La Integración Urgencias-Terapia Intensiva. Como Coordinar las acciones?

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Objectives

• Communication as a tool
• Collaborative QI asthma project
• Collaborative QI sepsis project
• Other collaborations
You Always Have a Choice

- Change Your Attitude
- Change Your Behavior
- Do Nothing
- Vote with Your Feet
The Role of Assumptions

4 WAYS TO RESIST

BLAME
PLACATE
COMPUTE
DISTRACT
What Works? What Does Not? Pediatric Intensivists

UNWANTED!

Discuss what works
Discuss what doesn’t work

PUSHY
CONTROLLING
DOMINEERING
UNDERMINING
ARROGANT
EXPLOSIVE
The ability to communicate may be THE most valuable skill you will learn.

- to teach
- to persuade
- to defend
Management of Asthma
Emergency Department

• Oxygen to maintain pulse oximetry >92%
• Short acting beta agonist therapy; three treatments spaced every 20-30 minutes or continuous administration if not improvement
• Inhaled ipratropium bromide
• Corticosteroids by the parenteral or oral route
• Intravenous magnesium sulfate and beta agonists (terbutaline)
• Disposition: Home or admission to the hospital
TCH Asthma QI Project
ER-Intensive Care- Hospital Medicine

• **Aim Statement**

  - Reduce inappropriate admissions to the Intermediate Care Unit (PCU) by the creation of guidelines surrounding asthma admissions to be adopted in an effort to improve the utilization of hospital resources.
TCH Asthma QI Project
ER-Intensive Care- Hospital Medicine

• Texas Children’s Hospital Evidenced Based Outcomes Center (EBOC) Asthma Guidelines

**CRS ≥ 6 with no improvement**
**FEV1 or PEF < 40 %**

- Admit to Special Care Unit based on patient care requirements and policy
- Suppl oxygen to achieve $\text{SpO}_2 \geq 92\%$
- Place on continuous SABA
- Add Ipratropium if not already given
- IV route for corticosteroid
- Consider adjunct therapies as above
- Mechanical ventilation as needed
TCH Asthma QI Project
ER-Intensive Care- Hospital Medicine

Clinical Respiratory Score (CRS):

- Clinical Respiratory Score (CRS):
- Utilization of this tool
- Objective & Subjective
- Data to better define the asthma severity

### Clinical Respiratory Score (CRS)

<table>
<thead>
<tr>
<th>Assess</th>
<th>Score 0</th>
<th>Score 1</th>
<th>Score 2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Respiratory Rate</strong></td>
<td>&lt;2 mos</td>
<td>&lt;2 mos</td>
<td>&lt;2 mos</td>
</tr>
<tr>
<td>&gt; 5 yrs &lt; 20</td>
<td>2-12 mos</td>
<td>50-60</td>
<td>&gt; 60</td>
</tr>
<tr>
<td>1-5 yrs &lt; 30</td>
<td>2-12 mos</td>
<td>40-50</td>
<td>2-12 mos</td>
</tr>
<tr>
<td>&gt; 5 yrs &lt; 30</td>
<td>&gt; 1-5 yrs</td>
<td>30-40</td>
<td>&gt; 1-5 yrs</td>
</tr>
</tbody>
</table>

| Auscultation                  | Good air movement, scattered inspiratory wheezing, loose rales/crackles. | Depressed air movement, inspiratory and expiratory wheezes or rales/crackles. | Diminished or absent breath sounds, severe wheezing, or rales/crackles, or marked prolonged expiration. |
| Use of Accessory Muscles      | Mild to no use of accessory muscles. Mild to no retractions, nasal flaring on inspiration. | Moderate intercostal retractions, mild to moderate use of accessory muscles, nasal flaring. | Severe intercostal and substernal retractions, nasal flaring. |
| Mental Status                 | Normal to mildly irritable | Irritable, agitated, restless. | Lethargic |
| Room Air SpO₂                 | > 95%  | 90-95%  | < 90%   |
| Color                         | Normal | Pale to normal | Cyanotic, dusky |

(Add score from all rows to calculate total CRS score)
TCH Asthma QI Project
ER-Intensive Care- Hospital Medicine

CRS Collection Times:

- Admission to Emergency Department
- Every 2 hours while in the Emergency Department
- Transfer to Intermediate Care Unit
- Admit to Intermediate Care Unit

• Why collecting CRS?
  - Enable use of common language while communicating among clinical practitioners.
# TCH Asthma QI Project

## ER-Intensive Care - Hospital Medicine

### Asthma Admission to PCU Checklist

<table>
<thead>
<tr>
<th>RN</th>
<th>Asthma Admission to PCU Checklist</th>
</tr>
</thead>
<tbody>
<tr>
<td>MD</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Date: ________________</td>
</tr>
<tr>
<td></td>
<td>Time: ________________</td>
</tr>
</tbody>
</table>

#### Severity

- [ ] Most recent time of which CRS ≥ 5. ______________ ________________
- [ ] CRS documented and transmitted verbally to receiving practitioner / RN prior to transfer to the PCU within 30 minutes of the report

#### Therapies

- [ ] Communicated O2 requirement: _____ % O2 Sat on _____ liters
  - [ ] NC
  - [ ] FM
  - [ ] Other: ________
- [ ] Corticosteroids. Time given ________ (at least 4 hours prior to report)
  - [ ] IV
  - [ ] PO

- [ ] Documented therapies:
  - [ ] 200cc/kg bolus(es)
  - [ ] Albuterol: 1.5 - 5 mg; O220min x 3 doses per BAMP protocol
  - [ ] Continuous Inhalation Albuterol 20 mg/hr > 2 hours
  - [ ] Magnesium Sulfate 40 mg/kg at least 1 hour prior to the report
  - [ ] Terbutaline ______________ mcg/kg/min
  - [ ] BIPAP
  - [ ] Epinephrine
  - [ ] Hellax
  - [ ] Other: ______________

#### Risk Assessment

- [ ] Any prior history of intubation
- [ ] ≥ 2 admissions to the hospital or ≥ 3 EC visits for asthma in the past 12 months
- [ ] Established Life-Threatening Asthma (LTA) patient
- [ ] Any past ICU admissions

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*Data collection for the purposes of QI project to improve the utilization of hospital resources surrounding asthma admissions.*

(Team: Sara Rooks, Jorge Coto-Agu, Carolyn Smith, Fernando Sheh, and Hossein Tavakolmehri)
In FY 2010, there were 184 patients admitted to the Intermediate Care Unit with a principal or secondary diagnosis of asthma with a length of stay: range 0 to 2 days.

Only 24% of patients evaluated the past two PDSA cycles actually met criteria for admission to the Intermediate Care Unit based on the CRS criteria (CRS $\geq 6$)
TCH Asthma QI Project
Financial Impact

PCU: 24%
N = 44

Acute Care Cost* $$$

Savings: $

AC/Obs: 76%, savings
N = 140

PCU Cost* $$$$$

Obs Unit Cost* $$

Savings: $$

Savings: $$

* Total Direct Cost per Day
TCH Asthma QI Project
ER-Intensive Care- Hospital Medicine

• What did we gain from this effort:
  – Routine use of a common language: CRS
  – Compliance by ALL practitioners (physicians, nurses and respiratory therapists) with asthma guidelines by TCH EBOC (Outcomes Center)
  – Improved communication among practitioners
  – Efficient use of resources and savings $$$$$$ to the system
Sepsis has Devastating Effects on Children Worldwide

• Most common cause of childhood death in the world
• 40-80,000 hospitalizations annually in the US for severe sepsis
• Prevalence has increased over last decade
• 8-14% hospital mortality
• 75% admitted to ICUs, and 25% ICU mortality
• $2 billion spent annually, with median costs >$50,000
Prevalence of Sepsis
US Children’s Hospitals

Sepsis: A Spectrum of Illness Across the Spectrum of Healthcare

- SIRS
- Sepsis
- Severe Sepsis
- Septic Shock

Healthcare Setting
Early Recognition of Shock Mortality

Early recognition and aggressive resuscitation of pediatric-neonatal septic shock by community physicians can lower mortality from 38% to 8%. NNT = 3.3

Han, Y. Pediatrics, 2003;112;793-9
American College of CCM
Definitions of Shock

<table>
<thead>
<tr>
<th>Threshold Rates</th>
<th>Heart Rate (bpm)</th>
<th>Mean Arterial Pressure-Central Venous Pressure (mm Hg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Term newborn</td>
<td>120–180</td>
<td>55</td>
</tr>
<tr>
<td>Up to 1 yr</td>
<td>120–180</td>
<td>60</td>
</tr>
<tr>
<td>Up to 2 yrs</td>
<td>120–160</td>
<td>65</td>
</tr>
<tr>
<td>Up to 7 yrs</td>
<td>100–140</td>
<td>65</td>
</tr>
<tr>
<td>Up to 15 yrs</td>
<td>90–140</td>
<td>65</td>
</tr>
</tbody>
</table>

### American College of CCM Definitions of Shock

<table>
<thead>
<tr>
<th>Description</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cold or warm shock</td>
<td>Decreased perfusion manifested by altered decreased mental status, capillary refill &gt; 2 secs (cold shock) or flash capillary refill (warm shock), diminished (cold shock) or bounding (warm shock) peripheral pulses, mottled cool extremities (cold shock), or decreased urine output &lt; 1 mL/kg/hr</td>
</tr>
<tr>
<td>Fluid-refractory/</td>
<td>Shock persists despite ≥60 mL/kg fluid resuscitation (when appropriate) and dopamine infusion to 10 μg/kg/min</td>
</tr>
<tr>
<td>dopamine-resistant shock</td>
<td></td>
</tr>
<tr>
<td>Catecholamine resistant</td>
<td>Shock persists despite use of the direct acting catecholamines; epinephrine or norepinephrine</td>
</tr>
<tr>
<td>shock</td>
<td></td>
</tr>
<tr>
<td>Refractory shock</td>
<td>Shock persists despite goal-directed use of inotropic agents, vasopressors, vasodilators, and maintenance of metabolic (glucose and calcium) and hormonal (thyroid, hydrocortisone, insulin) homeostasis</td>
</tr>
</tbody>
</table>

Septic Shock in Children
Time and Fluid Sensitive Resuscitation

Mortality Rate

Fluids given in 1 hr

<table>
<thead>
<tr>
<th>Volume (mL/kg)</th>
<th>Mortality Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;40</td>
<td>33%</td>
</tr>
<tr>
<td>20–40</td>
<td>52%</td>
</tr>
<tr>
<td>&lt;20</td>
<td>73%</td>
</tr>
</tbody>
</table>

Time to infuse

<table>
<thead>
<tr>
<th>Time (min)</th>
<th>Mortality Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;30</td>
<td>40%</td>
</tr>
<tr>
<td>30–60</td>
<td>58%</td>
</tr>
<tr>
<td>&gt;60</td>
<td>73%</td>
</tr>
</tbody>
</table>

FIGURE 1. Patients with septic shock—mortality versus first-hour resuscitation volume. \(P = 0.03\) (\(\chi^2\) for trend).

FIGURE 2. Patients with septic shock—mortality versus time to volume infusion. \(P = 0.015\) (\(\chi^2\) for trend).

Oliveira, CF et al. Pediatric Emergency Care 2008;24:810-815
Hemodynamic Support in Pediatric Sepsis: The 2016 Update

Recognition Bundle

Resuscitation Bundle

Stabilization Bundle

Performance Bundle
Barriers to the Implementation of the ACCM/PALS Guidelines

- Lack of adequate vascular access
- Lack of recognition of early shock
- Shortage of health care providers
- Non-use of goals and treatment protocols.
- Absence of a specialized transportation to secondary or tertiary hospitals
- Restricted number of ICU beds
- Lack of recognition of the ED role.

Oliveira, CF et al. Pediatric Emergency Care 2008;24:810-815
Sepsis Guidelines Implementation
Texas Children’s Hospital

• TCH EC published data: 191 encounters in 167 patients

• Before the shock protocol:
  – Time to boluses and antibiotics >>> 60 min

• After the shock protocol:
  – Improvement in time to first and third boluses, and time to antibiotics

Cruz et al, Pediatrics, 2011. 127:e758-766
Texas Children’s Hospital
ER-ICU Joined Sepsis Protocol
Texas Children’s Hospital
Compliance with ACCCM/PALS Sepsis Guidelines

• **Emergency Department**
  - Once a patient is identified in shock a pager is sent to the Transport Team
  - The Transport & Rapid Response team (Specialized Nurses) helped with the implementation of the guidelines
  - The protocol is followed and all the vitals signs and interventions are recorded (i.e. fluid bolus(es), inotropes, etc.)
  - A disposition is made: ICU, Intermediate care or hospital ward

Cruz, A et al; Pediatrics. 2011 Mar;127(3):e758-66
Texas Children’s Hospital
Compliance with ACCCM/PALS Sepsis Guidelines

• **Pediatric Intensive Care Unit**
  - If the patient received 60 cc/kg, the patient is admitted to this unit
  - If more interventions are required, then the protocol continues
  - If the patient is successfully resuscitated and no more interventions are needed, then the patient is observed in the unit for a minimum of 6-12 hrs

Cruz, A et al; Pediatrics. 2011 Mar;127(3):e758-66
Texas Children’s Hospital
ER-ICU Sepsis Protocol

• What did we learn
  – It is possible to work in collaboration with the ER team (Physicians, nurses and pharmacy personnel)
  – A protocol that is well designed but it is not implemented and followed, WILL FAIL!!!
  – Collaboration is feasible with other teams
  – Developing a protocol for a “PROTOCOL” might be necessary to achieve adequate results
Sepsis Guidelines Implementation
Hospital Materno-Infantil Monterrey

• A three-pronged approach
  – Educational Framework
    • Workshop: Recognition and Management of Sepsis
  – A Quality Improvement Initiative
    • Developing strategies to implement the protocol
    • Reconfiguration of the Triage System use at the ER
    • Utilization of existing resources
  – Retrospective and Prospective study
    • Important clinical outcomes: Length of stay, mortality.
Sepsis Guidelines Implementation
Hospital Materno-Infantil Monterrey

Emergency Traffic Light Triage System

Atención inmediata
Atención mediata

Puede esperar
Consulta normal
CHOQUE SEPTICO
Reconocimiento y Tratamiento

Jorge Coss-Bu, MD, Natasha Afonso, MD, Jaime Silva, MD, Ana Hinojosa, MD, Carlos Mares, MD, Alejandro Covarrubias, MD
Sepsis Guidelines Implementation
Hospital Materno-Infantil Monterrey

Improved identification of patients with septic shock without improvement in bolus administration
Sepsis Guidelines Implementation
Hospital Materno-Infantil Monterrey

Improved identification of patients with septic shock without improvement in antibiotic administration
Delivering High Quality Care
Responsibility of the Institutions

• **Structure:**
  - Evidence based, expert consensus guidelines
  - Trained personnel
  - Tertiary referral Children’s hospital

• **Process:**
  - Shock QI protocol in EC
  - Asthma QI protocol in EC

• **Outcomes:**
  - Collect patient outcome data, and re-assess process-oriented data collection