HISTORY OF PREHOSPITAL SYSTEM

Romans and Greeks used chariots to remove injured soldier from battlefield.
HISTORY OF PREHOSPITAL SYSTEM

D.J. LARREY and J.F. PERCY, Surgeon’s of Napoleon’s army

1797 institution of first prehospital system design to triage and transport the injured from field to aid station. Protocols dictated much of the treatment.
WORLD WAR I
For the first time mortality rate was linked with the time required to reach a facility.

The use of a simple Thomas splint in femur fractures reduced mortality from 80 to 20%
HISTORY OF PREHOSPITAL SYSTEM

From World War II to the seventies different pre-hospital systems for civilian were establish all over the world. Educational plan on first aid for different figures and population were made.

Huge investments were planned in all countries.
The MODERN CONCEPT of pre-hospital trauma care is born around the eighties trying to improve the first aid and starting from the concept that the first assessment and treatment, by dedicated trained paramedical staff, on accident scene would definitely change the outcome of injured people.
Several study were conducted about trauma patients mortality and the results show a trimodal distribution.
Trimodal distribution of death:

1. First peak occurs within second to minutes of injury
2. Second peak occurs within minutes to several hours following the injury
3. Third peak occurs within several days to weeks after the injury
First peak:
- Severe brain damage
- High spinal cord injury
- Rupture of major vessels

NON TREATABLE INJURIES
Second peak:
• Subdural or epidural hematomas
• Hemopneumothorax
• Ruptured spleen
• Liver lacerations
• Pelvis fractures
• Multiple other injuries associated with significant blood loss
Third peak:
• Sepsis
• Multiple organ system dysfunction
How to reduce these curves?
PRE-HOSPITAL MANAGEMENT

PREVENTION
- Difficult and expensive to enforce
- May be effective in the long term

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PRE-HOSPITAL MANAGEMENT

TRAUMA CARE
- Pre-hospital management
- ATLS protocols
- Damage control tactics
- COST-EFFECTIVE


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ATLS: Advanced Trauma Life Support
PRE-HOSPITAL MANAGEMENT

ICU QUALITY
- Management of complications
- Mainly MOF and ARDS
- Sepsis
- EXPENSIVE

ICU: Intensive Care Unit
MOF: Multiple Organ Failure
ARDS: Acute Respiratory Distress Syndrome
PRE-HOSPITAL MANAGEMENT

Curve 3 can also be reduced as a direct result of reduction in 1 and 2.
Pre-hospital works on reducing mortality rate on second peak providing:

- Early resuscitation
- Stabilization
- Safe referral to hospital
Pre-hospital may change completely the outcome for trauma patients, reducing:

- mortality rate in the first hour after accident
- percentage of post operative complications
- infections rate
- length of stay in hospital
Prehospital trauma care reduces mortality. Ten-year results from a time-cohort and trauma audit study in Iraq

Mudhafar K Murad¹,², Stig Larsen² and Hans Husum⁴*

The aims of the study were to evaluate to which extent a low-cost pre-hospital trauma system reduces deaths where out-of-hospital times are long, and to identify specific pre-hospital life support interventions that enhance survival.
Data Collection from January 1997 to December 2006

Paramedics at rural health centres were trained by the authors to provide pre-hospital trauma life support on-site and during protracted evacuation.

Paramedics were also trained to teach basic life support measures to layperson in villages.
# PRE-HOSPITAL MANAGEMENT

## TRAINING FOR PARAMEDICS

### Table 1 Pre-hospital treatment protocol

<table>
<thead>
<tr>
<th>Airway</th>
<th>Breathing</th>
<th>Circulation</th>
<th>Drugs</th>
</tr>
</thead>
</table>
PRE-HOSPITAL MANAGEMENT

RESULTS DIVIDED BETWEEN 3 CONSECUTIVE TIME PERIOD

• Overall mortality rate in hospital decrease from 17% (period 1) to 4% (periods 2-3)
• Pre-hospital mortality rates were reduced from 16% (period 1) to 1.7% (period 2) resulting in 1.3% (period 3)
• Field response time was reduced from 1.6 hours to 0.7 hours
• Out of hospital patients time reduce from 4.4 hours to 2.3 hours.
STUDY CONCLUSION

RURAL PRE-HOSPITAL TRAUMA SYSTEMS REDUCE TRAUMA MORTALITY.

WHERE OUT-OF-HOSPITAL TIMES ARE LONG, BASIC LIFE SUPPORT MEASURES BY TRAINED LAY FIRST HELPERS AND PARAMEDICS ARE LIFE SAVING.
PRE-HOSPITAL MANAGEMENT

 WHICH IS OUR STARTING POINT ?

 WHICH IS THE TERRITORIAL SERVICE PROVIDED IN AFGHANISTAN ?

 WHICH ARE THE WEAK POINTS ?
PRE-HOSPITAL MANAGEMENT

STARTING POINT
PRE-HOSPITAL MANAGEMENT

AFGHANISTAN HEALTH CARE SYSTEM
## BPHS

**Table 2: The Seven Elements of the BPHS and their Components**

| 1. Maternal and Newborn Care  (Table 2.1 – 2.5) | a. Antenatal care  (Table 2.1)  
b. Delivery care  (Table 2.2)  
c. Postpartum care  (Table 2.3)  
d. Family planning  (Table 2.4)  
e. Care of the newborn  (Table 2.5) |
|--------------------------------------------------|
| 2. Child Health and Immunization  (Table 2.6 – 2.7) | a. Expanded Program on Immunization (EPI)  (Table 2.6)  
b. Integrated Management of Childhood Illness (IMCI)  (Table 2.7) |
| 3. Public Nutrition  (Table 2.8) | a. Prevention of malnutrition  
b. Assessment of malnutrition |
| 4. Communicable Disease Treatment and Control  (Table 2.9 – 2.11) | a. Control of tuberculosis  (Table 2.9)  
b. Control of malaria  (Table 2.10)  
c. Prevention of HIV and AIDS  (Table 2.11) |
| 5. Mental Health  (Table 2.12) | a. Mental health education and awareness  
b. Case identification, diagnosis and treatment |
| 6. Disability and Physical Rehabilitation Services  (Table 2.13) | a. Disability awareness, prevention, and education  
b. Provision of physical rehabilitation services  
c. Case identification, referral and follow-up |
| 7. Regular Supply of Essential Drugs  (Table 2.14) | Listing of all essential drugs needed |
TRAUMA IS THE NEW CHALLENGE FOR TERRITORIAL HEALTH CARE SECTOR
PRE-HOSPITAL MANAGEMENT

WHICH INVESTMENTS ARE REQUIRED?

WHAT IS NEEDED TO IMPLEMENT PRE-HOSPITAL CARE?
PRE-HOSPITAL MANAGEMENT

FOUR KEY POINT:

1. TRAINED TRAUMA NURSES PRESENT 24/7
1. MEDICAL MATERIALS
1. DEDICATE ROOM FOR EMERGENCY
1. AMBULANCES 24/7
TRAINED TRAUMA NURSES

BASIC PRE-HOSPITAL TRAINING:
• Identify hypovolemic/haemorrhagic shock
• Resuscitation and fluid replacement
• Immobilization of limbs fractures
• Immobilization of suspect or present spinal injuries
• Immobilization of pelvis fractures
• Control of external bleeding
• Different wounds treatment (chest wound, evisceration, open fractures..)
• Neurological status evaluation (GCS) and head injury treatment
Identify the life threatening conditions and simultaneously manage:

**A**: AIRWAY MAINTENANCE AND CERVICAL SPINE PROTECTION

**B**: BREATHING AND VENTILATION

**C**: CIRCULATION WITH HEMORRHAGE CONTROL

**D**: DISABILITY (NEUROLOGICAL STATUS)

**E**: EXPOSURE / ENVIRONMENTAL CONTROL: UNDRESS THE PATIENT AND PREVENT HYPOTHERMIA
# Simple Protocols

## Estimated Blood Loss in Adult

<table>
<thead>
<tr>
<th>Blood loss (ml)</th>
<th>CLASS I</th>
<th>CLASS II</th>
<th>CLASS III</th>
<th>CLASS IV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to 750 ml</td>
<td>1000 ml Ringer</td>
<td>Up to 4000 ml Ringer</td>
<td>Up to 5000 ml (500 ml Haemacel + Ringer)</td>
<td>Up to 6000 ml (500 ml Haemacel + Ringer)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fluids</th>
<th>Class I</th>
<th>Class II</th>
<th>Class III</th>
<th>Class IV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Speed</td>
<td>Normal</td>
<td>1000 ml Ringer fast than slow down according patient vital signs.</td>
<td>500 ml Heamacel fast with Ringer Fast in second line. Slow down when patient Vital signs become acceptable.</td>
<td>500 ml Heamacel fast with Ringer Fast in second line. Slow down when patient Vital signs become acceptable.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pulse rate</th>
<th>&lt;100</th>
<th>100-120</th>
<th>120-140</th>
<th>&gt;140</th>
</tr>
</thead>
<tbody>
<tr>
<td>Systolic Blood pressure</td>
<td>Normal</td>
<td>90-120</td>
<td>&lt; 90 NO RADIAL PULSE</td>
<td>&lt; 60 No carotid pulse</td>
</tr>
<tr>
<td>Respiratory rate</td>
<td>14-20</td>
<td>20-30</td>
<td>&gt;30</td>
<td>&gt;35</td>
</tr>
<tr>
<td>Capillary Refill</td>
<td>Normal</td>
<td>More than 2 sec</td>
<td>More than 2 sec</td>
<td>Absent</td>
</tr>
<tr>
<td>Mental status</td>
<td>Normal</td>
<td>Anxious /irritable</td>
<td>Hostile/confused</td>
<td>Lethargic/Non Responsive</td>
</tr>
</tbody>
</table>
PRE-HOSPITAL MANAGEMENT

MEDICAL MATERIALS

- NGT set
- Foley catheter set
- IV set
- Bandage
- Splint
- Spinal board
- Suction machine + devices
- Oxygen + devices
- Sterile gauze
- Neck collar
- Pain killer
- Antibiotics
- Antiseptic
- Fluids (Ringer/Sodium Chloride/Haemacel)
- Airway cannula
PRE-HOSPITAL MANAGEMENT

HOW TO STORE
PRE-HOSPITAL MANAGEMENT

SIMPLE MATERIAL

IMMOBILIZATION OF SPINAL INJURIES

IMMOBILIZATION OF PELVIS FRACTURES
PRE-HOSPITAL MANAGEMENT

DEDICATED ROOM FOR EMERGENCY
Safe transportation with nurse present performing revaluation and treatment.

AMBULANCE WITHOUT NURSE IS LIKE A TAXi, JUST MORE COMFORTABLE!
PRE-HOSPITAL MANAGEMENT

AMBULANCE

REQUIRED MATERIAL

- STRETCHER WITH FLUID HANGER
- FLUIDS
- OXYGEN + DEVICES
- BLANKET / THERMIC BLANKET
- SUCTION MACHINE
- PILLOW
- LINEN
- SAFETY BOX
- FIRST AID BOX
FIRST AID POST (FAP)

REFERRAL CHART

Patient referred to Emergency Surgical Centre – Lashkargah – Afghanistan

FAP ___________________ Date: ___________________
Name ___________________ / ___________________
Age ________ Sex M♂ F♀ Height _____cm Weight ________ Kg
Coming from ___________________

<table>
<thead>
<tr>
<th>VITAL SIGNS at the FAP</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>HR rpm</td>
<td>BP mmHg</td>
<td>RR bpm</td>
<td>Temp °C</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GCS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Place of Injury</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time of Injury</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type of Injury</td>
<td>Bullet</td>
<td>Shell</td>
<td>Mine</td>
<td>Other</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

TREATMENT GIVEN IN THE FAP:

Fluids:

Drugs:

NPO since (hours):

<table>
<thead>
<tr>
<th>VITAL SIGNS during the transportation</th>
<th></th>
<th></th>
<th></th>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>After 30 min HR rpm BP mmHg T° °C</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>After 60 min HR rpm BP mmHg T° °C</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>After 90 min HR rpm BP mmHg T° °C</td>
<td></td>
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</tbody>
</table>

Name of the Nurse: ___________________ Signature ___________________
PRE-HOSPITAL MANAGEMENT
PRE-HOSPITAL MANAGEMENT
THANK YOU