Preplanning Disaster Triage for Pediatric Hospitals

TRAIN TOOLKIT

Lucile Packard Children's Hospital





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INTRODUCTION

The Triage by Resource Allocation for IN-patient (TRAIN) matrix is a tool for pediatric hospital disaster "pre-planning". It categorizes pediatric inpatients according to their resource transportation needs during an evacuation or mass casualty event requiring increased surge capacity. This tool can be implemented manually or within an electronic medical record. It accurately assesses patients quickly and easily to determine transport needs, which allows institutions to request and receive resources required for vertical movement in disaster.

This innovative tool applies to hospitalized patients with regards to their current resource transportation needs. Previous triage tools are primarily used in the pre-hospital setting and are based on severity of illness or predictors of mortality¹⁻³, which are not applicable to the inpatient population. This tool is most effective when incorporated into daily practices prior to a disaster.

This tool was originally created for the neonatal population⁴ and then modified for hospitalized pediatric and obstetrics patients. There are also future plans to incorporate the adult inpatient population.

LPCH TRAIN MATRIX

	Triage by Resou	y Resource Allocation for IN-patients [TRAIN]©	tients [TRAIN]©	
Transport	Car	BLS	Critical Care	Specialized
Life Support	Stable	Minimal	Moderate-Stable	Max-Unstable
Mobility	Car/Carseat	Wheelchair/stretcher	Transport rig	Immobile
Nutrition	PO Feeds	PO/NG	NG/PO + TPN/IL	NPO & TPN/IL
Pharmacy	PO Meds	PO Meds/IV Meds/IV Fluids	IV Drip x1	$\text{IV drip} \geq 2$
	Minimal = Hood o	Minimal = Hood or Low Flow Cannula O2, Peritoneal Dialysis, etc.	s, etc.	
Life Support	Moderate-Stable = grams, etc.	Moderate-Stable = Conventional Ventilator, CPAP/BiPAP/Hi-Flow, Externally paced, chest tube, wt < 1500 grams, etc.	-Flow, Externally paced, che	st tube, wt < 1500
	Max-Unstable = F	Max-Unstable = Highly specialized equipt., e.g., HFOV, ECMO, iNO, CVVH, Berlin Heart, etc.	J, iNO, CVVH, Berlin Heart,	, etc.
	Car/Carseat = able to ride in	e to ride in automobile with age-appropriate restraints	restraints	
Mobility	Transport rig = ag	Transport rig = age-appropriate rig with equipment for connecting to ambulance	cting to ambulance	
	Immobile = Unsa	$Immobile = Unsafe \ to \ move \ without \ special \ equipment \ e.g., \ neurosurgical/bariatric$	eurosurgical/bariatric	

BLUE

Transport: Car or Bus Life Support: Stable

- No need for monitoring*
- Room air
- Uncomplicated drains (ie: bili or JP drains)

Mobility: Car/Carseat

• No specialized equipment needed to transport patient

Nutrition: PO Feeds

- Oral feeds only
- No tube feeds

Pharmacy: PO Meds

- Oral meds only
- No intravenous medications

^{*}These patients may be considered for transport by car/bus or for discharge home in the setting of a disaster in which altered standards of care are present.

<u>GREEN</u>

Transport: Ambulance (BLS/ALS)

Life Support: Minimal

- Low flow cannula or hood oxygen
- Peritoneal dialysis (intermittent)
- May require cardiorespiratory monitoring

Mobility: Wheelchair/stretcher

- Baseline requirement (cerebral palsy)
- Restricted mobility due to devices (ie: spica casts, traction, halos, etc)

Nutrition: PO/NG

 Oral feeds in combination with tube feeds (ie: G-tube, nasogastric, nasoduodenal, nasojejunal, orogastric)

Pharmacy: PO Meds/IV Meds/IV fluids

- Intermittent intravenous medications
- Standard IV fluids (ie: dextrose with electrolytes, etc)

YELLOW

Transport: Critical Care

• Ambulance with RN +/- RT +/- MD

Life Support: Moderate-stable

- Conventional Ventilator
- CPAP/BiPAP/Hi-Flow/Continuous Nebulizer
- External pacemaker
- Chest tube
- Weight < 1500 grams
- Etc.

Mobility: Transport rig

- As based on equipment required to safely transport patient
 - o Examples: external ventricular drains, etc

Nutrition: NG/PO + TPN/IL

 Combination of enteral feeds (by mouth or tube feed) and parenteral nutrition (total parenteral nutrition/intralipid)

Pharmacy: IV drips X1

- Can have intermittent intravenous medications
- Single intravenous medication drip (ie. Insulin, basal narcotic drip, pressors, etc)

RED

Transport: Specialized

 Ambulance or Military –supported transport with combination of multiple RNs, likely with MD and RT

Life Support: Max-Unstable

- Highly specialized equipment
 - o High Frequency Oscillatory Ventilation
 - o ExtraCorporeal Membrane Oxygenation
 - o Inhaled Nitric Oxide
 - o Continuous Veno-Venous Hemofiltration
 - Ventricular Assist Devices
 - o Etc.

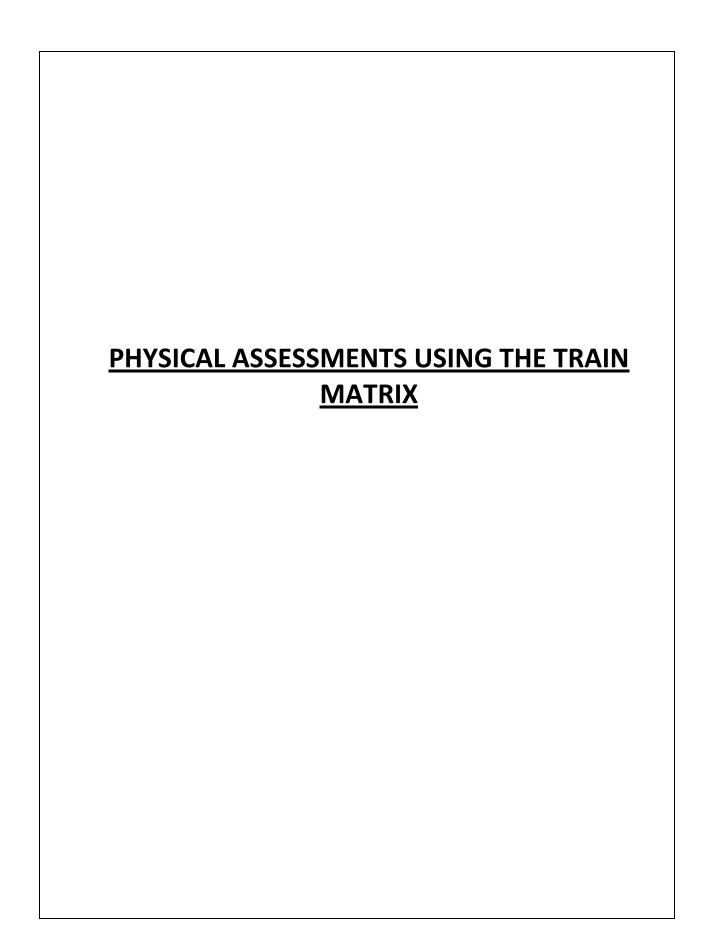
Mobility: Immobile

Nutrition: NPO & TPN/IL

- No enteral feeds
- Parenteral nutrition only

Pharmacy: IV drips ≥ 2

- Can have intermittent intravenous medications
- Multiple intravenous medication drips (ie. Insulin, basal narcotic drip, pressors, etc)



Daily Process

- 1. Assign one person *daily* to complete the TRAIN assessment form (see addendum A).
 - a. This individual may be whoever you decide is capable of completing the process accurately (i.e., Staff Nurse, Charge RN, Nurse Manager, Physician).
 - b. The accuracy of this tool is best when administered by someone familiar with the patients.
- Enter each of the Unit's bed numbers on the TRAIN assessment form.
- 3. Enter the name of the patient occupying each associated bed space.
- 4. Complete the information, including: 1) Date, 2) Time, and 3) Unit
- 5. Assign the appropriate color to each patient, according to the TRAIN matrix.
- 6. At the bottom of the table, total the number of patients in each TRAIN category
- 7. Have the TRAIN matrix and completed assessment forms readily available with disaster plans on your unit.

Instructions on Using the TRAIN Matrix

- 1. Look at each patient and assess by the following methods
 - a. Attached to Patient
 - i. Airway/Breathing- what equipment is being used, BiPAP, oxygen, etc.
 - ii. Circulation IV medications running (type and #), feeding tube, ECMO, etc.
 - iii. Physical assessment CT, casts, drains
 - b. In the room
 - i. Machines not in use PD, Bipap
 - ii. Mobility specialized wheelchair in room
- 2. Each patient will be categorized by maximum needs of each resource type (farthest category to the right).
 - a. For example, a patient who is on room air on a regular diet but is on a basal rate narcotic medication would be categorized as Yellow.

CONADULTED ACCECCAMENITO LIGINIC THE TRAIN
COMPUTER ASSESSMENTS USING THE TRAIN
<u>MATRIX</u>

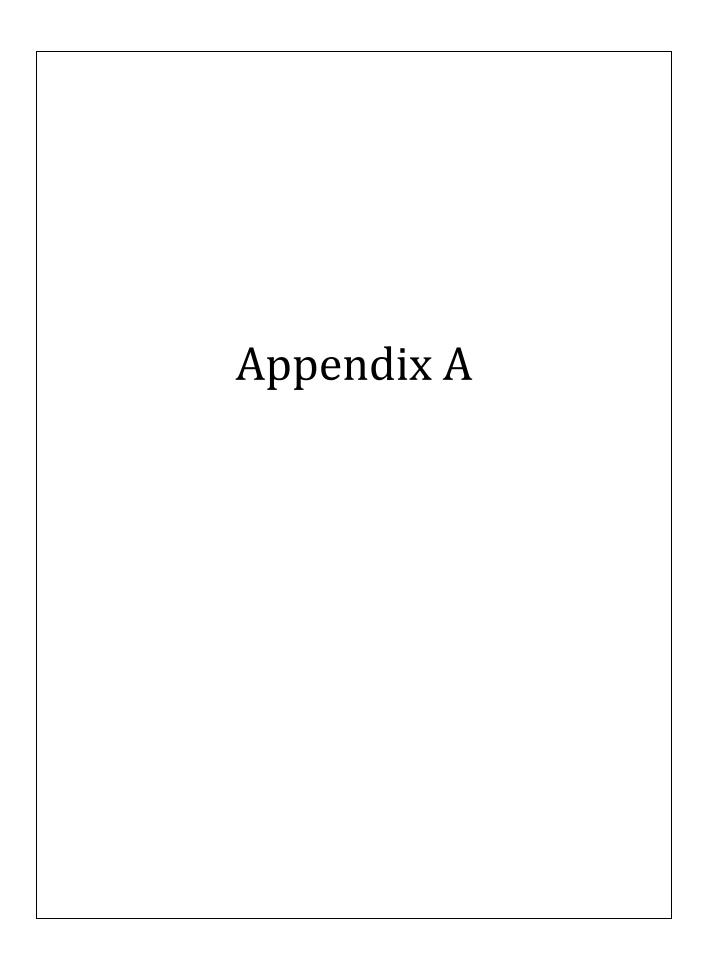
HELPFUL HINTS FOR COMPUTER CODING

We have found that computerization of this matrix decreases impact to nursing workflow and is more accurate and timely than when used manually. There may be institutions which do not yet have this capability, but which may grow to have them. We also recognize that multiple electronic medical record products are available. Each product will require different algorithms and coding elements. The following are helpful hints which we have used to successfully code the TRAIN matrix into our electronic medical record:

- The most accurate data for Life Support, Mobility and Nutrition resource types were pulled from nursing documentation
- The most accurate data for Pharmacy was pulled from the electronic medical administration record
- When programming the algorithm using the TRAIN matrix, categorization occurs with the highest resource need
- If data is documented in multiple places within the electronic chart, the coding should include both places and use the most recently charted data
- For Life Support and Nutrition, data is pulled over time (8 hours) to include patients who need intermittent ventilatory or nutritional support
- All categorization should be compiled into a report which is easily accessible
 - We recommend that the reports are printed once a shift for hospitals with high acuity where patient status can fluctuate more frequently
 - We recommend that these reports are made available to both unit and administrative leadership

REFERENCES

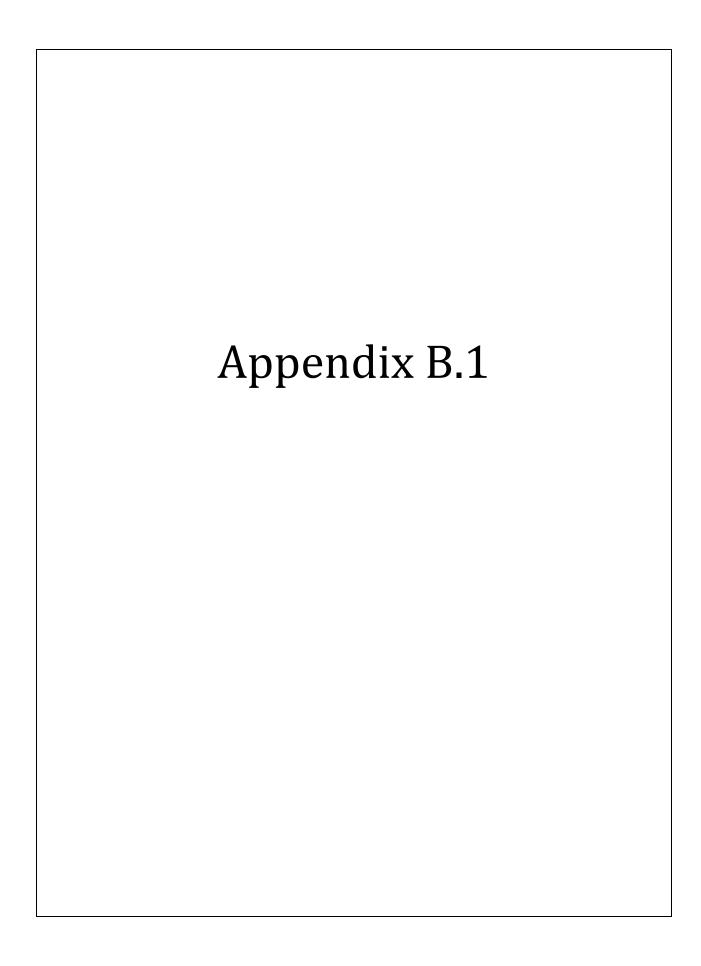
- 1. Hohenhause, S.M. (2005). Practical considerations for providing pediatric care in a mass casualty incident. Nursing Clinics North America. 40, 523-533.
- 2. Romig, L. (2002). Pediatric triage. A system to JumpSTART your triage of young patients. *Journal of Emergency Management*. 27(7), 52-58
- 3. Cohen R, Murphy B, Ahern T, Hackel A. (2010). Regional Disaster Planning for Neonatology. *Journal of Perinatology*, 30: 709-711.
- 4. Marcin JP, Pollack, MM, (2002). Triage scoring systems, servity of illness measures, and mortality predictions models in pediatric trauma. *Crit. Care Med* 30: 11 (Suppl) S457-S467.



TRAIN ASSESSMENT FORM te: Unit:

Date:

BED NUMBER	PATIENT NAME	BLUE	GREEN	YELLOW	RED







Using the TRAIN Matrix Self-Assessment Tool: Cases



Cases written by Anna Lin, MD Edited by Kristine Taylor, RN

Lucile S. Packard Children's Hospital Stanford University Medical Center May 2012





Johnny is a 5 year old boy who was admitted for asthma. He has a peripheral IV and is receiving maintenance fluids. He is requiring 2 lpm nasal cannula oxygen for support of his hypoxia. He is on oral steroids and inhaled albuterol.

– Using the TRAIN Matrix, how would this patient be categorized?





Joy is a 3 day old term newborn baby who is feeding well and gaining weight appropriately. She has not needed phototherapy and discharge is pending her mother's release after the C-section.

– Using the TRAIN Matrix, how would this patient be categorized?





Tommy is a 9 year old who sustained a dislocated femur fracture and requires traction in a cast. He has been using patient controlled analgesia with a basal rate. He has an epidural for additional pain control. His antibiotics were discontinued this morning, and he is tolerating a regular diet.

– Using the TRAIN Matrix, how would this patient be categorized?





Neveah is a 3 day old ex-29-week premature baby girl who has persistent pulmonary hypertension. She is requiring high frequency oscillatory ventilation with inhaled nitric oxide. She has been NPO and is on total parenteral nutrition.

– Using the TRAIN Matrix, how would this patient be categorized?





Katie is a 5 week old baby girl who was admitted for fever without source. She was found to have an E. coli urosepsis with bacteremia and is on daily intravenous ceftriaxone. She is otherwise breastfeeding without difficulty.

– Using the TRAIN Matrix, how would this patient be categorized?





Janice is a 12 year old with quadriplegic spastic cerebral palsy, developmental delay and seizure disorder admitted for pneumonia. She is on intravenous antibiotics. She is wheelchair-bound. She recently had a G-tube placed and receives a combination of bolus feeds during the day and continuous feeds at night. At baseline, she receives BiPAP at night, but has been on BiPAP throughout the day since she has been ill.

– Using the TRAIN Matrix, how would this patient be categorized?





Polly is a 6 month old ex-32-week premature infant girl who has short bowel syndrome due to necrotizing enterocolitis. She was admitted 3 days ago with fever and was found to have a central line infection. She is currently on intermittent IV antibiotics for the infection. Because of her short gut, she is not able to tolerate enteral feeds and has been on a 12 hour cycle of total parenteral nutrition.

Using the TRAIN Matrix, how would this patient be categorized?





Kevin is a 3 year old previously healthy boy who was admitted a half hour ago with scorpion envenomation. Because the antivenin is not readily available, he was electively intubated and placed on a midazolam drip at 6 mg/kg/hr.

–Using the TRAIN Matrix, how would this patient be categorized?





Camila is a 3 year old who was admitted for Kawasaki disease. She received IVIG last night and is now on high dose aspirin. She has been off IV fluids, is feeding well and is currently being monitored for fever after her IVIG treatment.

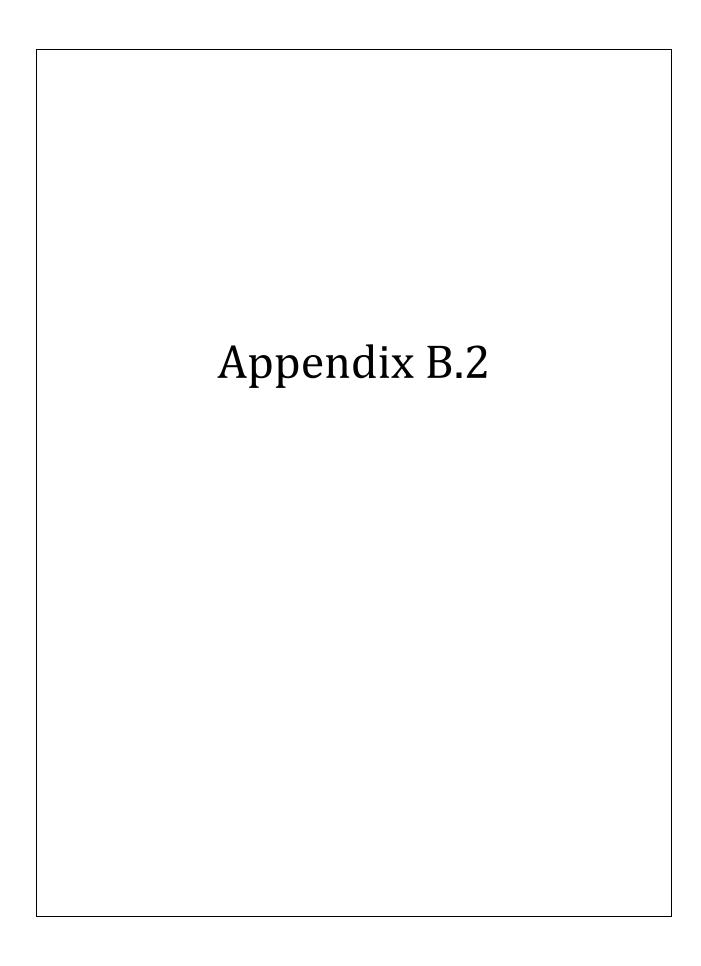
–Using the TRAIN Matrix, how would this patient be categorized?





James is a 6 year old who was admitted for asthma exacerbation, respiratory distress and hypoxia. He is requiring IV steroids, IV fluids and continuous albuterol treatments.

–Using the TRAIN Matrix, how would this patient be categorized?







Using the TRAIN Matrix Self-Assessment Tool: Cases



Cases written by Anna Lin, MD Edited by Kristine Taylor, RN

Lucile S. Packard Children's Hospital Stanford University Medical Center May 2012





Johnny is a 5 year old boy who was admitted for asthma. He has a peripheral IV and is receiving maintenance fluids. He is requiring 2 lpm nasal cannula oxygen for support of his hypoxia. He is on oral steroids and inhaled albuterol.

– Using the TRAIN Matrix, how would this patient be categorized?



Johnny is a 5 year old boy who was admitted for asthma. He has a peripheral IV and is receiving maintenance fluids. He is requiring 2 lpm nasal cannula oxygen for support of his hypoxia. He is on oral steroids and inhaled albuterol.

Johnny would fall into the GREEN category.

<u>Triage by Resource Allocation for IN-patients</u> [TRAIN][©]

Transport	Car	BLS	Critical Care	Specialize d
Life Support	Stable	Minimal	Moderate- Stable	Max- Unstable
Mobility	Car/Carseat	Wheelchair/stretcher		Immobile
Nutrition	PO Feeds	PO/NG	NG/PO + TPN/IL	NPO & TPN/IL
Pharmacy	PO Meds	PO Meds/IV Meds/IV Fluids	IV Drip x1	IV drip ≥ 2

	Minimal = Hood or Low Flow Cannula O2, Peritoneal Dialysis, etc.
Life Support	Moderate-Stable = Conventional Ventilator, CPAP/BiPAP/Hi-Flow, Externally paced, chest tube, wt < 1500 grams, etc.
	Max-Unstable = Highly specialized equipt., e.g., HFOV, ECMO, iNO, CVVH, Berlin Heart, etc.
	Car/Carseat = able to ride in automobile with age-appropriate restraints
Mobility	Transport rig = age-appropriate rig with equipment for connecting to ambulance
	Immobile = Unsafe to move without special equipment e.g., neurosurgical/bariatric





Joy is a 3 day old term newborn baby who is feeding well and gaining weight appropriately. She has not needed phototherapy and discharge is pending her mother's release after the C-section.

– Using the TRAIN Matrix, how would this patient be categorized?



Joy is a 3 day old term newborn baby who is feeding well and gaining weight appropriately. She has not needed phototherapy and discharge is pending her mother's release after the C-section.

Joy would fall into the **BLUE** category.

<u>Triage by Resource Allocation for IN-patients [TRAIN][©]</u>

Transport	Car	BLS	Critical Care	Specialized
Life Support	Stable	Minimal	Moderate- Stable	Max- Unstable
Mobility	Car/Carseat	Wheelchair/stretcher	Transport rig	Immobile
Nutrition	PO Feeds	PO/NG	NG/PO + TPN/IL	NPO & TPN/IL
Pharmacy	PO Meds	PO Meds/IV Meds/IV Fluids	IV Drip x1	IV drip ≥ 2

	Minimal = Hood or Low Flow Cannula O2, Peritoneal Dialysis, etc.
Life	Moderate-Stable = Conventional Ventilator, CPAP/BiPAP/Hi-Flow,
Support	Externally paced, chest tube, wt < 1500 grams, etc.
Support	Max-Unstable = Highly specialized equipt., e.g., HFOV, ECMO, iNO,
	CVVH, Berlin Heart, etc.
	Car/Carseat = able to ride in automobile with age-appropriate
	restraints
Mobility	Transport rig = age-appropriate rig with equipment for connecting to
	ambulance
	Immobile = Unsafe to move without special equipment e.g.,
	neurosurgical/bariatric





Tommy is a 9 year old who sustained a dislocated femur fracture and requires traction in a cast. He has been using patient controlled analgesia with a basal rate. He has an epidural for additional pain control. His antibiotics were discontinued this morning, and he is tolerating a regular diet.

– Using the TRAIN Matrix, how would this patient be categorized?



Tommy is a 9 year old who sustained a dislocated femur fracture and requires traction in a cast. He has been using patient controlled analgesia with a basal rate. His antibiotics were discontinued this morning, and he is tolerating a regular diet.

Tommy would fall into the YELLOW category

<u>Triage by Resource Allocation for IN-patients [TRAIN]</u>

Transport	Car	BLS	Critical Care	Specialized
Life	Stable	Minimal	Moderate-	Max-
Support	Stable	Willilliai	Stable	Unstable
Mobility	Car/Carseat	Wheelchair/stretcher <	Transport rig	Immobile
Nutrition	PO Feeds	PO/NG	NG/PO + TPN/IL	NPO & TPN/IL
Pharmacy	PO Meds	PO Meds/IV Meds/IV Fluids	IV Drip x1	IV drip ≥ 2

	Minimal = Hood or Low Flow Cannula O2, Peritoneal Dialysis, etc.
Life Support	Moderate-Stable = Conventional Ventilator, CPAP/BiPAP/Hi-Flow, Externally paced, chest tube, wt < 1500 grams, etc.
11	Max-Unstable = Highly specialized equipt., e.g., HFOV, ECMO, iNO, CVVH, Berlin Heart, etc.
	Car/Carseat = able to ride in automobile with age-appropriate restraints
Mobility	Transport rig = age-appropriate rig with equipment for connecting to ambulance
	Immobile = Unsafe to move without special equipment e.g., neurosurgical/bariatric





Neveah is a 3 day old ex-29-week premature baby girl who has persistent pulmonary hypertension. She is requiring high frequency oscillatory ventilation with inhaled nitric oxide. She has been NPO and is on total parenteral nutrition.

– Using the TRAIN Matrix, how would this patient be categorized?



Neveah is a 3 day old ex-29-week premature baby girl who has persistent pulmonary hypertension. She is intubated, on high frequency oscillatory ventilation and requiring inhaled nitric oxide. She has been NPO and is on total parenteral nutrition.

Neveah would fall into the **RED** category

<u>Triage by Resource Allocation for IN-patients [TRAIN]</u>[©]

Transport	Car	BLS	Critical Care	Specialized
Life	Stable	Minimal	Moderate-	Max-
Support	Stable	Willillai	Stable	Unstable
Mobility	Car/Carseat	Wheelchair/stretcher	Transport rig	Immobile
Nutrition	PO Feeds	PO/NG	NG/PO + TPN/IL	NPO & TPN/II
Pharmacy	PO Meds	PO Meds/IV Meds/IV Fluids	IV Drip x1	IV drip ≥ 2

	Minimal = Hood or Low Flow Cannula O2, Peritoneal Dialysis, etc.
Life Support	Moderate-Stable = Conventional Ventilator, CPAP/BiPAP/Hi-Flow, Externally paced, chest tube, wt < 1500 grams, etc.
	Max-Unstable = Highly specialized equipt., e.g., HFOV, ECMO, iNO, CVVH, Berlin Heart, etc.
Mobility	Car/Carseat = able to ride in automobile with age-appropriate
	restraints
	Transport rig = age-appropriate rig with equipment for connecting to ambulance
	Immobile = Unsafe to move without special equipment e.g.,
	neurosurgical/bariatric





Katie is a 5 week old baby girl who was admitted for fever without source. She was found to have an E. coli urosepsis with bacteremia and is on daily intravenous ceftriaxone. She is otherwise breastfeeding without difficulty.

– Using the TRAIN Matrix, how would this patient be categorized?



Katie is a 5 week old baby girl who was admitted for fever without source. She was found to have an E. coli urosepsis with bacteremia and is on daily intravenous ceftriaxone. She is otherwise breastfeeding without difficulty.

Katie would fall into the **GREEN** category.

Triage by Resource Allocation for IN-patients [TRAIN][©]

Transport	Car	BLS	Critical Care	Specialized
Life	Stable	Minimal	Moderate-	Max-
Support	Stable	lviiiiillai	Stable	Unstable
Mobility	Car/Carseat	Wheelchair/stretcher	Transport rig	Immobile
Nutrition	PO Feeds	PO/NG	NG/PO + TPN/IL	NPO & TPN/IL
Pharmacy	PO Meds	PO Meds/IV Meds/IV Fluids	IV Drip x1	IV drip ≥ 2

	Minimal = Hood or Low Flow Cannula O2, Peritoneal Dialysis, etc.
Life Support	Moderate-Stable = Conventional Ventilator, CPAP/BiPAP/Hi-Flow, Externally paced, chest tube, wt < 1500 grams, etc.
	Max-Unstable = Highly specialized equipt., e.g., HFOV, ECMO, iNO, CVVH, Berlin Heart, etc.
Mobility	Car/Carseat = able to ride in automobile with age-appropriate restraints
	Transport rig = age-appropriate rig with equipment for connecting to ambulance
	Immobile = Unsafe to move without special equipment e.g., neurosurgical/bariatric





Janice is a 12 year old with quadriplegic spastic cerebral palsy, developmental delay and seizure disorder admitted for pneumonia. She is on intravenous antibiotics. She is wheelchair-bound. She recently had a G-tube placed and receives a combination of bolus feeds during the day and continuous feeds at night. At baseline, she receives BiPAP at night, but has been on BiPAP throughout the day since she has been ill.

– Using the TRAIN Matrix, how would this patient be categorized?



Janice is a 12 year old with quadriplegic spastic cerebral palsy, developmental delay and seizure disorder admitted for pneumonia. She is on intravenous antibiotics. She is wheelchair-bound. She recently had a G-tube placed and receives a combination of oral feeds during the day and continuous feeds at night. At baseline, she receives BiPAP at night, but has been on BiPAP throughout the day since she has been ill.

Janice would fall into the YELLOW category

<u>Triage by Resource Allocation for IN-patients [TRAIN][©]</u>

Transport	Car	BLS	Critical Care	Specialized
Life	Stable	Minimal	Moderate-	Max-
Support	Stable	1711111101	Stable	Unstable
Mobility	Car/Carseat	Wheelchair/stretcher	Transport rig	Immobile
Nutrition	PO Feeds	PO/NG	NG/PO + TPN/IL	NPO & TPN/IL
Pharmacy	PO Meds	PO Meds/IV Meds/IV Fluids	IV Drip x1	IV drip ≥ 2

Life Support	Minimal = Hood or Low Flow Cannula O2, Peritoneal Dialysis, etc.
	Moderate-Stable = Conventional Ventilator, CPAP/BiPAP/Hi-Flow, Externally paced, chest tube, wt < 1500 grams, etc.
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Mobility	Car/Carseat = able to ride in automobile with age-appropriate restraints
	Transport rig = age-appropriate rig with equipment for connecting to ambulance
	Immobile = Unsafe to move without special equipment e.g., neurosurgical/bariatric





Polly is a 6 month old ex-32-week premature infant girl who has short bowel syndrome due to necrotizing enterocolitis. She was admitted 3 days ago with fever and was found to have a central line infection. She is currently on intermittent IV antibiotics for the infection. Because of her short gut, she is not able to tolerate enteral feeds and has been on a 12 hour cycle of total parenteral nutrition.

Using the TRAIN Matrix, how would this patient be categorized?



Polly is a 6 month old ex-32week premature infant girl who has short bowel syndrome due to necrotizing enterocolitis. She was admitted 3 days ago with fever and was found to have a central line infection. She is currently on intermittent IV antibiotics for the infection. Because of her short gut, she is not able to tolerate enteral feeds and has been on a 12 hour cycle of total parenteral nutrition.

Polly would fall into the **RED** category.

Triage by Resource Allocation for IN-patients [TRAIN][©]

Transport	Car	BLS	Critical Care	Specialized
Life Support	Stable	Minimal	Moderate- Stable	Max- Unstable
Mobility	Car/Carseat	Wheelchair/stretcher	Transport rig	Immobile
Nutrition	PO Feeds	PO/NG	NG/PO + TPN/IL	NPO & TPN/IL
Pharmacy	PO Meds	PO Meds/IV Meds/IV Fluids	IV Drip x1	IV drip ≥ 2

	Minimal = Hood or Low Flow Cannula O2, Peritoneal Dialysis, etc.
Support	Moderate-Stable = Conventional Ventilator, CPAP/BiPAP/Hi-Flow, Externally paced, chest tube, wt < 1500 grams, etc.
	Max-Unstable = Highly specialized equipt., e.g., HFOV, ECMO, iNO, CVVH, Berlin Heart, etc.
Mobility	Car/Carseat = able to ride in automobile with age-appropriate restraints
	Transport rig = age-appropriate rig with equipment for connecting to ambulance
	Immobile = Unsafe to move without special equipment e.g., neurosurgical/bariatric





Kevin is a 3 year old previously healthy boy who was admitted a half hour ago with scorpion envenomation. Because the antivenin is not readily available, he was electively intubated and placed on a midazolam drip at 6 mg/kg/hr.

–Using the TRAIN Matrix, how would this patient be categorized?



Kevin is a 3 year old previously healthy boy who was admitted a half hour ago with scorpion envenomation. Because the antivenin is not readily available, he was electively intubated and placed on a midazolam drip at 6 mg/kg/hr.

Kevin would fall into the YELLOW category.

Triage by Resource Allocation for IN-patients [TRAIN][©]

Transport	Car	BLS	Critical Care	Specialized
Life	Stable	Minimal (Moderate-	Max-
Support	Stable	IVIIIIIIIIII (Stable	Unstable
Mobility	Car/Carseat	Wheelchair/stretcher	Transport rig	Immobile
Nutrition	PO Feeds	PO/NG	NG/PO + TPN/IL	NPO & TPN/IL
Pharmacy	PO Meds	PO Meds/IV Meds/IV Fluids	IV Drip x1	IV drip ≥ 2

	Minimal = Hood or Low Flow Cannula O2, Peritoneal Dialysis, etc.
Life Support	Moderate-Stable = Conventional Ventilator, CPAP/BiPAP/Hi-Flow, Externally paced, chest tube, wt < 1500 grams, etc.
	Max-Unstable = Highly specialized equipt., e.g., HFOV, ECMO, iNO, CVVH, Berlin Heart, etc.
Mobility	Car/Carseat = able to ride in automobile with age-appropriate restraints
	Transport rig = age-appropriate rig with equipment for connecting to ambulance
	Immobile = Unsafe to move without special equipment e.g., neurosurgical/bariatric





Camila is a 3 year old who was admitted for Kawasaki disease. She received IVIG last night and is now on high dose aspirin. She has been off IV fluids, is feeding well and is currently being monitored for fever after her IVIG treatment.

–Using the TRAIN Matrix, how would this patient be categorized?



Camila is a 3 year old who was admitted for Kawasaki disease. She received IVIG last night and is now on high dose aspirin. She has been off IV fluids, is feeding well and is currently being monitored for fever after her IVIG treatment.

Camila would fall into the **BLUE** category.

Triage by Resource Allocation for IN-patients [TRAIN][©]

Transport	Car	BLS	Critical Care	Specialized
Life	Stable	Minimal	Moderate-	Max-
Support	Stable	wiiiiiiai	Stable	Unstable
Mobility	Car/Carseat	Wheelchair/stretcher	Transport rig	Immobile
Nutrition	PO Feeds	PO/NG	NG/PO + TPN/IL	NPO & TPN/IL
Pharmacy	PO Meds	PO Meds/IV Meds/IV Fluids	IV Drip x1	IV drip ≥ 2

	Minimal = Hood or Low Flow Cannula O2, Peritoneal Dialysis, etc.
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	Max-Unstable = Highly specialized equipt., e.g., HFOV, ECMO, iNO, CVVH, Berlin Heart, etc.
	Car/Carseat = able to ride in automobile with age-appropriate
Mobility	restraints
	Transport rig = age-appropriate rig with equipment for connecting to ambulance
	Immobile = Unsafe to move without special equipment e.g.,
	neurosurgical/bariatric





James is a 6 year old who was admitted for asthma exacerbation, respiratory distress and hypoxia. He is requiring IV steroids, IV fluids and continuous albuterol treatments.

–Using the TRAIN Matrix, how would this patient be categorized?



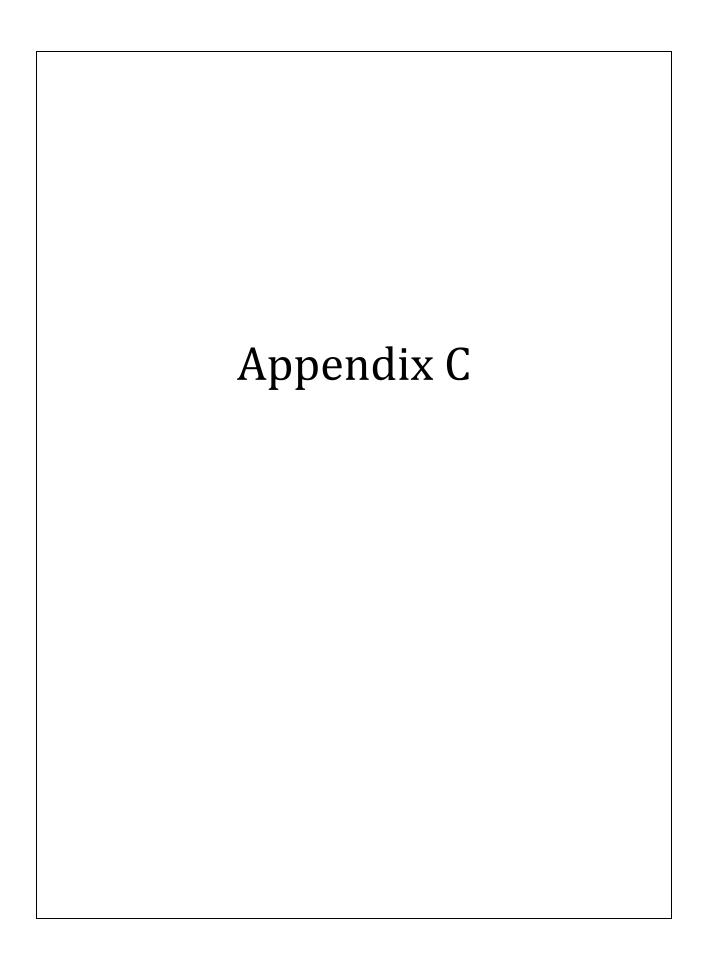
James is a 6 year old who was admitted for asthma exacerbation, respiratory distress and hypoxia. He is requiring IV steroids, IV fluids and continuous albuterol treatments.

James would fall into the YELLOW category.

Triage by Resource Allocation for IN-patients [TRAIN][©]

Transport	Car	BLS	Critical Care	Specialized
Life	Stable	Minimal	Moderate-	Max-
Support			Stable	Unstable
Mobility	Car/Carseat	Wheelchair/stretcher	Transport rig	Immobile
Nutrition	PO Feeds	PO/NG	NG/PO +	NPO &
			TPN/IL	TPN/IL
Pharmacy	PO Meds	PO Meds/IV Meds/IV	IV Drip x1	IV drip ≥ 2
		Fluids		1v urip <u>></u> &

Life Support	Minimal = Hood or Low Flow Cannula O2, Peritoneal Dialysis, etc.
	Moderate-Stable = Conventional Ventilator, CPAP/BiPAP/Hi-Flow, Externally paced, chest tube, wt < 1500 grams, etc.
	Max-Unstable = Highly specialized equipt., e.g., HFOV, ECMO, iNO, CVVH, Berlin Heart, etc.
Mobility	Car/Carseat = able to ride in automobile with age-appropriate restraints
	Transport rig = age-appropriate rig with equipment for connecting to ambulance
	Immobile = Unsafe to move without special equipment e.g., neurosurgical/bariatric







Preplanning Disaster Triage for Pediatric Hospitals



TRAIN
Triaging by Resource Allocation for Inpatients

Objectives

- Be able to quickly assess and accurately request the right resources from the emergency operations center.
- Streamline communication with a common code.
- Implement a standardized and automated inpatient hospital evacuation triage system with minimal impact to workflow.
- Increase awareness and disaster preparedness across the institution.





Emergency vs Disaster

A disaster is a type of emergency that, due to its complexity, scope, or duration, threatens the organization's capabilities and requires outside assistance to sustain [patient] care, safety, or security functions."





Status of Medical Triage

- Designed for Mass Casualty Events [MCE].
- Adapted from military for battlefield use.
- Currently the only types of trauma scoring systems involve pre-hospitalization assessment and predictors of morality ²⁻⁴.
- Difficult to apply during hospital disaster.





Background

- •Institute of Medicine (2006) recommends pediatric preparedness in developing disasters plan that address pediatric surge capacity.
 - -Understanding resource availability
 - -Knowing resource needs in advance





Present - Challenges

- Limited transportation resources
- No standardized system currently exist for rapidly triaging patients in alignment with the available transportation resources.
- An evacuation of a free standing children's hospital would immediately be a regional incident due to the nature and complexity of the patients.





TRAIN - Solution

Triaging by Resource Allocation for Inpatients

- 1. TRAIN will facilitate rapid triage of patients' transport needs before a disaster requiring evacuation occurs.
- 2. It will provide the ability to quickly and accurately request the right resources from the County in the event of an evacuation.
- 3. It will increase awareness and readiness for Emergency Operations across the institution.





TRAIN

Triage by Resource Allocation for IN-patients [TRAIN]

Transport	Car	BLS	Critical Care	Specialized
Life Support	Stable	Minimal	Moderate-Stable	Max-Unstable
Mobility	Car/Carseat	Wheelchair/stretcher	Transport rig	Immobile
Nutrition	PO Feeds	PO/NG	NG/PO + TPN/IL	NPO & TPN/IL
Pharmacy	PO Meds	PO Meds/IV Meds/IV Fluids	IV Drip x1	IV drip ≥ 2

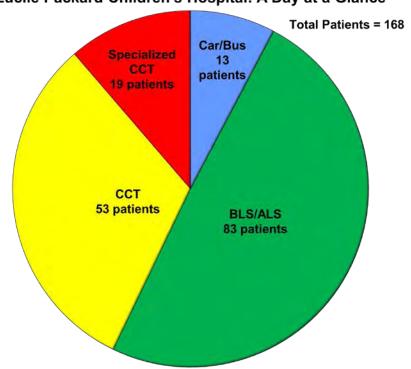
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	Car/Carseat = able to ride in automobile with age-appropriate restraints		
Mobility	Transport rig = age-appropriate rig with equipment for connecting to ambulance		
	Immobile = Unsafe to move without special equipment e.g., neurosurgical/bariatric		





An example of TRAIN at work





- County resource 50-64 BLS/ALS
- Patients assessed as blue maybe rapidly discharged in the event of evacuation or to increase surge capacity.
- This hospital would need over
 70 critical care transports.





Conclusion

TRAIN:

- -transfers patients at the appropriate level of care.
- decreases the amount of time in assessing patients' needs for evacuation.
 - •When used manually adds about 3 minutes to daily rounds.





Integration of TRAIN into electronic medical record

- Data from charting in EMR will be pulled into an automated algorithm
 - Categorization updates with doctor orders and nursing charting.
 - Integration minimizes impact to nursing workflow
- Reports from EMR will auto-print for the unit nurse leaders and administrative nursing supervisors twice a day



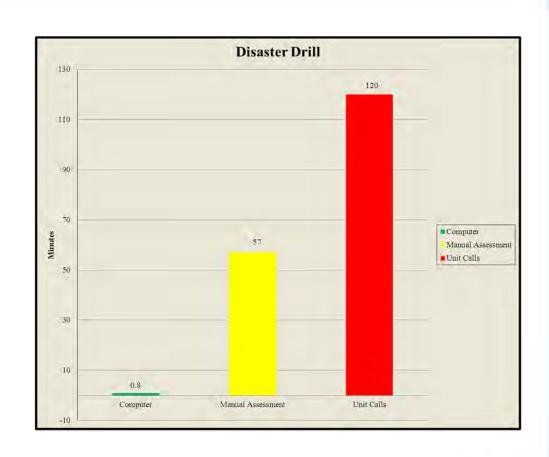


Disaster Drill: Patient transport needs assessment times

Computer generated TRAIN report – 48 second

Manual use of the TRAIN Matrix – 57 minutes

Command center request without TRAIN - over 2 hours







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