Management of Combat Casualties During Aeromedical Evacuation From a Role 2 to a Role 3 Medical Facility

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THIS STUDY WAS CONDUCTED UNDER A PROTOCOL REVIEWED AND APPROVED BY THE WILFORD HALL AMBULATORY SURGICAL CENTER IRB AND IN ACCORDANCE WITH THE APPROVED PROTOCOL
BACKGROUND

Continuum of Care

Emergent care (point of injury)

Movement to a medical treatment facility (MTF)

Intermediate care (Role 2 or Role 3 Facility)

Movement

Definitive care (Role 4 Facility)
OBJECTIVES

• Describe the use of intra-theater and inter-facility transports
• Describe the clinical care needs during intra-theater and inter-facility transport
METHODS

IRB Approved Retrospective Review of Medical Records with confirmed transport from Role 2 Facility to a Role 3 Facility During 2007 to 2016

- Original Destination
- Flight times
- Patient Characteristics
- Procedures performed
- Events
RESULTS

- 869 Available Role 2 to Role 3 mission records between January 2007 and December 2016
- Transport Times
  - Average intra-theater transport time was 39 minutes
  - Average Prehospital transport time was 22 minutes
- Highest level provider
  - RN (35% [95% CI, 31-40%])
  - Advanced level provider (21% [95%, CI, 17-25%])
  - Paramedic (8% [95% CI, 6-11%])
  - Unknown (18% [95% CI, 15-21%])
RESULTS

NUMBER OF RECORDS

- 17959
- 8980
- 869

ORIGINATION FACILITIES

- SHANK: 33%
- JALABAD: 17%
- GHANZI: 11%

DESTINATION FACILITIES

- BAGRAM: 74%
- KANDAHAR: 14%
- BASTION: 10%
- BALAD: <1%

n: Inter-Facility Transfer
1+ Inter-Facility Transfer
Available Role 2 to Role 3 Records
<table>
<thead>
<tr>
<th>RESULT</th>
</tr>
</thead>
<tbody>
<tr>
<td>97% were male</td>
</tr>
<tr>
<td>Median age 27</td>
</tr>
<tr>
<td>85% Battle Injuries</td>
</tr>
<tr>
<td>• &lt;50% were secondary to Explosive devices</td>
</tr>
<tr>
<td>• 37% Sustained Head Injuries</td>
</tr>
<tr>
<td>• 60% Sustained Lower Extremity Injuries</td>
</tr>
</tbody>
</table>
RESULTS

Procedures at Role 2

- Splenectomy: 1%
- Chest Needle Decompression: 3%
- Amputation Completion/Revision: 6%
- Fasciotomy: 9%
- Laparotomy: 9%
- Blood Product Administration: 22%

Procedures at R2
RESULTS

- In Flight procedures
  - PIV initiated (n=7)
  - CPR (n=1)

- In Flight documentation
  - Vital Signs (92%)
  - Labs (< 1%)
RESULTS

Care During Flight

- Blood Product Administration: 4%
- Wound Vac: 5%
- Chest Tube: 7%
- Central Line: 12%
- Arterial Line: 16%
- Mechanical Ventilation: 28%
- Had Drains: 44%
RESULTS

• In Flight events
  • Pain events (33%)
  • Respiratory Decompensation (16%)
  • Abnormal Hemodynamic event (8%)

• In flight Medications
  • Fentanyl (30%)
  • Paralytic (25%)
RESULTS

In-Flight Events

- Pain: 33%
- Respiratory: 16%
- Hemodynamic: 8%
- Neurologic: 7%
- Other: 14%

Other:
- Cardiac
- Bleeding
- Renal/Urinary
- Medication Reaction
- Vomiting/Nausea
- Allergic
- Unable to get measure
- Weather
- Equipment Failure
In-Flight Medications*

- Other Analgesic
  - Vicodin
  - Percocet

- Other Sedative
  - Valium
  - Lorazepam

- Paralytic
  - Vecuronium
  - Rocuronium
  - Pancuronium

*Medications Not Graphed
- Vasopressors
- Anti-seizure
- Anti-Coagulant
- Calcium
- Tylenol
- Solumedrol
- Narcan
- Decadron
- Sodium Bicarbonate
RESULTS

In-Flight Analgesics

- Fentanyl: 30%
- Morphine: 10%
- Diluadid: 14%
- Ketamine: 4%
- Other Analgesic: 1%
RESULTS

In-Flight Sedatives

- Propofol: 7%
- Versed: 16%
- Other Sedative: 0.040

Other Sedative
- Diazepam
- Lorazepam
Paralytic
- Vecuronium
- Rocuronium
- Pancuronium

*Medications Not Graphed
- Vasopressors
- Anti-seizure
- Anti-Coagulant
- Calcium
- Tylenol
- Solumedrol
- Narcan
- Decadron
- Sodium Bicarbonate

RESULTS

In-Flight Other Medications*

<table>
<thead>
<tr>
<th>Medication</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paralytic</td>
<td>25%</td>
</tr>
<tr>
<td>IV Drips</td>
<td>23%</td>
</tr>
<tr>
<td>Fluid Bolus</td>
<td>11%</td>
</tr>
<tr>
<td>Blood Products</td>
<td>4%</td>
</tr>
</tbody>
</table>
CONCLUSION

Inter-facility transports frequently have complex clinical care needs and include:

- Post-operative
- Ventilator
- Chest tube
- Wound vacuum
- Central/arterial line
- Analgesic
- Paralytic management
LIMITATIONS

- Retrospective, descriptive study
- Subjectivity despite trained data abstractors
- Need better documentation and timestamps
- Understand benefits of each timely intervention
ACKNOWLEDGEMENTS

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ANY QUESTIONS?