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

Grunauer MA, et al. Journal of Pediatric Intensive Care, 2016

### **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

UNICEF REPORT. The United Nations Children's Fund: New York 2014

- -Insufficient infrastructure
- -Socioeconomic factors

# PICUs in Latin America vs. Europe







#### 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

Aslakson RA. et al. Crit Care Med. 2014:42(11):2418-28



# **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.



# **ECUADOR: CURRENT STATE OF**

State of health/Function over time

PREDICTABLE OPPORTUNITIES TO INITIATE PALLIATIVE CARE TASKS IN THE PICU

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**POINT F: RECOVERY** Maximizing recovery and optimizing function Monitoring and managing late effects

# **PALLIATIVE CARE**

- 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					

Diagnosis (%)	Total
	n=510
Respiratory infections	103 (20%)
Trauma	67 (13%)
Congenital abnormalities	99 (19%)
CNS diseases	107 (21%)
Cardiac diseases	35 (7%)
Sepsis	25 (5%)
Others	74 (15%)
Grunauer MA;	Cordero A. 2011-2015, n

2011-2015					
	Total	PaPaS <25	PaPaS ≥25	P-value	
	n=511	n=372	n=139		
Age (years and SD)	5.3 ± 4.9	5.4 ± 4.9	5.1 ± 4.8	0.014	
Male sex (%)	266 (52%)	205 (55%)	61 (44%)		
Race: mestizo(%)	432 (85%)	332 (89%)	100 (72%)		
Days hospitalized (average and SD)	13.2 ± 13.8	12 ± 11.7	16 ± 18	0.0001	
Mortality: <b>4.8 %</b> PaPaS: <b>23.4 ± 2.9</b>					
Grunauer MA; Cordero A. 2011-2015, manuscipt under revisi					

#### 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

Grunauer MA, et al. Journal of Pediatric Intensive Care, 2016

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#### **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."

Lumb, Crit Care Clinics, 2006; 22:383-392

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



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





Grunauer MA, et al. Journal of Pediatric Intensive Care, 2016

#### THE LAUDE PROGRAM IN PEDIATRIC EMERGENCY AND CRITICAL CARE



Shock, multiorgan failure Severe malnutrition Disasters Diabetic Ketoacidosis Sharing bad news-communication Research methodology Ethics, Jaw Family-Centered Model of Care



Grunauer MA, et al. Journal of Pediatric Intensive Care, 2016



#### 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)

Grunauer MA, et al. Journal of Pediatric Intensive Care, 2016

#### THE LAUDE PROGRAM IN PEDIATRIC EMERGENCY AND CRITICAL CARE LESSONS LEARNED



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

SEC UNIVERSIDAD SAN FRANCISCO DE QUITO

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#### 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 POLICIY-SUBCENTRO DE SALUD AMAGUAÑA





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

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

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







# 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.



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