Transporting the Critically Injured Patient

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Stabilization and Transfer

objectives

- discuss the stabilization of the trauma patient using the ATLS ABCDE paradigm
- identify non-clinical issues that must be considered in the transfer of the trauma patient

Med Flight

Stabilization and Transfer
indications for air transfer

- true time-dependent surgical condition
  - aortic disruption, ongoing internal hemorrhage, continued CT drainage, etc
- medical condition in which limited out-of-hospital time is preferable
  - ventilator-dependent chest injury

Med Flight

Stabilization and Transfer

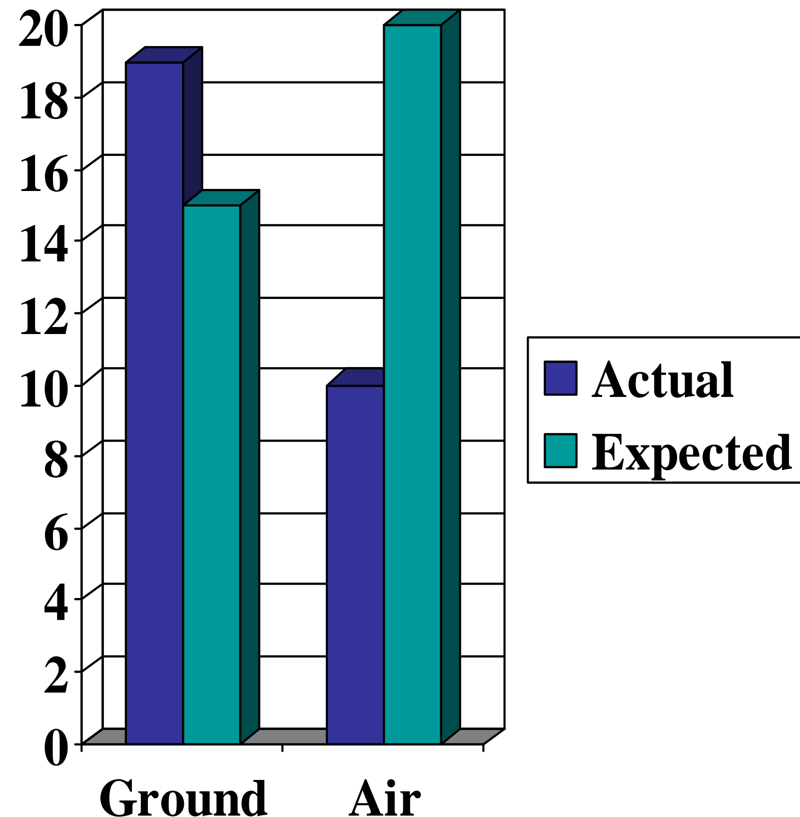
indications for air transfer

- use of air medical transport will result in significant time savings to the patient
- clinical requirements that exceed ALS care providers
  - ventilator, chest-tube, blood products, etc

Med Flight

Stabilization and Transfer
indications for air transfer

- comparison of 150 ground and air transport of blunt trauma victims who went to Level I center
- TRISS methodology



JAMA 249:3047, 1983

Med Flight

Stabilization and Transfer
indications for air transfer

- 4 year retrospective review
- multiple regression analysis of blunt trauma comparing ground vs. air outcomes
- 16,999 scene and interfacility transports included
- HEMS transport was associated with a significant decrease in mortality as compared with ground transport (OR, 0.76; 95% CI, 0.59–0.98;*p* 0.037 by likelihood ratio testing).

J Trauma 2002; 52:136-45

Med Flight

Stabilization and Transfer
indications for air transfer

Intervention	Cost per Year of Life ($)
Prehospital defibrillation	820
Air medical trauma transport[1]	2454
Prehospital paramedic system	8886
CABG for severe angina	23000
tPA for acute myocardial infarction	32,679

[1] **Ann Emerg Med 30:500, 1997**

Med Flight

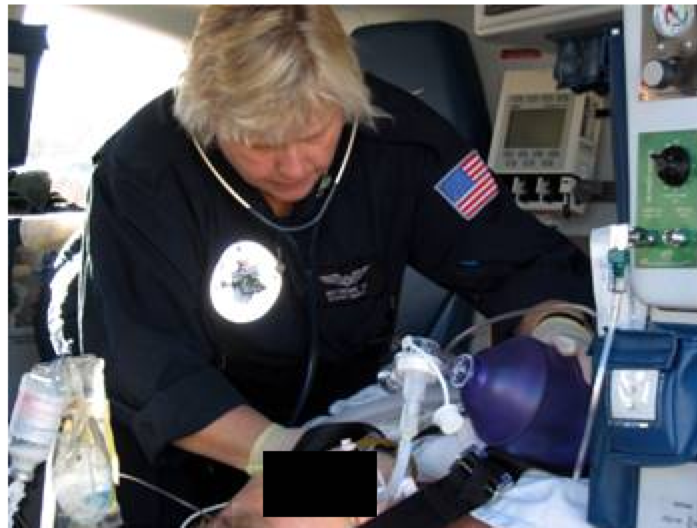
Stabilization and Transfer
airway

- supplemental oxygenation
  - Boyle's law
- typical indications for airway control in trauma
  - airway injury/protection
  - maximize oxygenation
  - control/assist ventilation
  - positive pressure ventilation

Med Flight

Stabilization and Transfer
airway

maintain a ***low threshold*** to controlling airway prior to air medical transport



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Stabilization and Transfer

airway

- 10,316 patients with moderate to severe head injury
- 3,017 transported by air medical transport
- improved survival: OR = 1.90 (1.60 to 2.25)
- good outcome: OR = 1.36 (1.18 to 1.58)

Davis et al: ***Ann Emerg Med*** 2005;46:115–22

Med Flight

Stabilization and Transfer
airway

- 4,098 patients with head/neck Abbreviated Injury Scale score of 3 or greater
- out of hospital endotracheal intubation – bad outcome
  - OR = 3.99 (3.21 to 4/93)
- ground endotracheal intubation compared to air medical
  - OR = 2.28 (1.83 to 2.85)

Wang et al: ***Ann Emerg Med*** 2004;44:439–50

Med Flight

Stabilization and Transfer
spinal immobilization

- maintain spinal immobilization for all patients with appropriate indications prior to assessment in Trauma Center

Med Flight

Stabilization and Transfer
spinal immobilization

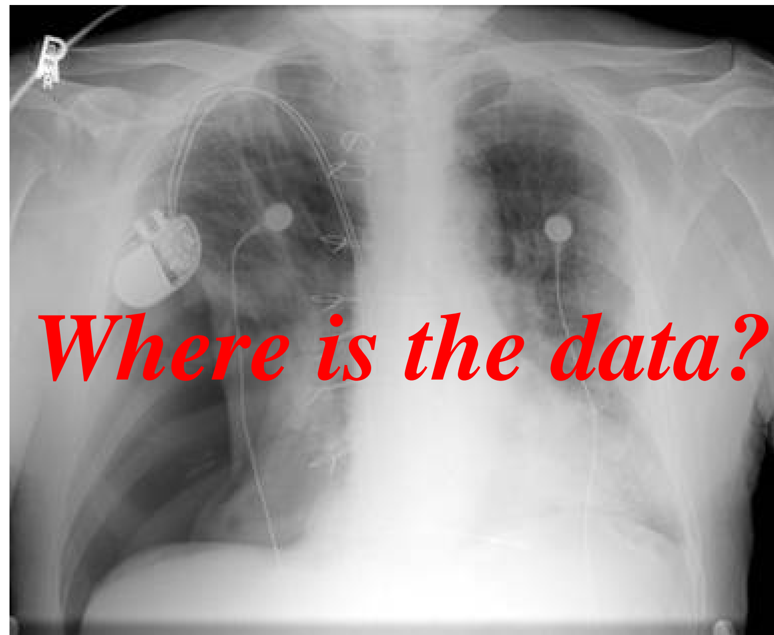
- 323 patients with trauma and indication for spinal immobilization
- feasibility of spinal clearance protocol examined
- only 40 patients (12%) would have been cleared
- 4/40 had spinal fractures identified

J Trauma 64(6):1529-32, 2008

Med Flight

Stabilization and Transfer
breathing

classic teaching: decompress all pneumothoraces prior to air medical transport



Med Flight

Stabilization and Transfer
circulation

- control all external bleeding
  - scalp lacerations
  - consider new hemostatic agents
- two large-bore intravenous lines
  - controversial
- blood products where available

Med Flight

Stabilization and Transfer
circulation

Shaftan - 1965; Miles - 1966

study animals with arterial injury who were resuscitated to normal BP had:

- larger hemorrhage volumes
- longer duration of bleeding
- higher incidence of rebleeding

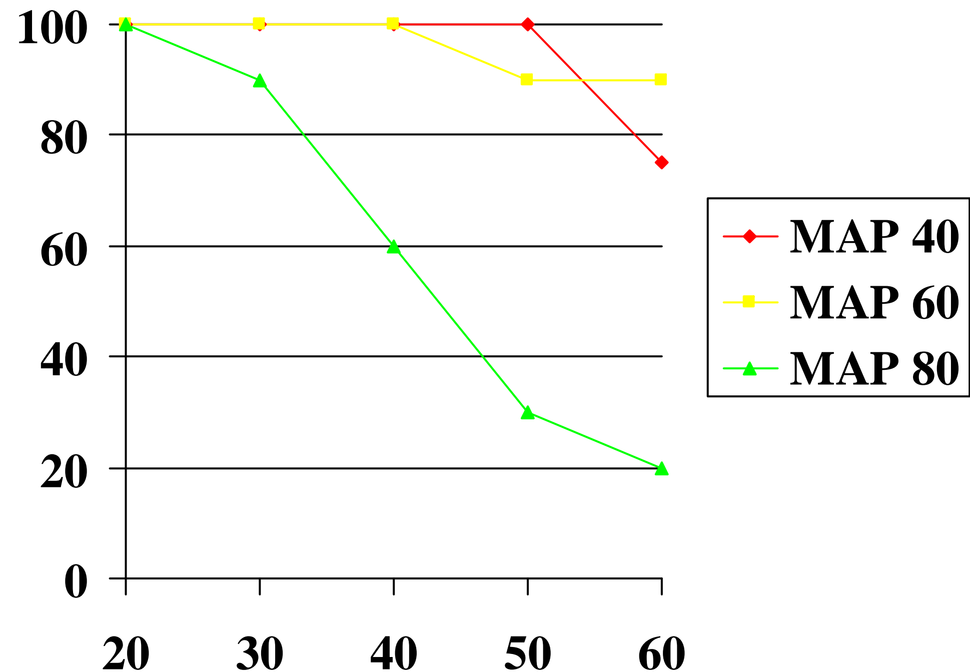
Surgery 58:851, 1965
Surgery 60:434, 1966

Med Flight

Stabilization and Transfer

circulation

- induced vascular injury in swine
- effect of fluid resuscitation on mortality rate



Ann Emerg Med 22:155, 1993

Med Flight

Stabilization and Transfer
circulation

- study characteristics
  - urban center with rapid transport to Trauma Center
  - BP < 90 mmHg
  - RTS > 0 who required operative repair
  - penetrating injuries to the torso
  - 598 patients randomized to receive field/ED resuscitation or intraoperative resuscitation only

NEJM 331:1105, 1994

Med Flight

Stabilization and Transfer
circulation

- conclusions
  - average fluid volumes in immediate resuscitation group were significantly greater than delayed resuscitation group (2.4 vs. 0.4 L)
  - higher systolic BP (79 vs. 72) in immediate resuscitation group
  - trend towards increased intraoperative blood loss in immediate resucitation group

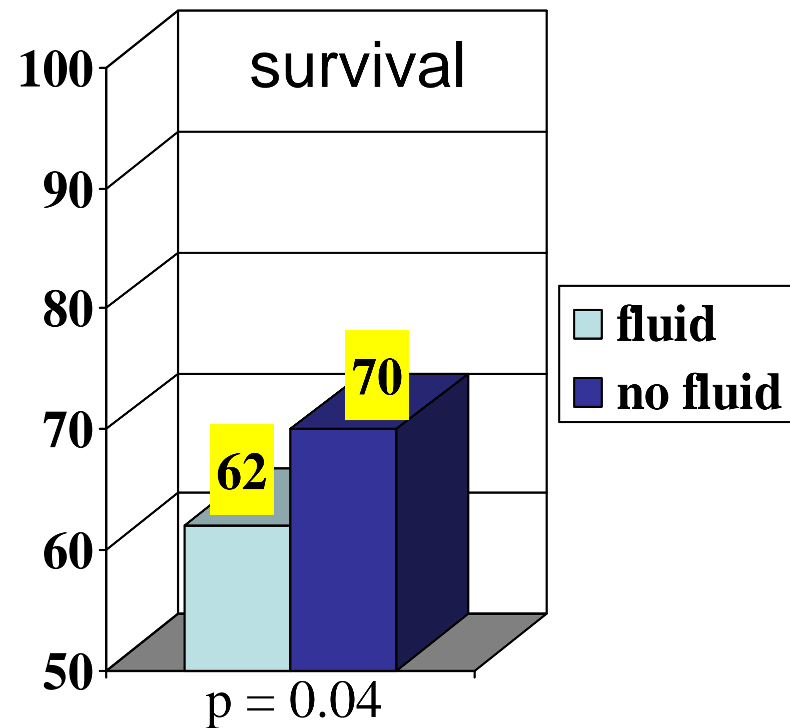
NEJM 331:1105, 1994

Med Flight

Stabilization and Transfer

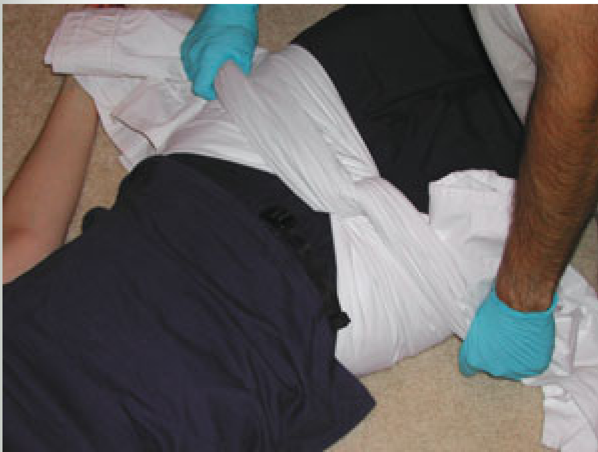
circulation

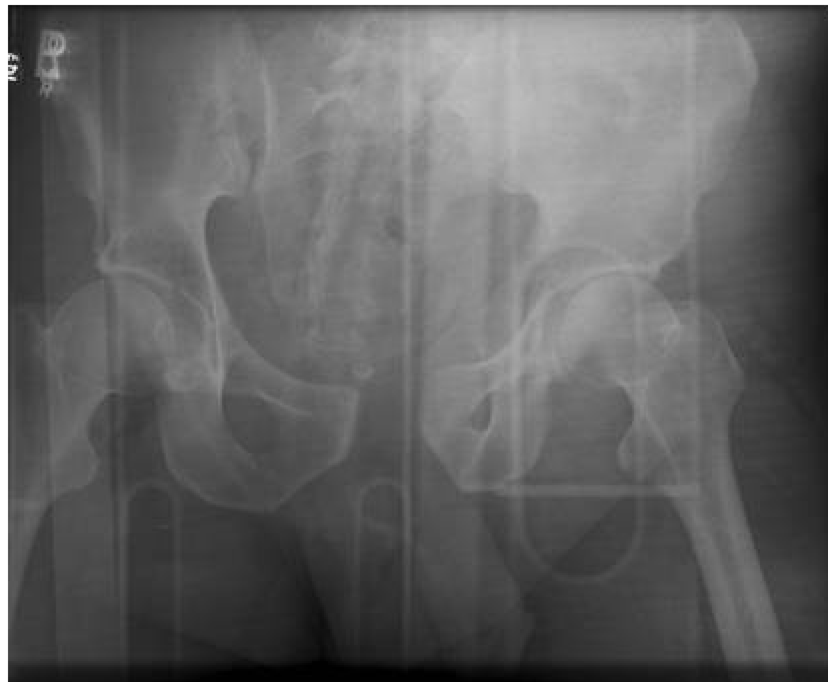
- conclusions
  - mortality greater in immediate resuscitation group



Stabilization and Transfer
circulation

- stabilize all unstable pelvic fractures





Med Flight

Stabilization and Transfer
disability

- early airway control
- adequate volume resuscitation
- sedation/analgesia/short-term paralysis
- controversial:
  - hyperventilation
  - steroids
  - osmotic agents
  - prophylaxis for seizures

Journal of Neurotrauma
Vol 24, Supplement 1,
May 2007

Med Flight

Stabilization and Transfer
environment

protect the trauma patient from the environment, especially during air transport

altitude = 1/(temperature)

Med Flight

Stabilization and Transfer

other items

- copy of all relevant paper work including face sheet, ED record, EMS report
- EMTALA transfer paperwork
- medical justification for transport
- Medicare authorization

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Stabilization and Transfer

other items

2827 W. Dublin Granville Rd.
Columbus OH 43235
Dispatch: 800.222.LIFE (5433)

FORM# 1863

Medical Transport Justification

Instructions: This form must be completed and signed by the attending physician prior to any MedFlight transport. Give completed forms to MedFlight personnel, or Fax directly to 877- MED-COM1 (877-633-2661) *Toll FREE*

Patient Data

Name ____________ Date of Transport ________ MedFlight Request # ________
Address ____________ Billing # ____________
City, State, Zip ____________ Insurance Carrier # ____________

Transport Data

Sending Hospital ____________ Receiving Hospital ____________
City/State ____________ City/State ____________
Transport Mode ☐ Helicopter ☐ Airplane ☐ Ambulance (MICU) Transport Date ____________
Is the receiving hospital the closest appropriate facility for this patient? ☐ YES ☐ NO

Transport Justification Data

A. The receiving hospital has the following clinical services available at their facility that we are unable to provide. (Check all that apply)

- ☐ Subspecialty intervention for a multi-system trauma.
- ☐ Subspecialty intervention for an orthopedic injury.
- ☐ Specialized pediatric care for a pediatric injury.
- ☐ High-risk Obstetrical services
- ☐ Hyperbaric treatment for toxic exposure or an emergent condition.
- ☐ Level III nursery care for a neonatal emergency.
- ☐ Other (Please describe):
- ☐ Diagnostics or intervention for a neurological injury or impairment.
- ☐ Surgical specialist for a gastro-intestinal injury or disease.
- ☐ Replantation team for an orthopedic injury.
- ☐ Burn center care for thermal injuries
- ☐ Invasive diagnostics/intervention for a cardio-thoracic injury or disease.
- ☐ Continuity of Care

B. The patient has clinical requirements during transport that exceed those provided by ALS/BLS services. (Check all that apply)

- ☐ Mechanical ventilation
- ☐ Advanced arrythmic therapy
- ☐ Advanced hemodynamic support
- ☐ Invasive arterial, venous or intracranial monitoring
- ☐ Other (Please describe)

C. *(For Air Transport Only- Check all that apply)* Air transport is required in order to:

- ☐ Minimize out-of-hospital time. Please give details; ____________
- ☐ Provide immediate surgical/procedural intervention. Please give details; ____________

Physician Certification Signature

I certify I have completed this report based upon the information available to me at the time of the patient's examination.

Date:

____________ **Sending Physician's Signature**

____________ **Sending Physician Name – Please Print**

Stabilization and Transfer

other items

Ohio Medical Transportation, Inc. DBA MedFlight of Ohio

Patient Name: ______________________ Request #: ____________ Transport Date: ____________

I request that payment of Authorized Medicare, Medicaid, or any other insurance benefits be made on my behalf to **Ohio Medical Transportation (MedFlight)** for any services provided to me by MedFlight now or in the future. I understand that I am financially responsible for the services provided to me by MedFlight, regardless of my insurance coverage, and in some cases, may be responsible for an amount in addition to that which was paid by my insurance. I agree to immediately remit to MedFlight any payments that I receive directly from insurance or any source whatsoever for the services provided to me and I assign all right to such payments to MedFlight. I authorize MedFlight to appeal payment denials or other adverse decisions on my behalf without further authorization. I authorize and direct any holder of medical information or documentation about me to release such information to MedFlight and its billing agents, and/or the Centers for Medicare and Medicaid Services and its carriers and agents, and/or any other payers or insurers as may be necessary to determine these or other benefits payable for any services provided to me by MedFlight, now or in the future. A copy of this form is valid as an original.

Privacy Practices Acknowledgment: by signing below, I acknowledge that I have received MedFlight's Notice of Privacy Practice.

SIGNATURE SECTION:

One of the following sections MUST be completed.

SECTION I – PATIENT SIGNATURE

The patient must sign here unless the patient is physically or mentally incapable of signing.

X ______________________

Patient Signature or Mark

If the patient signs with an "X" or other mark, someone, other than the crew, sign below as a witness.

X ______________________

Witness Signature

X ______________________

Witness Printed Name

If patient is physically or mentally incapable of signing, Section II must be completed.

SECTION II – AUTHORIZED REPRESENTATIVE SIGNATURE

Complete this section **only** if patient is physically or mentally incapable of signing.

Reason the patient is physically or mentally incapable of signing:

____

Authorized representative include **only** the following individuals (check one):

- ☐ Patient's Legal Guardian ☐ Patient's Health Care Power of Attorney
- ☐ Relative or other person who receives government benefits on behalf of patient
- ☐ Relative or other person who arranges treatment or handles the patient's affairs.
- ☐ Representative of an agency or institution that furnished care, services or assistance to the patient.

*I am signing **on behalf of the patient**. I recognize that signing on behalf of the patient is not an acceptance of financial responsibility for the services rendered.*

X ______________________ ______________________

Representative Signature and Title Printed Name of Representative

SECTION III – EMERGENCIES ONLY – AMBULANCE CREW AND FACILITY REPRESENTATIVE SIGNATURES

Complete this section **only** for emergency ambulance transports, if patient was physically or mentally incapable of signing, **and** no authorized representative (as listed in Section II) was available or willing to sign on behalf of the patient at the time of service.

A. Ambulance Crew Member Statement (must be completed by crew member at time of transport)

My signature below indicates that, at the time of service, the patient named above was physically or mentally incapable of signing, and that none of the authorized representatives listed in Section II of this form were available or willing to sign on the patient's behalf.

Reason pt incapable of signing: ______________________

Name and Location of Receiving Facility: ______________________ Time at Receiving Facility: ____________

X ______________________ ______________________

Signature and Title of Crewmember Printed Name of Crewmember

B. Receiving Facility Representative Signature

The above-named patient was received by this facility at the date and time indicated above.

X ______________________ ______________________

Signature of Receiving Facility Representative Printed Name and Title of Receiving Facility Representative

OR

C. Secondary Documentation (from Receiving Facility)

If no facility representative signature is obtained, the ambulance crew should attempt to obtain one or more of the following forms of documentation from the receiving facility that indicates that the patient was transported to that facility by ambulance on the date and time indicated above. The release of this information by the hospital to the ambulance service is expressly permitted by §164.506(c) of HIPAA.

- ☐ Patient Care Report (signed by representative of facility) ☐ Facility Face Sheet/Admissions Record
- ☐ Patient Medical Record ☐ Hospital Log or Other Similar Facility Record

Updated 1/17/08

Stabilization and Transfer
other items

- appropriate radiographs
  - chest x-ray
  - pelvis x-ray
  - CT head
  - CT neck
  - CT chest
  - CT abdomen/pelvis
- do not delay transfer

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Thank you !

Med Flight