 - 78	50.5 52 - 70	1.2 0.0 - 2.2	
CKH		4.0 4.3 - 8.3	1.4 0.8 - 1.9	72.8 64 - 77	52.6 52 - 69		
CFF					13.8 15 - 32		251.8 278 - 581

Device Name: TEG 6s

Case 9



Interpretation

- 1) CFF MA = 13.8 (low) - Give fibrinogen or cryoprecipitate
- 2) CRT MA = 50.5 (low) - Probably not due to platelets also – check platelet count or repeat TEG after fibrinogen
- 3) CK R time = 3.7 min (short) – No coagulation defect or heparin effect
- 4) CKH R Time = 4.0min - Same as CK R time No heparin effect
- 5) CRT LY30 = 1.2% No evidence of hyperfibrinolysis. Consider tranexamic acid 1g empirically in PPH if not already given

CM Citrated K,KH,RT,FF	TEG-ACT (sec)	R (min)	K (min)	ANGLE (deg)	MA (mm)	LY30 (%)
CK		3.7	1.4	72.5	52.0	1.2
		4.6 - 9.1	0.8 - 2.1	63 - 78	52 - 69	0.0 - 2.6
CRT	153.4	1.1	1.8	65.9	50.5	1.2
	82 - 152	0.3 - 1.1	0.8 - 2.7	60 - 78	52 - 70	0.0 - 2.2
CKH		4.0	1.4	72.8	52.6	
		4.3 - 8.3	0.8 - 1.9	64 - 77	52 - 69	
CFF					13.8	
					15 - 32	

What actually happened?

The patient was recognised to have fibrinogen deficiency and was given cryoprecipitate