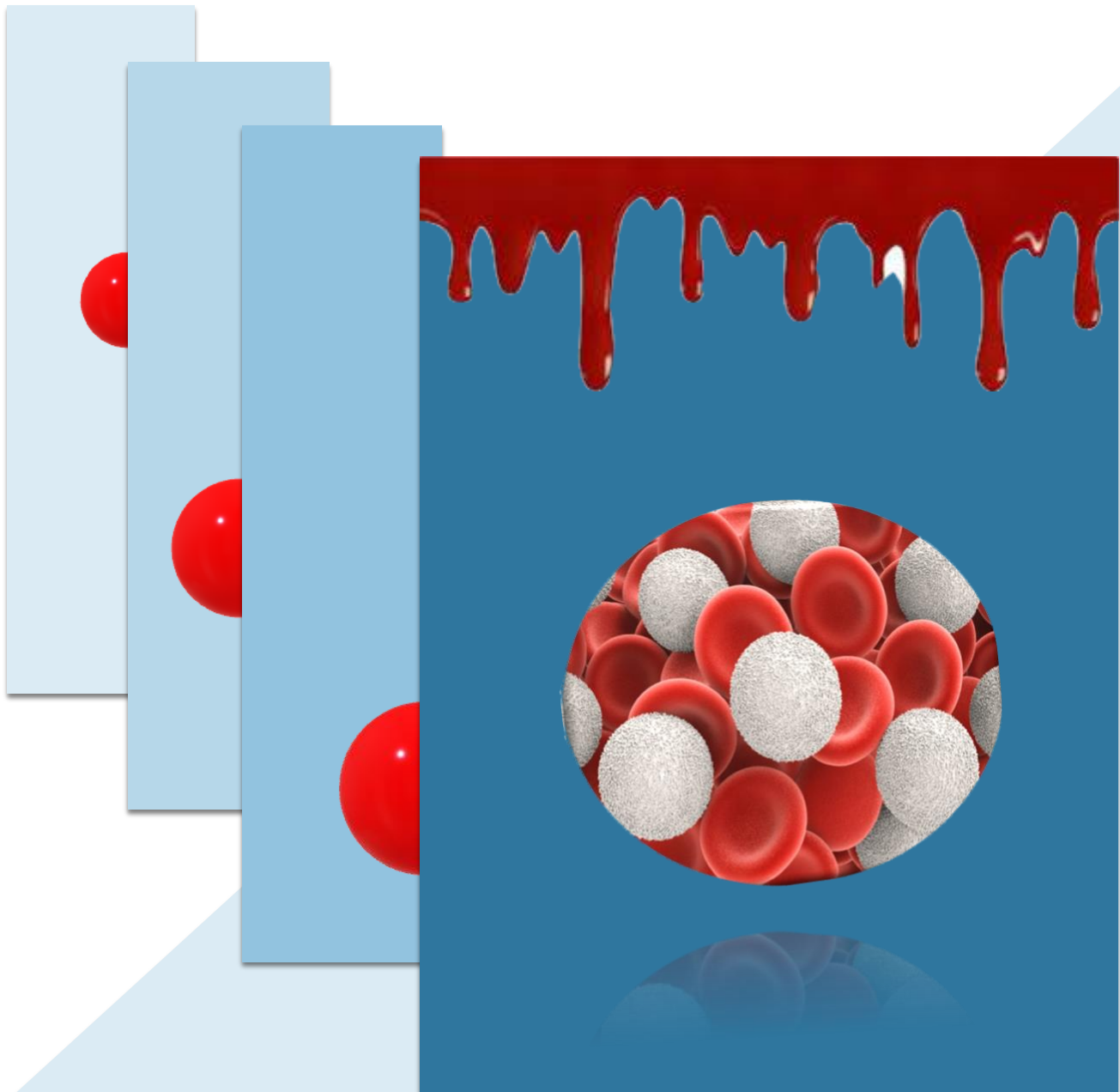


MASSIVE TRANSFUSION PROTOCOL  
FOR TRAUMA  
HOSPITAL SULTANAH AMINAH  
JOHOR BAHRU



TRAUMA -TRANSFUSION COMMITTEE COLLABORATION  
(Update September 2023)

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## UPDATING THE PROTOCOL

This protocol is updated in year 2023 and will be reviewed in a minimum period of three years (2026) or sooner if new evidence becomes available. When they are due for updating, the Chairman of the protocol and the committees of the related speciality will be informed. A multidisciplinary discussion will be held including on the scope of the revised protocol and the revision will be done accordingly.

## **LIST OF COMMITTEE**

Dr Mohd Amin Bin Mohidin  
Consultant Emergency and Trauma Physician

Mr Yuzaidi Bin Mohamad  
Consultant General and Trauma Surgeon

Dr Nuraini Sham  
Transfusion Medicine Specialist

Dr Mohd Mizan Bin Gusari  
Tranfusion Medicine Specialist

Dr Mohd Hilmi Senin  
Tranfusion Medicine Specialist

Dr Ong Su Ping  
Anaesthesiologist

Dr Zulaili Binti Asri  
Emergency Physician

## **LIST OF REVIEWERS**

Mr Rizal Imran Bin Alwi  
Head of Trauma Surgery Unit, Department of Surgery  
Dr Omar Bin Sulaiman  
Head of Anaesthesiology and Intensive Care Unit

## TITLE

Massive Transfusion Protocol (MTP) for trauma patients presenting with exsanguinating haemorrhage in hospitals with on-site Blood Banks.

## INTRODUCTION

Trauma is the leading cause of death worldwide in persons under 40 years and accounts for approximately 10% of all deaths in general. Almost 50% of patients with the lethal outcome within the first 48 hours after trauma dies from uncontrolled bleeding (8). On average, one in four trauma patients arriving in the trauma bay is already coagulopathic and in approximately 3 - 6 % of these situations, the exsanguinating haemorrhage requires massive transfusions.

Massive Transfusion Protocols for traumatic haemorrhage have been shown to improve outcomes if initiated early in the course of treatment (3). The blood and blood products are transfused at the Emergency Department or Operation Theatre as soon as possible in emergency potentially life-threatening situations; usually in response to on-going haemorrhage. Initiating a massive transfusion requires a mechanism to accurately identify patients that will need it as early optimal blood transfusion is essential to sustain organ perfusion and oxygenation.

A clinical pathway was developed in HSAJB to ensure efficient activation of the protocol, safe and rapid delivery of blood products and effective coordination of available resources.

HSAJB embarked in MTP for exsanguinating trauma since 2016. Since then, audit and feedbacks were analysed and few meeting were organized to update the protocol. Thus in 2023, the committees have agreed to make some changes on the activation criteria based on the latest evidence, feedback, audit and best practises available.

The committees have agreed to use **Trauma Associated Severe Haemorrhage (TASH) score** and only for cases that will go to Operation Theatre (OT) or ICU as the activation criteria for Massive Transfusion Protocol for Trauma.

## DEFINITION

### Massive Blood Transfusion

- Massive transfusion is defined as infusion of >10 units of red cell within 24 hours or a transfusion of blood and blood components equivalent to or more to the patient's total blood volume if less than 24 hours.
- Or Replacement of 50% or more of the estimated blood volume within 3 hours.
- In children - massive transfusion is defined as the requirement of packed red cells >40 mL/kg in the first 4 hours or >80 mL/kg in the first 24 hours (11).

## **Massive Blood Loss**

- Massive haemorrhage is defined as blood loss of 150 mL/min or 50% blood volume within 3 hours or loss of total blood volume in 24 hours (11).

## **RATIONALE OF MTP**

Protocolized transfusion for traumatic haemorrhage has been shown to improve outcomes if initiated early in the course of treatment (3).

Factors improving outcomes from exsanguinating haemorrhage are :

1. Early identification
2. Early control of bleeding
3. Initial resuscitation of the shock state
4. Early initiation of blood transfusions
5. Early initiation of critical care measures

Clinical conditions where exsanguinating haemorrhage can occur includes :

1. Severe intra-abdominal injury (intra-peritoneal bleed or retroperitoneal bleed)
2. Complex pelvic fractures,
3. Complex long bone fractures,
4. Complex facial fractures,
5. Penetrating chest and high force blunt torso injuries.
6. Massive bleeding from multiple or any regions.

## **OBJECTIVES OF MTP COMMITTEE**

To develop a commonly agreed pathway for Massive Transfusions Protocol for Trauma that will ensure the following:

1. accurately identify patients that will need massive transfusions,
2. ensure efficient activation of the protocol,
3. ensure safe and rapid delivery of blood products,
4. coordinate communications to ensure most effective use of available resources, and
5. prepare a mechanism for audit and review of the protocol.

## ACTIVATION OF MTP FOR TRAUMA

Prediction tools to identify the need for massive transfusions rely on simple scoring systems such as **TASH Score** (Trauma Associated Severe Haemorrhage Score) *Table 1*. In certain clinical scenarios, a senior clinician's assessment may provide valuable information on the need to initiate MTP. This early assessment is vital as injudicious transfusion of blood products may lead to unwarranted complications, namely Acute Respiratory Distress Syndrome (ARDS), infection, Multiple Organ Dysfunction Syndrome (MODS) and sepsis (5).

### TASH Score

1. TASH Score does not indicate that trauma patients should receive blood; it suggests that they should receive blood through a massive transfusion protocol. Meanwhile, the physician must be aware that safe 'O' blood is available as per usual request before MTP activation.
2. Predicts the need for massive transfusion based on clinical and laboratory data (Arterial Blood Gas for Hb and BE) that can be obtained within 15 minutes in ETD.
3. TASH score can be calculated by using an **MD calculator** application with a smartphone.

### MTP Activation Criteria

1. The decision must be made by the attending specialist (EP/ Surgeon/ Anaesthesiologist) and,
2. TASH score of more than 16 points (cut-off point for a binary prediction rule probability of MTP 50%).
3. If TASH score <17, decision to activate is by 2 attending specialist\*

### Exclusion Criteria

1. MTP should not be started if the patient is hemodynamically stable and,
2. The patient is planned for further imaging at the Radiology Department.

### Location of activation:

1. Emergency and Trauma Department or,
2. Operation Theatre

**The following personnel may activate MTP:**

1. Emergency Physician
2. Surgeon
3. Anaesthesiologist

*\*In any extreme cases where the managing team are **unable to calculate TASH Score** due to having a difficulty to take blood or failure of ABG machine in ETD **OR unreliable TASH Score**; the decision to **activate MTP** will rely upon clinical assessment and judgement by the **Emergency Physician and Surgeon and or Anesthesiologist (2 specialists)**.*

**Activation Sequence**

- Once activated, the medical officer will call the Blood Bank MO on call and convey only these essential messages:
  - Name of patient
  - Diagnosis
  - TASH Score
  - Name of Specialist who activates the MTP
  - MTP blood coordinator (name, phone number or speed dial)
  - Safe O has been given or not.
  - Location of activation
- No other details should be given.

**TERMINATION OF MTP**

- When appropriate endpoints are reached, the MTP must be terminated to limit resource utilization.
- The Emergency Physician or Surgeon is responsible for ending the MTP if the patient in ETD while the Anaesthesiologist or Surgeon is responsible for patients in OT or ICU.
- For subsequent MTP Box, the responsibility of MTP coordinator to call blood bank staff to inform them regarding the continuation of MTP box or to stand down. However, blood bank staff will call the MTP coordinator after 30 minutes from MTP box released to inform stand down (both parties need to be informed regarding stand down).
- Premature discontinuation of MTP should be avoided to minimize catch-up reactive transfusion.

**TABLE 1: Trauma Associated Severe Haemorrhage (TASH) Score**

<b>Variables</b>	<b>Points</b>
Haemoglobin (g/dl) < 7 < 9 < 10 < 11 < 12	8 6 4 3 2
Base excess (mmol/L) < -10 < -6 < -2	4 3 1
Systolic Blood Pressure (mmHg) < 100 < 120	4 1
Heart rate (beats/min) > 120	2
Free intraabdominal fluid (e.g. by FAST)	3
Clinically unstable pelvic fracture	6
Open or dislocated femur fracture	3
Male gender	1

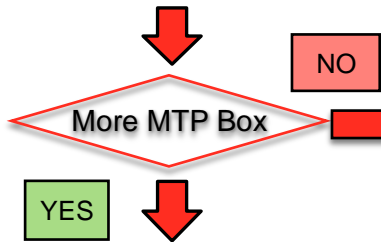
### MTP WORKFLOW

Activation in ETD / OT either by:  
 -Surgeon  
 -Emergency Physician  
 -Anaesthetist

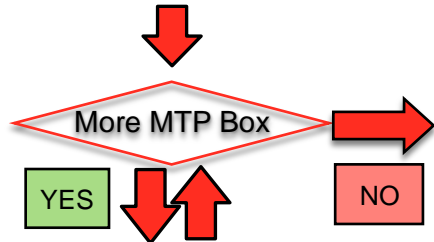
Criteria:  
 Trauma Associated Severe Haemorrhage (TASH) - Table 1 (point of 17 or more) or # (see below)

Activate MTP through the Blood Bank MO on call

**MTP BOX 1**  
 2 or 4 UNIT PACKED CELLS (depending on previous Safe O supplied)  
 4 UNIT FFP  
 4 UNIT PLATELET CONCENTRATE



**MTP BOX 2**  
 4 UNIT PACKED CELLS  
 4 UNIT FFP  
 6 UNIT CRYOPRECIPITATE



Subsequent box, alternate MTP BOX 1 and MTP box 2

**NOTIFY BLOOD BANK TO CEASE MTP IF INDICATED**

**Baseline Investigations:**

- i. FBC,
- ii. ABG
- iii. GXM
- iv. Coagulation Profile (PT/PTTK, Fibrinogen Level)
- v. BUSE/Creatinine/Se Calcium

**Then monitor ABG closely every 30 mins**

**Lab Turn Around Time:**  
 MTP Box 1: 20 minutes  
 MTP Box 2: 20 minutes  
 Subsequent box: 20 minutes  
 For COVID/SARI case: 30 minutes

**IMMEDIATELY:**

- Document the details of transfusion on blood card and blood chart.
- Return ALL USED & UNUSED blood & blood component.

**REQUIREMENTS:**

- All MTP patient will be registered (hospital BHT)
- Blood Form: **Name, NRIC, ETD RN (2 out of 3 must be correct)**
- At least 2 large bore IV access (**14/16 /18 G**)
- **MTP Kit: 2 GXM forms and 2 EDTA samples. Subsequent MTP Box: 1 GXM form and 1 sample**
- **MTP coordinators:**
  - **Surgical MO on call in ETD/Redzone ED MO**
  - **Anaesth MO/Specialist incharge in OT**
- Blood goes through **WITHOUT** airlock check

**AIM FOR:**

- Temperature > 35°C
- pH > 7.2
- Base excess < -6
- Lactate < 4 mmol/L
- Ca<sup>2+</sup> > 1.1 mmol/L
- Platelets > 50 x 10<sup>9</sup>/L

*If involves CNS/ Multiple trauma platelet >100 x 10<sup>9</sup>/L*

- PT/APTT < 1.5 x normal
- Fibrinogen > 1.0 g/L

**Important Notes:**

- **Level 1 infuser** shall be used to complete transfusion within **20 minutes**
- **Dual IV access :** *First IV access-* to transfuse PC. *Second IV access-* to transfuse platelet before other components
- **Single IV access :** to transfuse according to this sequence: Platelet -FFP/Cryo - P.C

\*Safe O blood is available as per normal request.  
 # In any extreme cases where the managing team **unable to calculate TASH Score** due to having a difficulty to take blood or failure of ABG machine in ETD **OR unreliable TASH Score**; the decision to **activate MTP** will rely upon clinical assessment and judgement by the **Emergency Physician and Surgeon and or Anaesthesiologist (2 specialists)**.

## CLERICAL AND ADMINISTRATION

### Patient

- All patient that require MTP must be registered for hospital admission and to be admitted to the Surgical Department by default.
- Identification of patient in ETD for MTP activation shall be on **ETD Registration Number (RN)** until MTP being terminated regardless of the place of termination.
- If MTP is activated in OT or ICU, identification of the patient is by **Name** and **ETD RN** or **Hospital RN number**.
- All MTP patient must have a hospital wrist tag with ETD RN if MTP activated in ETD.
- All patient must have at least 2 large-bore IV access (14G or 16G or 18G) for rapid and ease of blood transfusion.
- For unknown patient, his/her name will be identified as **UNKNOWN + ED RN + YEAR**  
Example: **UNKNOWN 1234523**. This UNKNOWN identification must be maintained until MTP termination.

### Patient's blood sample

- If initial blood sample is not available, the patient must be given safe O blood followed by blood sampling later.
- Ideally 1st sample requires 2 (two) patient's sample in EDTA tubes with a GXM form
- Blood investigations required: **FBC, ABG, GXM, BUSE/Creatinine, Coagulation profile (PT/PTTK + Fibrinogen Level)**

### MTP and blood request forms:

The blood request form will be highlighted at column that required to be filled (*Appendix 3*)

- Blood request form for the **first sample** (first MTP box) must have these informations:
  1. Patient's Identification - **Name, IC number or Passport number (for foreigner) and ETD RN.**
  2. Patient's Location
  3. **Name and contact number – MTP Activator (specialist)**
  4. **Name and contact number – MTP Coordinator**
- For unknown patient, his/her name will be identified as **UNKNOWN + ED RN + YEAR**  
Example: **UNKNOWN 1234523**. This UNKNOWN identification must be maintained until MTP termination.
- The IC and RN column for unknown patient will be filled with ETD RN. (*Appendix 3*).

- If there is a minor discrepancy of identification in the sample and form, MTP may be processed provided 2 out of 3 identifiers are correct. However, need to be discussed with the treating doctor.
- Blood form must be stamped **MTP** in red (available in ETD and OT). (*Appendix 2 & 3*).
- For all cycles, blood sample and forms are required
- Subsequent MTP Box and Blood request form
  5. Patient's Identification- name, IC number or Passport number for the foreigner and ETD RN.
  6. For all subsequent cycles, blood sample and GXM forms are required.

**Coordinators :**

- Initial blood coordinator is Surgical MO on call in ETD/ **Red Zone ED MO (if MTP is activated in ED)** to ensure blood sample and MTP Boxes are managed effectively.
- Once the patient in OT, **Anaesthesiology MO or specialist incharge OT will be the MTP coordinator.**
- All coordinators will be provided with a walkie-talkie for easier communication with the Blood Bank staff.

**Communication and walkie-talkie:**

- Once MTP is activated, the houseman will go to the Blood Bank to collect the MTP box 1 together with the walkie-talkie no 1 and 2 (labeled as **MTP1 and MTP2**) MTP1 for ED/Surg/OT and MTP2 for the HO/Runner. **MTP3** will be handled by the blood bank staff.
- Further communication with the blood bank staff is through a walkie-talkie until stand-down.
- The walkie-talkie **MTP1** will be handed over to the surgical coordinator in ETD and subsequently to Anaesthesiologist incharge in OT (if patient goes to OT).
- The walkie-talkie **MTP2** will be carried by the doctors who will be responsible to carry the MTP boxes till stand down.
- Upon stand down, all the walkie-talkies will be returned to the blood bank for safe keeping and charging.

**MTP Boxes:**

- The doctors "running" for first MTP box shall be the HO from ETD. Subsequent boxes will be the responsibility of the HO from the male surgical ward. They will carry with them the walkie-talkie (**MTP2**).
- MTP boxes are kept in Blood Bank. Skip the checking at the blood bank counter or OT airlock.

**Blood chart for blood labels, checklists and stickers.**

- All chart and checklists will be made available in ETD and OT.

**The sequence of blood and blood products transfusion**

- **Single intravenous access:** to transfuse platelet before other blood products such as PC and FFP.
- **Dual IV access :** *First IV access* - to transfuse PC. *Second IV access* : the sequence is as follows : Platelet - FFP - Cryoprecipitate.

**TYPE OF EQUIPMENT REQUIRED**

## 1. MTP Kit:

- a) Dedicated ETD and OT matron/sister to be in charge in preparation of MTP kit
- b) At least 5 MTP kit must be readily available at ETD and OT
- c) MTP Kit Box 1 is consists of 2 GXM forms (already stamped MTP) and 2 EDTA tubes with stickers
- d) MTP Kit Box 2 and subsequent boxes: 1 GXM form (already stamped MTP) and 1 EDTA tube with stickers

## 2. 'Level 1' fast flow fluid warmer with integrated air detector/clamp

3. Blood insulated box (*Appendix 4*)

- Size should be enough to fit in at least 12 - 16 blood and products
- Minimum of 3 insulated boxes (labelled as MTP Box) to be placed in Blood Bank.
- Platelet will be placed in sealed plastic bags and will be attached outside the MTP Box
- GXM form with MTP Box number and details of the blood and product will be attached outside the MTP Box

**DETERMINATION OF RATIOS**

- MTP Box 1:
  - 2 or 4 units urgent cross-matched PC, 4 units FFP, 4 units Platelet (depending on the previous Safe O supplied).
  - After receiving Box 2, the Blood Bank staff should be notified if MTP is to be continued.
- MTP Box 2:
  - 4 units full GXM PC, 4 units FFP, 6 units cryoprecipitate.
  - After MTP Box 2 has been supplied, and if MTP needs to be continued, then transfusions will be alternating between Box 1 and 2

- The parameters to be monitored every 30 minutes (ionised calcium, ABG) and FBC and Coagulation profile if available.
- All unused blood and products must be returned to blood bank immediately.

#### **PERFORMANCE INDICATOR**

- Return unused blood products are appropriately stored (number of units not properly stored)
- Number of unused blood returned/number of requests.
- Number of units not appropriately stored/ number of unused blood returned.
- 24 hours survival rate.

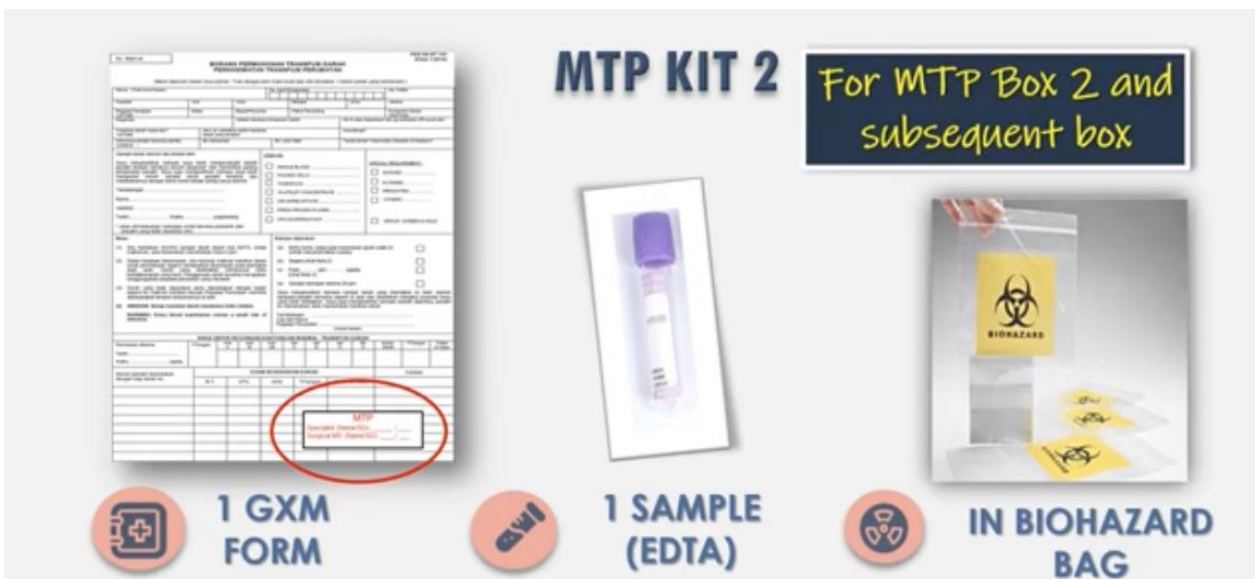
MTP Kit

Appendix 2



GXM forms with MTP stamp and name

Labelled with patient's details (must tally with the form)



GXM forms with MTP stamp and name

Labelled with patient's details (must tally with the form)

MTP blood form

PER-SS-BT 105  
 (Pind. 1/2016)

No. Makmal: BORANG PERMOHONAN TRANSFUSI DARAH  
PERKHIDMATAN TRANSFUSI PERUBATAN

(Mesti dipenuhi dalam dua salinan. Tulis dengan pen mata bulat dan sila tandakan ✓ dalam petak yang berkenaan.)

Nama (Tulis huruf besar)		No. Kad Pengenalan				No. Daftar	
Hospital	Unit	Wad	Bangsa	Umur	Jantina		
Pegawai Kerajaan Ya/Tidak	Kelas	Bayar/Percura	Pakar Perunding	Kumpulan Darah Ada/Tiada			
Diagnosa		Sebab transfusi komponen darah		Hb % atau keputusan lain yg berkaitan (Pit count etc)			
Transfusi darah masa lalu? Ya/Tidak		Jika 'ya' sebutkan tarikh transfusi darah yang terakhir		Komplikasi?			
Sekiranya pesakit seorang wanita, nyatakan ð		Bil. kehamilan	Bil. Lahir Mati	Tanda-tanda "Haemolytic Disease of Newborn"			

**Sampel darah diambil dan dilabel oleh:**

Saya mengesahkan bahawa saya telah mengenalpasti identiti pesakit dengan bertanya secara langsung\* dan memeriksa gelang pengenalan pesakit. Saya juga mengesahkan bahawa saya telah mengambil sendiri sampel darah pesakit tersebut dan melabelkannya dengan serta merta sebaik sahaja ianya diambil.

Tandatangan .....

Nama .....

Jawatan.....

Tarikh..... Waktu..... pagi/petang

\* (atau ahli keluarga / penjaga untuk kes-kes pediatrik dan pesakit yang tidak sedarkan diri)

**Units/ mls**

WHOLE BLOOD .....

PACKED CELLS .....

PAEDIPACK .....

PLATELET CONCENTRATE .....

CRYOPRECIPITATE .....

FRESH FROZEN PLASMA .....

CRYOSUPERNATANT .....

**SPECIAL REQUIREMENT :**

WASHED .....

FILTERED .....

IRRADIATED .....

OTHERS : .....

GROUP, SCREEN & HOLD

**Nota :-**

- Sila hantarkan 3ml-5ml sampel darah dalam tiub EDTA. Untuk makluman, ujian keserasian memerlukan masa 2 jam.
- Dalam keadaan kecemasan, sila hubungi makmal transfusi darah untuk pembekalan segera berdasarkan keserasian pada peringkat awal ujian. Darah yang dibekalkan mempunyai risiko ketidakserasian yang kecil. Penggunaan darah tersebut merupakan tanggungjawab pegawai perubatan yang merawat.
- Darah yang tidak digunakan perlu dipulangkan dengan kadar segera ke makmal transfusi kecuali Pegawai Perubatan meminta dipanjangkan tempoh simpanannya di wad.
- AMARAN: Setiap transfusi darah membawa risiko infeksi.

WARNING: Every blood transfusion carries a small risk of infection.

**Bekalan diperlukan**

(a) Serta merta, tanpa ujian keserasian darah (safe O)   
(untuk menyelamatkan nyawa)

(b) Segera (lihat Nota 2)

(c) Pada ..... jam.....pg/ptg   
(Lihat Nota 3)

(d) Sampel disimpan selama 24 jam.

Saya mengesahkan bahawa sampel darah yang disertakan ini telah diambil daripada pesakit bernama seperti di atas dan dilabelkan mengikut prosedur kerja yang telah ditetapkan. Saya juga mengesahkan bahawa setelah diperiksa, pesakit ini memerlukan/ akan memerlukan transfusi darah.

Tandatangan: .....

Cop dan Nama Pegawai Perubatan: .....

(Huruf besar)

**KHAS UNTUK KEGUNAAN KAKITANGAN MAKMAL TRANSFUSI DARAH**

Permintaan diterima	T/Tangan	Anti	Anti	Anti	Sel	Sel	Sel	Rh	Kump. Darah	T/Tangan	Tarikh & masa
		A	B	AB	A	B	O	D			
Tarikh.....											
Waktu .....pg/ptg											

Serum pesakit diserasikan dengan beg darah no.	UJIAN KESERASIAN DARAH					Catatan
	R.T.	37°C	AHG	T/Tangan.	Tarikh & masa	

**MTP BOX:**

**Activating Specialist (H/P No/Ext):**

1. ....

2. ....

**MTP Coordinator**  
ED MO/Surgical MO/Anaesthetist:

(H/P No/Ext):

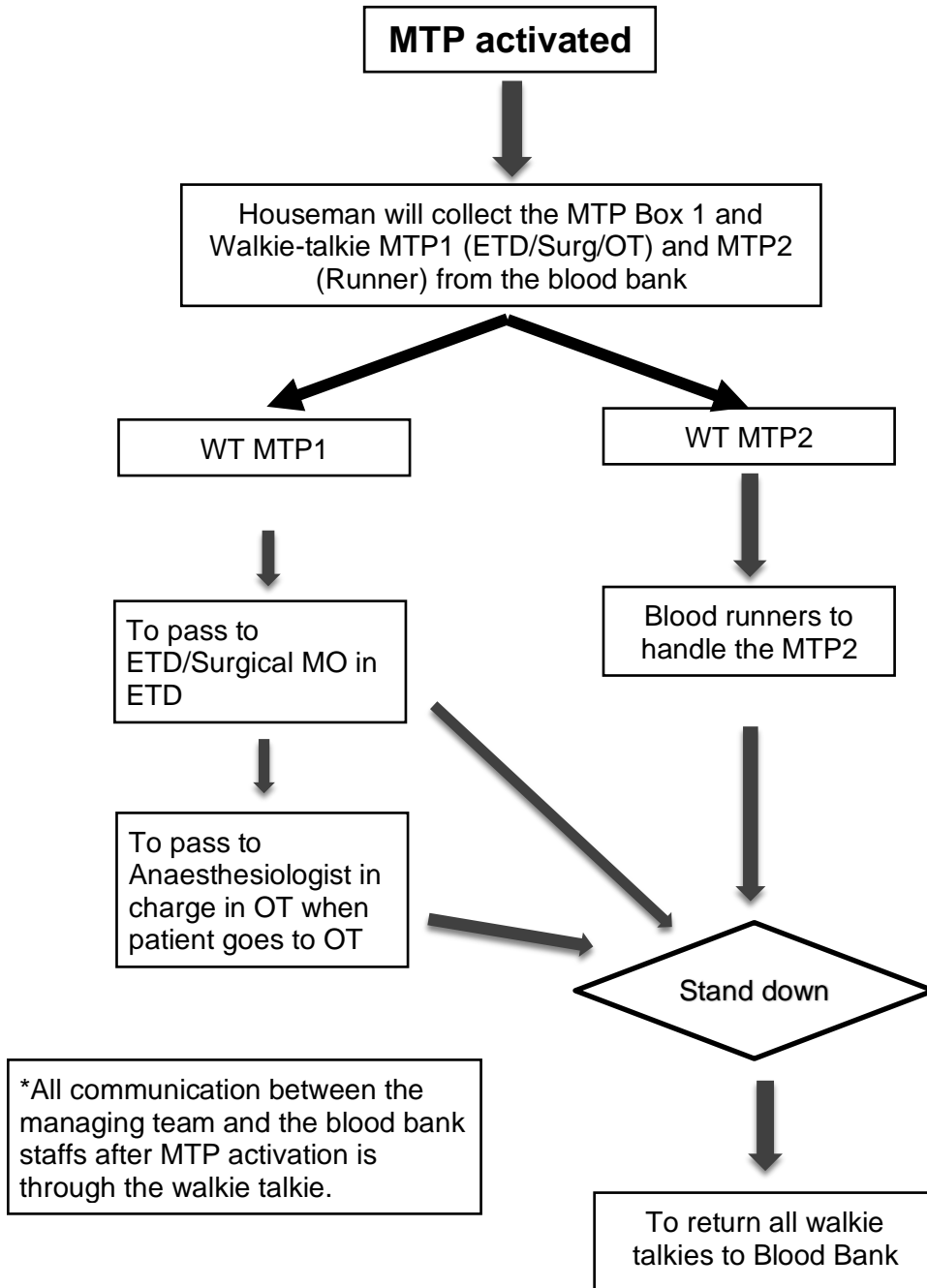
\*For unknown patient, his/her name will be identified as **UNKNOWN + ED RN + YEAR**  
Example: **UNKNOWN 1234523**.  
This UNKNOWN identification must be maintained until MTP termination.

MTP Boxes



Communications

WALKIE TALKIE

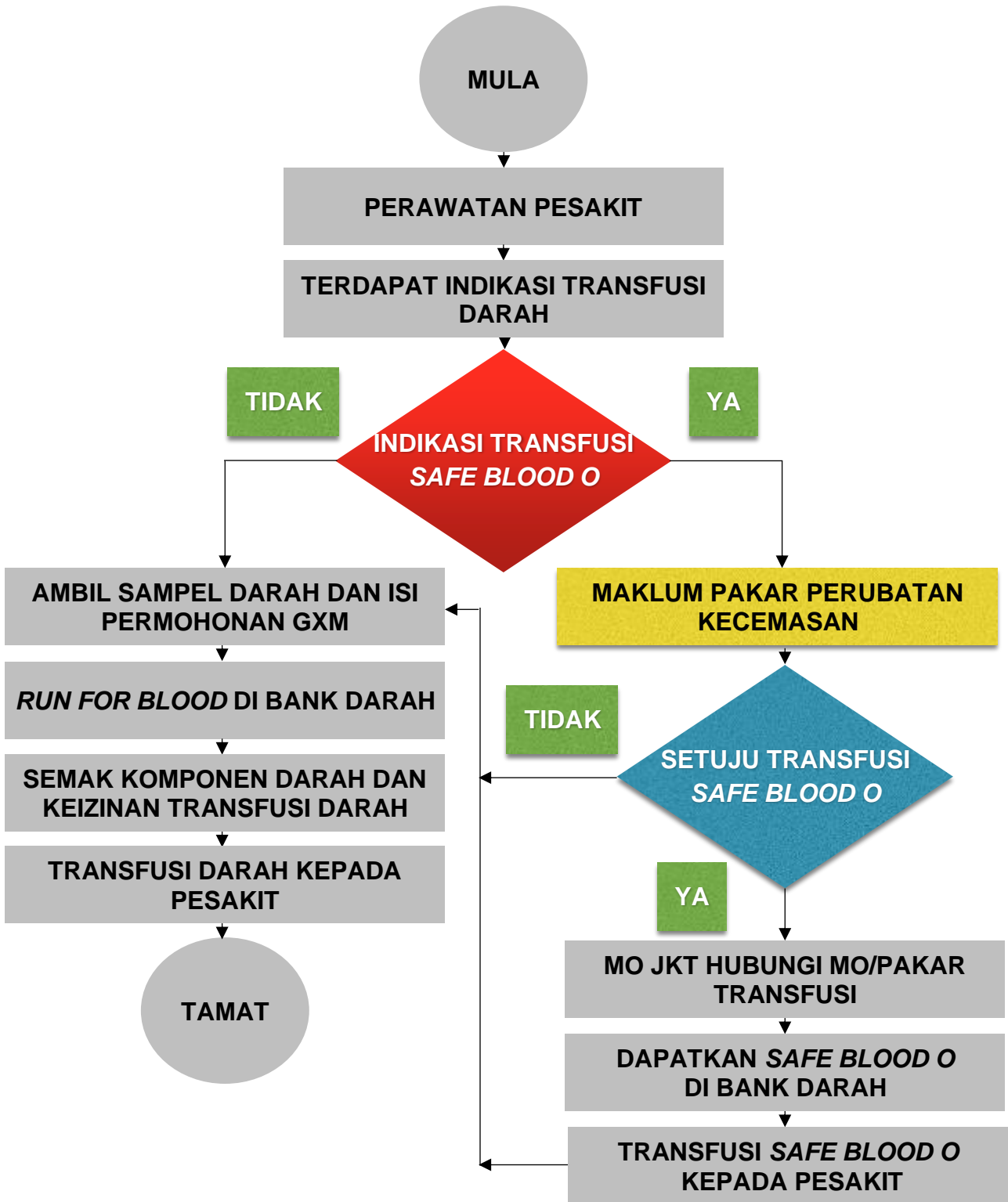


**MASSIVE TRANSFUSION PROTOCOL  
BLOOD AND BLOOD COMPONENT ADMINISTRATION CHART  
HOSPITAL SULTANAH AMINAH JOHOR BAHRU**

**NAME** : \_\_\_\_\_  
**HOSPITAL RN #** : \_\_\_\_\_ **ED RN #** : \_\_\_\_\_  
**COORDINATOR** : \_\_\_\_\_ **ctc #:** \_\_\_\_\_

<b>DATE &amp; TIME RECEIVED</b>	<b>BLOOD COMPATIBILITY STICKERS</b>	<b>VERIFIED BY</b>

**CARTA ALIR PERMOHONAN DARAH *SAFE BLOOD O* JABATAN  
KECEMASAN DAN TRAUMA HSAJB**



<b>QUALITY PROCEDURE</b>	<b>Document Number:</b>	<b>TM/HSA/CT/QP-004c</b>
<b>TITLE : MASSIVE TRANSFUSION PROTOCOL (MTP) BLOOD CHART</b>		
Department of Transfusion Medicine, Hospital Sultanah Aminah Johor Bahru	<b>Version number :</b>	<b>1.0</b>
	<b>Page number :</b>	<b>1 of 1</b>
	<b>Date issued :</b>	<b>13 JULY 2020</b>

**THIS FORM SHOULD BE FILLED UP BY MEDICAL LAB TECHNOLOGIST INCHARGE :** \_\_\_\_\_

Patient's details		MTP activation details	
Patient's Name : _____ _____		MTP Coordinator : _____ (MO Surgical)	
ID number : _____		Contact number : _____	
RN number : _____		MTP Activator : 1) _____ (Specialists)	
Location : _____		2) _____	
Diagnosis : _____		Call time and date : _____	
Blood group (if available) : _____		MO / Specialist Blood Bank: _____	
		MLT in charge : _____	
Blood and blood product issued			
Package No.	Sample received	Product issuing	Collection
<b>BOX 1</b> Tick : <input type="checkbox"/> 2 group specific (IS) <input type="checkbox"/> 4 group specific (IS) 4 FFP 4 PLT	No of sample : _____ Received by: _____ _____ Date: _____ Time: _____	Issued by : _____ _____ Date: _____ Time: _____	Collected by : _____ _____ Date : _____ Time: _____
<b>BOX 2</b> 4 group specific PC (IS) 4 FFP 6 CRYO	No of sample : _____ Received by: _____ _____ Date: _____ Time: _____	Issued by : _____ _____ Date: _____ Time: _____	Collected by : _____ _____ Date : _____ Time: _____
<b>BOX 3</b> 4 group specific PC (IS) 4 FFP 4 PLT	No of sample : _____ Received by: _____ _____ Date: _____ Time: _____	Issued by : _____ _____ Date: _____ Time: _____	Collected by : _____ _____ Date : _____ Time: _____
<b>BOX 4</b> 4 group specific PC (IS) 4 FFP 6 CRYO	No of sample : _____ Received by: _____ _____ Date: _____ Time: _____	Issued by : _____ _____ Date: _____ Time: _____	Collected by : _____ _____ Date : _____ Time: _____
Deactivation of MTP			
Deactivated by (Specialist) : _____ Deactivation time : _____ am/pm Date : _____			
Any blood product wastage : YES / NO If YES, please state : ____ PC ____ PLT ____ FFP ____ CRYOPRECIPITATE			

<b>QUALITY PROCEDURE</b>	<b>Document Number:</b>	<b>TM/HSA/CT/QP-004d</b>
<b>TITLE : MASSIVE TRANSFUSION PROTOCOL (MTP) RECORD</b>		
<b>Department of Transfusion Medicine, Hospital Sultanah Aminah Johor Bahru</b>	<b>Version number :</b>	<b>1.0</b>
	<b>Page number :</b>	<b>1 of 1</b>
	<b>Date issued :</b>	<b>13 JULY 2020</b>

**THIS FORM SHOULD BE FILLED UP BY BLOOD BANK MEDICAL OFFICER :** \_\_\_\_\_

Patient's details		MTP activation and deactivation details																																								
Patient's Name : _____		Date of MTP activation : _____																																								
ID number : _____		Time of MTP activation : _____ am/pm																																								
RN number : _____		MTP Coordinator : _____ (MO Surgical)																																								
Race : _____ Age : _____		Contact number : _____																																								
Blood Group : _____		Activated by : 1) _____ (Specialists)																																								
Date of admission : _____		2) _____																																								
GXM prior to MTP activation ? YES / NO. If yes : ___ units		MO / Specialist Blood Bank: _____																																								
Blood product ordered prior to MTP : _____ FFP _____ PLT _____ CRYO		Deactivated by (Specialist) : _____																																								
		Deactivation date & time : _____																																								
		Number of MTP cycles used: _____																																								
Clinical history		Adjuncts	Laboratory investigations results																																							
Diagnoses :		Crystalloid (ml) :	Pre MTP	Post MTP :																																						
1)			Date :	Date :																																						
2)		Time:	Time:																																							
Trauma Associated Severe Haemorrhage (TASH) Score:		Hb :	Hb :																																							
<table border="1"> <tr> <td>SBP</td> <td></td> </tr> <tr> <td>&lt; 100 mmHg (+4)</td> <td></td> </tr> <tr> <td>&lt; 120 mmHg (+1)</td> <td></td> </tr> <tr> <td>HR &gt; 120 beats/min (+2)</td> <td></td> </tr> <tr> <td>Unstable pelvic fracture (+6)</td> <td></td> </tr> <tr> <td>Open / dislocated femur fracture (+3)</td> <td></td> </tr> <tr> <td>FAST positive (+3)</td> <td></td> </tr> <tr> <td>Haemoglobin</td> <td></td> </tr> <tr> <td>&lt; 7 g/dL (+8)</td> <td></td> </tr> <tr> <td>&lt; 9 g/dL (+6)</td> <td></td> </tr> <tr> <td>&lt; 10 g/dL (+4)</td> <td></td> </tr> <tr> <td>&lt; 11 g/dL (+3)</td> <td></td> </tr> <tr> <td>&lt; 12 g/dL (+2)</td> <td></td> </tr> <tr> <td>Base excess</td> <td></td> </tr> <tr> <td>&lt; -10 (+4)</td> <td></td> </tr> <tr> <td>&lt; - 8 (+3)</td> <td></td> </tr> <tr> <td>&lt; - 2 (+1)</td> <td></td> </tr> <tr> <td>Male gender (+1)</td> <td></td> </tr> <tr> <td><b>TOTAL</b></td> <td></td> </tr> </table>		SBP		< 100 mmHg (+4)		< 120 mmHg (+1)		HR > 120 beats/min (+2)		Unstable pelvic fracture (+6)		Open / dislocated femur fracture (+3)		FAST positive (+3)		Haemoglobin		< 7 g/dL (+8)		< 9 g/dL (+6)		< 10 g/dL (+4)		< 11 g/dL (+3)		< 12 g/dL (+2)		Base excess		< -10 (+4)		< - 8 (+3)		< - 2 (+1)		Male gender (+1)		<b>TOTAL</b>		Colloid (ml) :	Plt :	Plt :
SBP																																										
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<b>TOTAL</b>																																										
		PT :	PT :																																							
		APTT :	APTT :																																							
		Tranexamic acid (dose) :	INR :	INR :																																						
		Fibrinogen :	Fibrinogen :																																							
		ABG :	ABG :																																							
		PCC / F VIIa (dose) :	pH :	pH :																																						
			Base excess:	Base excess:																																						
			Lactate :	Lactate :																																						
			Ca 2+ :	Ca 2+ :																																						
		No of blood products	Resuscitation time																																							
		Number of blood products transfused from MTP package :	Resuscitation time* : _____ hours																																							
		_____ PC (Safe O)	(*duration between <u>first</u> blood product transfused and <u>last</u> blood product transfused. First blood product transfused <u>includes</u> blood ordered before MTP activation.)																																							
		_____ PC (Specific Blood Group)																																								
		_____ PLT																																								
		_____ FFP																																								
		_____ CRYO																																								
		Time of first product transfused :																																								
		Time of last product transfused :																																								
Outcome																																										
Length of hospital stay (from MTP activation): _____ days		Mortality within 24 hours : YES / NO If YES , is it related to transfusion? YES/NO Cause of death : _____																																								



Walkie-talkie MTP 1 and MTP 2

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