Pediatric Rapid Response Teams

Guidelines for Implementing a Team

Illinois EMSC is a collaborative program within the Illinois Department of Public Health. Development of this presentation was supported in part by: Grant 5 H34 MC 00096 from the Department of Health and Human Services Administration Maternal and Child Health Bureau.
Disclaimer

This slide set and all related information provided in this session is in accordance with current practice at the time that this program was developed.
Illinois EMSC is a collaborative program within the Illinois Department of Public Health, aimed at improving pediatric emergency care within our state.

Since 1994, Illinois EMSC has worked to enhance and integrate:

- Pediatric education
- Practice standards
- Injury prevention
- Data initiatives
- Disaster preparedness

The goal of Illinois EMSC is to ensure that appropriate emergency medical care is available for ill and injured children at every point along the continuum of care.

This educational activity is being presented without the provision of commercial support and without bias or conflict of interest from the planners and presenters.
Table of Contents

I. Acknowledgements
II. Objectives
III. Introduction
IV. 1-Tier System vs. 2-Tier System
V. PRRT Essential Components
VI. PRRT Activation Examples
VII. PRRT Implementation
VIII. Conclusion
Acknowledgements

- IL EMSC Advisory Board
- IL Pediatric Preparedness Workgroup
- IL EMSC Facility Recognition Committee
- IL EMSC Quality Improvement Subcommittee

Leslie Flament, RN, BSN provided consultative services to this project and was responsible for drafting the module content that underwent review and further editing by the above groups.

This education module is a companion document to the Illinois EMSC’s Pediatric Rapid Response Team: Guidelines for Implementing a Team, 2011.
Objectives

- Review the benefits of Pediatric Rapid Response Teams (PRRT)
- Describe the necessary components for initiating a PRRT in the hospital setting
- Identify the educational requirements surrounding the use of a PRRT
- Review the steps to implement a PRRT
- Describe common barriers to implementing a PRRT, and potential solutions
- List existing references and resources for hospitals implementing a PRRT at their facility

NOTE: Hyperlinks are provided throughout the module to offer additional information
INTRODUCTION
A PRRT is a multidisciplinary group of clinicians within a hospital that bring pediatric critical care expertise to the child’s bedside.

Other Rapid Response Team nomenclature:

- Critical Access Team (CAT)
- Medical Emergency Team (MET)
- Critical Care Outreach (CCO)
Background

- **Institute for Healthcare Improvement (IHI)**
  - 100,000 Lives Campaign
  - Getting to Zero: The Kids Campaign
    - Reduce unnecessary and avoidable pediatric deaths that occur in hospitals

- **2010 American Heart Association**
  - Pediatric Advanced Life Support guidelines report that PRRTs may be beneficial

- **Promising Results**
  - One children’s hospital demonstrated an 18% decline in monthly mortality rate and a 71% decline in monthly codes after initiating a PRRT
    - 33 lives were saved during this PRRT study
Benefits

Goal: Prevent “failure to rescue” events by intervening early

- Reduce cardiac arrest and mortality rates\textsuperscript{5,6}
- Improve clinical outcomes and decrease length of hospital stays\textsuperscript{5}
- Augment a culture of safety attitude
- Incorporate family centered care
- Empower the medical team and families with resources for activating urgent medical assistance\textsuperscript{7}
Additional Benefit

PRRTs can provide pediatric expertise/resources to assist during:

- **Pediatric surge events**
- **Mass casualty incidents**

Source: Michael Rieger; www.fema.gov
Several hours of warning signs and symptoms of deterioration typically occur in admitted patients regardless of age before succumbing to cardiopulmonary arrest situations\(^4\)
<table>
<thead>
<tr>
<th>Systemic Issues Related to “Failure to Rescue” Events&lt;sup&gt;2,8,9&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Failure to recognize signs and symptoms of clinical deterioration</strong></td>
</tr>
<tr>
<td><strong>Failure in planning including assessments, treatments, and goals</strong></td>
</tr>
<tr>
<td><strong>Failure to communicate including delays in calling for assistance</strong></td>
</tr>
<tr>
<td><strong>Lack of readily available medical staff</strong></td>
</tr>
<tr>
<td><strong>Lack of empowerment in obtaining further assistance</strong></td>
</tr>
</tbody>
</table>
Success Requires Ongoing Commitment

PRRTs should be **established and maintained** to prevent the systemic issues found to contribute to “failure to rescue” events involving pediatric patients.

Source: Microsoft Clip Art
1-Tier System Versus 2-Tier System
1-Tier System

- Definition

One team within a hospital that responds to all pediatric rapid response events and all pediatric code events.
## 1-Tier System

### Benefits
- Definitive care is quick
- All services are immediately available with one team
- Implementation may be more practical for smaller hospitals

### Challenges
- Requires highly skilled personnel to respond to all events
- Can intimidate staff to initiate the response
- More costly
- Can strain staffing if all expert staff is from one hospital unit
2-Tier System

Definition

- The pediatric code team and the PRRT are completely separate
- Both teams establish criteria that differentiate the types of events to which each respond
- Include physiologic criteria/triggers that prompt when the PRRT should alert the Pediatric Code Team
### 2-Tier System

<table>
<thead>
<tr>
<th>Benefits</th>
<th>Challenges</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Less costly</td>
<td>- More staff with pediatric expertise are needed</td>
</tr>
<tr>
<td>- Less intimidating for staff to initiate</td>
<td>- Requires effective communication between both teams</td>
</tr>
<tr>
<td>- Larger hospitals may find this system easier to implement</td>
<td>- Formal quality improvement processes are needed for both teams</td>
</tr>
</tbody>
</table>
PRRT Essential Components

- Team composition
- Activation
- Location of response
- Documentation
- Pre-established guidelines
- Communication
- Evaluation Process
- Education
- Barriers and Solutions
Team Composition

- Based on individual hospital’s:
  - Needs
  - Culture
  - Available resources

- Must be able to respond immediately AND have the pediatric expertise necessary to respond to a variety of emergencies$^{6,8,10,11}$
Minimum core composition

- At least one physician or nurse with pediatric expertise
- Respiratory therapist with pediatric experience
Other PRRT Members Considerations

- Clinical:
  - Emergency Department RN
  - Pharmacist
  - Nurse Practitioner
  - Pediatric Hospitalist
  - Pediatric Intensivist
  - Pediatric ICU RN
  - Pediatric Residents

Must be able to respond immediately AND have the pediatric expertise necessary to respond to a variety of emergencies \(^6,8,10,11\)
Non-clinical:

- Nursing Supervisor
  - Arranges pediatric transfer
  - Facilitates communication with the patient’s primary physician as needed
- Chaplain
  - Promotes family presence
Activation: “No False Alarm” Approach

- Any serious concern for the patient is a valid reason to activate the team\(^6\)
  - Must maintain a nonjudgmental and non-punitive attitude when the PRRT is activated

- Promoting pediatric safety
  - Necessitates mutual respect and collaboration
  - Requires education of the PRRT process
Who Can Activate the PRRT

- Any Staff
  - Deterioration defined by established criteria
  - Any staff having serious concerns

- Families
  - One study demonstrated:
    - Only 8% of all PRRT activations were initiated by family
    - More than half of these family activated calls required transfer to the Pediatric Intensive Care Unit (PICU)
Criteria for Activating the PRRT

- Common reasons for initiating PRRT\(^6\)
  - Acute changes in heart rate, blood pressure, or respiratory rate
  - Hypoxia
  - Mental status changes
  - Staff and/or family concerns

Source: Kotagal, Ulma. 100,000 Lives campaign: Rapid Response Teams. Cincinnati Children’s Hospital Medical Center.
Pediatric Early Warning Score (PEWS)

**Pediatric Early Warning Score (PEWS)**

<table>
<thead>
<tr>
<th>Score</th>
<th>Behavior</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>0</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Reduced response to pain OR Lethargic/confused</td>
<td>Irritable</td>
<td>Sleeping</td>
<td>Playing/ Appropriate</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Bradycardia OR Tachycardia of 30 above normal rate OR Grey or cyanotic AND mottled OR Capillary refill 5 seconds or above</td>
<td>Tachycardia of 20 above normal rate OR Grey or cyanotic OR Capillary refill 3 seconds</td>
<td>Pale or dusky OR capillary refill 4 seconds</td>
<td>Pink OR capillary refill 1-2 seconds</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>50% FiO2 or 8+ liters/min. OR ≥25 below normal parameters with retraction or grunting</td>
<td>40% FiO2 or 6+ liters/min. OR Retractions OR ≥20 above normal parameters</td>
<td>30% FiO2 or 3+ liters/min. OR ≥10 above normal parameters OR using accessory muscles</td>
<td>Within normal parameters, no retractions</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Score by starting with the most severe parameters first.*

*Score 2 extra for every 15-minute nebs (includes continuous nebs) or persistent post-op vomiting.*

*Use “liters/minute” to score regular nasal cannula.*

*Use “FiO2” to score a high flow nasal cannula.*

**Normal Vital Signs**

are based on chronological age, not adjusted age.

used by norms for age, not adjusted baseline for the patient.

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Heart Rate at rest</th>
<th>Respiratory Rate at rest</th>
</tr>
</thead>
<tbody>
<tr>
<td>Newborn (birth – 1 month)</td>
<td>100-180</td>
<td>40-60</td>
</tr>
<tr>
<td>Infant (1 – 12 months)</td>
<td>100-180</td>
<td>35-40</td>
</tr>
<tr>
<td>Toddler (13 months – 3 years)</td>
<td>70-110</td>
<td>25-30</td>
</tr>
<tr>
<td>Preschool (4 – 6 years)</td>
<td>70-110</td>
<td>21-23</td>
</tr>
<tr>
<td>School Age (7 – 12 years)</td>
<td>70-110</td>
<td>19-21</td>
</tr>
<tr>
<td>Adolescent (13 – 19 years)</td>
<td>55-90</td>
<td>16-18</td>
</tr>
</tbody>
</table>

Used with permission from Children’s Hospitals and Clinics of Minnesota
PEWS Action Plan Algorithm

Pediatric Early Warning Score Algorithm

**PEWS Score 0-4**
- Yes: CN/2nd RN Assessed
- No: PEWS Score 5

**PEWS Score 5**
- Yes: Notify MD
- No: Intervention as Ordered

**PEWS Score 6**
- Yes: Notify MD
- No: Intervention as Ordered

**PEWS Score 7**
- Yes: Notify MD
- No: Intervention as Ordered

Intervention Required?
- Yes: Proceed to Intervention Required
- No: Proceed to PEWS Score 5

Intervention Required?
- Yes: Proceed to Intervention Required
- No: Proceed to PEWS Score 5

Transfer to ICU?
- Yes: Transfer to ICU
- No: Proceed to PEWS Score 5

Notify MD for Score that is double the previous assessment or for a score of 3 in any one of the first three categories.
Location of Response

- Defining the areas where the PRRT will respond helps guide the specific responsibilities of the team
  - Will the PRRT respond only to inpatient units?
  - Will the PRRT respond to radiology or other outpatient care areas?
  - Will the PRRT respond to child visitors?
## Locations of Response

<table>
<thead>
<tr>
<th>Inpatient Areas</th>
<th>Outpatient &amp; Non-clinical Areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can provide early intervention following established protocols</td>
<td>May be useful for assessing the situation</td>
</tr>
<tr>
<td>Further considerations are needed if children are admitted to pediatric beds on</td>
<td>Can assist with transporting the child safely to the emergency</td>
</tr>
<tr>
<td>adult units</td>
<td>department for further care</td>
</tr>
<tr>
<td>Examples of non-clinical areas where children may be present: cafeteria, lobby,</td>
<td></td>
</tr>
<tr>
<td>gift shop</td>
<td>Examples of non-clinical areas where children may be present:</td>
</tr>
<tr>
<td></td>
<td>cafeteria, lobby, gift shop</td>
</tr>
</tbody>
</table>
Key documentation elements:

- Reason for the call
- Who activated the call
- Interventions required and administered
- Team members that responded to the call
- Patient disposition after the event
Documentation Example

**Sample Documentation Record (303K)**

Used with permission from Children’s Hospital and Clinics of Minnesota.
**Documentation Example**

**Sample Documentation Record (171K)**

Used with permission from Baystate Medical Center Springfield MA 01199/Baystate
Pre-established Guidelines

Guidelines assist in organizing the care of the patient when a physician is not immediately available.

Guidelines should be developed through a multidisciplinary process.

- Airway adjuncts
- Oxygen therapy
  - Nebulizers
- Bedside glucose
- Vascular access
  - Isotonic crystalloid IVF bolus (10-20mL/kg)
- Medications
  - Examples: dextrose, naloxone, antihistamines

- Other considerations
  - Examples: X-Ray, labs, ECG
  - Plans for higher level of care
    - Admit or transfer to a PICU
SBAR is a standardized method for communicating critical medical information in order to prevent medical errors. SBAR is a standardized method for communicating critical medical information in order to prevent medical errors.

S: Situation
B: Background
A: Assessment
R: Recommendations

SBAR Guidelines

SBAR report to physician about a critical situation

Situation
I am calling about patient name and location.
The patient's code status is Code Blue.
The problem I am calling about is: _______
I am afraid the patient is going to arrest.
I have just assessed the patient personally:
Vital signs are: Blood pressure _____/_____ Pulse _____ Respiration _____ and temperature _____
I am concerned about the:
Blood pressure because it is over 200 or less than 100 or 36 mmHg below usual
Pulse because it is over 140 or less than 50
Respiration because it is less than 5 or over 40
Temperature because it is less than 95 or over 104

Background
The patient's mental status is:
Alert and oriented to person place and time
Confused and cooperative or non-cooperative
Agitated or combative
Lethargic but conversant and able to swallow
Stuporous and not talking clearly and possibly not able to swallow
Comatose. Eyes closed. Not responding to stimulation.
The skin is:
Warm and dry
Pale
Mottled
Diaphoretic
Extremities are cold
Extremities are warm
The patient is not or is on oxygen.
The patient has been on _____(min) or (%) oxygen for _____ minutes (hours)
The oximeter is reading ____%.
The oximeter does not detect a good pulse and is giving erratic readings.

Assessment
This is what I think the problem is: _____(say what you think is the problem).
The problem seems to be: cardiac, infection, neurologic, respiratory _______.
I am not sure what the problem is but the patient is deteriorating.
The patient seems to be unstable and may get worse, we need to do something.

Recommendation
I suggest or request that you _____ (say what you would like to see done).
Transfer the patient to critical care
Come to see the patient at this time
Talk to the patient or family about code status
Ask the on-call family practice resident to see the patient now.
Ask for a consultant to see the patient now.
Are any tests needed:
Do you need any tests like CXR, ABG, EKG, CBC, or BMP?
Others?
If a change in treatment is ordered then ask:
How often do you want vital signs?
How long do you expect this problem will last?
If the patient does not get better when would you want us to call again?

This SBAR tool was developed by Kaiser Permanente. Please feel free to use and reproduce this in the spirit of patient safety, and they request this information is retrained in the spirit of appropriate recognition.
Other Communication Needs

- Other physicians that may need to be contacted about the change in their patient’s condition:
  - Admitting physician
  - Hospitalist
  - Primary care physician

TIP:
Pre-assign this task and utilize the same standard method of communication as used to communicate with the PRRT
Evaluation Process

- Objectives:
  - Pediatric patient outcomes
  - Common reasons for PRRT activation
  - Frequency of usage
  - Who activated the team
  - Where was the activation
  - Benefits of a PRRT

[Sample Evaluation Form](87K) Used with permission from Children’s Hospital and Clinics of Minnesota
### Education: PRRT Members

**Core Training**
- Pre-established protocols
- Defined responsibilities
- Communication skills
  - Standard communication tool
- Expectations of the team
  - Documentation record

**Skill Maintenance**
- Mock rapid response alerts
- Advanced pediatric critical care training (e.g., APLS, PALS, ENPC)
- Other
  - Debriefing
  - Clinical updates
  - Annual competency activities
Education: Staff and Family

**Staff**
- PRRT process overview
- Responsibilities
  - Activation criteria
  - Notification process
  - Communication skills
  - Role throughout response
  - Educate families

**Family**
- Purpose of PRRT
- Activation Overview
  - Activation criteria
  - Notification process
  - Signage in patient rooms
Barriers and Solutions

- **Barrier**: Limited staffing and resources

- **Solution**: Utilizing the 1-Tier method instead of the 2-Tier method is one way to make use of existing staffing resources

- **Solution**: Educating staff during work time hours may help decrease education costs
Barriers and Solutions\textsuperscript{14,15}

- **Barrier**: Ineffective use of the PRRT

  - **Solution**: Encourage staff to be patient safety advocates
    - Conduct education on the PRRT process and review activation criteria
    - Reinforce the “no false alarm approach”

Source: Microsoft Clip Art
### Barriers and Solutions\(^5,16\)

<table>
<thead>
<tr>
<th>Barrier</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of communication and teamwork that exists between disciplines which may hinder the overall development of a PRRT program</td>
<td>No false alarm approach</td>
</tr>
<tr>
<td></td>
<td>Making pediatric safety a priority helps to encourage teamwork and cooperation among disciplines</td>
</tr>
<tr>
<td></td>
<td>Administrative support</td>
</tr>
</tbody>
</table>

Source: Microsoft Clip Art
Barriers and Solutions

- Culture and professional norms existing within a hospital follow a traditional health care hierarchy

- A collaborative multi-disciplinary approach is key and can help breakdown traditional health care hierarchy

AHRQ “Will It Work Here? A Decision maker’s Guide to Adopting Innovations” may be a useful reference when creating a new hospital program
PRRT Activation Examples
Inpatient Nurse Activation

An infant develops respiratory distress along with acute changes in vital signs after a bottle feeding during the night, which worries the inpatient pediatric nurse. The nurse then activates the PRRT.

Source: Microsoft Clip Art
A 4-year-old child develops an allergic reaction with respiratory distress after receiving an intravenous antibiotic. The parent activates the PRRT.

(Source: Optimistworld.com/anaphylaxis)
While a respiratory therapist is performing tracheostomy care, he notices an immediate decline in the child’s condition (e.g., increased work of breathing and change in mental status). The respiratory therapist activates the PRRT.

An 8-year-old child develops respiratory distress after receiving intravenous contrast during an outpatient procedure.

The radiology staff recognizes the change in the child’s condition and activates the PRRT.
A large number of pediatric patients is expected to seek medical care in the emergency department following a school bus crash. The PRRT is activated as part of the hospital Emergency Operations Plan (EOP).
PRRT Implementation
### Key components\(^5,6\)

<table>
<thead>
<tr>
<th>Administrative: Exists to implement the process AND maintain and sustain the services and system itself</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Afferent:</strong> Consists of staff being able to detect an event and trigger the response (team)</td>
</tr>
<tr>
<td><strong>Efferent:</strong> The area that provides the crisis response (the team itself) and available equipment</td>
</tr>
<tr>
<td><strong>Evaluative/Process Improvement:</strong> Exists to improve the patient care and safety</td>
</tr>
</tbody>
</table>
Stages to Implement a PRRT

Plan
Pilot
Implement
## PRRT Implementation Checklist

**Preparation and Commitment**

<table>
<thead>
<tr>
<th>#</th>
<th>Task</th>
<th>Task Completed</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Define goal/purpose</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Convene multi-disciplinary PRRT committee (list)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Obtain administration support (list)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**PRRT Composition**

| 4.  | Choose either a 1-Tier or 2-Tier System                             |                |       |
| 5.  | Define minimal composition                                          |                |       |
|     | - Pediatric critical care experts (list)                           |                |       |
|     | - Respiratory therapists (list)                                     |                |       |
| 6.  | Identify other clinical PRRT members (as applicable) (list)        |                |       |
| 7.  | Identify nonclinical PRRT members (as applicable) (list)            |                |       |

**PRRT Components**

| 8.  | Identify areas of response: (e.g., inpatient, outpatient, lobby, cafeteria) |                |       |
|     | - Clinical areas (list)                                              |                |       |
|     | - Nonclinical areas (list)                                           |                |       |
| 9.  | Establish age parameters                                             |                |       |
| 10. | Outline process for activation (e.g., overhead pager)               |                |       |
| 11. | Determine who can activate team                                     |                |       |
| 12. | Identify standardized assessment tool (e.g., PEWS)                  |                |       |

May 2013
### PRRT Implementation Checklist (continued)

<p>| | |</p>
<table>
<thead>
<tr>
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<tbody>
<tr>
<td><strong>13.</strong></td>
<td>Determine standardized communication tool (e.g., SBAR)</td>
</tr>
<tr>
<td><strong>14.</strong></td>
<td>Establish documentation record</td>
</tr>
<tr>
<td><strong>Responsible person(s):</strong></td>
<td></td>
</tr>
<tr>
<td><strong>14.</strong></td>
<td>Develop PRRT policy</td>
</tr>
<tr>
<td><strong>15.</strong></td>
<td>Create standing orders/protocols</td>
</tr>
<tr>
<td><strong>Responsible person(s):</strong></td>
<td></td>
</tr>
<tr>
<td><strong>16.</strong></td>
<td>Create documentation form/EMR process</td>
</tr>
<tr>
<td><strong>17.</strong></td>
<td>Create an evaluation tool that addresses:</td>
</tr>
<tr>
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<tr>
<td><strong>18.</strong></td>
<td>Develop quality improvement process:</td>
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<tr>
<td><strong>Responsible person(s):</strong></td>
<td></td>
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<tr>
<td><strong>19.</strong></td>
<td>Education: Target Audience:</td>
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<td><strong>20.</strong></td>
<td>Education: Formats</td>
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*May 2013*
Conclusion