The role of simulation medicine for the training of primary care paediatrician treating critically ill children

(a short overview with fotoimpressions)

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Emergency Association 061, Galicia (Spain)

Connections with:
Spanish Group of Paediatric Cardiopulmonary Resuscitation
Paediatric Working Group – ERC European Resuscitation council - www.ERC.edu
Table of contents

1) Introduction in “Simulation”

2) Part 1: the spanish experience

3) Part 2: Implementation for PCP Primary Care Paediatricians in Europe (?): possibilities and financial aspects
Landing with happy end
Compostela, enero 2009

At the first attempt!

My first thorax-drainage!
¿What is the difference? (1)
Simulation in aviation
Standard in other fields
Part 2: Spanish experience

- Primary care pediatricians: Who are and what they do?
- Do they need training?
- What scenarios must be simulated?
- Our experience: facts, comments and feelings
Target population: Pediatricians working out-of-hospital

- Spain: ± 44 million inhabitants
- All children have access to “specialized” primary care:
  - Universal public insurance coverage
  - Optional private care
- Around 8,000 primary care pediatricians
  - 80% public system / 20% private care
  - Environment: Urban-team, Rural-alone
PCP’s personal profile

- Varied background, experience and training
- Broad age range (29-69)
- Majority of women (2/1)
Standard training of pediatricians

- Hospital based
- Residence in Pediatrics in teaching hospitals (4 years):
  - Newborns
  - Emergency room
  - Inpatients (wards)
  - Night shifts
  - Other: neurology, gastroenterology, respiratory, cardiology, critical care units,…

... BUT WITHOUT STANDARDIZED UPDATE AND RE-TRAINING
Pediatric residents
PCP at real life
PCP’s daily clinical activity

- Health child program
- A great variety of no-urgent, no-serious, no-stressful problems
- Limited patient-time allocated

... But not-free of unexpected and potentially seriously ill children:

- Respiratory failure
- Seizures
- Tachycardia
- Anaphylaxia
- Septic shock...
The spectrum of Primary Care Centers in Spain
PCP’s perceived knowledge / skills gaps

For common problems, they have knowledge but need re-training
  - Asthma, Croup, Bronchiolitis…

For rare serious cases, they require skills
  - Cardiopulmonary arrest
  - Anaphylaxia
  - Septic shock
  - Trauma
  - Tachycardia….
Comparing training / working ratios

5 days/wk

90 min/wk

7 days/wk

20 min/wk

No training /wk

5 days/wk

5 days/wk
The SEPEAP simulation based training program

- Awareness of the need
- Multidisciplinary working group design
  - Course contents
  - Scenarios
- Instructors training
- Quality control and accreditation
- Participants’ input
- Updates and future proposals
Learning objectives*

- Recognition of the seriously ill child
- Assessment and re-assessment following the ABC sequence
- Crisis resource management
- Interaction with parents
- Activation of the EMS and transport team
- Contact with reference center

* Adaptable to non-pediatricians
Course contents

- Introduction to simulation and role playing

**Scenarios:**
- **A** (airway): Croup
- **AB** (airway-breathing): Asthma, Bronchiolitis
- **C1** (cardio-circulatory): Severe sepsis
- **C2** (cardiac): Supraventricular tachycardia
- **C3** (circulatory): Blunt trauma
- **D** (disability): Coma
- **E** (ethics): Conflictive case

Course’s evaluation by participants
Non-technical skills
On site simulation (Emergency Room)
PCP at the Simulation Center
The asthma scenario

19 scenarios analyzed
Duration: 15 + 2 min

- Time to oxygen: 92 ± 80 sec
- No signal from pulse oxymeter in first 5 min: 5/19
- Inadequate nebulization of drugs: 9/19
- Transport to hospital not considered: 10/19
- Tracheal intubation attempt 3/19 (without success)
### Asthma simulation score (0-16): 7.3 ± 2.6

<table>
<thead>
<tr>
<th></th>
<th>0</th>
<th>1</th>
<th>2</th>
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</thead>
<tbody>
<tr>
<td>Elevate head of patient</td>
<td>No or it takes &gt;5´</td>
<td>It takes 2-5´</td>
<td>Before 2´</td>
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<tr>
<td>Pulseoxymeter positioning</td>
<td>It takes &gt;2´ to put it or &gt;5´ without displaying information</td>
<td>It is placed between 1-2´ or 1-5´ without information</td>
<td>&lt; 1´ and &lt;1´ without information</td>
</tr>
<tr>
<td>O2 (mask or nasal cannulae)</td>
<td>No or it takes &gt;5´</td>
<td>Between 2-5´</td>
<td>Before 2´</td>
</tr>
<tr>
<td>Salbutamol</td>
<td>No or it takes &gt; 5´</td>
<td>Between 2-5´ or treat with &lt; 3 puff inh.</td>
<td>&lt;2´ and treatment nebulized or inhaled ≥3 puff.</td>
</tr>
<tr>
<td>Pulses/ capillary refill and blood pressure</td>
<td>No</td>
<td>Only one or lasting more than 5 min</td>
<td>Both before 5 min</td>
</tr>
<tr>
<td>Reassess the situation</td>
<td>No</td>
<td>Auscultate or consider if treatment is going.</td>
<td>Both</td>
</tr>
<tr>
<td>Transfer consideration</td>
<td>No</td>
<td>Before 10 min</td>
<td>Before 5 min</td>
</tr>
<tr>
<td>Peripheral line</td>
<td>It takes ≥ 2 min or it isn´t used to treat with steroids.</td>
<td>Not placing line</td>
<td>Line placed before 2 min and treat with steroids.</td>
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52 courses in 28 months (from May 2008): 832 participants

> 100,000 km
Venues
## Immediate opinion of participants

**N**: 764

<table>
<thead>
<tr>
<th>Item</th>
<th>Mean</th>
<th>SD</th>
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<tbody>
<tr>
<td>Previous information</td>
<td>8.1</td>
<td>1.2</td>
</tr>
<tr>
<td>Schedule and duration of course</td>
<td>8.7</td>
<td>0.4</td>
</tr>
<tr>
<td>Venue and classrooms</td>
<td>9.0</td>
<td>0.3</td>
</tr>
<tr>
<td>Documentation provided</td>
<td>9.0</td>
<td>0.4</td>
</tr>
<tr>
<td>Objectives corresponded to expectations</td>
<td>9.3</td>
<td>0.4</td>
</tr>
<tr>
<td>Subjects were relevant to the course</td>
<td>9.4</td>
<td>0.5</td>
</tr>
<tr>
<td>Course was useful for clinical practice</td>
<td>9.4</td>
<td>0.4</td>
</tr>
<tr>
<td>The teachers presented the concepts clearly</td>
<td>9.3</td>
<td>0.5</td>
</tr>
<tr>
<td>The cases reflected the reality of daily practice</td>
<td>9.2</td>
<td>0.4</td>
</tr>
<tr>
<td>Team engagement level</td>
<td>9.2</td>
<td>0.4</td>
</tr>
<tr>
<td>Instructor – participant relationship</td>
<td>9.7</td>
<td>0.2</td>
</tr>
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Scale 0 to 10
Integrating Simulation and CME

Simulation Center

- PICU
- NICU
- Onco-hem emergencies
- Residents
  - Basic, Advanced and Neonatal Life Support
- Adults emergencies
- Course Emergencies Online
- MOBILE SIMULATION
  - Standard courses
  - Activities in meetings
  - PCP training program
    - Courses in preparation: basic / advanced cardiology, respiratory problems, mechanical ventilation, transport
Part 2: The IMPLEMENTATION:

Definition of SIMULATION:
Various types of simulators exist,
from simple models to highly advanced, computer-driven systems
From low realistic to highly realistic environment
The actors = instructors

- How to train them?
- Stepwise approach inside a complete chain of training supervised by expert instructors

1) PBLS Paediatric Basic Life Support:
   - Easy subject -> focus on didactical issues as instructor/team training for instructors:
   - Medical students/young doctors (trained as individuals at school of medicine) learn teamwork staying in course faculty with nurses and paramedics (trained as teamplayer)

2) Paediatric Advanced Life Support: aquisition of more professional abilities and medical background -> more complex instructor skills

3) -> entrance in the world of the big game: highly advanced simulation
Ingredients:

- **Maniquins**: basic, advanced, highly advanced, actors
- Low tech -> high tech/human
- Low fidelity -> high fidelity

- **Environment**: low realistic – high realistic
- Low tech -> high tech
- Real / Virtual

- **Communication, Teamwork, Debriefing**
The bill? ¿¿¿€€€€ $$$$ ???

(What is the difference between Aviation and Medicine? (2) )

- Airlines will lose aircraft (expensive) and cabin crew (expensive) and not only the passengers...

- Health administration will lose “only” the patient, Hospital and Staff will survive!

- High investment in Simulation by airlines,

- Low investment in Simulation by health administration
To begin: use existing spaces and materials in the hospital (in situ simulation) (webcams with microfones for 25€ are not so bad !)

Cooperate with Simulation Centers, Dep. of Anaesthesia, medical emergency associations and their schools (Red Cross, St.John’s Amb, Firebrigade, etc)
Fotoimpressions

PBLS Paediatric Basic Life Support
Stress testing lab, Paediatric Clinic, Hannover
EPLS European Paediatric Life Support course

Trauma Scenario Station (garden of paediatric clinic)
EPLS, Firebrigade Hannover Sep 2010, vascular access skill station
Red Cross Simulation Center Hannover, Sept 2009
Firebrigade Hannover, Sept 2008, in cooperation with DRF-Luftrettung (german Air Rescue) & White Cross Southtyrol
Red Cross Simulation Center Hannover, Nov. 2010
Lou Halamek, CAPE, Lucil Packard Children Hospital, Stanford, California (USA) - instructor NRP Newborn resuscitation Programm.
AAP American Academy of Pediatrics
Real children in Paediatric Trauma training
Video http://www.provinz.bz.it/se/west/mup-paednotmed/orf.wmv

Brixen/Bressanone – Southtyrol, oct. 2008 – in cooperation with White Cross Southtyrol & DRF-Luftrettung (German Air Rescue)

Combination of module of Spanish paediatric trauma course AITP and advanced simulation
Conclusions

- PCP may improve their abilities by means of advanced simulation
- Simulation courses must be adapted to the target population needs
- Participants’ feedback is positive, immediately and at long-term
- Simulation Centers should consider programs directed to PCPs
- Broad range of simulation possibilities for all budgets are existing
- European Implementation for Simulation courses for PCP is easy
How to start?

connect with people with experiences

4th IPSSW 26th-27th Oct. 2011 Toulouse - France
www.ipssw2011.com

IPSS International Paediatric Simulation Society

Presentation on www.provinz.bz.it/se/PaedNotMed