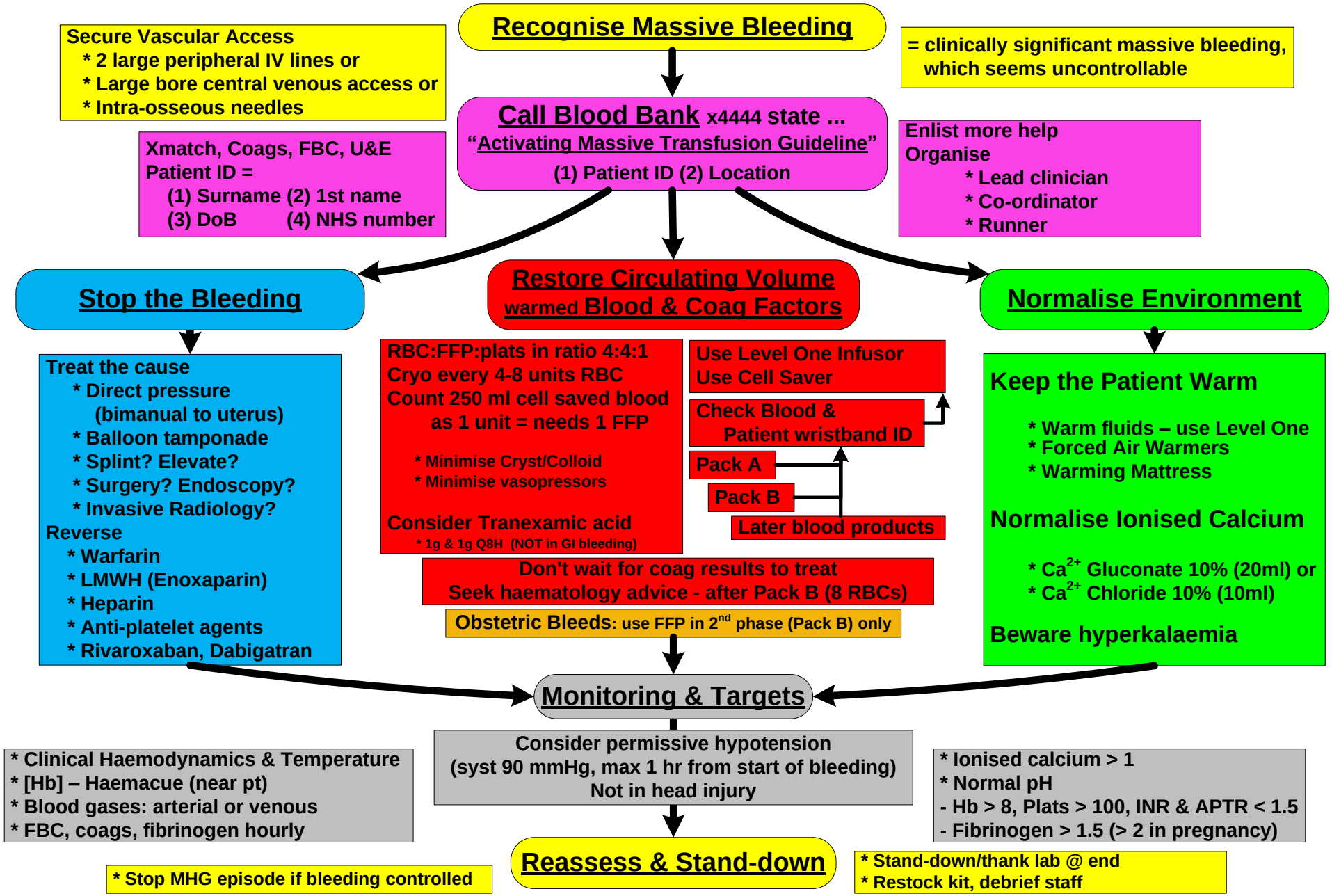
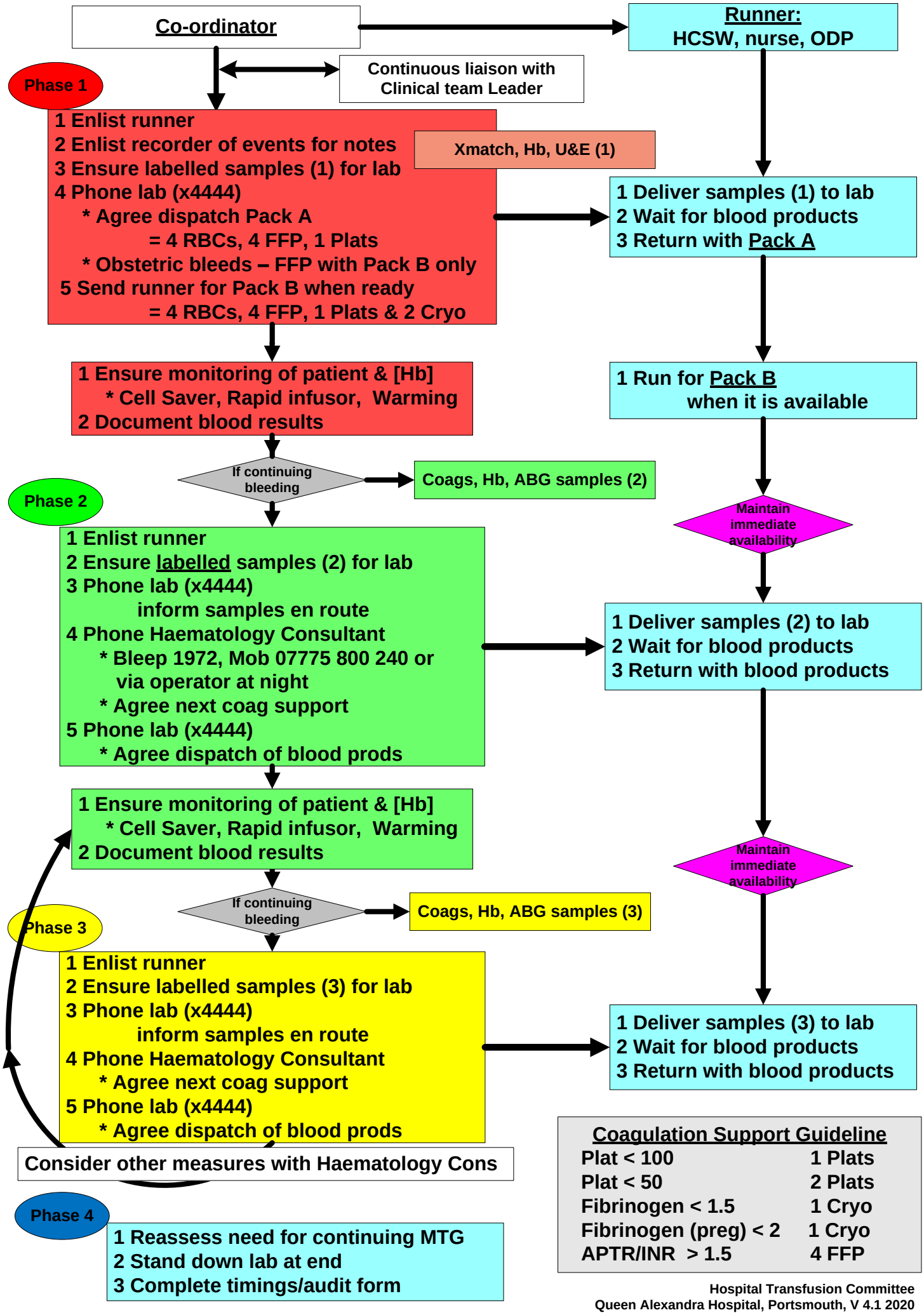
Massive Haemorrhage Guideline



Queen Alexandra Hospital, Portsmouth
Transfusion Committee: 2020 V4.1

Communication & Logistics



Coagulation Support Guideline	
Plat < 100	1 Plats
Plat < 50	2 Plats
Fibrinogen < 1.5	1 Cryo
Fibrinogen (preg) < 2	1 Cryo
APTR/INR > 1.5	4 FFP

Massive Haemorrhage Guideline: Notes and Caveats

Recognition of Massive Haemorrhage

- Definition: clinically significant massive bleeding, which seems uncontrollable.
    - This is a deliberately simple definition, without specific volumes, to prevent delays measuring volumes or waiting specific lengths of time to trigger a massive haemorrhage alert. It is better to trigger too many alerts (with the benefit of hindsight) than have too many delayed diagnoses of major haemorrhage.
    - If it looks like massive bleeding that seems uncontrollable – then it probably is!
- **Phone blood bank x4444: state "I want to activate the Massive Haemorrhage Guideline"**
- **Give patient identification details** and **site of patient (ED, ward)** and send blood samples
    - Use **NHS number** if available

Cross-Matching & Bloods

- Send cross-match bloods, FBC, U&E, Coagulation profile. All the necessary forms and a copy of this guideline should be available in areas likely to experience massive bleeding.
- Blood bank may already have a group & screen sample (e.g. in elective surgical patients) and can thus issue blood immediately but otherwise it takes 5 mins to obtain a blood group. Important to use the appropriate group FFP.
- Group **O Neg** blood may be sent initially but **O Pos** blood may be used in male patients (over 18 yrs) and older females over 55yrs (older than potential childbearing years).

Volume & Coagulation Factors

	RBCs	FFP	Plats	Cryo
Pack A	4	4	1	------
Pack B	4	4	1	2

- Best outcomes occur with ***concurrent*** use of RBC, FFP, platelets (in ration 4:4:1), with cryo (cryoprecipitate) every 4-8 units RBC. Minimise the volumes of crystalloids & colloids.
- The lab provides Pack A and Pack B will become available automatically shortly thereafter, unless a cancellation occurs & is communicated. Platelets may not be onsite, so may be delayed.
- *In obstetric haemorrhage only use FFP with Pack B (in phase 2)*, as patients *initially* hypercoagulable.
- Initial FFP is pre-thawed. Further blood products will be provided on basis of blood results (timed according to the algorithm) and liaison with consultant haematologist.
- Cell salvaged blood (CSB) contains no clotting factors. Count cell salvaged blood in transfusion count. CSB has high Hct, so 250 ml CSB = 1 unit. For example: 6 units bank blood + 1500 ml CSB = 12 units total and requires 12 units FFP.

***Consider* tranexamic acid** 1g IV over 10 mins, then 1 g infusion over 8 hrs (NOT in GI haemorrhage)

Organisation

This is the key strategy – to appoint roles to individuals, working to a plan/guideline, as a cohesive team.

- **Seeking help & support**
    - These situations are very labour intensive and several people are required.
    - Calling for help early is imperative. In theatre at least two anaesthetists are required.

- **Clinical Leader:** has overall responsibility and leads (ideally hands-off to allow situational awareness)

  The Clinical Leader has responsibility for clinical interventions
    - Emergency Dept (ED) = consultant or most senior ED clinician
    - Theatre = consultant or most senior anaesthetist
    - MAU/SAU/Wards = consultant or most senior clinician

- **The coordinator role**
    1. to liaise with the clinical team leader and others to ensure the guideline is followed
    2. to ensure the appropriate measures take place in a timely, planned, organised manner
    3. to document and time the key points & events
    4. to offload administrative and telephone work from the clinical leader
    5. to ensure any problems with structure or process are highlighted, to be addressed & sorted

  Clinicians should understand the checklist element to this role, and despite the pressures, should remain professional & courteous & attentive.

- **Appointing roles**
    - The clinical leader has overall leadership for the resuscitation. If there is sufficient manpower and skill-mix, the clinical leader should remain "hands-off" the patient to maintain situational awareness. The roles of clinical leader & coordinator are complimentary. The most senior doctor may choose to take either role or neither role, allowing a trainee to take the helm.
    - Coordinator may be a doctor, senior nurse or an experienced ODP.
    - The ED has tabards to identify the team roles, including a scribe.

- **Noise & overcrowding**
    - The clinical area can become overcrowded and excessively noisy. Clinical leader may ask people to stand back or leave; radio or music should be turned off. Clearly these events are rare and afford useful learning opportunities. Stressful situations require quick thinking staff and quiet, calm and efficient support.

- **Haematology Consultant:** bleep 1972, day mobile 07775 800240, at night via operator

Equipment

- **Rapid Infusion Devices – Level 1** and **Forced air warmers** are available in ED, Theatre, Critical Care, Maternity. These devices are crucial & are needed urgently.

Reversal of Pharmacological Anticoagulation

A) Warfarin

- **Vit K** 1-2 mg increments & **Octaplex** (Prothrombin Complex Concentrate) 2000 units.
- Vit K in doses of 5-10 mg will prevent later re-warfarinisation for some time.

B) Anti-platelet drugs

- Platelet transfusion likely to be most effective measure. Avoid DDAVP in this situation.

C) Heparin

- Heparin has a short half-life & **protamine causes significant hypotension**.
- Consider Protamine with care & reluctance. Probably ineffective in treating SC heparin.

D) LMW Heparin (e.g. clexane)

- FFP is of no use in reversing heparin of any sort. In theory it could increase the anticoagulant effect by providing further antithrombin.
- Consider **protamine** but effect is variable, has intrinsic anticoagulant effects itself and **may cause hypotension.** Give slowly <5mg/min I.V. and do not exceed guidelines below.

LMWH Heparin regime	**40mg (Prophylactic dose)**			**1.5mg/kg (Treatment dose)**		
Time since LMWH dose	≤ 8 hrs	8-12 hrs	> 12 hrs	≤ 8 hrs	8-12 hrs	> 12 hrs
Protamine Dose	50 mg	20 mg	None	50 mg	20 mg	None

E) Factor Xa Inhibitors (e.g. Rivaroxaban)

Consult haematologist, who may consider Prothrombin Complex Concentrate (PCC – Octaplex)

F) Thrombin Inhibitors (e.g. Dabigatran)

Consult haematologist, who may consider Idarucizumab (Praxbind®)

Treatment of hypocalcaemia

- 10-20ml 10% calcium gluconate (kinder to peripheral veins) or calcium chloride 10% 10ml.

Haemodynamic Monitoring

- Monitor pulse rate, BP, CRT, peripheral perfusion/warmth, urine output, mentation.
- Pain, anxiety or awareness, cold climate, beta blockade may influence these signs.
- Consider resuscitation using a goal of a palpable radial pulse. Permissive hypotension i.e. targeting a modest BP, as in blunt trauma care, may have a place but is **bad for head injuries** and there is evidence of **poor outcomes if it persists beyond an hour**.
- Do not waste time on an arterial line in a shocked, hypovolaemic patient – resuscitate first.
- Monitor the continuing blood loss if this is feasible. Central venous *pressure* measurements are not helpful.