

# Mechanism to ensure the patient safety in special emergency circumstances

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# Transfusion in a hospital setting

- Transfusions
  - a therapeutic method
  - a daily practice across a wide range of hospital clinical settings for elective and emergency situations.
- What does patient safety means in terms of blood transfusion?

# Patient safety

- Blood components
  - available
  - safe: no adverse transfusion reaction
  - clinically effective: benefits for patient
  - efficient; no unnecessary transfusion
- Transfusion of the right unit of blood to the right patient at the right time, and in the right condition and according to appropriate guidelines

# Patient safety in emergency situation

- In emergency situations this concept change in the sense that:
  - a heavily bleeding patient needs **large amounts of blood** and blood components **in short time** ( availability of blood, procedures, protocols?)
  - no time for mandatory pretransfusional testing (safety?, risk of transfusion reaction?)
- A single patient with catastrophic bleeding can be a major challenge for the clinical and blood bank teams

# Patient safety in emergency situation

- Another important issue is represented by road traffic accidents and other disasters when several unconscious injured patients may arrive at the hospital within a short period creating risks due to
  - problems in identifying the patients
  - problems with traceability of blood components

# Massive hemorrhage

- Is potentially life threatening and occurs in many clinical settings:
  - acute medical pathology: upper gastrointestinal (variceal, non-variceal) acute bleeds
  - trauma
  - surgical
  - obstetrics

# Massive hemorrhage

## Definition

Expected blood loss of:

- one blood volume over less than 24 hour period
- 0,5 blood volume in 3 hours
- > 4 units of red blood cells in one hour

# The aim of transfusion

- Blood components are administered in order to maintain tissue oxygenation and to correct the coagulopathy
- Indications are based on clinical and laboratory data
- The objectives of transfusion therapy in massive bleeding:
  - Hb > 7 g/dl
  - fibrinogen > 1 g/dl
  - Plt > 50x 10<sup>9</sup>/l
  - APTT < 1,5 x witness value



# Hypovolemic shock

Prevent hypovolaemic shock and its consequences - a challenge for:

- front line clinicians
- blood bank - which provide transfusion support, pretransfusion tests, logistic

**Recognising major blood loss very early and taking effective action promptly is vital.**

The critical nature of the situation may lead to tension between those treating the patient and blood bank

**Efficient communication is paramount for effective management and good outcomes.**

# Major haemorrhage procedure

- Clinical and blood bank experiences indicates that **delays in providing blood in life-threatening emergency** can occur for various reasons and contribute to **mortality in critical situations** such as obstetric haemorrhage
- Hospitals should have **Major haemorrhage procedure** that identifies roles, responsibilities and communication routes for providing blood in emergency
- It is imperative that this local protocol includes robust and **clearly understood communication channels** between staff in the clinical area and those in the blood bank.

# Major haemorrhage procedure-Blood bank

As a minimum, the local protocol should address the following points:

- The immediate availability of uncrossmatched group O red cell units for patients with massive haemorrhage
  - reserve stock O + and O – (whole blood and red cell concentrate)
    - Whole blood benefits:
      - blood volume restoration, the level of fibrinogen, a reduction in exposure to a large number of donors
- Procedures for the rapid provision of „group compatible“ red cell units (i.e. red cell units identical to or compatible with the patient“s blood group, but not crossmatched)
  - the right time to switch from compatible non-identical to identical blood group, according to local written protocols
- Procedures for the rapid provision of thawed plasma and platelet concentrates for patients with massive haemorrhage.

# Major haemorrhage procedure - clinical area

- The clinical area must ensure that the blood bank is made aware of a patient with massive haemorrhage as soon as possible.
- There must be a locally agreed and well understood **trigger term to request initiation of the massive haemorrhage protocol.**
- It is necessary to find a balance between the need to access blood components as rapidly as possible in cases of urgent need and rigorous procedures very legitimately aimed at avoiding unnecessary use of blood components and wastage.

# Example of a major hemorrhage procedure- clinical area

1. If there are several staff working with emergency cases, one person should take charge of ordering blood and communicating with the blood bank
2. Take blood sample for crossmatching. Set up the intravenous infusion and get the blood sample and blood request form to the blood bank as quickly as possible
3. For each patient tubes and blood request must be clearly labelled. If the patient is not identified, an emergency identification number should be used. Use the patient name only if you are sure you have correct information
4. Tell the blood bank how quickly the blood is needed for each patient. Communicate using words that have been previously agreed with the blood bank.
5. Use special stock of emergency O neg. for girls and for women of child bearing age
6. **Do not wait for crossmatched blood if the patient is exsanguinating**
7. If another request for blood is needed for the same patient use the same identifier as on the first request.

# Protocol for the administration of blood products in massive hemorrhage with a pre-defined ratio - example

1	4 U RCC
2	4 RCC + 4 FFP + PC (adult dose)
3	8 U Cryoprecipitate (CP)
4	Calcium, according to the monitoring
5	4 RCC + 4 FFP + PC (adult dose) + 8 U CP + calcium
6	rFVIIa* ( usually after 8-12 U de RCC)
7	Correct temperature, acidemia, calcium level, the number of platelets and Fibrinogen

# Management of major haemorrhage

- This kind of guideline on the management of massive blood loss that establishes which blood components should be available and in what timescales, especially in obstetric settings should be available at national or local level
- While the need for rapid access to blood and blood components is well understood in clinical practice, a review of the reporting systems data has shown that the systems to ensure the rapid provision of these components can fail due to **misunderstandings** at every point in the process.
  - lack of understanding of the urgency of the situation
  - over-zealous application of rules and protocols aimed at non-urgent situations
  - poor communication of exact requirements or specific problems.
- **- even it is important to monitor laboratory test results frequently during massive transfusion although administration of blood / components should not wait for these.**

# Traceability in emergency circumstances

- It is not expected that emergency patient treatment should be either compromised or delayed due to the completion of the various regulatory requirements imposed by the local regulations.
- It is, however, expected that the **necessary records relating to traceability, haemovigilance reporting** be completed in full as soon as practicable following the transfusion event.



# Massive transfusion during a red phase blood shortage

## Red phase blood shortage (RPBS)

- Demand for blood greatly exceeds supply
- All other measures to increase the supply of blood have been exhausted

## Mechanism for ensure blood supply (RPBS) – level

- Rationing blood components across the country
  - redistribution of blood components between BE (**level 1**)
  - rationing the blood components to individual patients at the hospital (**level 2**)
- The most complicated triage decision is on the patient level
- Better to have a triage tool of patients established at the national level
- Blood rationing is one of the most challenging ethical issues faced in health care, raising ethical concerns about decision making process

# Conclusion

The management of patient safety in emergency circumstances consists of:

- availability of blood and blood components
- trained personnel to recognise major blood loss very early and taking effective action promptly
- Efficient communication
- Major haemorrhage procedure
- Clinical transfusion guideline for management of major bleeding
- written protocols and procedures – blood bank

Thank you