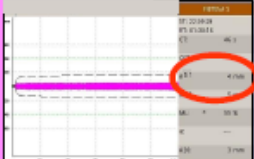
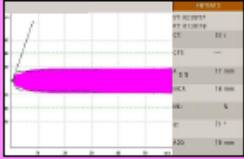
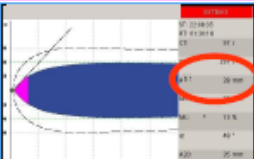
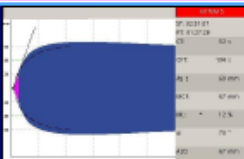

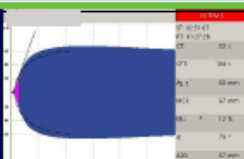

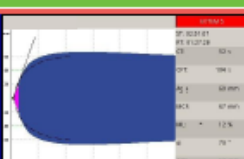


\* Note this algorithm assumes patients have already received TXA – thus fibrinolysis is now 4th

## KEMH ROTEM Algorithm for Critical Bleeding

**Key Points:** This algorithm should be used in conjunction with the KEMH Blood Product Guidelines for Major Obstetric Haemorrhage. Only treat abnormal values if active bleeding or at high risk of bleeding. Repeat ROTEM analysis 10 mins after intervention to assess response.

	ABNORMAL ROTEM	CRITERIA	DIAGNOSIS	INTERVENTION	CORRECTED ROTEM
<b>FIBRINOGEN</b>		<b>FIBTEM A5 ≤ 10mm</b>	<b>Low fibrinogen</b>	<b>Cryoprecipitate OR Fibrinogen concentrate</b> (see dosing guide) <b>AND Tranexamic acid 1g</b>	
<b>PLATELETS</b>		<b>EXTEM A5 ≤ 35mm</b> and <b>FIBTEM A5 ≥ 10mm</b>	<b>Low platelets</b>	<b>Platelets: 1 adult dose</b> (correlate with platelet count)	
		<b>EXTEM A5 ≤ 25mm</b> and <b>FIBTEM A5 ≤ 10mm</b>	<b>Low platelets</b> and <b>Low fibrinogen</b>	<b>Platelets and fibrinogen</b> (correlate with platelet count)	
<b>FACTORS</b>		<b>EXTEM CT 80-140s</b> and <b>FIBTEM A5 ≤ 10mm</b>	<b>Low fibrinogen</b>	Correct <b>fibrinogen</b> and reassess	
		<b>EXTEM CT &gt; 140s</b> and <b>FIBTEM A5 ≤ 10mm</b>	<b>Low fibrinogen</b> and <b>Low coagulation factors</b>	<b>FFP 1-2U + Fibrinogen as Indicated</b> (Consider Prothrombinex-see below)	
<b>FIBRINOLYSIS</b>		Early Diagnosis <b>EXTEM A5 ≤ 35mm</b> or <b>FIBTEM CT &gt; 600s</b>	<b>High likelihood of excess fibrinolysis</b>	<b>Tranexamic acid 1g</b> Consider repeat dose if has lost over 1 blood volume since initial dose	
		Late Diagnosis <b>EXTEM or FIBTEM ML ≥ 5%</b>	<b>Excess fibrinolysis</b>		

### Fibrinogen Dosing Guide

FIBTEM A5 Target: ≥ 12mm

FIBTEM A5	Increase required	Cryoprecipitate	Fibrinogen Concentrate
9-10mm	2-3 mm	1-2 doses	2g*
7-8mm	4-5 mm	1-2 doses	3g*
4-6mm	6-8 mm	2 doses	4g
<4mm	≥ 9mm	2 doses	6g

\*Outside of currently approved guidelines, must be discussed with haematologist

### Fibrinogen Concentrate

#### Guidelines For Use

- Consultant anaesthetist or haematologist approval required.
- Patients must be experiencing life threatening haemorrhage.
- Fibrinogen concentrate may be indicated instead of, or in addition to, cryoprecipitate if the FIBTEM A5 is 8mm or below, OR there is a high suspicion of coagulopathy in a life threatening haemorrhage.
- Use at higher FIBTEM values may be appropriate in patients refusing cryoprecipitate.

#### Administration

- Reconstitute 1g in 50ml warm sterile water (use prepared kit in fluid warmer).
- Swirl gently and do not shake (to avoid foaming).
- Administer each 1g via syringe driver over 2-4 mins if life-threatening haemorrhage or over 10 mins if not.

### Cryoprecipitate

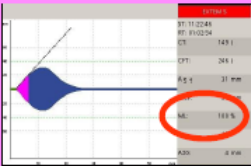
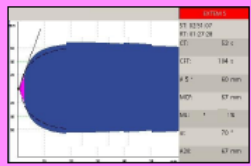
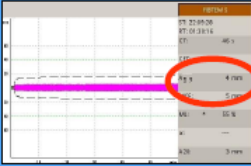
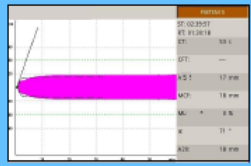
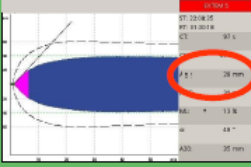
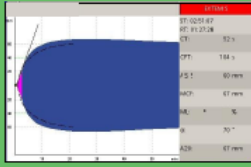
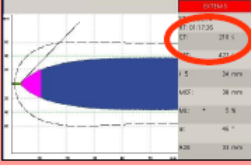
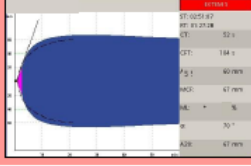
1. 1 dose is equivalent to 10 whole blood units or 5 apheresis units.
2. May be supplied as whole blood units or as apheresis units (or a combination) 1 apheresis unit = 2 whole blood units.
3. Availability time: generally available within 10 minutes of request being made

### Prothrombinex

1. Haematologist approval required
2. Consider as an alternative to FFP for patients with coagulation factor deficiency (e.g. prolonged EXTEM CT see above) in the following circumstances:
  - Circulatory overload
  - Rapid correction in extreme coagulopathy

# SCGH ROTEM Algorithm for Critical Bleeding

**Key Points:** This algorithm should be used in conjunction with the SCGH Critical Bleeding Protocol. Only treat abnormal values if active bleeding or at high risk of bleeding. Repeat ROTEM analysis 10 mins after intervention to assess response.

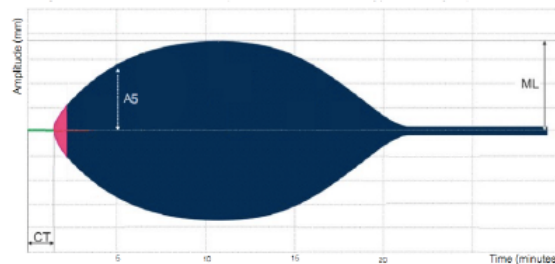
	ABNORMAL ROTEM	CRITERIA	DIAGNOSIS	INTERVENTION	CORRECTED ROTEM
<b>FIBRINOLYSIS</b>		Early Diagnosis <b>EXTEM A5 ≤ 35mm</b> or <b>FIBTEM CT &gt; 600s</b>	<b>High likelihood of excess fibrinolysis</b>	<b>Tranexamic acid 1g</b> Consider repeat dose if has lost over 1 blood volume since initial dose	
		Late Diagnosis <b>EXTEM or FIBTEM ML ≥ 5%</b>	<b>Excess fibrinolysis</b>		
<b>FIBRINOGEN</b>		<b>FIBTEM A5 ≤ 10mm</b>	<b>Low fibrinogen</b>	<b>Cryoprecipitate</b> (see dosing guide)	
<b>PLATELETS</b>		<b>EXTEM A5 ≤ 35mm</b> and <b>FIBTEM A5 &gt; 10mm</b>	<b>Low platelets</b>	<b>Platelets: 1 adult dose</b> (correlate with platelet count)	
		<b>EXTEM A5 ≤ 25mm</b> and <b>FIBTEM A5 ≤ 10mm</b>	<b>Low platelets and Low fibrinogen</b>	<b>Platelets and fibrinogen</b> (correlate with platelet count)	
<b>FACTORS</b>		<b>EXTEM CT 80-140s</b> and <b>FIBTEM A5 ≤ 10mm</b>	<b>Low fibrinogen</b>	Correct <b>fibrinogen</b> and reassess	
		<b>EXTEM CT &gt; 80s</b> but <b>FIBTEM A5 &gt; 10mm</b>	<b>Low coagulation factors</b>	<b>FFP 1-4U</b> or <b>Prothrombinex 10 U/kg</b> (+ fibrinogen if indicated)	
		<b>EXTEM CT &gt; 140s</b> and <b>FIBTEM A5 ≤ 10mm</b>	<b>Low fibrinogen and Low coagulation factors</b>		

## Fibrinogen Dosing Guide

### FIBTEM A5 Target: ≥12mm

FIBTEM A5	Increase required	Cryoprecipitate*
9-10mm	2-3 mm	10 Units
7-8mm	4-5 mm	15 Units
4-6mm	6-8 mm	20 Units
<4mm	≥9mm	20-25 Units

\*Cryoprecipitate dosing is for standard adult units (Cryo 5 units = Fibrin A5 increase of approx 2mm)

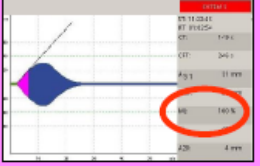
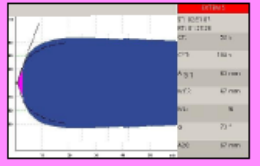
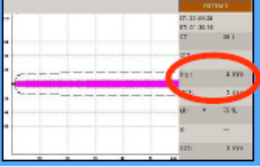
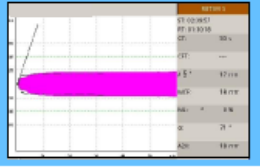
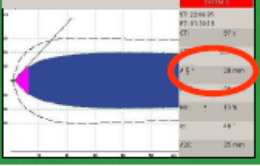
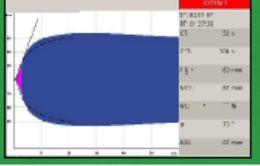
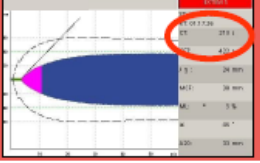
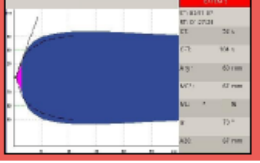


## Prothrombinex

- Warfarin Reversal: Indicated for urgent reversal of warfarin in critical bleeding, usual dose 25-50U/kg (+/- FFP) discuss with haematologist.
- Consider as an alternative to FFP for patients with coagulation factor deficiency (e.g. prolonged EXTEM CT see above) in the following circumstances:
  - Circulatory overload
  - Rapid correction in extreme coagulopathy
  - Consider lower dose 10U/kg (round to nearest 500U).

# FSH ROTEM Algorithm for Critical Bleeding

This algorithm should be used in conjunction with the FSH Major Haemorrhage Protocol  
 Treat abnormal values only if there is active bleeding or the patients is at high risk of bleeding.  
 Repeat ROTEM analysis 10 mins after any intervention to assess response.

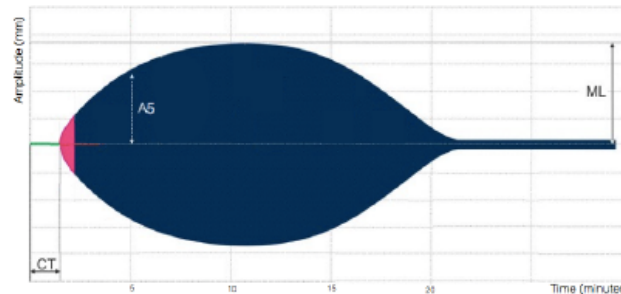
	ABNORMAL ROTEM	CRITERIA	DIAGNOSIS	INTERVENTION	CORRECTED ROTEM
FIBRINOLYSIS		Trauma (within 3hrs) OR Post partum haemorrhage  Flat trace OR Maximal lysis >5%	→  Hyperfibrinolysis	Tranexamic acid 1g	
FIBRINOGEN		FIBTEM A5 ≤10mm	Hypofibrinogenemia	Cryoprecipitate	
PLATELETS		EXTEM A5 ≤35mm with normal fibrinogen*	Thrombocytopenia	Platelets	
FACTORS		EXTEM CT 90-140sec with normal fibrinogen** OR EXTEM CT >140sec	Low coagulation factors	Fresh Frozen Plasma 2-4u OR Prothrombinex 25IU/kg	

## Cryoprecipitate Dosing Guide

FIBTEM A5	Non-obstetric	Obstetric
7-10	1 dose	2 doses
<6	2 doses	3 doses

One dose = five apheresis units = Fibrinogen A5 increase of approximately 4mm

\*If EXTEM ≤25 and FIBTEM A5 ≤10 consider replacing both factors  
 \*\*Fibrinogen replacement in the context of hypofibrinogenemia may overcome a minor prolongation of clotting time

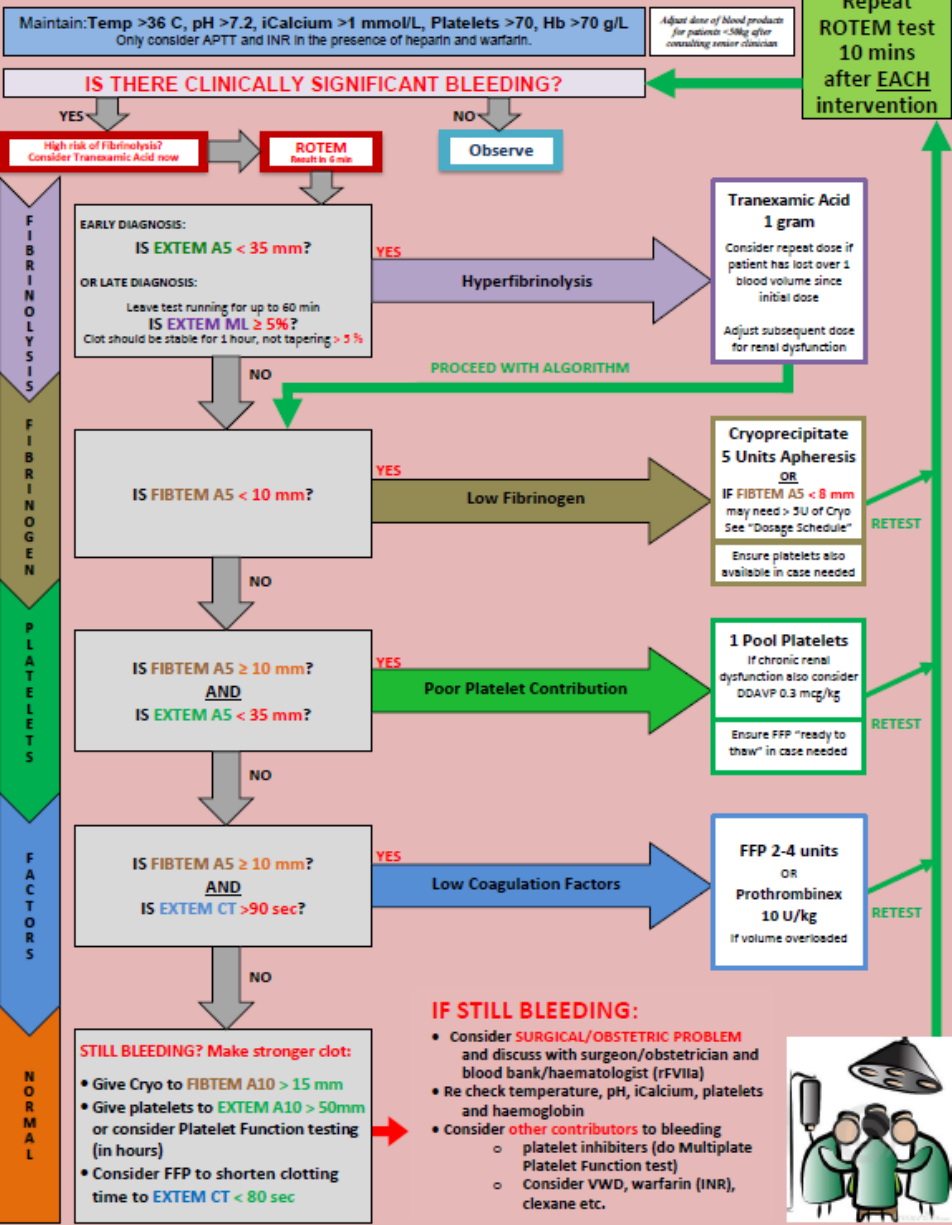


## Key components

EXTEM CT Clotting Time	Thrombin generation
EXTEM A5 Amplitude at 5 minutes	Fibrinogen and platelet concentration and function
FIBTEM A5 Amplitude at 5 minutes	Fibrinogen concentration and function
ML % Maximal lysis	Degree of fibrinolysis over temogram



# GENERAL SURGICAL / OBSTETRIC HAEMORRHAGE ROTEM TRANSFUSION ALGORITHM (2017)



Please stick this label in the patients progress notes

## ROTEM ANALYSIS AND TREATMENT PLAN

\*\*Nurse or JMO to circle algorithm used then insert results from ROTEM Next circle range (action red range) and use algorithm to create a plan.\*\*

Date: / / Time:

ALGORITHM USED (circle one):

CARDIAC/VASCULAR or GENERAL/OBSTETRIC

- For CARDIAC/VASCULAR start here and do all:
  - INTEM CT = ..... Below 205 / 205 & Above
  - HEPTEM CT = ..... Below 205 / 205 & Above
- For GENERAL/OBSTETRIC start here (this section only):
  - EXTEM A5 = ..... Below 35 / 35-40 / Above 40
  - FIBTEM A5 = ..... Below 10 / 10-15 / Above 15
  - EXTEM CT = ..... Below 80 / 80-90 / Above 90
  - EXTEM ML = ..... Below 5 / 5 & Above

Management Plan: .....

Please stick this label in the patients progress notes

