Pediatric Critical Care Transport

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Objectives

- Review the basic principles of transport
- Overview of our transport process
- Non-Technical skills during transport

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Droogh *et al. Critical Care* (2015) 19:62
DOI 10.1186/s13054-015-0749-4

CRITICAL CARE

REVIEW Open Access

Transferring the critically ill patient: are we there yet?

Joep M Droogh[1*], Marije Smit[1], Anthony R Absalom[2], Jack JM Ligtenberg[3] and Jan G Zijlstra[1]

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Introduction

- Pediatric intensive care unit → decreased morbidity/mortality for many devastating pediatric illnesses
- PICU regionalization/patient distance often warrant need for transport
- Initial stabilization followed by appropriate transport → lowered morbidity/mortality

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Intensive Care Medicine
June 2000, Volume 26, Issue 6, pp 740–744 | Cite as

Comparison of a specialist retrieval team with current United Kingdom practice for the transport of critically ill patients

Authors Authors and affiliations
G. Bellingan, T. Olivier, S. Batson, A. Webb

- Reduction in acute physiology disturbances and a reduced mortality in critically ill patients transferred by a specialized retrieval team

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Intensive Care Med. 2004 Feb;30(2):302-308. doi: 10.1007/s00134-003-2066-7. Epub 2003 Nov 15.

Comparison of interhospital pediatric intensive care transport accompanied by a referring specialist or a specialist retrieval team.

Vos GD[1], Nissen AC[2], H M Nieman F[3], Meurs MMB[4], van Vlaardenburg DA[5], Ramsay G[6], Donckerwolcke RAMG[6].

- 137 transports performed by referral specialist (mainly pediatrician)
- 112 transports performed by pediatric intensivist team
- Transfers performed by the referral physicians were associated with a higher incidence of complications, unviability of equipment and more frequent requirements for acute intervention

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Pediatric Critical Care Transport Team

- Established in 1989
- Two transport teams
  - Resident physician, transport nurse, transport respiratory therapist
- Ground ambulance, helicopter, fixed wing
- 800-1000 pediatric transports per year
- Dispatch team within 30 minutes of initial call

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Goal

- To provide safe, state of the art pediatric medical care while in transit
- Extension of pediatric intensive therapy to referring hospital via direct communication and the transport team
- Early resuscitation ABC's, cerebral protection and use of Evidence based medicine

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Indications for Emergency Transport of Pediatric Patients

(Johnson & Gonyea, *Mayo Clin Proc*, 1993; 68:982-987)

- Respiratory--30%
- Neurologic--22%
- Trauma
  - Head--7%
  - Other--11%
- Cardiovascular--6%
- Other--24%

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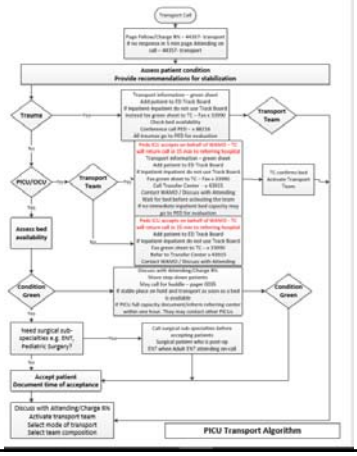
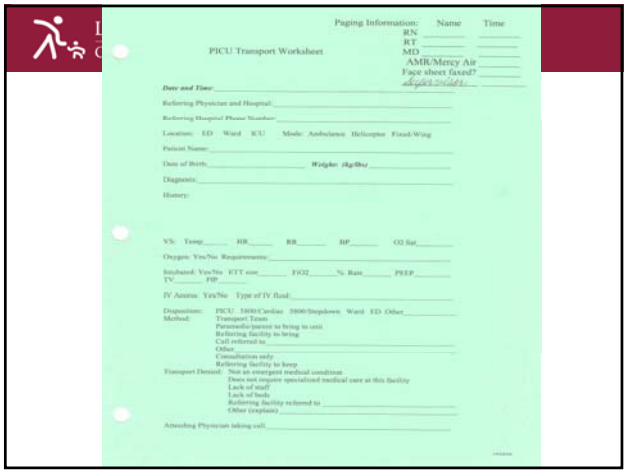
Transport Process

- ~ A call comes in from another hospital
- ~ The administrative assistant will take the call and fill out part of an information sheet (green sheet)
- ~ The PICU attending/fellow will talk to the MD at the facility and gather more information determine the patient's status
- ~ Availability of beds is considered with the Charge Nurse and patient placement
- ~ The patient is accepted and the transport team is activated



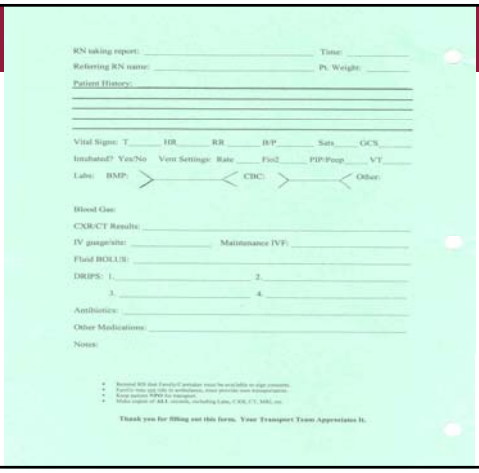


PICU Transport Worksheet

Paging Information: Name Time
RN
RT
MD
AMR/Mercy Air
Face sheet faxed?
Weight Orders?

Date and Time:
Referring Physician and Hospital:
Referring Hospital Phone Number:
Location: ED Ward ICU Mode: Ambulance Helicopter Fixed-Wing
Patient Name:
Date of Birth: Weight: (kg/lbs)
Diagnosis:
History:

VS: Temp HR RR BP O2 Sat
Oxygen: Yes/No Requirements:
Intubated: Yes/No ETT size: FIO2 % Rate PEEP
TV PIP
IV Access: Yes/No Type of IV fluid:
Disposition: PICU 3800/Cardiac 3800/Stepdown Ward ED Other
Method: Transport Team
Parents/to/parent to bring to unit
Referring facility to bring
Call referred to
Other
Consultation only
Referring facility to keep
Transport Denied: Not an emergent medical condition
Does not require specialized medical care at this facility
Lack of staff
Lack of beds
Referring facility referred to
Other (explain)
Attending Physician taking call



RN taking report: _____ Time: _____

Referring RN name: _____ Pt. Weight: _____

Patient History: _____

Vital Signs: T_____ HR_____ RR_____ B/P_____ Sats_____ GCS_____

Intubated? Yes/No Vent Settings: Rate_____ Fio2_____ PIP/Peep_____ VT_____

Labs: BMP: CBC: Other:

Blood Gas:

CXR/CT Results: _____

IV gauge/site: _____ Maintenance IVF: _____

Fluid BOLUS: _____

DRIPS: 1._____ 2._____

3._____ 4._____

Antibiotics: _____

Other Medications: _____

Notes:

Thank you for filling out this form. Your Transport Team Appreciates It.

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Pediatric Transport Team

Composition

- Physician - Pediatric resident /fellow
- PICU Nurse
- PICU Respiratory Therapist
- Ambulance driver/Helicopter pilot
- EMT

Skills

- Cognitive
- Procedural
- Non-technical skills

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Pre transport Information

- »Referring physician, hospital, city, telephone number
- »Patient name, age, weight
- »Prehospital history
- »Clinical status at presentation, current
- »Interventions performed
- »Current medications
- »Current problem list
- »Allergies

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Pediatric Transport Equipment

- Comprehensive/compatible
- Self-sufficient
- Last duration of transport
- Battery powered
- Compact, light
- Minimal movement artifact

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Pediatric Transport Equipment

- BP cuffs
- Suction catheters
- Infant/adult electrodes
- Lancets
- Cotton balls
- Band-aids
- Surgilube
- Alcohol wipes
- Betadine swabs
- Crystalline temps
- Syringes
- Tubing
- Feeding tubes
- Foley catheters
- Sterile gloves
- Needles
- Tape
- IV's
- Arm boards
- Tourniquets
- Intraosseous needles
- Bulb syringe
- Gauze
- Minor surgical instruments

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Pediatric Transport Medications

- Adenosine
- Albumin
- Amiodarone
- Ampicillin
- Ativan
- Atropine
- Benadryl
- Calcium
- Cefotaxime
- Decadron
- Dextrose
- Dilantin
- Dopamine
- Epinephrine
- Isuprel
- Lasix
- Lidocaine
- Mannitol
- Milrinone
- Morphine
- Sodium bicarbonate
- Nafcillin
- Nipride
- Norcuron
- Pentothal
- Phenobarbital
- Prostin
- Solumedrol
- Versed
- Crystalloid
- 3% saline
- Chemstrips

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Medication Bag

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Nursing Supplies

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Respiratory Supplies

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Common complications

Table 1 Incidents

	Medical		
	Cardiovascular	**Respiratory**	**Technical**
Incidence	6-24%	0-15%	9-36%
Common events	Hypo-/hypertension	Inadequate ventilation	Power failure
	Brady-/tachycardias	Oxygen desaturation	Gas supply problems
	Arrhythmias		Missing equipment
			Damaged equipment

Up to 31% of incidents are classified as significant; up to 79% require an intervention; 52 to 91% are preventable.

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Anesthetists' Non-Technical Skills

Categories	Elements
Task management	• Planning and preparing • Prioritising • Providing and maintaining standards • Identifying and utilising resources
Team working	• Co-ordinating activities with team members • Exchanging information • Using authority and assertiveness • Assessing capabilities • Supporting others
Situation awareness	• Gathering information • Recognising and understanding • Anticipating
Decision making	• Identifying options • Balancing risks and selecting options • Re-evaluating

+ Confirms roles and responsibilities of team members
+ Discusses case with surgeons or colleagues
+ Considers requirements of others before acting
+ Co-operates with others to achieve goals

E.g. behavioural markers for good practice

E.g. behavioural markers for poor practice

– Reduces level of monitoring because of distractions
– Responds to individual cues without confirmation
– Does not alter physical layout of workspace to improve data visibility
– Does not ask questions to orient self to situation during hand-over

Non-technical skills in the intensive care unit
T.Reader, R. Flin, K. Lauchr
British Journal of Anesthesiology 96 (5):551-9 (2006)

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Question

» Following elements are essential in a safe and efficient pediatric critical care transport

» A) Training and skill
» B) Initial resuscitation at the referring hospital
» C) Effective communication between the teams
» D) Specialized equipment
» E) All of the above