CASE 12

Thanks to Dr Gareth Ansell 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

↓COAG FACTORS
Deficit or Disorder (i.e. anticoagulant)

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

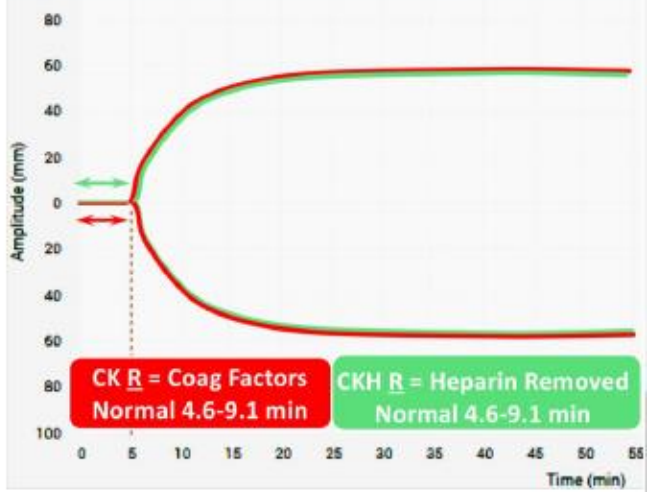
CKH R shorter than CK R

HEPARIN EFFECT

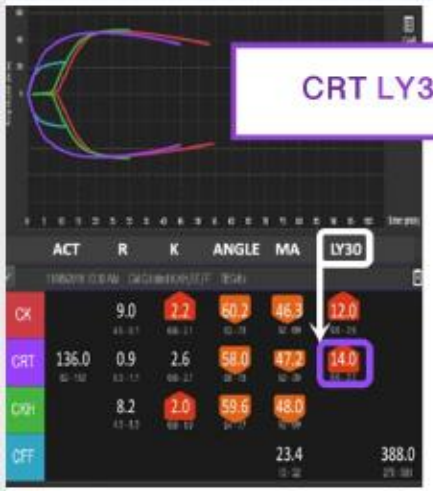
Protamine
~1mg /100u heparin

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



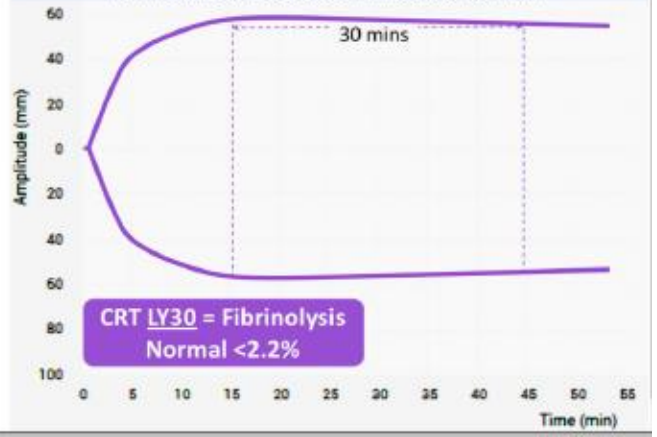
CRT LY30 >2.2%

HYPERFIBRINOLYSIS

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

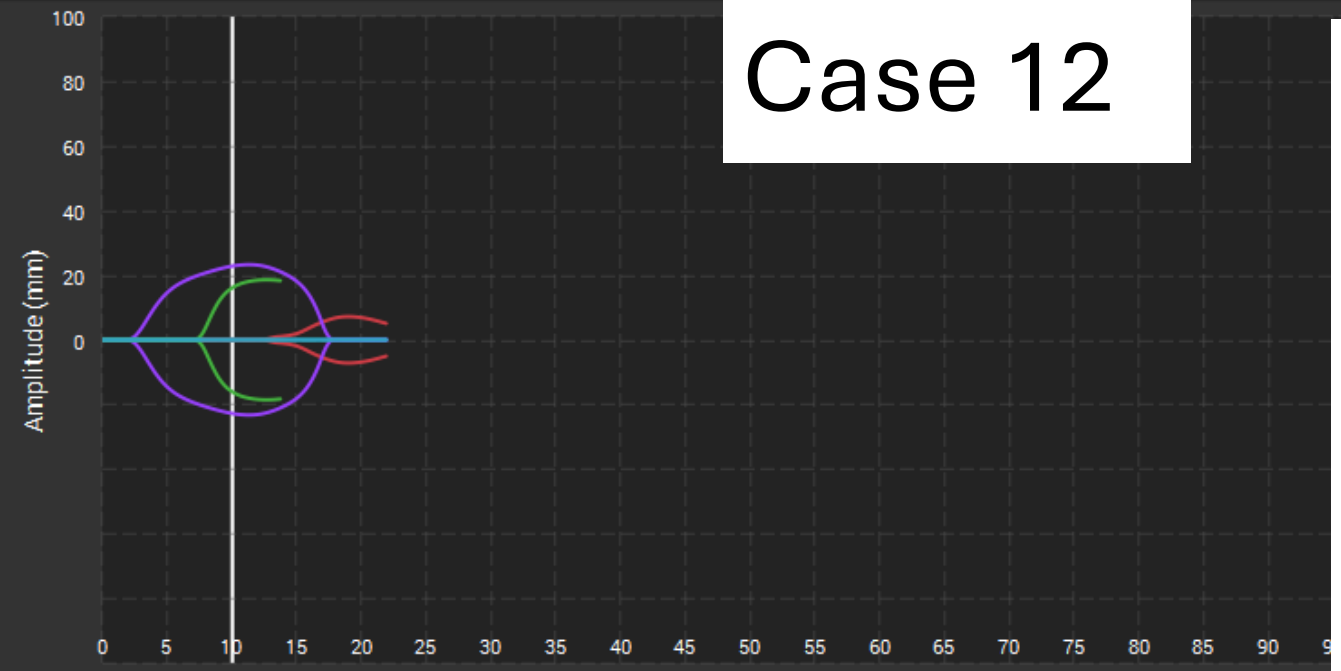
Preemptive Use:
Major trauma, give within 3 hours (CRASH 2)
Consider in surgery where major bleeding occurs or is anticipated

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 12



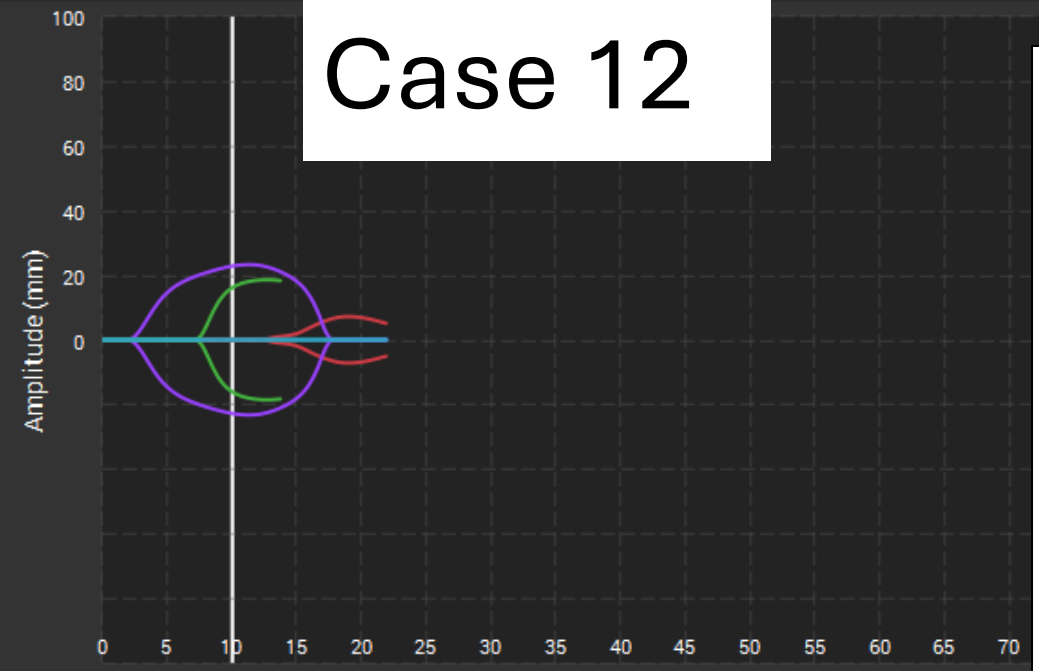
70yr old male bleeding during return to theatre laparotomy

What does the TEG show?

What products will you give?

	TEG-ACT	R	K	ANGLE	MA	LY30	FLEV
	10/25/2016 2:05 PM	CM Citrated K,KH,RT,FF	TEG 6s				Add Note
CK		15.1 (4.6 - 9.1)	--- (0.8 - 2.1)	42.9 (63 - 78)	6.6 (52 - 69)	--- (0.0 - 2.6)	
CRT	303.1 (82 - 152)	2.7 (0.3 - 1.1)	4.8 (0.8 - 2.7)	52.0 (60 - 78)	22.9 (52 - 70)	--- (0.0 - 2.2)	
CKH		7.7 (4.3 - 8.3)	--- (0.8 - 1.9)	59.5 (64 - 77)	18.3 (52 - 69)		
CFF					--- (15 - 32)		--- (278 - 581)

Case 12



10/25/2016 2:05 PM CM Citrated K,KH,RT,FF TEG 6s

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CKH		7.7 (4.3 - 8.3)	--- (0.8 - 1.9)	59.5 (64 - 77)	18.3 (52 - 69)	
CFF					--- (15 - 32)	

Interpretation

1) CFF MA = 0 (profoundly low) - Give large dose of fibrinogen or cryoprecipitate
2) CRT MA = 22.9 (profoundly low) - Probably needs platelets as well. Check FBC. Recheck TEG after fibrinogen
3) CK R time = 15.1 min (prolonged) – Coagulation defect or heparin effect.
4) CKH R Time = 7.7min (normal) - Probable heparin effect – check clinical history if has had heparin consider protamine
5) CRT LY30 = 100% ?? No number on the screen but the trace indicates severe hyperfibrinolysis. Give TXA 1g

Gareth's Interpretation:
This patient has heparin on board. They need fibrinogen concentrate/cryo as severely deficient, empiric TXA, they may need platelets and protamine but it would depend on the clinical situation on whether I would give that straight away. or commence RBC/fibrinogen replacement and remeasure.