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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Hospital de los Valles
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

Capt. John Severns - 2007
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

Campos-Miño, et al. Medicina Intensiva, 2012; 36:3-10
PICU-Hospital de los Valles
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

State of health/Function over time
POINT F: RECOVERY

Maximizing recovery and optimizing function
Monitoring and managing late effects
According to the Worldwide Palliative Care Alliance:

- Ecuador’s Palliative Medicine Development Ranking:
  - 3a → Countries with limited provision of palliative care

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

Eva Bergstraesser; Richard D Hain; José L Pereira

*BMC Palliative Care* 2013, 12:20.
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

Grunauer MA; Cordero A. 2011-2015, manuscript under review
## DIAGNOSES UPON ADMISSION 2011-2015

<table>
<thead>
<tr>
<th>Diagnosis (%)</th>
<th>Total</th>
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<tr>
<td></td>
<td>n=510</td>
</tr>
<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>
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</table>
# Demographic Variables

## 2011-2015

**Mortality:** 4.8 %

**PaPaS:** 23.4 ± 2.9

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
<th>PaPaS &lt;25</th>
<th>PaPaS ≥25</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n=511</td>
<td>n=372</td>
<td>n=139</td>
<td></td>
</tr>
<tr>
<td><strong>Age (years and SD)</strong></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><strong>Male sex (%)</strong></td>
<td>266 (52%)</td>
<td>205 (55%)</td>
<td>61 (44%)</td>
<td></td>
</tr>
<tr>
<td><strong>Race: mestizo (%)</strong></td>
<td>432 (85%)</td>
<td>332 (89%)</td>
<td>100 (72%)</td>
<td></td>
</tr>
<tr>
<td><strong>Days hospitalized (average and SD)</strong></td>
<td>13.2 ± 13.8</td>
<td>12 ± 11.7</td>
<td>16 ± 18</td>
<td>0.0001</td>
</tr>
</tbody>
</table>

Grunauer MA; Cordero A. 2011-2015, manuscript under revision
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

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

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

Discard the concept of universality

Grunauer MA, et al. Pediatric Critical Care Medicine, 2014; 15:4 (144)

http://www.projectadapt.org/
THE LAUDE PROGRAM IN PEDIATRIC EMERGENCY AND CRITICAL CARE

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

THE LAUDE PROGRAM IN PEDIATRIC EMERGENCY AND CRITICAL CARE

Grunauer MA; Amato MBP; Barbas CSV; et al. American Journal of Respiratory and Critical Care Medicine 1997; 155
Grunauer MA; Fabara E; et al Pediatric Critical Care Medicine 2014; 15 (Suppl): p119
THE LAUDE PROGRAM IN PEDIATRIC EMERGENCY AND CRITICAL CARE
LESSONS LEARNED

- 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?
THE LAUDE PROGRAM IN PEDIATRIC EMERGENCY AND CRITICAL CARE

COMPONENTS

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

Conferences

- Pediatric Evaluation
- Pediatric Airway in health and disease
- Trauma
- Child Maltreatment
- Shock
- Children with special Health care needs
- Neonatal Emergencies
- Central Nervous System Emergencies
- Cardiovascular Emergencies
- Non traumatic surgical emergencies
- Medical Emergencies
- Toxicology
- PALS Essentials
PROGRAM IN PEDIATRIC EMERGENCY AND CRITICAL CARE — APLS COMPONENT
PROGRAM IN PEDIATRIC EMERGENCY AND CRITICAL CARE — APLS COMPONENT

Overall Impression

- Book Usefulness
- Good Presentation's Quality
- Proper Skill Stations Organization
- Adequate Balance of Course Activities
- Faculty Adequate Preparation & Knowledge
- I am confident after the course to treat severe pediatric patients
- I plan to teach others what I have learned
- The information learned will be valuable for my practice

0 1 2

APLS Team
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
PROGRAM IN PEDIATRIC EMERGENCY AND CRITICAL CARE IMPLEMENTATION COMPONENT IN THE WORK PLACE

APPLIED PROJECT IN THE HOSPITAL GINECO OBSTÉTRICO ISIDRO AYORA – PEDIATRIC ASSESSMENT TRIANGLE AND NRP
PROGRAM IN PEDIATRIC EMERGENCY AND CRITICAL CARE IMPLEMENTATION COMPONENT IN THE WORK PLACE

CHANGE IN HEALTH POLICY-SUBCENTRO DE SALUD AMAGUAÑA
IMPLEMENTATION OF CODE BLUE IN THE PEDIATRIC AREA OF THE HOSPITAL SAN FRANCISCO DE QUITO

PROGRAM IN PEDIATRIC EMERGENCY AND CRITICAL CARE IMPLEMENTATION COMPONENT IN THE WORK PLACE
ALGORITHM FOR PEDIATRIC RESPIRATORY PROBLEMS MOST COMMONLY SEEN IN TYPE A HEALTH CENTERS

PROGRAM IN PEDIATRIC EMERGENCY AND CRITICAL CARE IMPLEMENTATION COMPONENT IN THE WORK PLACE
Training TEAMS instead of individual training was highly successful
PROGRAM IN PEDIATRIC EMERGENCY AND CRITICAL CARE IMPLEMENTATION COMPONENT IN THE WORK PLACE

IMPLEMENTATION OF CODE BLUE RESPONSE IN THE HOSPITAL DE LOS VALLES
PROGRAM IN PEDIATRIC EMERGENCY CRITICAL CARE
APLS COMPONENT

180 PROFESSIONALS In 20 provinces TRAINED in 12 MONTHS
PICU - MIC: MODELS OF INTEGRATED CARE IN PEDIATRIC INTENSIVE CARE UNITS IN CENTERS AROUND THE WORLD

- Models of care used in PICU's around the world
- 17 countries
- 31 actively participating centers

### Number of Participating Centers per Country

- Philippines: 3.2%
- Argentina: 3.2%
- Italy: 6.5%
- Ghana: 3.2%
- Mexico: 6.5%
- Ecuador: 3.2%
- China: 3.2%
- Ukraine: 3.2%
- Malaysia: 3.2%
- Chile: 6.5%
- Bolivia: 3.2%
- Kazakhstan: 6.5%
- Switzerland: 3.2%
- Spain: 3.2%
- USA: 12.9%
- India: 9.7%
- Turkey: 19.4%
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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www.usfq.edu.ec