<table>
<thead>
<tr>
<th>PUSAT PERUBATAN UNIVERSITI MALAYA</th>
</tr>
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<tbody>
<tr>
<td><strong>UNIVERSITI MALAYA</strong></td>
</tr>
<tr>
<td><strong>NAMA DOKUMEN:</strong></td>
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<tr>
<td><strong>NOMBOR DOKUMEN:</strong></td>
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<tr>
<td><strong>TARIKH KELULUSAN:</strong></td>
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<td><strong>TARIKH BERKUATKUASA:</strong></td>
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<td><strong>TARIKH KAJISEMULA:</strong></td>
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<tr>
<td><strong>PENULIS DOKUMEN:</strong></td>
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<td><strong>DISEMAK OLEH:</strong></td>
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<tr>
<td><strong>DILULUSKAN OLEH:</strong></td>
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<td><strong>DISAHKAN OLEH WAKIL PENGURUSAN:</strong></td>
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</table>

DOKUMEN INI ADALAH HAK MILIK SEPENUHNYA PUSAT PERUBATAN UNIVERSITI MALAYA (PPUM). SEBARANG SALINAN SEBAHAGIAN ATAU SELURUHNYA DOKUMEN INI TIDAK DIBENARKAN SAMAI SEKALI KECUALI MENDAPAT KEBENARAN SECARA BERTULIS DARI BAHAGIAN PENGURUSAN KUALITI, PUSAT PERUBATAN UNIVERSITI MALAYA.
Objectives

To form a trauma system and a multidisciplinary trauma team for a rapid, coordinated and standardized approach to trauma cases.

Components of the proposed trauma system

1. Trauma team members and their roles
2. Trauma activation criteria
3. Activation and notification procedures
4. Equipments
5. Activation
6. Review of effectiveness
7. Training

1. Trauma team members

As we are a teaching centre with multiple subspecialties, the trauma team members have to be quite elaborate. However, it has to take into account of the availability of the team members at all times. For example, the surgical lecturer might not be available at all times, hence a senior surgical resident is adequate during a Full Activation. Hence, for activation of the trauma team, I would suggest to divide into three activation:

   a. Full activation
   b. Partial activation
   c. Consultation

Full activation: Trauma Emergency Surgery (general surgery and orthopaedic) / Paediatric Surgery directed. Emergency physician / emergency medicine registrar assumes Team Leader before the arrival of Surgical Lecturer. Team leadership is handed over to Surgical Lecturer once arrived. Surgical Lecturer is expected to be
present in the T+K upon patient arrival or within 15 minutes of activation. If Surgical Lecturer is engaged, Senior Surgical Resident will resume as Surgical Lecturer. Specialties consultants are expected to come within 30 minutes if they are available in the hospital. Their consultancy can be directed also by phone.

**Partial activation:** Trauma Emergency Surgery (general surgery and orthopaedic) / Paediatric Surgery directed. Emergency physician / emergency medicine registrar assumes Team Leader before the arrival of Senior Surgical Resident. Senior Surgical Resident is expected to be present upon patient arrival or within 20 minutes of activation. The Surgical Lecturer is to be contacted within 20 minutes of the patient’s arrival and he/she participates in all therapeutic decisions and all major procedures.

**Consultation:** Specialties called at the discretion of the emergency physician / registrar

### a. Full activation team members

- Emergency physician (present upon patient arrival)
- Surgical lecturer (present upon patient arrival or within 15 minutes)
- Senior surgical resident (resume function of surgical lecturer if the latter is engaged)
- Anaesthesia lecturer
- Anaesthesia medical officer
- Chief resident orthopaedic
- Orthopaedic resident
- Emergency medicine registrar
- Emergency medicine resident (resus)
- Surgical resident
- Trauma and emergency sister
- Trauma and emergency nurse(2)
- Assistant medical officer
- Radiology lecturer/MO on call
- Radiographer
Laboratory technician (standby at the lab)
Blood bank technician (standby at the blood bank)

Procedure
- In the ideal situation all personnel involved in the “Full Activation” should be present prior to patient’s arrival but that doesn’t happen regularly hence we should divide this into ideal team and temporary team members.
- The trauma and emergency registrar will assign roles to selected temporary team members

Guidelines for roles and responsibilities

<table>
<thead>
<tr>
<th>Roles</th>
<th>Staff</th>
<th>Duties</th>
<th>Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Team leader</td>
<td>*Emergency physician / surgical lecturer / senior surgical resident</td>
<td>- Manage or direct team efforts&lt;br&gt;- Initiate interventions / care&lt;br&gt;- Perform primary and secondary survey&lt;br&gt;- Delegate airway management&lt;br&gt;- Order appropriate lab and radiographs&lt;br&gt;- Responsible for all medications and fluids given&lt;br&gt;- Make transfer decisions Coordinate priorities when more than one critical patient</td>
<td>Foot of the patient</td>
</tr>
<tr>
<td>Airway</td>
<td>*Emergency medicine registrar / anaesthesia medical officer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>------------------------</td>
<td>-------------------------------------------------------------</td>
<td></td>
<td>Head of trauma bed</td>
</tr>
<tr>
<td></td>
<td>Opening the airway</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ventilation</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Intubation</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Keep patient informed</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Alert team leader of any change of conscious level</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| C-spine                | Emergency medicine resident                                 |  | Head of trauma bed |
|------------------------|-------------------------------------------------------------|  |  |
|                        | Maintain C-spine stabilization                              |  |  |

<p>| IV / Procedures        | Emergency medicine resident (resus)                         |  | On patient left side |
|------------------------|-------------------------------------------------------------|  |  |
|                        | AMO                                                          |  |  |
|                        | CR orthopaedic                                              |  |  |
|                        | Orthopaedic and surgical resident                           |  |  |
|                        | Insert large bore Iv lines                                  |  |  |
|                        | Remove clothing form left side of body                      |  |  |
|                        | Neuro assessment                                            |  |  |
|                        | Assist with procedures as directed                          |  |  |
|                        | I/O chart                                                   |  |  |
|                        | Needle thoracicentesis                                      |  |  |
|                        | Chest tube                                                  |  |  |
|                        | Pericardiocentesis                                           |  |  |
|                        | Bleeding control                                            |  |  |
|                        | CBD                                                          |  |  |
|                        | NG tube                                                      |  |  |
|                        | Immobilisation                                              |  |  |
|                        | Application of pelvic sling                                 |  |  |
|                        | FAST                                                         |  |  |
|                        | Document case (each specialty)                               |  |  |</p>
<table>
<thead>
<tr>
<th>Provider assistant</th>
<th>Nurse (1)</th>
<th>Assist with procedures as directed</th>
<th>On patient left side</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vitals and recorder</td>
<td>Nurse (2)</td>
<td>Take, monitor and record vitals</td>
<td>On patient left side, toward foot of bed</td>
</tr>
<tr>
<td>IV med</td>
<td>Nurse (3)</td>
<td>Remove clothing form right side of body</td>
<td>On patient right side</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Attach/observe cardiac monitor</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Prepare/administer medications</td>
<td></td>
</tr>
<tr>
<td>Scribe</td>
<td>Nurse (4)</td>
<td>Record case on white board</td>
<td>White board</td>
</tr>
<tr>
<td>Runner</td>
<td>Sister T+K</td>
<td>Retrieve equipment, supplies, make copies, assist with ER traffic control</td>
<td>T+K desk</td>
</tr>
<tr>
<td>Radiology lecturer/MO on call</td>
<td></td>
<td>Provide advice and assistance in radiological investigation</td>
<td>Radiology suite</td>
</tr>
</tbody>
</table>
b. Partial activation members

- Emergency registrar (present upon patient arrival)
- Senior Surgical resident (present upon patient arrival or within 15 minutes)
- Surgical resident
- Orthopaedic resident
- Emergency medicine resident (resus)
- Trauma and emergency sister
- Trauma and emergency nurse(2)
- Assistant medical officer
- Radiology MO on call
- Radiographer
- Laboratory technician (standby at the lab)
- Blood bank technician (standby at the blood bank)
### Roles and Staff

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▪ Initiate interventions / care  
▪ Perform primary and secondary survey  
▪ Delegate airway management  
▪ Order appropriate lab and radiographs  
▪ Responsible for all medications and fluids given  
▪ Make transfer decisions | Foot of the patient          |
| Airway         | Emergency medicine resident (resus) | ▪ Opening the airway  
▪ Ventilation  
▪ Intubation  
▪ Keep patient informed  
▪ Alert team leader of any change of conscious level | Head of trauma bed          |
| C-spine        | AMO/nurse                      | ▪ Maintain C-spine stabilization | Head of trauma bed        |
| IV / Procedures| ▪ Emergency medicine resident (resus) | ▪ Insert large bore IV lines  
▪ Remove clothing form | On patient left side        |
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- AMO
- Orthopaedic and surgical resident
- left side of body
- Neuro assessment
- Assist with procedures as directed
- I/O chart
- Needle thoracicentesis
- Chest tube
- Pericardiocentesis
- Bleeding control
- CBD
- NG tube
- Immobilisation
- Application of pelvic sling
- FAST
- Document case (each specialty)

- Vitals and recorder
- Nurse (2)
- Take, monitor and record vitals

- IV med
- Nurse (3)
- Remove clothing form right side of body
- Attach/observe cardiac monitor
- Prepare/administer medications
2. Trauma activation criteria

a. Full activation:

1. Polytrauma: trauma involving 2 or more organ system
2. Trauma patient who is a non-responder and partial responder (persistent SBP ≤ 90 mmHg)
3. GCS < 9
4. Respirations ≤ 8 or ≥ 28
5. Any intubated trauma patients
6. Penetrating trauma to head, neck, chest or abdomen
7. Crush injury to torso
8. Pelvic fracture with Class II – IV shock or unstable pelvic fracture
9. Inhalational injury
10. Spinal cord injury with neurogenic shock
11. Emergency physician / registrar discretion
b. Partial activation

1. Heart rate > 120/min with signs of poor tissue perfusion
2. Any trauma patient receiving blood or blood products to maintain adequate perfusion
3. Insertion of airway adjunct in the field
4. 2 or more long bone fracture
5. GCS 10 – 12
6. Flail chest
7. Abdominal pain, guarding or distension
8. Emergency physician / registrar discretion

b. Consultation: called at the discretion of the emergency physician/registrar (master year 4) based on mechanisms of injury, high risk circumstances or extremes of age

1. External, uncontrolled bleeding (depending on area) : Orthopaedics or other relevant specialties
2. Tension pneumothorax only : Cardiothoracic
3. Focal neurological deficit: Orthopaedics
4. Mangled, pulseless or crushed extremity injury : Orthopaedics
5. Needle decompression in the field due to tension pneumothorax only : Cardiothoracic
6. Any open long bone fracture: Orthopaedics
7. Burn of 20% or > BSA : Plastic
8. Penetrating trauma proximal to knee and elbow: Orthopaedics (limbs) or other specialties
9. Pregnancy > 20 weeks: Surgical and O+G
10. Focal neurological deficit: Spine / neurosurgical
12. Other injuries: Emergency physician / registrar discretion
3. Activation and notification procedures

**Authority to activate the trauma team:**

Activation of trauma team is an HOSPITAL ACTIVATION. However, the communication is initiated by the Trauma and Emergency.

**From prehospital care:**

EMS provider → Call Centre → Trauma and Emergency, AMOU32 / Sister on duty → Full or partial activation

**From red zone:**

Red zone nurse or emergency medicine resident (resus) or emergency medicine registrar → Trauma and Emergency, AMO U32 / Sister on duty → Full or partial activation

**Note:**

- Only the emergency physician, senior surgical resident or emergency medicine registrar can downgrade or cancel activations.

**Notification procedures:**

AMO U32 / Sister on duty → operator → activate the SMS system for TRAUMA TEAM

**SMS:**

Type of trauma alert:

Age:

Sex:

Mechanism of injury:

Current location:

Interventions:

ETA (if prehospital):
4. Equipments:

- Walkie-talkie
- Telephones
- SMS system
- Trauma activation forms

5. Activation

As stated earlier above.

6. Review of effectiveness

Trauma team audit has to be conducted on a 6 months basis to ascertain:

- Outcome
- Response time
- Staff commitment
- Ways of improvements
- Publications

7. Training

Training is expected to be conducted to staff involved:

- BTLS
- MTLS
- ATLS
- Trauma Surgery Course

Conclusion:

Trauma system is a compulsory entity to a Trauma centre. The success of the system will depend on the commitment of the various teams involved.