Critically Ill Transport for Dummies
Advanced Topics in Medical Direction

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DISCLOSURE

> No Disclosures
OBJECTIVES

At the conclusion of this activity, the learner should be able to:

- Identify the limitations for inter-facility transports.
- Identify some indications for inter-facility transports.
- Identify what is good to send, what can’t be sent, and what requires consultation.
- Recognize the challenges of care in providing inter-facility transport.

The Literature (or lack thereof)

- No randomized trials of critical care transport, with the majority of the literature based on observational studies, case series, and expert opinion.
- Studies often lack a control group. In air versus ground studies, the ground cohort often serves as the control group.
- Of the literature out there, much of it is from Australia, the United Kingdom, and other areas of Europe.

Why do we transport?

- There are no clear guidelines.
  - Must weigh the potential benefits of transport to the patient against the potential risks.
  - Transfer should only occur if it is likely to improve the patient’s clinical outcome.
Why do we transport?

- Most commonly because of the need for investigations and/or specialized care.

Regionalization

Duplication of services

Cost

Access

- While only 21% of the United States population lives in rural areas without immediate access to specialist care, 60% of all fatal motor vehicle crashes occur in these rural areas.

Who do we transport?
Who do we transport?

- Trauma patients
  - Probably the largest group transferred

- Stroke patients
  - tPA is not the only time sensitive treatment

- Cardiac patients
  - 79% of STEMI patients transferred required an ALS intervention during the transport (most commonly anti-arrhythmic administration)

Who do we transport?

- High-risk OB patients
  - They need highly specialized care that is only available in certain areas.
  - But we can only transport them sometimes…

Who do we NOT transport?
Who do we NOT transport?

› High-risk OB patients
  - Active labor is a contraindication for critical care transport.
  - Helicopters are not equipped to provide simultaneous maternal and neonatal resuscitation.
  - Delivery or tocolysis should be achieved at the sending facility prior to transport and then if needed an additional neonatal team can be dispatched.

Who do we NOT transport?

› Cardiac arrest patients
  - Coding patients are not candidates for transport.
  - A patient in cardiac arrest will receive no benefit from rapid transport during resuscitation.
  - Performing cardiac resuscitation in a dimly lit, cramped, and moving space is not in the patient’s best interest.
  - Patients are only transported if return of spontaneous circulation is obtained...and maintained!!

Who do we NOT transport?

› Special Populations
  - Psychiatric patients
  - Prisoners
  - HazMat exposures
Who does the transport?

- Staffing
  - The patient must continue to receive the same level of care they were receiving at the referring hospital up to and during transport.
  - When comparing patients transported by specialist critical care transport teams to those transported by staff from the referring facility, the specialist teams were less likely to deliver an acidotic and hypotensive patient.

- Additional team members must be added as needed to provide for special equipment or conditions.
  - Perfusionists
  - Respiratory Therapists
  - Physicians
What is the best mode of transport?

- Decision is that of the referring physician.
  - As well as the risks and benefits of each type of transport.
  - There are no clearly recognized guidelines.

- Ground
  - Larger size
  - Takes longer

- Air
  - Rotor-wing
    - Quick
    - Constrained by weather
    - Expensive
    - Limited space and maneuverability
  - Fixed-wing
    - Long-distance
    - Can fly in most weather
    - Expensive

“A study of scene trauma transports found that if the patient was located 45 miles from the referring hospital, the patient’s transport was faster by air even with nonsimultaneous dispatch of the ground crew and helicopter crew.”

“Others note, however, that defining a universal distance beyond which the helicopter is faster is difficult.”

“A study from Canada found that even for long distances, due to variability in helipad placement, geography, and overall systems, ground transport may actually be faster than by air.”

Constraints in Transport

- Limited resources
  - Only a few crew members with inability to get an extra set of hands
  - You only have the medications and equipment in the vehicle
  - No internet
  - Ventilator has limited modes
  - No x-ray / CT / lab

Constraints in Transport

Volume 35-100 cubic feet

Constraints in Transport

Volume 325 cubic feet
Environmental challenges

- Vibration
  - Leads to fatigue on personnel
  - Can be hard on equipment
  - Discomfort for the patient

- Dryness
  - Leads to fatigue of personnel

- Loud
  - Difficult to assess patient

- Altitude
  - Physiologic considerations
How do we deal with the constraints?

- **Preparation:** What is your plan?
- **Anticipation:** Use technology, expect the worst
- **Training:** Regular, exhaustive, usability
- **Teamwork:** Crew must be able to rely on one another

What regulates the transport of the critically ill patient?

- **EMTALA**
  - An Australian study found that transferring a patient required an average of 4.7 phone calls per patient and a mean time of 1 hour from the time of the decision to transfer until the patient was accepted at a receiving facility.

What regulates the transport of the critically ill patient?

- **EMTALA**
  - Case law has established that “qualified personnel and equipment” may be a higher level of care than is generally available on most EMS transport vehicles.
  - *Burditt v US Department of Health and Human Services*
    - Transfer of pregnant patient who delivered in the ambulance during the transport. The transfer was found to be inappropriate, because a physician and a fetal monitor (which were available at the sending facility) did not accompany the patient.
Who is the medical control for the transport?
- Sending physician
  - Knows the patient
- Receiving physician
  - Often times is the specialist
- Transport agency’s medical director
  - Knows transport teams capabilities, equipment, supplies, protocols

It would be great if critical care transports were overseen by physicians trained in critical medicine and out-of-hospital medicine.

What is clinically important?
- Know when to say NO
- Vent from
  - Bedside to bedside
  - Know the vent / know the modes
  - Don’t use long-acting paralytics
- Secure the airway at the sending facility
- Do we ever need a long spine board?

What to do next?
- Review your critical care protocols
- Talk to the medical director of whoever does critical care transport in your area
- Find an intensivist and make them interested in out-of-hospital medicine
- Learn some critical care
References


THANK YOU!

Questions?

- Please contact me if I can be of any assistance
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