Lessons from the Design and Implementation of a Pediatric Critical Care and Emergency Medicine Training Program in a Low Resource Country
The South American Experience
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OBJECTIVES
- Define the importance of an Integrated Model of Care that incorporates Pediatric Palliative Care (PPC) and a human rights-centered approach into the Pediatric Intensive Care Unit (PICU)
- Identify opportunities to implement palliative care in different stages of illness

OBJECTIVES
- Describe a model of continuous medical education that increases the number of professionals competent in the integrated care of critically ill children in low resource environments

INTRODUCTION
- Why do we prolong the survival of critically ill patients?
- Children’s rights
- Health equity
- Social justice

INTRODUCTION
- 6.3 million children died in 2013, mostly in developing countries
- Only about 10-20% of these children were ever referred to a hospital and about 30-50% of them died the first day of hospitalization due to:
  - Lack of specialists
  - Insufficient infrastructure
  - Socioeconomic factors

PICUs in Latin America vs. Europe
Family-Centered Model of Care

- Shared decision-making model
- Multidisciplinary meetings that involve the family
- Consistency in communication and interculturality
- Honesty
- Presence of the family during rounds and CPR
- Flexible and constant visits
- Support for the family before, during, and after the patient’s discharge or death


QUALITY OF LIFE!
Integrated Model of Care

- Critical Care + Palliative medicine with a focus on human rights

“The term palliative care is often perceived by some of my colleagues and by some parents as synonymous with giving up hope or working with the death squad—and with death itself.”

“What they can’t understand is that it is clear that applying palliative care really leads to children living longer and better.”

Dr. Stefan Friedrichsdorf

MYTHS ABOUT PALLIATIVE CARE IN THE PICU

- Myth #1: A child must have a terminal illness or be at the end of their life to receive palliative care
- Myth #2: Palliative care = giving up hope
- Myth #3: A child should have a DNR in order to receive palliative care
- Myth #4: PPC is only applicable for children with cancer
- Myth #5: In order to provide PPC, you must also abandon all of the disease-directed treatment

Stefan J. Friedrichsdorf, et al. EPEC-Pediatrics, 2010-2016

PEDIATRIC PALLIATIVE CARE

- Pediatric palliative care prevents, identifies, and treats the suffering of children with serious illnesses as well as that of their families and the teams that care for them
- Pediatric palliative care is appropriate in whatever stage of the disease, and it can be applied in conjunction with treatment directed at curing the disease

PPC is initiated when the life-threatening disease has been diagnosed and continues whether or not the child receives curative treatment

**PEDIATRIC PALLIATIVE CARE**

- PPC prevents, identifies, and treats the suffering of children with serious illnesses as well as that of their families and the teams that take care of them.
- PPC is appropriate in all stages of the disease and can be provided alongside treatment directed at curing the disease.
- UNDHR/CRC: 2, 3, 4, 5, 6, 7, 8, 9, 12, 13, 14, 15, 16, 17, 18, 19, 20, 23, 24, 25, 27, 28, 29, 30, 31, 33, 34, 39, 42.

**PREDICTABLE OPPORTUNITIES TO INITIATE PALLIATIVE CARE TASKS IN THE PICU**

![Diagram of state of health/function over time]

**POINT F: RECOVERY**

- Maximizing recovery and optimizing function
- Monitoring and managing late effects

**ECUADOR: CURRENT STATE OF PALLIATIVE CARE**

- According to the Worldwide Palliative Care Alliance:
  - Ecuador’s Palliative Medicine Development Ranking:
    - 3a Countries with limited provision of palliative care

**OBJECTIVES OF THE STUDY**

- Implement the PaPaS scale in a pediatric patient population in HDLV’s PICU
- Determine the functionality of the scale in this population
- Demonstrate the validity of the PaPaS scale to predict which patients should receive PPC
- Discover associations between PaPaS scores with morbidity and mortality

**Paediatric Palliative Screening Scale (PaPaS Scale): applications in the PICU**

- Eva Bergstraesser; Richard D Hain; José L Pereira
  - *BMC Palliative Care* 2013, 12:20.

**Ecuador: Paediatric Palliative Screening Scale (PaPaS Scale): applications in the PICU**

**DIAGNOSES UPON ADMISSION 2011-2015**

<table>
<thead>
<tr>
<th>Diagnosis (%)</th>
<th>Total n=510</th>
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<tbody>
<tr>
<td>Respiratory infections</td>
<td>103 (20%)</td>
</tr>
<tr>
<td>Trauma</td>
<td>67 (13%)</td>
</tr>
<tr>
<td>Congenital abnormalities</td>
<td>99 (19%)</td>
</tr>
<tr>
<td>CNS diseases</td>
<td>107 (21%)</td>
</tr>
<tr>
<td>Cardiac diseases</td>
<td>35 (7%)</td>
</tr>
<tr>
<td>Sepsis</td>
<td>25 (5%)</td>
</tr>
<tr>
<td>Others</td>
<td>74 (15%)</td>
</tr>
</tbody>
</table>

**DEMOGRAPHIC VARIABLES 2011-2015**

<table>
<thead>
<tr>
<th></th>
<th>Total n=511</th>
<th>PaPaS ≤25</th>
<th>PaPaS ≥25</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years and SD)</td>
<td>5.3 ± 4.9</td>
<td>5.4 ± 4.9</td>
<td>5.1 ± 4.8</td>
<td>0.014</td>
</tr>
<tr>
<td>Male sex (%)</td>
<td>266 (52%)</td>
<td>205 (55%)</td>
<td>61 (44%)</td>
<td></td>
</tr>
<tr>
<td>Race: mestizo (%)</td>
<td>432 (85%)</td>
<td>332 (89%)</td>
<td>100 (72%)</td>
<td></td>
</tr>
<tr>
<td>Days hospitalized (average and SD)</td>
<td>13.2 ± 13.8</td>
<td>12 ± 11.7</td>
<td>16 ± 18</td>
<td>0.0001</td>
</tr>
</tbody>
</table>

**Mortality: 4.8%**

**PaPaS: 23.4 ± 2.9**

**THE INTEGRATED MODEL OF CARE “LAUDE” IN PEDIATRIC EMERGENCY AND CRITICAL CARE**

**Team Training**

*Pediatric Intensive Care & Palliative Medicine*

All children are admitted to the Program:

“INTEGRATED MODEL OF CARE”

irrespective of their prognoses


**IMPLEMENTATION:**

- Innovation for Humanity Program
- Johns Hopkins University
- Universidad San Francisco de Quito
- Hospital de los Valles

**GOAL:**

Development of Units of Excellence in Pediatric Intensive Care with an Integrated Model of Care

**GOAL: CONTRIBUTE TO THE DEVELOPMENT OF NATIONAL CAPACITY**

- Provide “the best evidence-based, most cost-effective medicine focused on the conservation of resources in a socially responsible way.”


**GENERATION OF THE LAUDE PROGRAM IN PEDIATRIC EMERGENCY AND CRITICAL CARE**

Discard the concept of universality

Grunauer MA, et al. Pediatric Critical Care Medicine, 2014; 15:4 (144)
Advanced Resuscitation
Shock
Heart failure
Arrhythmias
Myocarditis, cardiomyopathy
Congenital Cardiac Malformations
Cardiac tamponade
Postoperative care for cardiac surgery
Trauma
Withdrawal of life support
Brain death
Sedation and anesthetic management
Pain as the fifth vital sign

Obstructive pulmonary symptoms, asthma, bronchiolitis, respiratory infection
Shock, multiorgan failure
Severe malnutrition
Disasters
Diabetic Ketoacidosis
Sharing bad news—communication
Research methodology
Ethics, law
Family-Centered Model of Care

In 2 years, we trained 3 hospitals and 30 doctors in Quito
Scholarly products
The mortality rate from the first evaluated center lowered from 7.6% to 5%
Duration of the program
Cost $150,000–250,000 USD (Volunteer model: $40,000 USD)

How can we maintain the quality, sustainability and the impact of this program?

APLS + Integrated Model of Care
PROGRAM IN PEDIATRIC EMERGENCY AND CRITICAL CARE —APLS COMPONENT

DIFFERENCES IN PRE AND POST TEST SCORES BEFORE AND AFTER APLS TRAINING

N (169) 75.5 post-APLS versus 64.8 pre-APLS (p<0.0001)

APLS Team, manuscript in preparation, 2016
IMPLEMENTATION OF CODE BLUE IN THE PEDIATRIC AREA OF THE HOSPITAL SAN FRANCISCO DE QUITO

ALGORITHM FOR PEDIATRIC RESPIRATORY PROBLEMS MOST COMMONLY SEEN IN TYPE A HEALTH CENTERS

TYPE C OPERATIVE UNIT OF SAN RAFAEL: IMPLEMENTATION OF ADVANCED PEDIATRIC LIFE SUPPORT ALGORITHMS

Training TEAMS instead of individual training was highly successful

IMPLEMENTATION OF CODE BLUE RESPONSE IN THE HOSPITAL DE LOS VALLES

180 PROFESSIONALS in 20 provinces TRAINED in 12 MONTHS

Number of Participating Centers per Country

- Philippines 12%
- Argentina 9%
- Italy 7%
- Ghana 3%
- Mexico 9%
- Ecuador 2%
- China 3%
- Ukraine 3%
- Malaysia 3%
- Colombia 3%
- Turkey 19%
- USA 13%
- Switzerland 3%
- Spain 3%
SUMMARY

- Ecuador can establish a Model of Integrated Care for critically ill children.
- This program is aimed at providers with no formal training in PCC and who, nonetheless, care for severely ill children.
- This program resulted in stronger, more cohesive PICU teams with improved resuscitation times and coordination during simulation rounds.
- Hospitals that implemented the program had a decrease in mortality rates.

Thank you!

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