

Massive Transfusion Protocol

Department of Transfusion Medicine,
Hospital Tuanku Ja'afar

Massive Transfusion Protocol (MTP): Critical Workflow

ACTIVATION & PHASE 1 RESPONSE

Activation Criteria:
ABC Score ≥ 2



For a start, this new MTP activation is only in ED.

MTP must be activated only by a Specialist.

MTP Coordinator to inform Blood Bank MO On-call.

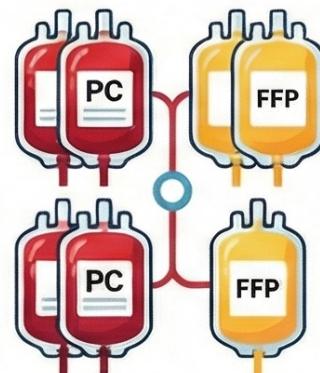


Safe 'O' Blood Availability

Safe 'O' stock remains available for emergency use prior to formal MTP activation.



1st Package: Under 30 Minutes



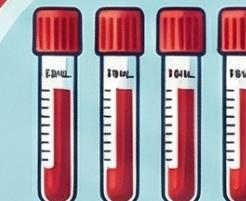
Initial supply includes 4 units of PC (emergency crossmatch) and 4 units of FFP.

≤ 30 Min

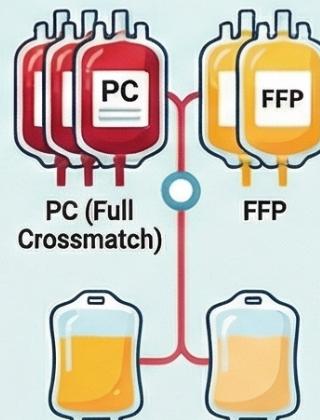
CONTINUATION & REQUIREMENTS

The MTP Kit Requirement

Requires 10mL blood in 4 EDTA tubes and 4 GXM forms every 2 cycles.



Package 2 & Subsequent Cycles



PC (Full Crossmatch)

FFP

Platelets

Cryoprecipitate
Based on availability

≤ 45 Min

Delivered within 45 minutes; includes 4 units PC (full crossmatch), 4 FFP, and potential platelets/ cryoprecipitate

MTP Coordinator Transition

The Anaesthesiology MO takes over as coordinator once the patient enters the Operating Theater.



45 Minutes within any package supply

MTP Coordinator must update Blood Bank MO On-call for MTP Continuation / Deactivation
or
Auto-termination

MTP - Content

- MTP Introduction
- Massive Haemorrhage and Massive Transfusion Definitions
- Options @ HTJS
- Criteria for activation
- Roles – BB Team & Clinician Team
- MTP Packages
- MTP Flow
- MTP Kit
- Challenges
- Gantt Chart
- Tabletop Exercise

Massive Transfusion Protocol – Introduction

- MTP : Process of blood transfusion management in the massive haemorrhage patient.
- Agreeable protocol between blood bank & stakeholder
- Based upon a **fixed ratio** of Packed Red Blood Cells (PRBCs), Fresh Frozen Plasma (FFP), Platelet and Cryoprecipitate in each pack / cycle (1:1:1:1 ratio).
- MTP allows ;
 - rapid volume restoration
 - maintenance of circulating volume
- improve organ perfusion and tissue oxygenation

OP17 OUTCOME EVALUATION OF MASSIVE TRANSFUSION PROTOCOL IN EMERGENCY DEPARTMENTS, HOSPITAL PUTRAJAYA AND HOSPITAL AMPANG: A 3-YEAR RETROSPECTIVE STUDY

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Introduction: Massive transfusion protocol (MTP) is defined as the delivery of ten or more units of packed red cell within 24 hours, replacement of 50% total blood volume within 3 hours or replacement of one entire blood volume within 24 hours. It facilitates close adherence to ideal haemostatic resuscitation - a transfusion ratio of 1:1:1 of fresh frozen plasma (FFP), platelets (PLT) and a packed red blood cell (PRBC), which interrupts the lethal triad of acidosis, hypothermia and coagulation, thus affecting the outcome of patients in terms of survival and mortality.

Data was obtained from patient's electronic medical record (EMR). They were divided into two groups, which are MTP activated and non MTP activated groups. The outcome was evaluated based on transfusion delivery time (time from MTP activation to time of blood transfusion), 24 hour and 30 days mortality, length of hospital stay (LOS) and presence of transfusion error.

Results: Out of 253 patients who received blood transfusion, MTP is only activated in 49 (20%) patients. The prevalence of MTP is higher in trauma patients compare to non trauma (35.1% vs 7%). The results showed that MTP resulted in shorter transfusion delivery time (median 35 min vs 55.5 min, $p<0.001$) in MTP group compare to the non MTP, and reduced 24 hour mortality (36.8% vs 63.8%) and 30 hour mortality (10.7% vs 89.3%,) ($p=0.016$). There were no significant association between MTP activation and length of hospital stay (LOS). Meanwhile, no data on transfusion error was obtained.

Conclusion: In conclusion, MTP results in shorter transfusion delivery time and reduced 24hours and 30 days mortality. There was no significant association between MTP and length of hospital stay (LOS), and data was not obtained for transfusion error.

STUDY ON PRACTICE OF MASSIVE TRANSFUSION PROTOCOL ACTIVATION IN HOSPITAL UNIVERSITI SAINS MALAYSIA

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Abstract

Massive transfusion protocol (MTP) was designed to improve the outcome of patients at risk of massive haemorrhage. This study focused on the prevalence, indications, factors associated with indication of MTP activation cases and twenty-four-hour mortality among those who received MTP in Hospital Universiti Sains Malaysia (USM). A retrospective cross-sectional study was performed on 110 patients for whom MTP was activated in Hospital USM. Data were extracted from the medical records and blood bank system (MyTransfusi). Descriptive statistics and logistic regression were used for statistical analysis. A total of 273,087 patients were admitted to Hospital USM and 193 patients required MTP activation during the study period. The prevalence of MTP activation was only 0.07%. This study included 110 MTP activation cases which consisted of 62 (56.3%) trauma and 48 (43.7%) non-trauma patients. The overall mean age of patients was 40.0 years old, and majority were male (66.4%). The two most common MTP activation indications were motor vehicle accidents (93.5%) and gastrointestinal bleeding (50%). Female and presence of comorbidity significantly associated with MTP activation indication. Meanwhile, no emergency procedure and non-compliance to activated MTP were significantly associated with high mortality within twenty-four-hour post MTP activation. The prevalence of MTP was low. Our result suggested that early emergency procedures and compliance towards MTP improved patient outcomes.

Keywords: Compliance, Indications, Massive Transfusion Protocol (MTP), Mortality.

Massive Haemorrhage

- Active ongoing haemorrhage at the rate of 150ml/min with hemodynamic instability (systolic blood pressure < 90mmHg and/or heart rate > 110 per minute).
- Loss of 50% of blood volume** within 3 hours.
- Loss of total body blood volume** in 24 hours.

*** Adult blood volume is approximately 70ml/kg*

Massive Transfusion

- Transfusion of > 50% total body blood volume in 3 hours
- Transfusion of > total body blood volume in 24 hours.

Options @ HTJS available now...

Product	Emergency TAT	Routine TAT
Safe 'O'	Immediately	NA
Emergency GXM	30 minutes	NA
Full GXM	NA	2 hours
GSH - GXM	30 minutes	2 hours
Blood Component (FFP, Plt, Cryo)	30 minutes	2 hours

Criteria for MTP Activation

ABC

PWH

TASH

Meeting on 20/11/2024 ; decided for ABC

Criteria for MTP Activation

ASSUMPTION OF BLOOD CONSUMPTION (ABC)

Score Items	Points	Points
Positive Focused Assessment with Sonography for Trauma (FAST)	Yes = 1	No = 0
Systolic BP \leq 90 mmHg in the Emergency Department	Yes = 1	No = 0
HR \geq 120 in the Emergency Department	Yes = 1	No = 0
Penetrating mechanism	Yes = 1	No = 0
Score 0 or 1 : Patient is less likely to require massive transfusion		
Score 2, 3 or 4 : Patient is likely to require massive transfusion		

score of ≥ 2 was found to predict the need for massive transfusion with a sensitivity of 75% and specificity of 86%

Criteria for MTP Activation

PRINCE OF WALES HOSPITAL / RAINER (PWH)

Score items	Points
SBP < 90 mmHg	3
GCS ≤ 8	1
HR > 120 bpm	1
Displaced Pelvic Fracture	1
CT scan or FAST positive	2
Base deficit > 5 mmol/L	1
Haemoglobin (Hb) ≤ 7g/dL	10
Haemoglobin (Hb) 7.1 - 10 g/dL	1
Total score > 6 indicated the need for MTP	

Criteria for MTP Activation

Trauma Associated Severe Haemorrhage (TASH) Score

Score items	Description	Points
Gender	Male	1
	Female	0
Systolic Blood Pressure	<100mmHg	4
	<120mmHg	1
	≥120mmHg	0
Heart Rate	<120 bpm	2
	≥120 bpm	0
Clinically unstable pelvic fracture		6
Open or dislocated femur fracture		3
Positive Focused Assessment with Sonography for Trauma (FAST) for intra-abdominal fluid		3
Haemoglobin	< 7 g/dL	8
	< 9 g/dL	6
	< 10 g/dL	4
	< 11 g/dL	3
	< 12 g/dL	2
	≥ 12 g/dL	0
Base Excess	< -10mmol/L	4
	< -6mmol/L	3
	< -2mmol/L	1
	≥ -2mmol/L	0

Trauma associated severe haemorrhage score of 18 corresponds well to a massive transfusion probability of almost 50% of the time

MTP HTJS - Roles

Trauma Team



Blood Bank

<ul style="list-style-type: none">• Decision for MTP activation/deactivation only by Specialist -EP / Surgeon• MTP coordinator (MO-appointed by Specialist) to contact MO Blood Bank on call for MTP activation• MTP runners (HO-appointed by MTP coordinator) to take blood sample, fill & bring up MTP kit to blood bank and to collect MTP packages• MTP runners must have good communication with -MTP coordinator -Blood Bank staff (MLT)• MTP coordinator to update MO Blood Bank on call for MTP continuation / deactivation• To take baseline blood investigation : FBC, ABG, PT/APTT/INR, fibrinogen	<ul style="list-style-type: none">• MO BB on call will inform blood bank staff (MLT) & Specialist BB on call• MO BB on call coordinates with blood bank staff (MLT) & MTP coordinator<ul style="list-style-type: none">• To prepare blood components according to packages in time• Proceed MTP upon continuation• Stop MTP upon deactivation / auto termination
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MTP Packages

1st
package
4 : 4

- 4 PC emergency cross match
- 4 FFP

≤ 30
minutes



Subsequent
packages
4 : 4 ± PLT*, CRYO

- 4 PC full cross match
- 4 FFP
- ± 4 PLT* and/or 6 CRYO

≤ 45
minutes

*based on availability

Massive Transfusion Protocol

Department of Transfusion Medicine & Trauma Team, Hospital Tuanku Ja'afar

Criteria to activate MTP ;

Assumption of Blood Consumption(ABC) ≥ 2

Information required by Blood Bank

- Name of Specialist who activates MTP
- Patient's details
- MTP Coordinator's name & contact number

Sample and form (MTP Kit) required*

- 10 mL of blood sample in 4 EDTA tubes
- 4 GXM forms

*Each complete MTP Kit is used for **2 cycles** of MTP package. **Every time after 2 cycles**, new complete MTP Kit is required (if planned to continue MTP)

If antibody detected ;

- Blood components (FFP, platelet, cryoprecipitate will be supplied as planned)
- For PC, full cross match compatible will be supplied

To activate MTP

- Only by Specialist

- **MTP coordinator to inform Blood Bank MO on call**

1st package (≤ 30 minutes)

- 4 units PC emergency crossmatch
 - 4 units FFP

45 minutes within previous package supply →

MTP coordinator must update Blood Bank MO on call →
MTP Continuation / Deactivation OR Auto-termination

2nd package and subsequent MTP packages (≤ 45 minutes)

- 4 units PC full cross match
 - 4 units FFP
- Consider 4 units platelet* and/or 6 units cryoprecipitate
*based on availability

To deactivate MTP

MTP coordinator to notify Blood Bank MO on call

Information

Safe 'O'

- Safe 'O' blood stock is available for emergency cases in the ED
- Safe 'O' blood should be transfused prior to MTP activation

MTP Coordinator

- Must be available to discuss cases with Blood Bank MO on call
- Once the patient is in the OT, **anaesthesiology MO** will be the **MTP coordinator**.
- To fill up MTP feedback form

MTP Runners

- To take blood sample, fill & bring up MTP kit to blood bank

Baseline Blood Investigation

- FBC, ABG, PT/APTT/INR, fibrinogen

List of Items for MTP Kit

Item	Quantity	Remark
1) EDTA tube	4	2-3 mL blood sample per tube
2) GXM forms	4	4 GXM forms <div style="border: 1px solid red; padding: 2px; display: inline-block;">MTP : 1</div> 4 units PC (1 st package) <div style="border: 1px solid red; padding: 2px; display: inline-block;">MTP : 1</div> 4 units FFP (1 st package) <div style="border: 1px solid red; padding: 2px; display: inline-block;">MTP : 2</div> 4 units PC (2 nd package) <div style="border: 1px solid red; padding: 2px; display: inline-block;">MTP : 2</div> 4 units FFP (2 nd package)
3) MTP Stamp	1	<div style="border: 1px solid red; padding: 2px; display: inline-block;">MTP :</div> For GXM forms & Slip Permintaan Darah for MTP
4) Tube labels (blank sticker)	4	
5) Slip permintaan darah	4	
6) Biohazard plastic	1	
7) Despatch book	1	

Each complete **MTP Kit** is used for 2 cycles of MTP package. Every time after 2 cycles, new complete **MTP Kit** is required.

MTP Kit :

- 10 ml of blood sample in 4 EDTA tubes
- 4 GXM forms

MTP Package	MTP Kit needed?*
1 st package	YES
2 nd package	NO
3 rd package	YES
4 th package	NO
5 th package	YES

*Each complete **MTP Kit** is used for 2 cycles of MTP package. Every time after 2 cycles, new complete **MTP Kit** is required.

Form I - PC

MTP Kit

Form II - FFP

No. Makmal:	MTP : 1						
BORANG PERMOHONAN TRANSFUSI DARAH PERKHIDMATAN TRANSFUSI PERUBATAN							
(Mesti diperlukan 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/Percuma		Pakar Penundung		Kumpulan Darah Adu/Tida	
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 →		Bil. kehamilan		Bil. Lahir Mati		Tanda-tanda 'Haemolytic Disease of Newborn'	
Sampel darah diambil dan dilabel oleh:			Unit/s			D	
Saya mengesahkan bahawa saya telah mengenalpasti identiti pesakit dengan bertanya secara langsung dan memerlukan gelang pengenal pesakit. Saya juga mengesahkan bahawa saya telah mengambil sendiri sampel darah pesakit tersebut dan melabalkannya dengan serta merta sebaik sahaja ia diambil.			<input type="checkbox"/> WHOLE BLOOD <input type="checkbox"/> PACKED CELLS <input type="checkbox"/> PAEDIPACK <input type="checkbox"/> PLATELET CONCENTRATE <input type="checkbox"/> CRYOPRECIPITATE <input type="checkbox"/> FRESH FROZEN PLASMA <input type="checkbox"/> CRYOSUPERNATANT				SPECIAL REQUIREMENT :
Tandatangan _____			<input type="checkbox"/> WASHED <input type="checkbox"/> FILTERED <input type="checkbox"/> IRRADIATED <input type="checkbox"/> OTHERS :				
Nama _____			<input type="checkbox"/> GROUP, SCREEN & HOLD				
Jawatan _____							
Tarikh Waktu pagi/petang							
*(atau ahli keluarga/ penjaga untuk kes-kes pediatrik dan pesakit yang tidak sedarkan diri)							
Nota:-							
<p>(1) Sila hantarkan 3ml-5ml sampel darah dalam tiub EDTA. Untuk makluman, ujian keserasian memerlukan masa 2 jam.</p> <p>(2) Dalam keadaan kecemasan, sila hubungi makmal transfusi darah untuk pembekalan segera berdasarkan keserasian pada peringkat awal ujian. Darah yang dibekalkan mempunyai risiko ketidakeserasian yang kecil. Penggunaan darah tersebut merupakan tanggungjawab pegawai perubatan yang merawat.</p> <p>(3) Darah yang tidak digunakan perlu dipulangkan dengan kadar segera ke makmal transfusi kecuali Pegawai Perubatan meminta dipanjangkan tempoh simpanannya di wad.</p> <p>(4) AMARAN: Setiap transfusi darah membawa risiko infeksi.</p>						Bekalan diperlukan	
						<p>(a) Serta merta, tanpa ujian keserasian darah (safe O) (untuk menyelamatkan nyawa)</p> <p>(b) Segera (lihat Nota 2)</p> <p>(c) Pada jam pg/ptg (Lihat Nota 3)</p> <p>(d) Sampel disimpan selama 24 jam.</p>	
						Saya mengesahkan bahawa sampel darah yang disertakan ini telah diambil daripada pesakit bermula 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)	

No. Makmal:	MTP : 1				
BORANG PERMOHONAN TRANSFUSI DARAH PERKHIDMATAN TRANSFUSI PERUBATAN					
(Mesti dinonohi dalam dua salinan. Tulis dengan pena mata bulat dan tinta tandakan. / dalam notak yang berkenaan.)					
Nama (Tulis Huruf Besar)			No. Kad Pengenalan		No. Daftar
Hospital	Unit	Wad	Bangsa	Umur	Jantina
Pegawai Kerajaan Ya/Tidak	Kelas	Bayar/Percuma		Pakar Perunding	Kumpulan Darah Ada/Tida
Diagnosa	Sebab transfusi komponen darah			Hb % atau keputusan lain yg berkaitan (Pit count etc)	
Transfusi darah masa lalu? Ya/Tidak	Jika ya sebukti tarikh transfusi darah yang terakhir			Komplikasi?	
Sekiranya pesakit seorang wanita, nyatakan →	Bil. kehamilan		Bil. Lahir Mati	Tanda-tanda 'Haemolytic Disease of Newborn'	
Sampl darah diambil dan dilabel oleh:			Units/mls		
Saya mengesahkan bahawa saya telah mengenalpasti identiti pesakit dengan bertanya secara langsung* dan memeriksa gelang pengenal pesakit. Saya juga mengesahkan bahawa saya telah mengambil sendiri sampel darah pesakit tersebut dan melabalkannya dengan serta merta sebaik sahaja ianya diambil.			<input type="checkbox"/> WHOLE BLOOD <input type="checkbox"/> PACKED CELLS <input type="checkbox"/> PAEDIPACK <input type="checkbox"/> PLATELET CONCENTRATE <input type="checkbox"/> CRYOPRECIPITATE <input type="checkbox"/> FRESH FROZEN PLASMA <input type="checkbox"/> CRYOSUPERNATANT		<u>SPECIAL REQUIREMENT</u> <input type="checkbox"/> WASHED <input type="checkbox"/> FILTERED <input type="checkbox"/> IRRADIATED <input type="checkbox"/> OTHERS : <input type="checkbox"/> GROUP, SCREEN & HOLD
Tandatangan					
Nama					
Jawatan					
Tarikh Waktu pagi/pelang					
Silakan hubungi/penjaga untuk kes-kes pediatrik dan pesakit yang tidak sedarkan diri)					
Nota:-					
(1) Sila hantarkan 3ml-5ml sampel darah dalam tiub EDTA. Untuk makluman, ujian keserasian memerlukan masa 2 jam. (2) Dalam keadaan kecemasan, sila hubungi makmal transfusi darah untuk pembekalan segera berdasarkan keserasian pada peringkat awal ujian. Darah yang dibekalkan mempunyai risiko ketidakeserasian yang kecil. Penggunaan darah tersebut merupakan tanggungjawab pegawai perubatan yang merawat. (3) Darah yang tidak digunakan perlu dipulangkan dengan kadar segera ke makmal transfusi kecuali Pegawai Perubatan meminta dipanjangkan tempoh simpanannya di wad. (4) 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) <input type="checkbox"/> (b) Segera (lihat Nota 2) <input type="checkbox"/> (c) Pada jam pg/ptg (Lihat Nota 3) <input type="checkbox"/> (d) Sampel disimpan selama 24 jam. <input type="checkbox"/>					
Saya mengesahkan bahawa sampel darah yang disertakan ini telah diambil daripada pesakit bernama seperti di atas dan dilabelkan mengikut presedur kerja yang telah ditetapkan. Saya juga mengesahkan bahawa setelah diperiksa, pesakit ini memerlukan/atau memerlukan transfusi darah.					
Tandatangan: Cop dan Nama Pegawai Perubatan (Huruf besar)					

Please fill up
completely
(For 1st
package)

Form III - PC

MTP Kit

Form IV – FFP/PLT/CRYO

No. Makmal:	MTP : 2				
BORANG PERMOHONAN TRANSFUSI DARAH PERKHIDMATAN TRANSFUSI PERUBATAN					
(Mesti dinetral dalam dua bahasa. Tulis dengan pena mata halus dan cira tandakan. /dalam netral yang berkenaan)					
Nama (Tulis Huruf Besar)			No. Kad Pengenalan		No. Daftar
Hospital	Unit	Wad	Bangsa	Umur	Jantina
Pegawai Kerajaan Ya/Tidak	Kelas	Bayar/Percuma		Pakar Perunding	
Diagnosa			Sebab transfusi komponen darah		Hb % atau keputusan lain yg berkaitan (Pit count etc)
Transfusi darah masa lalu? Ya/Tidak		Jika ya' sebutan tarikh transfusi darah yang terakhir			Komplikasi?
Sekiranya pesakit seorang wanita, nyatakan ->		Bil. kehamilan		Bil. Lahir Mas	
Sampel darah diambil dan dilabah oleh:		Unit/sus		SPECIAL REQUIREMENT:	
Saya mengesahkan bahawa saya telah mengenalpasti identiti pesakit dengan bertanya secara langsung* dan memerlukan gelang pengenal pasti. Saya juga mengesahkan bahawa saya telah mengambil sendiri sampel darah pesakit tersebut dan melabakkannya dengan serta merta sebaik sahaja lama diambil.		<input type="checkbox"/> WHOLE BLOOD <input type="checkbox"/> PACKED CELLS <input type="checkbox"/> PAEDIPACK <input type="checkbox"/> PLATELET CONCENTRATE <input type="checkbox"/> CRYOPRECIPITATE <input type="checkbox"/> FRESH FROZEN PLASMA <input type="checkbox"/> CRYOSUPERNATANT		<input type="checkbox"/> WASHED <input type="checkbox"/> FILTERED <input type="checkbox"/> IRRADIATED <input type="checkbox"/> OTHERS : <input type="checkbox"/> GROUP, SCREEN & HOLD	
Tandatangan _____					
Nama _____					
Jawatan _____					
Tarikh _____ Waktu _____ pagi/petang					
* (atau ahli keluarga/ penjaga untuk kes-kes pediatrik dan pesakit yang tidak sedarkan diri)					
Nota:-		Bekalan diperlukan			
(1) Sila hantarkan 3ml-5ml sampel darah dalam tiub EDTA. Untuk makluman, ujian keserasian memerlukan masa 2 jam. (2) Dalam keadaan kecemasan, sila hubungi makmal transfusi darah untuk pembekalan segera berdasarkan keserasian pada peringkat awal ujian. Darah yang dibekalkan mempunyai risiko ketidakserasan yang kecil. Penggunaan darah tersebut merupakan tanggungjawab pegawai perubatan yang merawat. (3) Darah yang tidak digunakan perlu dipulangkan dengan kadar segera ke makmal transfusi kecuali Pegawai Perubatan meminta dipanjangkan tempoh simpanannya di wad. (4) AMARAN: Setiap transfusi darah membawa risiko infeksi.		(a) Serta merta, tanpa ujian keserasian darah (safe O) <input type="checkbox"/> (b) Segera (Lihat Nota 2) <input type="checkbox"/> (c) Pada jam pg/pltg (Lihat Nota 3) <input type="checkbox"/> (d) Sampel disimpan selama 24 jam. <input type="checkbox"/>			
		Saya mengesahkan bahawa sampel darah yang disertakan ini telah diambil daripada pesakit bermula seperti di atas dan dilabekan 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)			

Please fill up
completely
(For 2nd
package)

No. Makmal:	BORANG PERMOHONAN TRANSFUSI DARAH PERKHIDMATAN TRANSFUSI PERUBATAN					PER-SS-BT 105 (Pind. 1/2016)
MTP : 2						
(Mesti dipenuhi dalam dua salinan. Tulis dengan pen mata bulat dan sila tandakan ✓ dalam petak yang berkacaan.)						
Nama (Huruf Besar)			No. Kad Pengenalan		No. Daftar	
Hospital	Unit	Wad	Bangsa	Umur	Jantina	
Pegawai Kerajaan Ya/Tidak	Kelas	Bayari/Percuma		Pakar Perunding	Kumpulan Darah Ada/Tidak	
Diagnosa	Sebab transfusi komponen darah			Hb % atau kepususan iain 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 →	Bil. kehamilan		Bil. Lahir Mati	Tanda-tanda 'Haemolytic Disease of Newborn'		
Sampel darah diambil dan dilabah oleh:			Units/mls	SPECIAL REQUIREMENT:		
Saya mengesahkan bahawa saya telah mengenalpasti identiti pesakit dengan bertanya secara langsung* dan memerlukan gelang pengenal pesakit. Saya juga mengesahkan bahawa saya telah mengambil sendiri sampel darah pesakit tersebut dan melabahkannya dengan serta merta sebaik sahaja ianya diambil.			<input type="checkbox"/> WHOLE BLOOD <input type="checkbox"/> PACKED CELLS <input type="checkbox"/> PAEDIPACK <input type="checkbox"/> PLATELET CONCENTRATE <input type="checkbox"/> CRYOPRECIPITATE <input type="checkbox"/> FRESH FROZEN PLASMA <input type="checkbox"/> CRYOSUPERNATANT	<input type="checkbox"/> WASHED <input type="checkbox"/> FILTERED <input type="checkbox"/> IRRADIATED <input type="checkbox"/> OTHERS : <input type="checkbox"/> GROUP. SCREEN & HOLD		
Tandatangan _____						
Nama _____						
Jawatan _____						
Tarikh _____ Waktu _____ pagi/petang						
*(atau ahli keluarga/ penjaga untuk kes-kes pediatrik dan pesakit yang tidak sedarkan diri)						
Nota:-			Bekalan diperlukan			
(1) Sila hantarkan 3ml-5ml sampel darah dalam tub EDTA. Untuk makluman, ujian keserasian memerlukan masa 2 jam. (2) Dalam keadaan kecemasan, sila hubungi makmal transfusi darah untuk pembekalan segera berdasarkan keserasian pada peringkat awal ujian. Darah yang dibekalkan mempunyai risiko ketidakserasan yang kecil. Penggunaan darah tersebut merupakan tanggungjawab pegawai perubatan yang merawat. (3) Darah yang tidak digunakan perlu dipungkangan dengan kadar segera ke makmal transfusi kecuali Pegawai Perubatan meminta dipanjangkan tempoh simpanannya di wad. (4) AMARAN: Setiap transfusi darah membawa risiko infeksi.			(a) Serta merta, tanpa ujian keserasian darah (safe 0) (untuk menyelamatkan nyawa) <input type="checkbox"/> (b) Segera (Lihat Nota 2) <input type="checkbox"/> (c) Pada jam pg/ptg (Lihat Nota 3) <input type="checkbox"/> (d) Sampel disimpan selama 24 jam. <input type="checkbox"/>			
			Saya mengesahkan bahawa sampel darah yang disertakan ini telah diambil daripada pesakit bernama seperti di atas dan dilabah mengikut presedur 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)			
WARNING: Every blood transfusion carries a small risk of infection.						

Example of complete Blood Request Form

Suggestion : MTP Corner @ ED



Massive Transfusion Protocol

Department of Transfusion Medicine & Trauma Team, Hospital Tuanku Ja'afar

Criteria to activate MTP ;
Assumption of Blood Consumption(ABC) ≥2

Information required by Blood Bank

- Name of Specialist who activates MTP
- Patient's details
- MTP Coordinator's name & contact number

Sample and form (MTP Kit) required*

- 10 mls of blood sample in 4 EDTA tubes
- 4 GXM forms

*Each Safe O request for all trauma cases must be accompanied by MTP Kit (1 + 4 GXM forms-KIV for MTP activation)

*Each complete MTP Kit is used for 2 cycles of MTP package. Every time after 2 cycles, new complete MTP Kit is required (if plan to continue MTP)

If antibody detected ;

- Blood components (FFP, platelet, cryoprecipitate will be supplied as planned)
- For PC, full cross match compatible will be supplied

- To activate MTP
- Only by Specialist

MTP coordinator to inform Blood Bank MO on call

1st package (≤ 30 minutes)

- 4 units PC emergency crossmatch
- 4 units FFP

45 minutes within previous package supply →
MTP coordinator must update Blood Bank MO on call →
MTP Continuation / Deactivation OR Auto-termination

2nd package and subsequent MTP packages (≤ 45 minutes)

- 4 units PC full cross match
- 4 units FFP
- Consider 4 units platelet* and/or 6 units cryoprecipitate
*based on availability

To deactivate MTP

MTP coordinator to notify Blood Bank MO on call

Information

MTP coordinator

- Must be available to discuss cases with Blood Bank MO on call
- Once the patient is in the OT, **anaesthesiology MO** will be the **MTP coordinator**.
- To fill up MTP feedback form

MTP runners

- To take blood sample, fill & bring up MTP kit to blood bank

Baseline Blood Investigation

- FBC, ABG, PT/APTT/INR, fibrinogen

HOSPITAL TUANKU JA'AFAR SEREMBAN
PUSAT PERKHIDMATAN DARAH

BORANG PERMOHONAN TRANSFUSI DARAH

(Mesti dipenuhi dalam dua salinan oleh Pegawai Penulisan. Tulis dengan pen mata bulat dan sila yang disediakan.)

No Telefon:	No Kad Pengenalan	No Daftar			
Hospital	Unit	Wad	Bangsa	Umur	Jantina
Pegawai Karangan	Kelass		Bayar/Percuma	Pekerja Perunding	Kumpulan Darah (atau/dua)
Diagnosa			Sebab transfusi darah	%	
Transfusi darah masa lalu?	Jika ya, sebanyak tukar transfusi	Kompikasi?			
Sejurus sejak seorang wanita, bil. Kehamilan	Bil. Lahir Mati	Tanda-tanda "Haemolytic Disease Of Newborn"			
Nyatakan =					

Contoh darah diambil oleh _____
Contoh darah diambil oleh _____
Pada _____ jam _____/____/____

Ummum PLATELET CONCENTRATE
 FROZEN PLASMA CRYOPRECIPITATE
 WASHED RED CELLS FRESH FROZEN PLASMA CRYOPRECIPITATE
 LEUCOCYTES POOR BLOOD CRYOPRECIPITATE
 GROUP SCREEN & HOLD AUTOTRANSFUSION BLOOD

Bukalah dipertukarkan _____ GSH
(a) Sarita merta, tarja, ujian keserasian darah (untuk menyelamatkan nyawa)
(b) Segas (ihat nota 2)
(c) Pada _____ jam _____/____/____
(d) Disimpan selama 24 jam

Tandatangan: _____
Cip dan Nama _____
Pegawai Penulisan: _____

KHAS UNTUK KEGUNAAN KANTINJANGAN MAMPUAL PUSAT PERKHIDMATAN DARAH

Permisikan diberikan	Ant. A	Ant. B	Ant. AB	Set. A	Set. B	Set. O	Rh. D	KUMP. DARAH	T.T.	Tarikh	Masa
pada _____ jam _____/____/____											

Sejurus sejak seorang wanita, bil. Kehamilan _____
Cip dan Nama _____
Catatan

Persegi pasuk dilengkapi dengan beg darah No. _____ R.T. 37°C AHG T.T. Tarikh dan Masa

UJIAN KESERASIAN DARAH

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Persegi pasuk dilengkapi dengan beg darah No. _____ R.T. 37°C AHG T.T. Tarikh dan Masa

HTJS/PATH/PPD/GXM-01

SLIP PERMINTAAN UJIAN BEKALAN DARAH / KOMPONEN
Pusat Perkhidmatan Darah
Hospital Tuanku Ja'afar, Seremban.

NAMA PESAKIT :

NO KP :

RN :

WAD :

TARIKH PERMINTAAN GSH DIHANTAR :

BEKALKAN : PC WB

: FFP CRYO

: PLATELET

: LAIN-LAIN :

Tandatangan / cop Doktor :

TARIKH :



Deactivation of MTP

- MTP Coordinator to update Blood Bank MO on call
- Blood bank will stop to preparing MTP packages
- ED to return all used blood bags and unused blood products
- MTP Coordinator to fill up feedback form (for audit purposes) within 24 hours



Draft for MTP Feedback Form

(to be filled by MTP Coordinator)



Name	
Department	
Position	
Role during MTP	
Date of MTP	
Who activate the MTP	
Patient's name	
Diagnosis	
Location of patient/ward	
If pregnant, specify gestation, parity and gestational age	
Criteria for activation	
How many MTP package	
Time activate	
Time received blood product	
Patient outcome	
Any suggestion to improve	

Challenges

- BB and ED distance (decanting)
- No safe O stock @ ED
- Inadequate blood sample, incomplete form
- Limited MLT to handle MTP case especially after office hour
- Limited blood product (platelet)
- Blood bank not updated for MTP continuation / deactivation



GANTT CHART

Task	October 2024	November 2024	December 2024	January 2025	February 2025
MTP Discussion – Blood Bank	/				
MTP Discussion – Trauma Team		/			
Training – (Blood Bank & ED)			/		
Drill & Review				/	
Implementation					/

MTP TABLETOP EXERCISE

- Total participants : 25 (15 ED, 5 Surg, 5 Anes)
- 4 teams ---(5-6 participants/team)
- 2 case scenarios

Blood Bank Counter
@ STAGE

Team 1 @ ED

Team 2 @ OT

Team 3 & Team 4 waiting

Thank you

