SPHP Demographics

- 4 Acute Care Hospitals
- 1 Acute Care Rehabilitation Hospital
- 7 Long term care facilities
- Assisted Living
- Outpatient services
- Home Care
- Behavioral Health
- 2 schools of nursing

**Member of Trinity Health Care System**
- 89 hospitals
PURPOSE

To outline the management of the pediatric patient with suspected sepsis using an invasive protocol.

THE RORY STAUNTON STORY

- 12 year old boy, 5 ft. 9 inches and 160 pounds

- **Wednesday**, Rory scraped his *elbow* in gym class

- **Thursday morning**, seen by PCP for *vomiting* and *leg pain*

  - Temp *104º F (40 C)*, *tachycardia*, *tachypnea*, high BP
  - MD Concerned → sent to ER
THE RORY STAUNTON STORY

- Same day, seen in ER
  - CBC – elevated WBC not communicated to family
  - Dx with viral syndrome – upset stomach and dehydration
  - Fluid bolus given, Tylenol Rx, and sent home
- Friday returned to ER
  - Dx with septic shock, ICU care
ON SUNDAY, RORY DIED!

“Rory Staunton’s case could change the world”
-Dr. Kevin Tracey
Feinstein Institute

Sentinel Events

Communication failures contribute to over 65% of sentinel events in the US.

Most Frequently Identified Root Causes of Sentinel Events Reviewed by The Joint Commission by Year

<table>
<thead>
<tr>
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<th>2011 (N=1243)</th>
<th>2012 (N=901)</th>
<th>Jan to Jun 2013 (N=446)</th>
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<tbody>
<tr>
<td>Human Factors</td>
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<td>Physical Environment</td>
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<td>Information Management</td>
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<td>Information Management</td>
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<td>Physical Environment</td>
<td>150</td>
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<tr>
<td>Operative Care</td>
<td>207</td>
<td>Continuum of Care</td>
<td>95</td>
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<tr>
<td>Care Planning</td>
<td>144</td>
<td>Operative Care</td>
<td>93</td>
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<tr>
<td>Continuum of Care</td>
<td>137</td>
<td>Medication Use</td>
<td>91</td>
</tr>
<tr>
<td>Medication Use</td>
<td>97</td>
<td>Care Planning</td>
<td>81</td>
</tr>
</tbody>
</table>

The majority of events have multiple root causes. Please refer to subcategories listed on slides 5-7.

The Joint Commission

Office of Quality Monitoring - 8
Pediatric Emergency Care in the US

- 89% of Pediatric Ed visits were seen in non pediatric hospitals (community hospitals)

- 75% of these hospitals see over 7,000 pediatric visits annually.

- 6% of the ED’S surveyed reported having the equipment and supplies recommended by THE American Academy of Pediatrics and American College of Emergency Physicians

Middleton, K.R. 2006
2009 Guidelines For Pediatric Patients

- American Academy of Pediatrics
- American College of Emergency Physicians
- Emergency Nursing Association
RORY’S REGULATIONS

• January 29, 2013

• Governor Cuomo Announces NYS to “lead the nation by becoming the first state to require all hospital to adopt best practices for the early identification and treatment of sepsis, a medical condition which is the number one killer in hospitals and the eleventh leading cause of death in the United States.”

NYS DOH 405 Regulations

“The medical staff shall adopt, implement, periodically update and submit to the Department evidence-based protocols for the early recognition and treatment of patients with sepsis, severe sepsis and septic shock (“sepsis protocols”) that are based on generally accepted standards of care.
NYS DOH Regulation Con’t

- Sepsis protocols must include components specific to the:
  - Identification
  - Care and treatment of adults and of children
  - Clearly identify where and when components will differ for adults and for children
Pediatric Sepsis Team St. Peter’s Health Partners

- ER Physicians
- Pharmacist
- Nursing Educators/ Clinical Nurse Specialists
- Chief of Pediatrics
- Neonatologist
- Nursing Directors
- Lab Supervisors
- Respiratory Therapists
- Infection Control
- Patient Safety/ QI
Challenges in Community Hospitals

- Pediatric Patients are Portable
PEDIATRIC SEPSIS MANAGEMENT
POLICY STATEMENTS

• Pediatric Sepsis Management will be used on all patients less than or equal to 14 years old.

• Neonates under 14 days of life can be admitted to the NICU after consultation with the Neonatologist on call.
• All pediatric patients who are not responsive to fluid resuscitation will be transferred to a higher level of care.

• This policy applies to all patients in the ED as well as the inpatient setting (excluding the newborns and NICU).
EARLY IDENTIFICATION

• In the ED, the **Pediatric Sepsis Screen** is performed:
  
  ED Triage or the initial RN assessment:
  
  • Electronically alerts the nurse and provider of a patient at risk for sepsis

Physician/ Provider Evaluation:

• The physician then performs an assessment and determines if sepsis is present
PEDIATRIC ASSESSMENT TRIANGLE

- Appearance
- Circulation to Skin
- Work of Breathing
- General Impression

Adapted from ENPC Provider Manual (4th ed), 2012, p. 54
Sepsis Stratification

Pediatric patients are stratified, by the physician/provider, into one of the following:

- SIRS →
- Sepsis →
- Severe Sepsis →
- Septic shock
SIRS Criteria: Systemic Inflammatory Response Syndrome

- **Temperature:**
  - Greater than 38 C (100.4 °F) or less than 36 C (96.8 °F)

- **Heart rate:**
  - Above 180 beats per minute in neonate (less than 30 days)
  - Above 160 beats per minute in infant (1 to 12 months)
  - Above 110 beats per minute in child (1 year to 11 years)
  - Above 90 beats per minute in adolescent (12 to 14 years of age)

- **Respiratory Rate:**
  - Above 60 for neonate or infant (birth to 12 months)
  - Above 40 for child 1 to 3 years
  - Above 34 for child 3 to 5 years
  - Above 30 for child 6 to 11 years
  - Above 20 in adolescent (12 to 14 years of age)
SIRS Criteria Con’t

• Systolic Blood Pressure
  • Below 60 mmHg in neonate (less than 30 days)
  • Below 70 mmHg in infant (1 to 12 months)
  • Below [70 plus age in years x2] mmHg for child 1 to 10 years
    i.e. Age 6 child: 70+12= 82 for SBP threshold
  • Below 90 or a drop of greater than 40 mmHg from baseline in child/adolescent 11 to 14 years

• WBC
  • Above 12 thousand or Less than 4 thousand or
  • More than 10% bands
Sepsis Criteria

SIRS + Source of Infection = Sepsis

Infection can be suspected or a present source
Severe Sepsis Criteria

Sepsis + **New Onset** organ dysfunction/failure:

As evidenced by 1 or more of the following:

- Bilateral pulmonary disease with new or increased O2 requirements to maintain saturations greater than 90
- Elevated Creatinine for age
- Urine output less than 0.5 mL/kg/hr for more than 2 hrs
- Bilirubin greater than 2.0 mg/dL
- Platelet count less than 100 thousand
- Lactate greater than 2 mmol/L
- Decreased Level of Consciousness
Septic Shock Criteria

Sepsis + **New Onset** cardiovascular dysfunction:

- Hypotension or need for vasopressors or 2 of the following:
  - Unexplained metabolic acidosis
  - Serum Lactate greater than 4 mmol/L
  - Urine output less than 0.5 mL/kg/hr
  - Capillary refill delayed 3 seconds and/or peripheral pulses diminished
TREATMENT: First 1 Hour of Care

• Administer $O_2$: maintain saturations greater than 94%

• Establish IV/IO/UV access: 2 large bore lines

• Initial fluid resuscitation bolus: 20 mL/kg of warmed Normal Saline over 5 to 10 minutes; may repeat 2 additional boluses of Normal Saline (up to total of 60 mL/kg in the first hour)
TREATMENT: First 1 Hour of Care

- **Lab studies:** Lactate level, Finger stick blood glucose, Blood Cultures x 2 (obtain prior to antibiotic administration)
- **Administer Antibiotics:** within 1hr of initial VS or Triage
- **Monitor urine output:** should be greater than 1mL/kg/hr
- **Maintain MAP:** within age appropriate range
- **Report lack of improvement in condition to MD and consider vasopressors**
TREATMENT: First 1 Hour of Care

- **Repeat lab studies:** as ordered to include lactate until normal range for age

- **Repeat finger sticks** to monitor glucose levels

  - **Treat hypoglycemia** to maintain blood glucose values:
    - Greater than 50 mg/dL for neonates (less than 28 days)
    - Greater than 70 mg/dL for all other pediatric patients

- **Continue Fluid Resuscitation:** continue boluses as determined by clinical signs
TREATMENT: Hours 1 to 6 of Care

• If not responsive to fluid resuscitation (i.e. capillary refill is greater than 2 seconds) or MAP is less than 40 to 60 mmHg (age appropriate),

  • Call Transport Team (higher level of care needed) AND
  • Start Vasopressors while waiting for the transport team to arrive:
    • Dopamine 5 to 20 mcg/kg/min and titrate 2.5 mcg/kg/min every 5 minutes to maintain goal of MAP 40 to 60 mmHg (age appropriate)

• Administer Antibiotics: continue schedule as ordered
TRANSFER CRITERIA: Higher Level of Care

Patient is deteriorating and we are unable to stabilize:

• Vasopressors needed to maintain MAP
• Respiratory decompensation
Challenges in Pediatrics

• **#1 issue** in delay of care is vascular access
  • Standard of Care is an Intraosseous needle must be inserted if unable to obtain vascular access

• **#2**: Blood Draws
  • How much is too much?
  • Can we even get the blood?

• **#3**: Timeliness of starting antibiotics
  • Relates to #1 and #2
  • Systems issues with medication orders/ administration
EXCLUDED PATIENTS

- Interventions in the protocol are clinically contraindicated
- Advanced directives in place which preclude protocol interventions or patient is on hospice care
- Enrollees in IRB approved clinical trials for which interventions are inconsistent with established protocols
- All newborns and infants in the NICU
- All patients 15 years old or greater
New York State Department of Health

- Minimum Pediatric Care Standards for New York State Hospitals, Emergency Departments, and Intensive Care Units

- Emergency Medical Services for Children Advisory Committee, published in September 2015

- Capital District Pediatric Emergency Preparedness Group (Annual Conference May 2016)
Moving Forward in 2016

- Revision of the pediatric policy and provider orders
- Mandatory Education
- Implementation of the Pediatric Early Warning Score (PEWS)
- Assure all minimum pediatric care standards for hospitals and emergency rooms are met
- Continue to Collaborate with Albany Med
## Pediatric Early Warning Score

<table>
<thead>
<tr>
<th>Category</th>
<th>Score</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Behavior</strong></td>
<td>0</td>
<td>No action needed, continue to assess</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>Notify charge nurse, call pediatric provider on call and call a pediatric rapid response</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Notify charge nurse, call pediatric provider on call and call a pediatric rapid response</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Notify charge nurse, call pediatric provider on call and call a pediatric rapid response</td>
</tr>
<tr>
<td><strong>Cardiovascular</strong></td>
<td>0-3</td>
<td>Less than 0.5 mL/kg/hour of urine output over the last 4 hours OR greater than 3 BMs or emesis events in the last 12 hours</td>
</tr>
<tr>
<td></td>
<td>4-6</td>
<td>RR 5 below normal OR SpO2 less than 90% OR rejections and/or grunting</td>
</tr>
<tr>
<td><strong>Respiratory</strong></td>
<td>0</td>
<td>RR greater than 10 above normal limits OR SpO2 98 to 100% on any O2 device OR SpO2 94 to 97% on RA OR using accessory muscles</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>RR greater than 20 above normal limits OR SpO2 90 to 93% OR relocations</td>
</tr>
<tr>
<td><strong>Output</strong></td>
<td>2</td>
<td>3 BMs or emesis events in the last 12 hours</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Less than 0.5 mL/kg/hour of urine output over the last 4 hours OR greater than 3 BMs or emesis events in the last 12 hours</td>
</tr>
</tbody>
</table>

**Score**
- **0-3 (Green)**: No action needed, continue to assess
- **4-6 (Yellow)**: Notify charge nurse, call pediatric provider on call and call a pediatric rapid response
- **7+ (Red)**: Notify charge nurse, call pediatric provider on call and call a pediatric rapid response

**A single ‘3’ in any category, immediately notify charge nurse, call pediatric provider on call, and call a pediatric rapid response**

Modified from the original PEWS tool developed by Royal Alexandra Children’s Hospital, Brighton, UK.

Listen to families – they know their children best!

Case Study: 10 day old Baby Violet

- From out of town, visiting family in Albany
- Presented to ED with:
  - Moaning/ grunting noises per father
  - Temp 38.9 C
  - Lethargy
  - Poor feeding
Remember…

- **Early Identification:** in ED and Inpatient units using SIRS Criteria

  Re-assess!  Re-assess!  Re-assess!

- **Vascular Access:** for fluid resuscitation; yes, this may mean IO access

- **Antibiotics:** within 1\textsuperscript{st} hour of care

- **Transfer:** higher level of care (PICU or NICU)
Take Home Message

- Signs of poor perfusion:
  - Fever
  - Abnormal vitals
  - Altered mental status
  - Decreased urine output
  - Poor capillary refill

- Hypotension:
  - *Late, ominous sign* in pediatric patients
  - Followed closely by cardiopulmonary collapse
Questions