
Standards of Care for Children in Emergency Departments

Version 3.0

International Federation of Emergency Medicine



This document is a consensus document aimed at assisting hospitals around the world in defining minimum standards of care for children aged 0-18 years in the Emergency Department.

Each chapter contains:

- essential and desirable recommendations
- explanatory text
- references
- resources

INTERNATIONAL FEDERATION FOR EMERGENCY MEDICINE

34 Jeffcott Street
West Melbourne VIC 3003
T +61 3 9320 0444 | F +61 3 9320 0400
E ifem@acem.org.au | www.ifem.cc

Produced by: International Federation for Emergency Medicine

ISBN: 978-0-9873901-0-3

Further copies of this publication can be obtained from the International Federation for Emergency Medicine website at: www.ifem.cc/resources/ifem-policies-guidelines/

Disclaimer: Content within this publication was accurate at the time of publication.

This work is copyright. It may be reproduced in whole or part for study or training purposes subject to the inclusion of an acknowledgment of the source. It may not be reproduced for commercial usage or sale. Reproduction for purposes other than those indicated above, requires written permission from the

International Federation for Emergency Medicine.

© International Federation for Emergency Medicine 2019

Published: July 2012

Updated June 2014

Updated April 2019

PS-05 Standards of Care for Children in Emergency Departments

Paediatric Special Interest Group

Table of Contents

STANDARDS OF CARE FOR CHILDREN IN EMERGENCY DEPARTMENT

INTRODUCTION

Message from the Standards Lead.....	III
Standards Contributors.....	V
PEMSIG.....	VIII
IFEM.....	X
Address from PEMSIG Chair.....	XI

CHAPTER ONE

Introduction Standards 3.0.....	1
---------------------------------	---

CHAPTER TWO

Scope of Standards.....	5
-------------------------	---

CHAPTER THREE

Challenges facing PEM.....	9
----------------------------	---

CHAPTER FOUR

An Integrated Service.....	17
----------------------------	----

CHAPTER FIVE

Child and Family Centered.....	23
--------------------------------	----

CHAPTER SIX

Initial Assessment of an Ill or Injured Child.....	29
--	----

CHAPTER SEVEN

Stabilising and Treating an Ill or Injured Child.....	37
---	----

CHAPTER EIGHT

The Staffing of an Emergency.....	45
-----------------------------------	----

CHAPTER NINE

Staff Training and Competencies.....	53
--------------------------------------	----

CHAPTER TEN

Equipment, Supplies and Medications.....	61
--	----

CHAPTER ELEVEN

Quality and Safety.....	65
-------------------------	----

CHAPTER TWELVE

Policies, Procedures and Guidelines.....	71
--	----

CHAPTER THIRTEEN

Information System and Data Analysis.....	75
---	----

CHAPTER FOURTEEN

Pre-Hospital Care.....	81
------------------------	----

CHAPTER FIFTEEN

Mass Casualty/ Patient surges.....	87
------------------------------------	----

CHAPTER SIXTEEN

Safeguarding Children & Young People.....	93
---	----

CHAPTER SEVENTEEN

Adolescents, Mental Health & Substance Use.....	105
---	-----

CHAPTER EIGHTEEN

Death of a child in the ED.....	111
---------------------------------	-----

CHAPTER NINETEEN

Advanced Training and Academic Research.....	117
--	-----

CHAPTER TWENTY

Essential Recommendations.....	123
--------------------------------	-----

CHAPTER TWENTY-ONE

Desirable Recommendations.....	131
--------------------------------	-----

CHAPTER TWENTY-TWO

List of Abbreviations.....	137
----------------------------	-----

CHAPTER TWENTY-THREE

Appendix 1.....	139
-----------------	-----

CHAPTER TWENTY-FOUR

Appendix 2.....	145
-----------------	-----

CHAPTER TWENTY-FIVE

Appendix 3.....	153
-----------------	-----



MESSAGE FROM THE
STANDARDS LEAD

~
Dr. Rodrick Lim



Dear colleague,

Thank you for caring for children, and seeking out resources related to improving paediatric emergency care systems across the world. These Standards are the work of an amazing group of people, who care very deeply about care for children.

Our hope, is that with the guide of these Standards, it will provide guidance, information, and urgency to your local health system, so that we can move the needle for children's health.

This work would not have been possible without the countless hours people have donated in order to provide their wisdom to this project. Without the organisation IFEM, none of this work would be possible. The collaboration between countries and people is truly astounding!

« Children are the world's most valuable resource and its best hope for the future » John F Kennedy

Thanks again, and please do not hesitate to reach out and help us improve this resource!



Or better yet, come join us!

“

There can be no keener revelation of a society's soul than the way in which it treats its children.

-Nelson Mandela



DR. RODRICK LIM

Standards Lead PEMSIG

Paediatric Emergency Medicine
SPECIAL INTEREST GROUP
STANDARDS v3.0 CONTRIBUTORS

EXECUTIVE REVIEW COMMITTEE:

Dr Baljit Cheema, MD

Emergency Medicine Society of South Africa – SOUTH AFRICA

Dr Ffion Davies, MD

Royal College of Emergency Medicine - UK

Dr Marianne Gausche-Hill, MD

American College of Emergency Physicians - USA

Dr. Rodrick Lim, MD

Canadian Association of Emergency Physicians - CANADA

GROUP ADVISOR:

Felix Hay

Paediatric Advanced Nurse Practitioner in Children's Emergency Medicine - UK



CHAPTER CONTRIBUTORS:

Dr. Baljit Cheema	Chapters 1,3 (LMIC),6,7
Dr. Camilo Gutierrez	Chapters 3 (HIC),14
Dr. Rodrick Lim	Chapters 2,9,17
Dr. Ffion Davies	Chapters 4,8
Dr. Marianne Gausche-Hill	Chapters 4,8,14
Dr. Prinetha Moodley	Chapter 5
Dr. Heloise Buys	Chapters 5,6
Dr. Indumathy Santhanam	Chapter 7
Dr. Simon Chu	Chapter 8
Dr. Rahim Valani	Chapter 9
Dr. Sashikumar Ganapathy	Chapter 11
Dr. Teng Sung Shin	Chapter 11
Dr. Brianna McKelvie	Chapter 11
Dr. Zaw Lwin	Chapter 11
Dr. Simon Chu	Chapter 12
Dr. Ed Oakley	Chapter 12
Prof. Dr. Patrick VandeVoode	Chapter 13
Prof. Yehezkel (Hezi) Waisman	Chapter 15
Prof. Andrew Rowland	Chapter 16
Dr. Javeed Sukhera	Chapter 17
Dr. Adriana Yock-Corrales	Chapter 18
Prof. Franz Babl	Chapter 19

STANDARDS 1.0-2.0 CONTRIBUTORS:

Dr. Ffion Davies, MD
Dr. Marianne Gausche-Hill, MD
Dr. Simon Chu, MBBS DCH FACEM MMed
Dr. Baljit Cheema, MD
Dr. Angelina Ang, MD
Dr. Liliana Caceres, MD
Prof. Yehezkel (Hezi) Waisman
Jason Gray, Emergency Children's Nurse
Dr. Steven Krug, MD

Thank you to Renée Vachon for her time and effort copyediting this book.

This document should be cited as follows:
Paediatric Emergency Medicine Special Interest Group:
Standards of Care for Children in Emergency Department. Version 3.0.
International Federation of Emergency Medicine.
2019

PAEDIATRIC EMERGENCY MEDICINE SPECIAL INTEREST GROUP



Paediatric Emergency Medicine

SPECIAL INTEREST GROUP

A network of international health care professionals with interest in Paediatric Acute Care joined in a virtual community

Promote

Sharing of information amongst Paediatricians, Emergency Physicians & Paediatric Emergency Physicians

On-line and in person networking, mentoring and support from interested individuals around the world

Collaboration & best practice in education and training in the field of Paediatric Emergency Care

Act

Be a contact point and a resource for projects related to paediatric care worldwide

Provide advice and information to all member organisations at local, national or regional levels

Resources

A directory of international fellowship opportunities for physicians

Curriculum for Paediatric Emergency Medicine training programs

International Standards of Care of Children in Emergency Departments

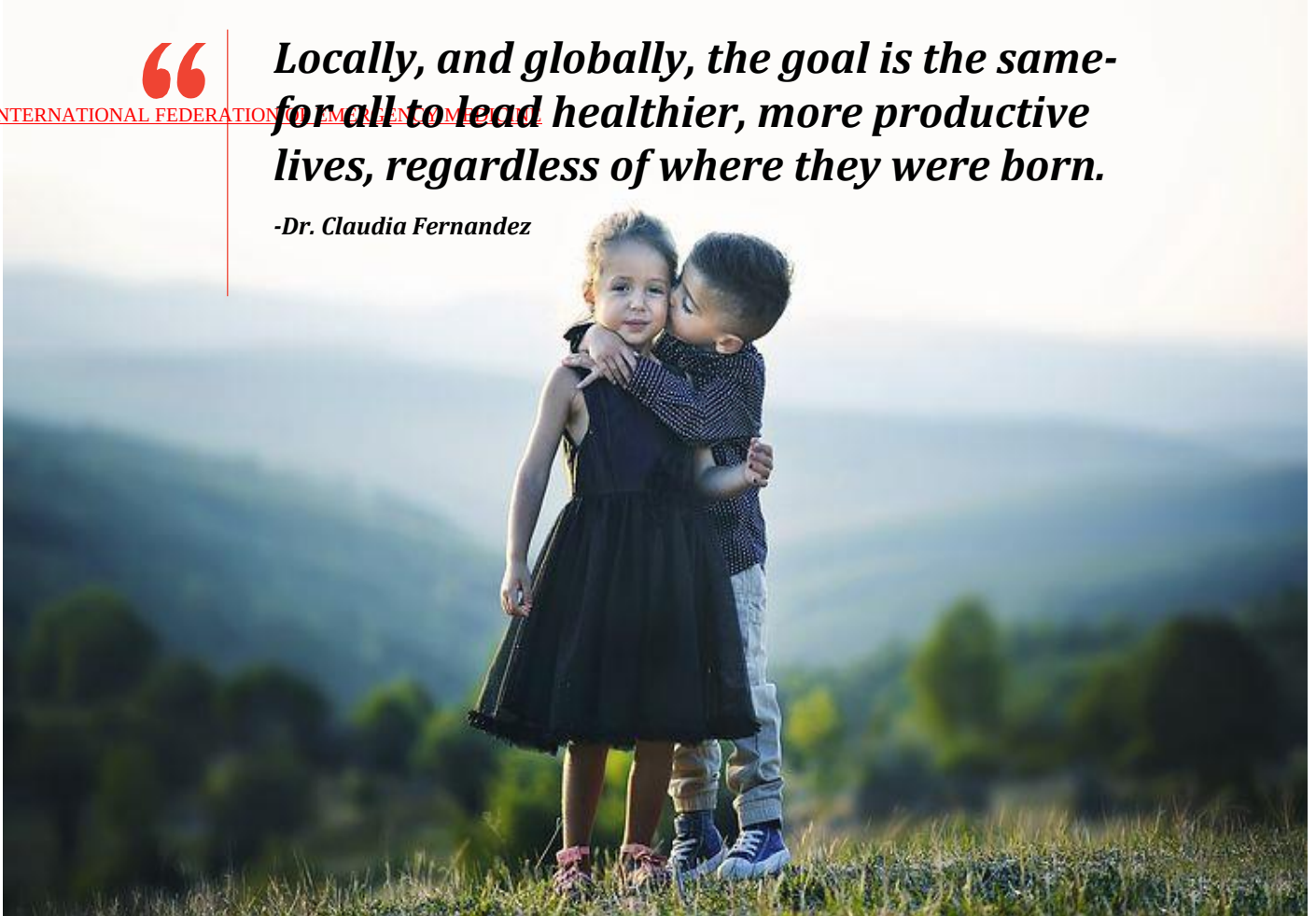
Roadmap for the development of Paediatric Emergency Medicine in your country

If you are interested in learning more or in joining the PEMSIG Group, please contact admin@ifem.cc

“

***Locally, and globally, the goal is the same-
for all to lead healthier, more productive
lives, regardless of where they were born.***

-Dr. Claudia Fernandez





INTERNATIONAL FEDERATION FOR
EMERGENCY MEDICINE

**IFEM will promote access to, and lead the development of,
the highest quality of emergency medical care for all people.**

- exchange information on topics of international interest;
- provide a mechanism for international collaborative research;
- provide a mechanism for international elective opportunities for trainees in emergency medicine programs;
- provide an avenue for international sabbatical and exchange opportunities for practitioners of emergency medicine;
- act as a forum for common problems and approaches to solving problems specific to emergency medicine;
- offer advice and guidance to emergency medicine practitioners worldwide in the formation of national associations and training and certification programs;
- provide a network system of centers to facilitate international cooperation in the event of national or man-made disasters;
- organise an international conference on topics of interest in emergency medicine, and
- act as a resource in the development of emergency medical services.

Address from PEMSIG Chair

STANDARDS 3.0

~

Dr. Camilo E Gutierrez

IFEM: Paediatric Emergency Medicine Special Interest Group



As the development of emergency medicine and acute care systems is well underway globally with over 50 countries where the specialty is fully recognised and another 30 or 40 more working to establish their own systems, the development of Paediatric Emergency Medicine systems is lagging.

In the United States, a thirteen year gap existed between the recognition



“

We now have a membership of almost 100 clinicians with a special interest in PEM, representing over two dozen countries and multiple national associations.

of emergency medicine and paediatric emergency medicine care, and it became apparent in many ways that recognition, understanding, and management priorities in paediatric patients do differ from the approach to adult counterparts.

We are reaching a point in which the establishment of acute care systems globally is imminent, we know the general challenges that regions and countries have, and we need to identify specific challenges related to our individual environments.

Within the Paediatric Emergency Medicine Special Interest Group (PEMSIG) of IFEM, we have undergone a similar transformation, from a small group back in 2010 of eight individuals; we now have a membership of almost 100 paediatric care clinicians, representing over two dozen countries and multiple national associations.

It is time to realise that as emergency and acute care systems develop, we need to include actively the awareness of the important differences that children require in their care. We can no longer allow years' worth of knowledge and action gap before

we realise that parallel to the development of adult systems, children need to be prioritised and their care should evolve at equal pace as their adult counterparts.

In this document, you will find a guide, a consensus aimed at assisting hospitals around the world in defining minimum standards of care for children in the Emergency Department that has been developed and updated to be a useful resource for your institution.

Camilo E Gutierrez MD, FACEP FAAEM

*Chair, IFEM: Paediatric Emergency
Medicine Special Interest Group*



Introduction

STANDARDS v3.0



Dr. Baljit Cheema

Paediatric Emergency Medicine Special Interest Group: IFEM



Emergency care of children and global child mortality

In 2017, an estimated 6.3 million children died globally, with 5.4 million of these deaths occurring before the age of 5, most of them from easily preventable or treatable causes such as pneumonia or gastroenteritis. This equates to approximately 15,000 children under-5 dying unnecessarily, every day of 2017. Child deaths are unevenly spread around the world with 80% of global under-5 deaths occurring in two regions of Low and Middle Income Countries (LMIC): 50% in sub-Saharan Africa and 30% South Asia.¹

The good news is that there has been a marked reduction in child mortality levels globally, with many millions of children less dying annually than in previous centuries, the sad news is that many millions more could have been saved if all countries had achieved the same low mortality rates as the European Union (See Figure 1).^{1,2}

It has been said that: “Quality may be defined as adhering to expected standards” and “In pediatric care, such standards exist to ensure that children receive appropriate care; to avoid harmful practices; and to provide a benchmark for professional development, self-monitoring, and accreditation.”³ We in IFEM PEMSIG believe that improvements in emergency care can help to reduce the number



“

Quality may be defined as adhering to expected standards.

of children dying globally.

Background to IFEM PEMSIG Standards

In view of the absence global standards for emergency care for children, a small group of passionate Emergency Medicine (EM), Paediatric and Paediatric Emergency Medicine (PEM) specialists published the first set of IFEM standards for the emergency care of children in 2012, using an expert consensus approach. These standards were translated into Spanish and Chinese. With an updated version (Standards 2.0) being published in 2014. We have had positive feedback from our members about the usefulness of these standards over the years.

In recognition of the fact that the practice of the emergency care of children is evolving, we felt it critically important that our standards keep abreast of the latest thinking, technology and practice. With this in mind, Dr. Rod Lim, the IFEM PEMSIG Standards Lead, has heroically led the process of a full revision of the IFEM standards, to produce this Standards 3.0 document.

IFEM PEMSIG Standards 3.0

This edition of the standards document is a fully revised and expanded version of the previous standards documents. In it we have comprehensively examined key aspects of emergency care of children and given recommendations regarding the standards that should be attained by those running emergency departments where children are seen. This was quite a task given the inevitable diversity of circumstances, we hope we achieved a balanced and meaningful view due to the inputs of a broad range of global experts.

The recommendations are divided into those we considered essential and those which were deemed desirable, they are practical and pragmatic and written in clear language. Our hope is that they will help be a practical tool to help emergency workers and their managers globally, to advocate and motivate for improvements to the emergency care of children in their own facilities, wherever they may be.

Figure 1: Child mortality relative and potential reductions²

The world is much better; The world is awful; The world can be much better Our World in Data



Child deaths refer to children younger than 5 years. 'Current' refers to the latest available data which is from 2017. The country with the lowest child mortality rate is Iceland [0.21%]. Data source: World Development Indicators for global births and deaths in 2017. The estimate for the global child mortality rate in 1800 [43%] is based on the work by Gapminder. This is a visualization from OurWorldInData.org, where you find data and research on how the world is changing.

Licensed under CC-BY-SA by the author Max Roser.

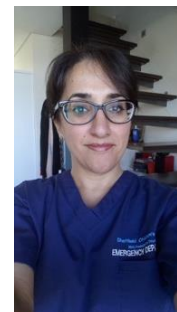
The Standards 3.0 document has had inputs from a wide range international of EM, Paediatric and PEM experts, all of whom are committed members of IFEM PEMSIG, and we owe a major debt of gratitude to all the listed authors, who gave their time and energy so generously. Much additional hard work was done by the Executive Review Committee who reviewed, edited and revised every chapter of this document over a 2 year period. The hardest and most onerous job, however, fell to Rod Lim; without his commitment and dedication, we would not have this valuable resource available for our members, and for the global emergency care community striving towards reducing child mortality around the world.

It has been a great privilege and honour for me to serve as PEMISG chair during the time that this document was being revised and updated. My heartfelt hope is that the IFEM PEMSIG Standards 3.0 will help policy-makers, managers and health workers around the world to advocate and motivate for improvements in the quality of emergency care for children. Wherever you are in the world, whether you work in LMIC settings, where children's emergency care may just be starting to evolve, or if you are based in a state of the art emergency facility in a High-Income Country (HIC), there is something in this document for you.

Baljit Cheema MB BS, BSc, MRCPCH, DTM&H, MPhil

IFEM: Paediatric Emergency Medicine Special Interest Group

Immediate Past Chair (2016-2018), RoadMap Lead (2018-2020), Standards Lead (2012-2016)



REFERENCES:

1. Hug L, Sharrow D, Zhong K, et al.: Levels & Trends in Child Mortality Report 2018 [Internet]. 2018. [cited 2019 Mar 2] Available from: <https://data.unicef.org/wp-content/uploads/2018/09/UN-IGME-Child-Mortality-Report-2018.pdf>
2. Roser M: The world is much better; The world is awful; The world can be much better. [Internet]. *Our World Data* 2018; Available from: <https://ourworldindata.org/much-better-awful-can-be-better>
3. Campbell H, Duke T, Weber M, et al.: Global Initiatives for Improving Hospital Care for Children: State of the Art and Future Prospects [Internet]. 2007; [cited 2019 Mar 2] Available from: www.pediatrics.org/cgi/doi/10.1542/

Purpose and
SCOPE OF STANDARDS

Paediatric Emergency Medicine Special Interest Group: IFEM



Why do we need standards of care for children in Emergency Departments?

The International Federation of Emergency Medicine aims to publish and update standards in order to improve the emergency care of children around the world. There is evidence that publishing standards assists both managers and clinical staff to deliver improvements. For example, improvement was seen following publication of similar documents in the UK¹ and the USA². Despite this, children even in developed countries often lack good emergency care³. Although the Standards which were released in 2012 were of benefit in many countries, much work is left to be done!

Do emergency medical care systems need to be formally established to make use of this document?

No, this document will be helpful even to those working in countries where emergency medical systems are evolving. It will help them to be better prepared in their planning for the provision of emergency care of children.



The standards here do not cover the whole of emergency care: they highlight the special and unique needs of children.

What do we mean by “Emergency Department (ED)”?

This document is intended for use in countries with established hospital Emergency Departments (EDs). This means an area of the hospital where patients can arrive with illness or injury, without an appointment and be seen by a team in an area dedicated to emergency care. The standards here do not cover the whole of emergency care: they highlight the special and unique needs of children, assuming that a basic emergency department is functioning. Hospitals where patients are seen in the out-patient clinic area or on admissions wards may also find elements of this document useful.

Is this document aimed only at medical and nursing staff?

No, these standards are not only clinical standards for medical personnel; they are also about the design and organisation of the department and its staff. Chapter 3 covers particular challenges relating to Paediatric Emergency Care (PEC). Good care cannot happen without a functioning network extending from pre-hospital (ambulance and primary care) healthcare, through to emergency department care and on to in-hospital care. Chapter 4 describes issues for PEC networks. Many disciplines who are dedicated to improving care for children will find many uses from these standards.

What do we mean by “children”?

This document aims to cover the needs of the newborn up to 18 years. Children aged 12-18 have many similarities to adults, but there are still very important differences. These teenagers in fact are often “in a gap” – health services are more commonly designed to treat either smaller children or adults. Those children aged 16-18 are regarded mostly as adults, but can be quite vulnerable, and many children’s hospitals treat this age group.

What do we mean by “Paediatric Emergency Medicine (PEM)”?

For optimum care, there is a unique skill-set needed to treat acutely ill infants, children and teenagers. Paediatric emergency care is a mixed skill-set that results from specialised training taken from both Paediatric and Emergency medicine expertise. EM staff can benefit from the non-surgical skills, communication skills and family centered practice of Paediatric staff, and Paediatric staff can benefit from the organisational, critical care, ultrasound and trauma skills of EM staff.

Does this mean very specialised training?

No, not necessarily. There is a large variability across the world. Training can be added on after core training in either EM or Paediatrics (see Chapter 19). Much depends on whether a country has EM training as specific training and if so, as standalone training or as an add-on after training in other specialities.

In countries with very established EDs and where Emergency Medicine (EM) is a full core

speciality (e.g. USA, Canada, Australia, New Zealand, UK) PEM is a sub-speciality of EM &/or Paediatrics, with its own training. The sub-specialty of PEM recently been recognized in South Africa, with the training path planned to be through either EM or Paediatrics.

In others such as South America, Spain, Sweden, Ireland, PEM specialists exist although PEM is not formally recognised as a subspecialty in its own right, or indeed EM may not be regarded as a core speciality - but as a super-speciality after core training in another area (e.g. Israel, Denmark).

Regardless, if the ED accepts a full range of acute care needs across the age spectrum, the doctors and nurses should have the skills to achieve excellent care across the range of age and disease, for example a child with a fracture who also has child protection issues, or a pale, floppy 5-day-old baby, or a teenager intoxicated with drugs or alcohol. Chapter 9 covers staff training and competences.

Does this mean separate facilities?

Not necessarily. There is no “right” model. Facilities may be purely Paediatric or mixed with adults. A Paediatric Emergency Department (PED) is often part of or co-located with an Adult Emergency Department, but with often some separation to protect children from distress. Approximately 6% of mixed EDs in the United States have a physically separate Paediatric ED but there are over 180 Children’s Hospitals with an ED treating children up to 21 years of age. In the UK nearly all EDs have a separate waiting area for children, the vast majority have treatment areas reserved for children, while about 20% have a purpose built area (usually next to the main ED) but only 4% of EDs are in a separate children’s hospital.

Chapter 20 contains the full set of recommendations from this document. The Appendices contain checklists and resources that we hope are useful to EDs worldwide as well as a full list of abbreviations used.



IFEM’s Mission is:

- > To advance the growth of high quality emergency medical care through education and standards.***
- > To lead the collaboration and networking necessary to establish universal equality in service and care.***
- > To promote the creation and growth of the specialty of emergency medicine in every country***



REFERENCES:

1. Standards for Children and Young People in Emergency Care Settings (third edition) 2012. Royal College of Paediatrics and Child Health. <https://www.rcpch.ac.uk/resources/facing-future-standards-children-young-people-emergency-care-settings>
2. American Association of Paediatrics policy statement on Care of Children in Emergency Departments, 2009, Krug S, Gausche-Hill M. Guidelines for care of children in emergency departments. *Paediatrics* 2009;124:1233-1243. <http://aappolicy.aappublications.org/cgi/content/full/Paediatrics:107/4/777>
3. Emergency Care for Children: Growing Pains. Committee on the future of emergency care in the United States Health System. The National Academies Press 2007, ISBN-13:978-0- 309-10171-4
 1. <http://www.seup.org/seup/html/pub/publicaciones.htm>
 2. www.seup.org/seup/pdf/publicaciones/er.urgencias.pdf

Challenges facing
PAEDIATRIC EMERGENCY MEDICINE

Paediatric Emergency Medicine Special Interest Group: IFEM



INTRODUCTION

There are significant challenges facing Paediatric Emergency Medicine globally from Low and Middle-Income Countries (LMIC) to High-Income Countries (HIC). Advocacy for improvement in both is certainly needed, but the challenges that are faced are very different. This chapter focusses on some of the challenges facing PEM in the global context: the first section examines the difficulties faced by those working in Low and Middle-Income Countries (LMIC) and the second looks at issues more specific to High-Income Countries (HIC)

Low & Middle-Income Countries (LMIC)

Dr. Baljit Cheema

Sustainable Development Goal (SDG) 3 calls for an end to preventable deaths of newborns and children under-5 and specifies that all countries should aim to reduce under-5 mortality to at least as low as 25 deaths per 1,000 live births by 2030.¹ Great strides were made during the Millennium Development Goal (MDG) era with the under-5 mortality rate falling from 93 deaths per 1,000 live births in 1990 to 39 in 2017 – a 58 per cent reduction. This equates to 1 in 26 children dying before reaching age 5 in 2017, compared to 1 in 11 in 1990.¹

In most HIC settings SDG 3 has already been met but there is still much work to be done in LMIC where the vast majority of child deaths occur. In 2017 the sub-Saharan region of Africa had the highest under-5 mortality rate in the world with an average of 76 deaths per 1,000 live births. This means 1 in 13 children died before their fifth birthday – 14 times higher than the global average rate of 1 in 185 in HIC and 20 times higher than the ratio of 1 in 263 in the region of Australia and New Zealand.¹



“

Often times paediatric preparedness is substandard with significant gaps in the ability to safely manage children at the prehospital and emergency department levels.

The category LMIC is a broad grouping and it must be acknowledged that there will be considerable variation within this bracket, without doubt there are many centres of paediatric excellence leading the way in places such as India, China, Africa and South America. But even within individual countries, there can be huge disparities between what happens in larger, better resourced urban centres and the district or rural hospitals, which are usually the first-referral level facilities for most sick children in LMIC.²

The World Health Organization (WHO) recently published their standards of care for children and adolescents, this is an excellent resource covering a broad range of issues but is not specifically focused on emergency care standards.³ We in IFEM PEMSIG believe that global standards for emergency care are essential to improving paediatric emergency care across the board, and thereby, helping reduce child mortality.

Primary & Public Health versus Hospital Emergency Care

Healthcare expenditure is limited globally and quite rightly there has been a focus on strengthening public health (PH) measures and primary health care (PHC) programs, such as WHO Integrated Management of Childhood Illnesses (IMCI)⁴, in LMIC for many decades. However, PHC services are not designed to manage critical illness in children, beyond initial basic interventions and it is known that 10-20% of children seen at PCH in LMIC are referred up to a hospital for further care.^{5,6} Unfortunately, there is considerable evidence that the quality of emergency care at first-referral level hospitals in LMIC settings for these very sick children is poor, and urgently needs to be improved.^{6,7}

The obstacles in the way of quality improvement of paediatric emergency care in LMIC are enormous, but not insurmountable: with recognition and appropriate collaborative efforts globally, reductions in child mortality can be made. Some key problem areas specific to LMIC are outlined below:

Patient load and burden of disease

The sheer numbers of sick children presenting to LMIC emergency areas can be overwhelming, for example in 2017 the Chennai Children's Hospital had 609,816 child attendances in their emergency and outpatient's area (1670/day) with approximately 20-30 resuscitations of critically ill children daily (Personal communication: Dr Indumathy Santhanam). The Paediatric Emergency Department at Queen Elizabeth Central Hospital in Blantyre, Malawi sees 91,000 children per year, of whom 26,000 are admitted annually.⁸

The types of acute illnesses that children present with are simple common childhood conditions, which have often worsened due to poverty, overcrowding, malnutrition and delays in reaching healthcare services.^{1,2,6,9} The latest WHO data (Figure 1) show acute respiratory infections and diarrhoeal diseases to be the cause of over 1 million deaths in children under-5 in 2017.⁹ We know that these conditions are simple to treat with good

quality emergency care.

Staffing

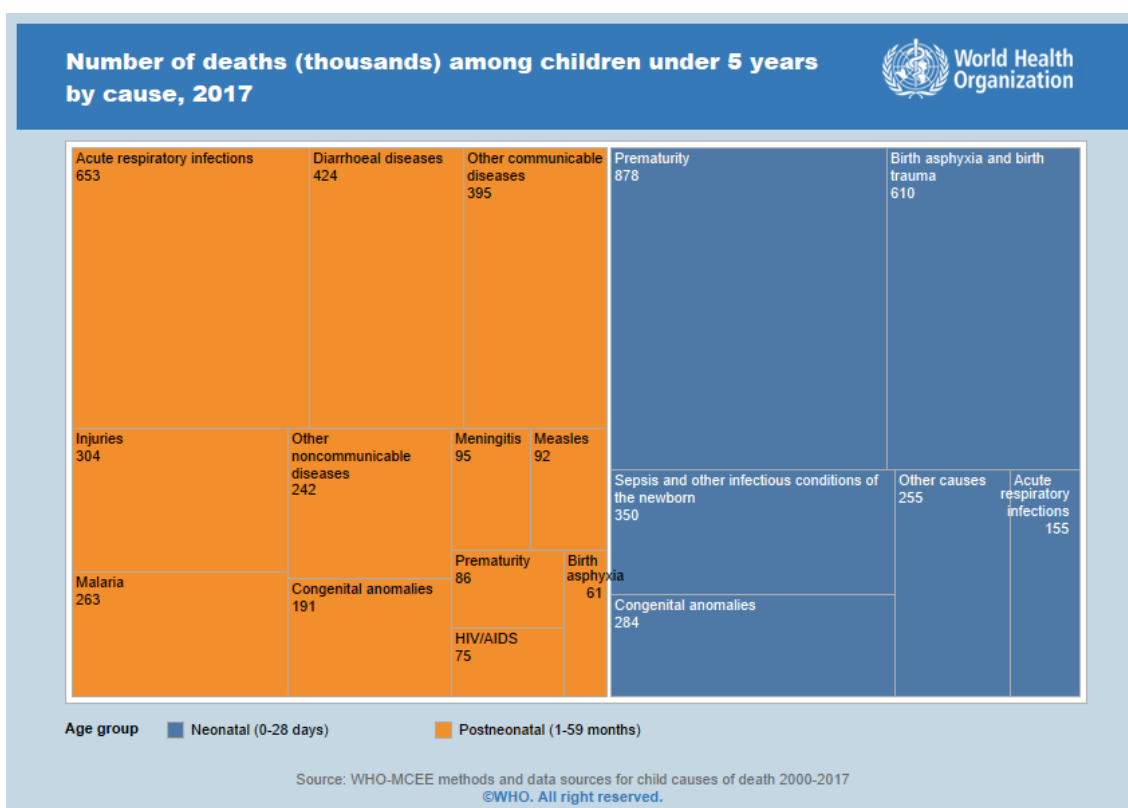
The WHO global workforce data shows that there are huge shortfalls of medical and nursing staff in LMIC settings. One study evaluating the shortage of health workers in Africa calculated that “it would take 36 years for physicians and 29 years for nurses and midwives to reach WHO’s recent target of 2.28 professionals per 1000 population for the countries taken as a whole – and some countries would never reach it.”¹⁰

Another obstacle to improving the quality of emergency healthcare in LMIC is that the medical and nursing staff manning the ‘frontlines’ are often junior and they are frequently unsupported. In LMIC emergency settings, especially rurally, there is often no easy way access senior physicians (e.g. EM, PEM or paediatrics) for advice either in person or telephonically.

Equipment & Medications

In some LMIC even the most basic item, such as oxygen, suction equipment, self-inflating bags and correct sized facemasks, may be unavailable in the emergency areas. Monitoring is often problematic, and even if functioning monitors are present, there is often an absence of neonatal and paediatric sized probes. A detailed survey of 14 Kenyan first-referral hospitals found that oxygen and isotonic crystalloids for intravenous infusion were rarely or never available in 2(14%); suction tubes and newborn bag and mask were rarely or never available in 3 to 6 of the hospitals and oxygen monitors and intravenous giving sets were rarely or never available in 11 (79%) of facilities.⁸ Clearly these will impact on the ability to provide quality emergency care to children.

Figure 1: WHO Causes of child mortality⁹



Available from: https://www.who.int/gho/child_health/mortality/child_health_004.png

Infrastructure

Many essential infrastructure elements that permit quality emergency care to happen are taken for granted in HIC settings e.g. good road networks, emergency medical systems, telephonic or radio communications. A recent study found no evidence of EMS systems in 33 of 55 (61%) African countries, the authors reported that only 8.7% of the African population had access to at least one EMS system in 2012.¹¹

Even things as basic as water and electricity might not be present in some hospitals where very sick children will be taken for emergency care. Electricity was reliably available 24 hours a day in only 29% of the public hospitals evaluated in one study in Tanzania.¹²

Summary:

Paediatric emergency guidelines, training programs and standards of care aimed at LMIC must bear in mind, that simple, common illnesses such as respiratory infections and gastroenteritis cause most childhood deaths in these settings. There must be a focus on getting basic equipment and supplies, as well as training and support to those on the frontlines, with employment of adequate numbers of emergency staff at first-referral level hospitals in LMIC. The wider infrastructure in terms of transport and communication impacts hugely on the quality of emergency care that can be provided.

There is good evidence that there have been significant improvements in the overall health

and well-being of the majority citizens of the world. Whilst it is no doubt, still right to divert the bulk of resources towards PHC & PH in LMIC, it is now time to bring funding and attention to help improve what happens when children arrive at hospital level care. It is hoped that these standards will help frontline staff, healthcare managers and policy makers working in LMIC to motivate for improvements in the emergency care of children.

HIGH INCOME COUNTRIES (HIC)

Dr. Camilo Gutierrez

As the development of emergency medicine and acute care systems is well underway globally with over 50 countries where the specialty is fully recognised and another 30 or 40 more working to establish their own systems, the development of paediatric emergency medicine systems is lagging.

Emergency Medicine is almost 50 years old. In the United States, the first Emergency Medicine residency training program was established in 1970, and the specialty recognised in 1979, but it was not until 1992 that Paediatric Emergency Medicine was established as an independent subspecialty. During these thirteen years it became apparent in many ways that recognition, understanding, and management priorities in paediatric patients do differ from the approach to adult counterparts.

Currently according to a recent survey in the U.S.A. 97.8% of respondents work in non-children's hospitals and care for 82.7% of children, and there is a broad variation in care depending on the volume of children seen in emergency departments.¹³

Even in mature emergency medicine systems, often times paediatric preparedness is substandard with significant gaps in the ability to safely manage children at the prehospital and emergency department levels. Despite of guidelines, standards, and recommendations set forth by national societies^{13, 14-18}, recent studies identify that despite scoring improvements from prior surveys¹⁹ still gaps on the availability of paediatric equipment exist, mostly for airway management and central venous access, and disaster and transfer plans that include children. Other important issue is the presence of barriers to guideline implementation which vary from economic reasons, to lack of training resources to lack of engagement from their local institutions.¹⁹

However, the awareness that has developed after prior interventions and by the efforts of the paediatric emergency medicine community, there has been a success in the increase of paediatric equipment, the caregiver's knowledge of its location and use, the use of standardise dosing tables as in pre-calculated chart or length-based tools.

But most important perhaps, has been the identification of a "paediatric champion" which has been dubbed a Paediatric Emergency Care Coordinator (PECC) that has been

associated with a higher preparedness score across all paediatric volume categories. The presence of PECCs increased the likelihood of having all the recommended components vital to the care of children, including a paediatric quality improvement process.

As described in Chapter 1, the skills for emergency care of children do not usually lie fully in either paediatric facilities / staff, or in emergency departments / staff. General (non-paediatric) medical and nursing training usually contains variable or minimal amounts of paediatric teaching.

So, what have we learned from the past decade of paediatric emergency care development?

Unless the specific needs of children are recognised, children will have a lower standard of care than adults. This does not imply the need for highly specialised equipment, staff or facilities, just giving attention to the basic differences between children and adults would be a starting point.

We understand now, that probably one of the most important interventions, is to have a paediatric “champion”, that could be a physician or nurse, someone who can lead the effort to bring awareness regarding simple issues such as the availability of guidelines, appropriate doses of medication per weight, and help specifically in highlighting the different needs children have in emergency and acute care settings.

Innovation, technical aspects, managing performance, communication, partnerships, and political commitment have been identified as 6 key components to successful and sustainable implementation of public health programs.²⁰ Through a coalition of national stakeholders, the U.S.A. National Paediatric Readiness Project provides the partnerships, communication, and commitment to make this public health initiative a success. Administration of the project by cohorts allows each state to compare their own completion rates with those of other states.

The technical aspects of the <http://www.pedsready.org> site allow for immediate feedback to the respondents on their readiness score, benchmarking with similar hospitals, and a gap analysis that in all likelihood motivates nurse managers to participate. The availability of electronic resources through the <http://www.paediatricreadiness.org> site provides additional assistance to ED managers seeking to improve paediatric readiness.

A well-functioning system of paediatric emergency care coordinators (PECC) does not have to be expensive. Information can be shared, for example if paediatric and emergency medicine staff learn from each other, sharing of already developed and used guidelines. Hospital managers can appoint ED staff with specific responsibility for PECC to aid liaison

and make simple changes; there is a wealth of resources available to help, which are found in the resources appendix at the back of this document.

A lead nurse and doctor can ensure that the ED is alert to child welfare problems (see Chapter 16), can make sure that communication and family-orientated care is highlighted as important (see Chapter 5), and advise on issues such as information equipment (see Chapter 10), and technology (see Chapter 13). Providing a child-friendly environment and some basic equipment is not expensive.

Improvements in workforce and staff training are clearly more resource-dependent (see Chapters 8, 9) and strategic improvements in the whole network of healthcare can be expensive and require support from managers and politicians. Sometimes though, change can be facilitated just by increased awareness of the problems. This document aims to help clinicians and managers review and improve their services.

CHALLENGES FACING PAEDIATRIC EMERGENCY MEDICINE: ESSENTIAL RECOMMENDATIONS

1. As emergency healthcare systems mature, countries must consider the special requirements of the paediatric patient with respect to environment, equipment and staff skills & training, ensuring they meet the needs of both the paediatric and adult population of emergency patients.
2. Where EDs see patients of all ages, there must be a lead doctor and lead nurse for paediatric issues, this Paediatric Emergency Care Coordinator or “paediatric champion” would lead the efforts in raising awareness of the specific needs of children in their individual setting.

DESIRABLE RECOMMENDATIONS

1. Access to established guidelines and recommendations, such as this document, to use as a resource when attempting to implement change, to ensure buy-in from leadership in your workplace settings.

RERERENCES:

1. Hug L, Sharrow D, Zhong K, et al.: Levels & Trends in Child Mortality Report 2018 [Internet]. 2018. [cited 2019 Mar 2] Available from: <https://data.unicef.org/wp-content/uploads/2018/09/UN-IGME-Child-Mortality-Report-2018.pdf>
2. Duke T, Cheema B: Paediatric emergency and acute care in resource poor settings. *J Paediatr Child Health* 2016; 52:221-226
3. World Health Organisation: Standards for improving the quality of care for children and young adolescents in health facilities. First. Geneva, Switzerland: 2018.
https://www.who.int/maternal_child_adolescent/documents/quality-standards-child-adolescent/en/
4. WHO | Integrated Management of Childhood Illness (IMCI) [Internet]. WHO 2017; [cited 2019 Mar 6] Available from: https://www.who.int/maternal_child_adolescent/topics/child/imci/en/
5. Campbell H, Duke T, Weber M, et al.: Global Initiatives for Improving Hospital Care for Children: State of the Art and Future Prospects [Internet]. 2007; [cited 2019 Mar 2] Available from: www.pediatrics.org/cgi/doi/10.1542/
6. Nolan T, Angos P, Cunha AJLA, et al.: Quality of hospital care for seriously ill children in less-developed countries. *Lancet* 2001; 357:106–110
7. English M, Esamai P, Wasunna P, et al.: Delivery of paediatric care at the first-referral level in Kenya [Internet]. *Lancet* 2004; 364:1622–1629
8. Molyneux EM, Langton J, Njiram'madzi J, et al.: Setting up and running a paediatric emergency department in a hospital in Malawi: 15 years on. *BMJ Paediatr Open* 2017; 1:e000014
9. WHO | Causes of child mortality [Internet]. WHO 2018; [cited 2019 Mar 3] Available from: https://www.who.int/gho/child_health/mortality/causes/en/
10. Kinfu Y, Dal Poz MR, Mercer H, et al.: The health worker shortage in Africa: are enough physicians and nurses being trained? [Internet]. *Bull World Health Organ* 2009; 87:225–230[cited 2019 Mar 3] Available from:

- <https://www.scielo.org/pdf/bwho/2009.v87n3/225-230/en>
11. Mould-Millman N-K, Dixon JM, Sefa N, et al.: The State of Emergency Medical Services (EMS) Systems in Africa [Internet]. *Prehosp Disaster Med* 2017; 32:273–283[cited 2019 Mar 4] Available from: <http://www.ncbi.nlm.nih.gov/pubmed/28228178>
 12. Baker T, Lugazia E, Eriksen J, et al.: Emergency and critical care services in Tanzania: a survey of ten hospitals [Internet]. 2013. [cited 2019 Mar 2] Available from: <http://www.biomedcentral.com/1472-6963/13/140>
 13. Writing the Next Chapter of Global Emergency Medicine Development. *Emergency Physicians International*. July 2018. Retrieved from <https://www.epijournal.com/home/2018/7/3/mulligan-writing-the-next-chapter-of-global-emergency-medicine-development>
 14. Paediatric Emergency Medicine: What lies ahead. Ludwig S. *Peds Emerg Care* 2001 p280
 15. Gausche-Hill M, Ely M, Schmuhl P, et al. A National Assessment of Paediatric Readiness of Emergency Departments. *JAMA Paediatr*. 2015;169(6):527-534. doi:10.1001/jamapaediatrics.2015.13
 16. American Academy of Paediatrics; American College of Emergency Physicians; Emergency Nurses Association. *Guidelines for care of children in the emergency department*. American Academy of Paediatrics Disaster Toolkit for Children and Families. http://www.aap.org/en-us/advocacy-and-policy/aap-health-initiatives/Children-and-Disasters/Documents/Checklist_ED_Aug2010.pdf.
 17. Institute of Medicine. Committee of the Future of Emergency Care in the U.S. Health System. *Emergency Care for Children: Growing Pains*. Washington, DC: National Academy Press, 2006.
 18. McGillivray D, Nijssen-Jordan C, Kramer MS, Yang H, Platt R. Critical Paediatric Equipment Availability in Canadian Hospital Emergency Departments. *Ann Emerg Med* 2001;37:371-376
 19. Athey J, Dean JM, Ball J, Wiebe, Melese-d'Hospital I. Ability of Hospitals to Care for Paediatric Emergency Patients. *Paediatr Emerg Care* 2001;17:170-174
 20. Middleton KR, Burt CW. Availability of Paediatric Services and Equipment in Emergency Departments: United States, 2002-03. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Health Statistics. *Advance Data* 2006;367:1-16
 21. Gausche-Hill M, Schmitz C, Lewis RJ. Paediatric Preparedness of US Emergency Departments: a 2003 Survey. *Paediatrics* 2007;120:1229-1237
 22. Standards for Children and Young People in Emergency Care Settings (third edition) 2012. Royal College of Paediatrics and Child Health. www.rcpch.ac.uk/emergencycare
 23. American Association of Paediatrics policy statement on Care of Children in Emergency Departments, 2009, Krug S, Gausche-Hill M. Guidelines for care of children in emergency departments. *Paediatrics* 2009;124:1233-1243. <http://aappolicy.aappublications.org/cgi/content/full/paediatrics;107/4/777>
 24. Krug S, Gausche-Hill M. Guidelines for care of children in emergency departments. American Association of Paediatrics policy statement on Care of Children in Emergency Departments *Ann Emerg Med* 2009; 54:543-52.
 25. Policy Statement: Care of Children in the Emergency Department: Guidelines for Preparedness. *Ann Emerg Med* 2001;37:423-428.
 26. Luaces Cubells C, Ortis Rodriguez J, Trenchs Sainz de la Maza V, Pou Fernández J y Grupo de trabajo de calidad de la Sociedad Española de Urgencias de Paediatría (SEUP). Encuesta nacional sobre las urgencias pediátricas. Aspectos organizativos y funcionales. *Emergencias* 2008;20: 322-327. <http://www.seup.org/seup/html/pub/publicaciones.htm>

An Integrated **SERVICE DESIGN**

Paediatric Emergency Medicine Special Interest Group: IFEM



Introduction

The Emergency Department (ED) will reach the full potential for its patients only when it integrates with, and coordinates with, other services in the region. This includes pre-hospital, primary and hospital care. The role of the ED varies around the world. Services may be offered at some sites only under specific circumstances, such as limiting their role to resuscitation and triage. More extensive and well-staffed services may treat a full range of medical conditions and injuries for up to 24 hours a day, and will use the full range of diagnostic tools.

The ED may be part of a children-only or adult-only service, or may be mixed. Mixed EDs are a common situation in some countries, especially where emergency medicine has been established as a specialist service, 24 hours a day,

“

Regional Network is the provision of care



with its own staff.

Route of entry varies from country to country, and hospital to hospital. Patients may self-transport to the ED or arrive via ambulance services. Alternatively, patients may go to the ED because of a referral by another health professional (this may be following a face-to-face or a telephone consultation).

In many countries, patient numbers overwhelm ED services. This is often because patients find it difficult or expensive to access primary care and specialist care services. For the ED to be able to give adequate resources to the immediate care within the hospital itself. Senior staff from the ED (clinical and managerial staff) should be involved in these conversations and agreements. In serious cases, the local region can help by making access to primary and specialist care easier. This works best if there are agreed patient pathways between the hospital and community services, and sufficient specialists and beds within the hospital itself. Senior staff from the ED (clinical and managerial staff) should be involved in these conversations and agreements. In this document the arrangements of provision of care between primary care, other forms of health and social care, and the different hospitals neighboring each other, are referred to as the “regional network”

Differences between adult and paediatric regional networks

The role of the ED should be agreed and understood in the regional network and governed or regulated by a department or ministry of health. There needs to be a clear line of authority to designate hospitals with particular capabilities, such as trauma, stroke, and paediatric care.¹ Not all hospitals will have the inpatient resources to definitively care for critically ill or injured children. Ambulance services must understand which facility within their regional network they should transport children to, whether for injury or for illness. Depending on the number of hospitals available, there may be the option to designate hospitals in a way which makes it clear what type of patient each hospital should receive. Hospitals may self-categorise, be certified for specialty services by a certifying organisation, or they may be formally designated by regional networks or ministries of health or other authoritative organisations within their country.

Fewer paediatric patients arrive to EDs by ambulance than adults. In developed countries, those who do arrive by ambulance tend to be sicker. However, in areas where primary care is difficult to access, large numbers of paediatric patients will self-present with minor, self-limiting illness. Infants aged 0-2 years, usually form a large proportion of the visits. However, in developing countries, where pre-hospital care is less developed and primary care access is generally also limited, mode of arrival does not help differentiate acuity. In these settings, severely ill children are often brought by public transport and may have late presentations due to factors such as parental education levels, late recognition, transport costs and distance to health facilities. In developing countries, the WHO (World health organisation) Integrated Management of Childhood Illnesses (IMCI) program is often used by nurses at primary care facilities. This program has clear guidelines on which children need to be referred for hospital-level care,

along with some basic management steps to initiate prior to transfer.² IMCI and other WHO emergency programs (such as Emergency Triage Assessment and Treatment (ETAT)³, are usually introduced and coordinated at national or regional network level. Awareness of guidelines at local hospital level is very important.

In general, paediatric emergency care is lower cost and lower volume than adult emergency care, therefore there are consequences for the organisation of the regional network's services. Paediatric-only facilities are often smaller and fewer, and may not receive the same investment of resources as adult services. Staff training can be more difficult to support. The regional network should recognise these differences between adult and paediatric emergency care.

Lastly, there may be some financial differences between management of children and adults in the ED. For healthcare systems where payment is required for emergency care and the family cannot or will not pay for care, the ethics of denying treatments to children merit special consideration, and clear guidance to ED staff, that caring for children regardless of payment is a social imperative.



Co-ordinated care of the paediatric patient in the ED

The capability of each hospital for paediatric care must be clear and understood by all of the health services in the area. Any guidelines or documents in the network relating to "patients" should make it clear if they include children as well as adults. The age cut-off defining a "child" varies in practice in different areas but in each region, it must be agreed. There are some good examples of clear documents describing their own state or country's arrangements for a regionalised network.^{1, 4,5} It is important to remember that EDs designated as adult-only receiving facilities may sometimes receive very sick children, because families will take a child to the nearest hospital. Therefore, every region needs arrangements to safely receive a child (from neonatal to teenage) in an adult-designated

ED, and to transfer the child safely to a paediatric facility.

In this situation, primary- or secondary-level hospitals must have clear and agreed upon guidelines about which children should be transferred, and the referral mechanism must be simple and understood by both hospitals. In some countries specialist transport / retrieval services exist, particularly for critically ill children.

In some cities, the ED which receives children is in a hospital which is an entirely paediatric facility, so the ED only sees paediatric patients. While this generally improves delivery of safe, high quality care of children, it is important that the right skills are present for all presentations across the range of age groups, including trauma situations, and older adolescents.

Managers of the regional network should examine the spectrum of illness and injury which is present in its EDs, and work with primary and specialist care services to help the ED with managing the workload through appropriate policies based on hospital resources. The hospital must also ensure that ED staff have the right training, policies and procedures, equipment and supplies, and medications to deal with its spectrum of paediatric illness and injury.

Clear identity and relationships with healthcare providers external to the ED should be agreed. A close working relationship is needed with primary care and community services, pre-hospital care, intensive care, surgery, orthopaedics and radiology/ pathology services.

In some hospitals, the ED exists and accepts children, but without paediatric specialist support on the same site. In this situation, the ED staff must be trained to the right level to deal with children for stabilisation before transfer to another hospital. Indeed a high level of training and competency in paediatric resuscitation may be needed, compared with a fully paediatric-supported unit. In all hospitals there, must be access to paediatric specialist advice (at least by telephone) and those specialty centres should provide a clear and efficient process for acceptance of transfers.



On a large hospital site, there may be co-location or mixing of adults and children. Audio-visual separation of adult and paediatric emergency care sites may be ideal so that children and adults are not mixed together in waiting or treatment areas, but can be difficult to achieve due to building and personnel limitations. On some large hospital sites, the children's ED is distant from the adult-receiving ED. In this situation the paediatric emergency care site should not be compromised by its size, staffing, or proximity to diagnostic services (e.g. Computerised Tomography scan).

One advantage of close co-location of the adult and paediatric ED is to share equipment and staffing. Higher numbers of patients and facilities/staffing improves the versatility of the ED, and its ability to quickly respond to surges in patient arrivals. In a co-located paediatric and adult ED, staff can rotate or move between areas on a shift by shift, or hour by hour basis.

In the management structure of hospitals with both adult and paediatric services, it must be agreed whether the ED services are governed by the Acute / Emergency section of hospital management, or the Paediatric section/department, if these are different. Written agreements about provision of care for children's emergencies must match the reality of the workload of the ED. Where there is controversy then the best way to evaluate the options is to analyse the demographic data such as actual patient numbers, their age, the time of day of presentation and the disease profile presenting to the ED. This information should be used to decide staff numbers and training, the size and scope of the ED's facilities, and clear organisational responsibilities and accountability for the ED, within the hospital.

For the smoothest treatment of a child with any condition, an evidence-based, agreed care pathway can help (see Chapter 11). This means that the journey from arrival to diagnosis and definitive treatment is coordinated by ED staff with input from other consulting

services (e.g. radiology, orthopaedics and other departments) and runs smoothly, rather than being negotiated each time by staff who may not be aware of the full scope of care for the child. Written clinical pathways are especially useful for predictably difficult areas such as mental health and social problems, child protection (safeguarding children and young people), or dealing with sudden death in children (Chapters 16, 18).

AN INTEGRATED SERVICE DESIGN:

ESSENTIAL RECOMMENDATIONS

1. Pre-hospital, primary care and hospital services for emergency paediatric care must be integrated, and the role and capabilities of each ED within the regional network should be clear, communicated to stakeholders within the network, and coordinated with Emergency Medical Service (EMS).
2. Clear, written guidelines for transfer criteria to specialist paediatric centers must exist, and mechanisms for swift and expert transfer agreed.
3. All EDs must be prepared at all times to deal with the initial resuscitation of a child brought in unexpectedly.
4. The ED must be staffed and equipped to deal with the full range of ages and clinical presentations of children that it normally receives.
5. Access to specialist paediatric advice to the ED must exist 24 hours a day (by telephone, telemedicine, internet or in person).

DESIRABLE RECOMMENDATIONS

1. Managerial documents governing regional networks of emergency care should specify which arrangements apply to paediatric patients.
2. Core specialties should be available to assist the ED; these include anesthesia for all ages of child, critical care, general paediatric medicine, emergency surgery, orthopaedic, and radiology and pathology services.

REFERENCES:

1. Kocher KE, Sklar DP, Mehrotra, A et al. Categorization, Designation, and Regionalization of Emergency Care: Definitions, a Conceptual Framework, and Future Challenges. Acad Emerg Med 2010; 17:1306–1311.

2. World Health Organisation (1999). Improving Child Health IMCI: The integrated approach. World Health Organisation. https://www.who.int/maternal_child_adolescent/documents/chd_97_12_Rev_2/en/
3. World Health Organisation. (2016). Updated guideline: paediatric emergency triage, assessment and treatment: care of critically-ill children. World Health Organisation. <http://www.who.int/iris/handle/10665/204463>
4. American Academy of Paediatrics, Committee on Paediatric Emergency Medicine, American College of Emergency Physicians, Paediatric Committee, Emergency Nurses Association Paediatric Committee. Joint Policy Statement: Guidelines for care of children in emergency departments. Paediatrics 2009;124:1233-1243. PMID: 1970172
5. Gausche-Hill M, Ely M, Schmuhl P, Telford R, Remick KE, Edgerton E, Olson LM: National assessment of paediatric readiness of US emergency departments. JAMA-Pediatr 2015;169:527-534. PMID: 25867088
6. Remick KE, Kaji AH, Lenora LM, Ely M, Schmuhl P, McGrath M, Edgerton EA, Gausche-Hill M: Paediatric readiness and facility verification. Ann Emerg Med. 2016 Mar;67(3):320-328.e1. doi: 10.1016/j.annemergmed.2015.07.500. Epub 2015 Aug 29
7. Remick K, Gross T, Adalgais K, Shah MI, Leonard JC, Gausche-Hill M. Coordination of paediatric emergency care in EMS systems; submitted Prehosp Emerg Care 2017;6:1-9. [Epub ahead of print] PMID: 28059586
8. Normas y estándares de acreditación para servicios de urgencias pediátricas y centros de instrucción en Medicina de urgencias pediátricas. SOCIEDAD ESPAÑOLA DE URGENCIAS PAEDIATRICAS (SEUP), https://seup.org/pdf_public/gt/mejora_acred_seup.pdf Unidad de urgencias hospitalaria Estándares y recomendaciones. Accessed March 9, 2019.

Child and family
CENTERED CARE

***Paediatric Emergency Medicine Special Interest
Group: IFEM***



Introduction



“

Child- and family-centred care (CFCC) is an approach to healthcare which recognises the developmental and behavioral needs of children as patients, the integral role of the child's care-givers, and encourages a mutually beneficial collaboration among patient, family and the ED team.¹⁻³ CFCC helps to deliver excellent care for children and adolescents in the stressful setting of the ED, by understanding the child's developmental stage, their psychological needs and the wider needs of the family unit. CFCC is key to undertaking a good clinical assessment of a sick or injured child, to improve and facilitate treatments such as procedures, and to achieve the best patient outcomes by improving care satisfaction and patient safety.³⁻⁷ CFCC also benefits the ED staff by reducing stress in caring for paediatric patients and increasing ED staff job satisfaction.

Differences between children and adults

- Ill or injured children usually attend ED with family members or adults, and assessment and treatment involves these care-givers.
- There is an enormous range of developmental, cognitive, and behavioral capabilities within any paediatric age group. While there may be obvious variation between for example infant, pre-school, school-aged, adolescents, there can also be substantial variation (as there is in adult practice) within the same age group. Dialogue, decisions and responsibility for treatment must be shared with parents or legal guardians in most circumstances. If a situation such as a life-threatening emergency requires staff to act without the parent' / legal guardian' permission, the same principles apply as in an unconscious adult: if treatment is clearly in the patient's best interests and truly urgent, staff can proceed.
- Where possible, the child's maturity should be respected and they should be involved in decisions about their care.
- While all patients generally benefit from the presence of family members, this is particularly true for children. As so many children are not capable of fully communicating their current symptoms or their past medical history, and they may not cooperate with aspects of the clinical examination or diagnostic testing, family members are invaluable in providing vital information and in assisting the delivery of care. *Child and Family Centred Care helps adolescents in the stressful setting of the ED by understanding the child's developmental stage, needs and the wider needs of the family unit.*
- The ED environment can be particularly stressful for a child. An anxious child often can be very obstructive and resist making treatment difficult. This will affect clinical assessment and treatment adversely. Therefore, it is best to keep the child with their caregiver. Consider allowing the child to be examined and treated on the parent's lap if this helps, and allow the parent to help deliver treatments.

Delivering CFCC

Family needs and family presence

Care-givers of ill or injured children will generally be anxious and feel protective, and must have ample opportunity to share their concerns and have questions answered. While most parents willingly consent to tests and treatments, fearful parents may not immediately offer their trust and assent. Taking the time to listen and understand concerns, combined with efforts to fully inform, and when needed, engaging the assistance of a trusted source of medical advice (e.g. the child's primary or specialty care provider), may help develop a partnership between ED staff and the family.

Whenever possible, the delivery of emergency care to children should occur in the presence of care givers and other key family members.^{3,6,7} The option of family presence should be offered for all aspects of emergency care, including invasive procedures and resuscitation (see Chapters 6, 18).⁶⁻⁹ The vast majority of families believe they should be present during medical treatment, and family presence does not appear to reduce efficiency or success rates for invasive or resuscitation procedures.^{8,9} EDs should develop policies, practices and ED culture changes supporting family presence.^{3,5,6,8,10,11}



Effective communication

Effective communication with children and families is key for best patient outcomes.^{2,3,7} Parents are often needed to help determine the presence and severity of symptoms, therefore communication must be directed to the child and their accompanying family member(s). ED staff should be aware of child development and be capable of communicating with children of all ages at a developmentally appropriate level. Children can be remarkably perceptive and can be involved in treatment discussions. Engaging the child in the right way will promote trust and cooperation with ED care, and reduce both patient and family member anxiety. Awareness of cultural factors also play a pivotal role in the delivery of CFCC.

Timely access to qualified interpreter services is essential for effective communication when a language barrier exists.^{2,3,5,12} The common use of accompanying family members or friends as translators runs the risk of inaccurate information and may compromise patient privacy and safety,^{5,12-14} with patients and families bringing unique family

structures, religious views, and health care beliefs and practices to the ED. ED care providers should also be vigilant for families with limited health literacy so ED discharge instructions and patient education materials should match the family's needs. At discharge, you are usually relying on the family to provide care for the child so it is important to avoid advice which is too medicalised, impractical or insensitive to cultural context. Lastly, communication with the patient's primary care provider is another necessary component of CFCC, as most General Practitioners will often have responsibility for the whole family (see Chapter 3).^{2,15,16}

The right environment

Treatment rooms for children require more space per patient than needed in adult care areas, in order to accommodate family members and a greater range of equipment (see Chapter 10). Other considerations for the environment of care include:

- Enough examination rooms suitable for children, to match the proportion of children in the ED attenders.
- Waiting area and the ED itself must be safe for children.
- Access to these areas should be controlled to ensure safety at all times.
- Waiting and treatment areas that are separated both in sight and sound from adult care areas and ideally securely zoned off from the adult areas (e.g. security doors), to protect children from harm; although this is not possible in all EDs and at all times, every effort should be made to find a reasonable compromise.
- Paediatric care areas should be safe with respect to accident risks (e.g. sharps boxes not stored on the floor).
- The environment of the paediatric area should be child and family-friendly. Murals, posters, colorful decoration, and familiar distractions (e.g. cartoon videos, computerised games, toys, books) help allay anxiety and pain, and can make ED care much easier for all concerned. Fundraising for these resources from the local area may be quite easy: for example, local newspapers and businesses will often help provide toys or money.
- There should also be resources for older age groups. Adolescents prefer some privacy away from small children, and need books, magazines or different distractions, and will often read health promotion material. This is a good opportunity to provide information on sexual health, smoking, drugs, etc. (see Chapter 17)
- A suitable area should be available adjacent or within the ED for breast-feeding and nappy-changing.

Local fundraising via special events or local media will often be very successful in attracting charitable donations for facilities or equipment for children's emergency areas.

Finally, child life or play specialists are an invaluable resource in the delivery of CFCC and in the creation of an environment of care supportive of the needs for children and family. The role of a play specialist in the ED includes.¹⁷

- Providing distraction therapy for potentially distressing procedures.
- Providing support for siblings and family members during the delivery of care.
- Enhancing nursing and medical skills to involve play in the management of procedures in children.
- Creation and maintenance of a child-centred environment, including advising on safe and appropriate toys and facilities.
- Supervision of play in the ED.



CHILD AND FAMILY CENTERED CARE:

ESSENTIAL RECOMMENDATIONS

1. Child and family centred care (CFCC) must be a priority for staff and managers through clinical practice, staffing, and environmental design.
2. The ED environment must be safe for children.
3. Children must be separated from distressing sights and sounds of other patients, with some separation from the main waiting area for adults.
4. The option of family-member presence must be encouraged for all aspects of ED care.
5. The ED must contain enough child-orientated treatment rooms (depending on the proportion of child ED attenders) with sufficient space to accommodate family members.
6. Younger children must have access to nutrition (this includes provision for breast-feeding).
7. ED staff must give health advice and explanations in clear language and ensure they have been understood, being considerate that the family will usually have responsibility for delivering on going healthcare.
8. Guidelines for medical treatment should be available for balancing the wishes of the child, legal responsibility of the guardian and the child's best interests.

DESIRABLE RECOMMENDATIONS

1. The paediatric areas should look attractive to children and aid in distraction from the stressful environment. The provision of toys, books etc. and employment of

- play specialists should be considered, to facilitate high quality care.
2. Timely access to qualified interpretive services should be available 24 hours a day.
3. Services provided should reflect the cultural context of the family and encourage families to be involved in patient care decisions.
4. Communication barriers such as literacy and the educational level of the family should be considered when giving health information.
5. Written information should be available for common conditions and written in simple language and languages relevant for the patient population, using diagrams where appropriate, to aid understanding.

REFERENCES:

1. American Academy of Paediatrics, Committee on Paediatric Emergency Medicine, American College of Emergency Physicians and Paediatric Emergency Medicine Committee. Patient- and family-centered care and the role of the emergency physician providing care to a child in the emergency department. *Paediatrics* 2006; 118:2242-4.
2. O'Malley PJ, Brown K, Krug SE and the American Academy of Paediatrics Committee on Paediatric Emergency Medicine. Patient- and family-centered care of children in the emergency department. *Paediatrics* 2008; 122:e511-21.
3. Westergaard F. Promoting a patient and family-centered environment of care in the emergency department, in Krug SE. *Paediatric Patient Safety in the Emergency Department*. Oakbrook Terrace, IL: Joint Commission Resources, 2010.
4. American Academy of Paediatrics Steering Committee on Quality Improvement and Management and Committee on Hospital Care. Principles of paediatric patient safety: reducing harm due to medical care. *Paediatrics* 2011; 127:1199-210.
5. Frush K, Krug SE. American Academy of Paediatrics, Committee on Paediatric Emergency Medicine. Patient safety in the paediatric emergency care setting. *Paediatrics* 2007;120:1367-75.
6. Gausche-Hill M, Krug S, American Academy of Paediatrics, Committee on Paediatric Emergency Medicine, American College of Emergency Physicians, Paediatric Committee and Emergency Nurses Association Paediatric Committee. Guidelines for care of children in the emergency department. *Paediatrics* 2009; 124:1233-43.
7. Institute of Medicine Committee on Paediatric Emergency Medical Services. *Emergency care for children: growing pains*. Washington, DC: National Academies Press, 2006.
8. Guzzeta CE, Clark AP, Wright JL. Family presence in emergency medical services for children. *Clin Paediatr*

- Emerg Med 2006; 7:15-24.
9. Sacchetti A, Guzzeta CE, Harris R. Family presence during resuscitation attempts and invasive procedures: is there science behind the emotion. Clin Paediatr Emerg Med 2003; 4:292-301.
 10. Emergency Nurses Association. Family-centered care tool for the emergency department. Emergency Nurses Association. <http://www.ena.org/IQSIP/Practice/Pages/PedCare.aspx>
 11. Farah MM, Thomas CA, Shaw KN. Evidence based guidelines for family presence in the resuscitation room: a step-by step approach. Paediatr Emerg Care 2007; 23:587- 91.
 12. Woodward T. Communication involving paediatric patients and their families in the ED and beyond, in Krug SE. Paediatric Patient Safety in the Emergency Department. Oakbrook Terrace, IL: Joint Commission Resources, 2010.
 13. Taveras EM, Flores G. Why culture and language matters: the clinical consequences of providing culturally and linguistically appropriate services to children in the emergency department. Clin Paediatr Emerg Med 2004; 5:76-84.
 14. Hampers LC, Cha S, Gutglass DJ, et al. Language barriers and resource utilization in a paediatric emergency department. Paediatrics 1999; 103:1253-6.
 15. Lipkin PH, Alexander J, Cartwright JD, American Academy of Paediatrics Council on Children with Disabilities. Care coordination in the medical home: integrating health and related systems of care for children with special health care needs. Paediatrics 2005; 116:1238-44.
 16. Yamamoto LG. Treating children with special health care needs in the ED, in Krug SE. Paediatric Patient Safety in the Emergency Department. Oakbrook Terrace, IL: Joint Commission Resources, 2010. Child Life Services. Child Life Council, American Academy of Paediatrics Committee on Hospital Care. Paediatrics 2006; 118(4):1757-63.

ILL OR INJURED CHILD

Paediatric Emergency Medicine Special Interest Group: IFEM



Introduction

Every child arriving at an ED should have a rapid visual inspection by a qualified/trained nurse (or doctor) as soon as possible after arrival; this is to quickly identify children with life-threatening features who need immediate resuscitation. Reception, security and other non-qualified staff may also be trained to identify an extremely ill or fitting patient, and to alert senior staff. When a seriously ill patient arrives at ED there must be no barriers to accessing treatment: administrative or payment transactions must only take place after a child commences medical care.

A trained member of staff must assess all patients presenting for emergency care within 15 minutes of arrival. The ideal timing, manner and extent of this initial assessment will vary from one setting to another depending on many factors.

The word “triage” has a variable meaning, in the original context of mass casualty settings triage referred to a simple system for rapidly sorting casualties into priority groups.¹ In modern ED practice, the initial assessment process is more detailed than this – it is usually performed by trained staff, takes less than 5 minutes, identifies potentially life-threatening problems and allocates a priority assignment for the patient (usually on a 3-5-point scale). This initial assessment will vary from one setting to another depending on many factors.

In a busy ED, triage is an essential organisational step that can save many lives by early identification of life-threatening problems. Triage also allows an ED to measure the case mix of the current patients (by



“

The French word “trier”, the origin of the word “triage”, first appeared in the late 1700’s attributed to Baron Dominique Jean Larrey, the Surgeon in Chief to Napoleon’s Imperial Guard.

seeing how many are waiting in each triage category) and it can help identify when the ED personnel resources are overloaded. The most suitable model of initial assessment will vary for different situations - this chapter describes a range of models available for children.

Differences between children and adults

Children can be difficult to assess clinically, compared with adults. In the often noisy and chaotic setting of an ED children easily become frightened and cry or are uncooperative, thereby altering their vital signs and making clinical parameters more difficult to interpret, and sometimes making it impossible to get even basic vital signs measured.

This means that ED staff need to have the communication and assessment skills to deal with a sick child (see Chapter 9), and have a triage / assessment tool suitable for children, using age-appropriate normal ranges for heart rate, respiratory rate and blood pressure.

Choosing the right type of initial assessment model

Several different initial assessment models exist – examples are summarised in Table 1. Any ED may use different models flexibly, depending on staffing, current workload and acuity of new arrivals. In developing countries patients are likely to be sicker, so a more rigid approach of an immediate visual inspection of new arrivals followed by a thorough initial assessment very soon after arrival by a qualified nurse is recommended.

Table 1: Models of initial assessment / triage

Model	Example	Timing & Time	Involves	Outcomes
Rapid visual inspection	Quick “eyeball” of new arrivals to ED	Immediately upon arrival – takes a few seconds	Quick look at face and body to check color, breathing and if floppy / lifeless	Identifies obviously ill child immediately
Brief initial assessment	Patient Assessment Triangle (PAT) ²	Within 5 minutes of arrival – takes less than a minute	Quick assessment of: appearance, work of breathing and skin circulation	Identifies high priority child immediately. Overlaps with streaming (below)
Streaming	Categorisation by area of ED e.g. resuscitation room, illness area, minor injury area, deflection to other services e.g. primary care / dentist	Within 15 minutes of arrival. Takes 2-3 minutes per patient	Quick history, can include measuring vital signs as well	For allocation to the right area in EDs where there is a choice of receiving areas. Patient would receive full initial assessment in that area as opposed to the general arrivals area
See and Treat	Rapid assessment and full management by senior emergency doctor or nurse	Performed within 15 minutes or may follow brief initial assessment / streaming, takes 5-	For uncomplicated cases. Replaces full assessment and incorporates treatments and	Overall quicker throughput to limit ED congestion. If cases are more complicated than

		15 minutes per patient	discharge rapidly	initially thought, they are referred into main ED
Full initial assessment	Comprehensive assessment, usually using a standardised and validated tool (See Figure 1)	Within 15 minutes of arrival. Takes approximately 3-5 minutes per patient.	Most involve assessment of: presenting complaint, key emergency signs and vital signs	Allocation to a triage category to allow prioritisation of whole ED workload

Rapid Visual Inspection

All new arrivals in the ED must be quickly inspected to look for obvious signs of life-threat or serious illness. Ideally a qualified ED staff member will perform this rapid visual inspection and it should take just a few seconds to do. In every ED the reception, security and other non-qualified staff should also be trained to identify a lifeless, extremely ill or fitting patient, and have a way of alerting trained staff.

Brief initial assessment

In certain circumstances an abbreviated initial assessment (rather than a full initial assessment) may be appropriate. For example, in some resource poor situations several families may be waiting, even for initial assessment. In these situations, a staff member trained in the use of a tool such as the PAT², should quickly assess waiting children and eliminate the queue. In this situation a full assessment must still take place within 15 minutes. In India, ED staff utilising this PAT tool have created a very focused and comprehensive evaluation which is done in 5 minutes whilst providing immediate emergency care as needed.³

Streaming

In EDs with several areas of the department with separate functions (e.g. resuscitation, injuries area, illness area) a brief initial assessment is combined with rapid re-direction of patients to the appropriate receiving area, where a full initial assessment will take place. Local policy and considerations may allow omission of measurement of certain vital signs (e.g. pulse oximetry, blood pressure) on well appearing patients. In some EDs, this allows the patient to be diverted to another (non-ED) service, to ensure the ED only sees suitable patients.

See and treat

At times when there is a good staff: patient ratio, initial assessment can incorporate treatment or advice, followed by immediate discharge. This can be called a “see and treat” system, which is more efficient than passing the case on to another nurse / doctor. This is more suited for low acuity patients. A trained primary care nurse practitioner may be useful in this regard.

Full initial assessment

Whether or not a brief assessment (see above) has taken place a more comprehensive initial assessment should be performed within 15 minutes of arrival, by a member of ED staff (usually an experienced nurse). This full initial assessment, which is often called “triage”, requires specific training.

Many systems have been evolved around the world to standardise full initial assessment – Figure 1 show examples of several established triage systems for children.

Figure 1: Examples of paediatric triage systems ⁴⁻¹¹

• Canadian Paediatric Triage and Acuity Scale
• Manchester Triage System for Paediatric Emergency Care
• Soterion Rapid Triage System
• Emergency Severity Index
• National Triage Scale
Paediatric Triage Systems specifically for developing countries:
• South African Triage Scale (SATS)
• World Health Organisation Emergency Triage Assessment & Treatment (ETAT)

Initial assessment should be governed by policies to reduce variation and risk of individual practice (see Chapters 11, 12). Staff should understand modifications needed for children presenting with mental health problems, complex disabilities or chronic disease, or suspected child abuse.

Finally, if waiting times are long, triage-type assessment should be repeated to ensure that any child who deteriorates whilst waiting is detected.

Initiation of treatments and next steps

During initial assessment it is also commonplace for basic treatments to be initiated before comprehensive patient review. During times of ED overload these extra tasks may have to be minimised to save time, but on the whole the ED is much more efficient if these tasks are initiated early.

Some common examples for children are given below:

- Pain assessment and provision of analgesia appropriate to the age of the child including topical creams that numb the skin for patients likely to need blood tests and/or intravenous cannulation
- Fracture immobilisation such as splint or slings
- First aid for small or minor burns

- Simple soft tissue injury & wound management measures such as clean dressings
- X-Ray requests
- Prescribing of an antipyretic drug
- Prescribing of bronchodilators
- Trial of oral rehydration solution
- Provision of a sterile container to collect a urine sample in unexplained fever

Pain must be assessed¹²⁻¹³ and treated within 30 minutes of arrival. Pain assessment in children is a core competence for ED staff (see Chapter 9).

Vital Signs

Most triage / assessment systems depend on recording of vital signs. All children must have vital signs measured and recorded on the triage sheet. Standard vital signs include respiratory rate, heart rate, temperature, pulse oximetry and blood pressure. Pulse oximetry and blood pressure are sometimes omitted depending on the triage tool used. Very sick, unstable or collapsed children should not have any delay in getting emergency medical attention in order for full vital signs to be measured in triage, they should be taken to the resuscitation immediately where emergency management can be initiated alongside measurement of full vital signs and completion of triage paperwork.

Blood glucose

Young children and babies are particularly vulnerable to hypoglycemia when unwell. Not feeding well and maybe vomiting as well– this combined with the fact that they have smaller glycogen reserves, puts them at high risk for hypoglycemia. Any child who appears seriously unwell or has a reduced level of consciousness must have a blood glucose measured at triage. Again, there should not be any delay in getting a very sick looking child to the resuscitation area, the blood glucose can be measured in the resuscitation room in these cases.

Special Circumstances

A system should be in place for children with special needs or chronic diseases so that there is rapid access to clinical records, standard care pathways and patient-specific management plans. Some examples of special needs are:



- Chronic, complex diseases (e.g. congenital problems, learning disabilities, metabolic problems)
- Malnutrition – in countries where this is prevalent children should also be visually inspected for signs of severe malnutrition at triage; the WHO recommends looking for signs of visible severe wasting or pitting oedema of both feet. Children with evidence of severe malnutrition should be triaged with a higher triage category as they are at higher risk of serious illness and rapid deterioration.
- Mental health problems, drugs, alcohol dependency (see Chapter 17)

Translators should be available for families who do not speak the predominant local language.

All staff should be aware of the local guidelines for precautions and measures required for the initial assessment of patients presenting with Chemical-Biological-Radiological-Nuclear-Explosive (CBRNE) related signs or symptoms.

INITIAL ASSESSMENT OF AN ILL OR INJURED CHILD:

ESSENTIAL RECOMMENDATIONS

1. Every child arriving at an ED must have a rapid visual inspection very soon after arrival.
2. All staff members (including non-healthcare qualified) must be trained and empowered to alert others to the arrival of a seriously ill child.
3. All ED clinical staff must be highly competent in recognising the seriously ill or injured child, and recognising a deterioration in a child's condition.
4. A critically ill or injured child must be moved immediately to a suitable resuscitation area – there should not be delays to complete triage processes in the triage area.
5. There must be no barriers to accessing immediate initial assessment by a qualified staff member trained in the recognition of serious illness in children.
6. All patients presenting for emergency care must receive a full initial assessment by suitably trained staff within 15 minutes of arrival.
7. The choice of an efficient model of initial assessment for children must take into consideration time available, staff skills, case mix and current workload.
8. All children must have vital signs (temperature, respiratory rate and heart rate) measured at initial assessment; blood pressure and oxygen saturations should be included if the child is seriously ill, but unstable or critically-ill looking children should not be delayed in triage to measure vital signs, these can be measured in the resuscitation area.
9. Drug dosages must be based on an accurate weight, but weight can be estimated using standard tools for very sick or unstable children.
10. All patients in moderate or severe pain must have pain relief provided within 30 minutes of arrival.

DESIRABLE RECOMMENDATIONS

1. In countries where malnutrition is prevalent, at risk children should also be visually inspected for signs of severe malnutrition at triage.
2. For children with special needs, chronic diseases or complex conditions, initial

- assessment should include a request for priority access to hospital notes and clinical management plans and these children should be prioritised as they are vulnerable.
3. Initial assessment should include modifications for children presenting with mental health problems, complex disabilities or chronic disease, or suspected child abuse.

REFERENCES:

1. I Robertson-Steel. Evolution of triage systems Emerg Med J. 2006 February; 23(2): 154–155.
2. Dieckmann RA, Brownstein D, Gausche-Hill M. The paediatric assessment triangle: a novel approach for the rapid evaluation of children. Paediatr Emerg Care. 2010 Apr;26(4):312-5.
3. Santhanam I. Paediatric emergency Medicine Course. 2nd Ed 2013. Jaypee Brothers Medical Pub. ISBN 978-93-5090-694-1.
4. Gravel J, Manzano S, Arsenault M. Validity of the Canadian Paediatric Triage and Acuity Scale in a tertiary care hospital. CJEM. 2009 Jan;11(1):23-8.
5. Manchester Triage Group Staff; Windle Jill, Mackway-Jones, Kevin; Marsden, Janet (2006). Emergency triage. Cambridge, MA: Blackwell Pub. ISBN 0-7279-1542-8.
6. Maningas PA, Hime DA, Parker DE, McMurry TA. The Soterion Rapid Triage System: evaluation of inter-rater reliability and validity. J Emerg Med. 2006 May;30(4):461-9.
7. The ESI Triage Group (2005); Emergency Severity Index, Version 4: Implementation Handbook <http://www.ahrq.gov/research/esi/esihandbk.pdf>
8. G. Fitzgerald, The National Triage Scale. Emergency Medicine, 8(1996), pp. 205–206
9. Cheema, B, Stephen, C, Westwood A. Paediatric triage in South Africa. SAJCH May 2013;7(2):43-45.
10. World Health Organisation Emergency Triage Assessment and Treatment (ETAT) Course http://www.who.int/child_adolescent_health/documents/9241546875/en/index.html
11. Canadian Paediatric Triage and Assessment Scale. <http://caep.ca/resources/ctas>
12. Rasha Srouji, Savithiri Ratnapalan, and Suzan Schneeweiss. Pain in Children: Assessment and Non-pharmacological Management. International Journal of Paediatrics 2010 (4); Article ID 474838. doi:10.1155/2010/474838
13. Erica L. Liebelt Assessing children's pain in the emergency department. Clinical Paediatric Emergency Medicine, Volume 1, Issue 4 , 260-269, September 2000 College of Emergency Medicine (UK) Guideline for the Management of Pain in Children, 2010 <http://www.collemergencymed.ac.uk/Shop-Floor/Clinical%20Guidelines>

Stabilising and Treating an
ILL OR INJURED CHILD

Paediatric Emergency Medicine Special Interest Group: IFEM



Introduction

Once a patient has had an initial triage (see Chapter 6) the next goal is to resuscitate, stabilise and treat ill and injured patients. All patients require a focused assessment to formulate a differential diagnosis and management plan. This management plan is commenced in the ED and continues either with the patient discharged to the care of the family, to an inpatient team or with a General Practitioner.

The length of time spent on the assessment, diagnosis and treatment phase in ED varies widely from minutes through to a period of hours in many cases. Sometimes long stays are present due to a lack of hospital beds: overcrowding of the ED is common in some countries, while virtually non-existent in others (see Chapter 3).

In some hospitals, observation wards are utilised, where patients may stay under the care of the ED staff for up to 24 hours, reducing admissions to the inpatient wards of a hospital. However, this requires a suitable area where patients can be safely observed and there must be adequate medical and nurse staffing to ensure patients are properly monitored and regularly reviewed.

As described above, there are many phases, durations and locations of care that ED physicians are responsible for paediatric patients. This chapter focuses on the first few hours after arrival in the ED.

Differences between children and adults

Emergency services for children lag well behind those available for adults worldwide (see Chapter 3). In Sub-Saharan Africa, where 43% of the population is younger than 15 years of age¹ it is likely that equipment, resources and services for children are even less available.

Whilst the total numbers of critically ill children are less than adult patients, every ED must be able to treat a seriously ill child. This is particularly important in 'adult only' ED's. A basic



“

Investigations and treatments are more difficult to perform in children and may require a different approach.

level of competence for resuscitating children is needed in all EDs as parents or caregivers will often bring a very sick child to the nearest hospital, which may be an adult only ED.

Children often become ill more rapidly than adults, but usually recover quickly and are less likely to have underlying chronic illnesses. EDs often see high numbers of children aged less than 2 years because they have frequent viral illnesses and present with non-specific symptoms such as fever, poor feeding and vomiting. It can be more difficult to accurately assess small children for the likelihood of serious illness.

Investigations and treatments are more difficult to perform in children and may require a different approach. More time, effort and staff are often needed during investigations and treatments performed on children. It may be necessary to sedate or anaesthetise a small, uncooperative or frightened child in order to complete procedures such as laceration repair or fracture reduction.

Parents of sick children may not have had time to bring essential items with them. A range of appropriate infant foods should be stocked, a private space for breastfeeding mothers, diapers and changing facilities should be available. A play area can help to make waiting a less difficult time for parents and children (see Chapter 5).

Stabilising and treating sick children

Initial Resuscitation & Stabilisation Of A Seriously Ill Children

Call for help:

There should be clearly defined criteria for when and how a call for help to wider ED or hospital staff should be made. Traditionally this type of call has been called a 'cardiac arrest', 'code' or 'medical emergency response team' call.

A child should not have to be in cardio-respiratory arrest for such a call to be made. Any child who is showing signs of impending or collapse (even if still breathing and with some effective circulation) requires, urgent resuscitative measures, and will benefit from a trained team of staff.

Senior clinical support

Senior clinical support is likely to be more readily available in developed countries compared with developing countries. In developed countries senior support be that ED, paediatric, intensive care or anesthetic support - is often on site or rapidly available. In developing countries, this sort of support may only be available in a few tertiary centers and even then, most often only during limited hours. In smaller hospitals, and even in larger ones after hours it is common practice for the ED area to be staffed by junior doctors with little or no senior support. Hence, it is imperative that ED teams in developing countries, should be trained to provide resuscitation until or without expecting rapid senior help to arrive.

Team-work, roles and protocols

It is recommended that all staff in EDs be trained in systems or protocols which allocate specific roles and tasks to each team member during assessment and resuscitation of acutely ill or injured children. Because critical ill or injured children are not cared for regularly by most staff, “mock codes” or simulated patient practice is recommended, at a minimum biannually. One such system that appears to work well in the high volume, high acuity, low resource setting of India, is the Paediatric Emergency Medicine Course “Team Approach”²

ED clinical staff members, should be trained to recognise imminent cardio-respiratory arrest and initiate respiratory support and age appropriate chest compressions if required. The team must be able to organise themselves, to continue providing good quality ventilation and chest compressions, as well as advanced resuscitation fluids and medications.

Emergency staff should be able to continue providing goal directed-time sensitive resuscitation until therapeutic goals are achieved, return of spontaneous circulation, cessation of resuscitation or arrival of more senior or specialist support.

Designated team members, should be able to continue rapidly assessing important aspects such as: response to airway management, fluids and medications – looking systematically for signs of improvement or deterioration, in-order to plan the next intervention(s). The team members, should be able to document concurrently following each intervention to track management during resuscitation.

Caregivers should be given the opportunity to be present during resuscitation of a child (see Chapters 5, 18).

Resuscitation algorithms & weight estimation

Resuscitation algorithms should be clearly visible in resuscitation areas and all staff should be familiar with these. A paediatric resuscitation cart /bag must be available with airway, vascular access supplies and equipment for children of all ages. Also, a difficult airway cart should be available in the resuscitation area and a process for consulting with other experts in airway management should be clearly in place (see Chapter 10).

A method for estimating weight for children who are too unstable to be weighed must be available. One commonly used method is the use of standard formulae for estimating weight from age.² Alternatively, rapid estimates of weight can be obtained from tapes measuring length of the child e.g. the BroselowTape.³ These estimates may be inaccurate if children are either malnourished or overweight. The Paediatric Advanced Weight Prediction in the Emergency Room (PAWPER) tape uses both length and an evaluation of body habitus

to estimate weight.⁴

Ideally, to avoid medication errors, a weight-based drug reckoner⁵ should be available (i.e., precalculated dosing by kg bodyweight in mLs utilising a standardised formulary). Each page is designated for the nearest weight in kilograms. Since, drug calculations vary with weight, such resources can help reduce medication errors in times of crisis.

Clinical support tools

Any ED's where children are seen should have guidelines on the assessment, investigation and management of common emergency conditions. These guidelines should be easily accessible and regularly updated (See Chapter 11). Many children's hospitals in the United States have such clinical pathways and guidance for care for a variety of conditions on-line and readily accessible. Increasingly doctors worldwide are accessing clinical guidelines on-line or via Apps. Where feasible access to relevant clinical tools, algorithms and guidelines should be provided in EDs.

Further Assessment, Investigation and Treatment

The presence of Emergency consultants has been associated with better quality of care and fewer complaints⁶, with decreased hospital admissions, fewer invasive tests being performed. If a junior doctor or nurse is in doubt as to whether further investigations are needed they must consult a senior, especially for radiation exposure (see below).



Every effort must be made to minimise painful or unnecessary investigations and procedures in children, and to balance the need for these against the realistic difference they will make in management decisions.

It may be possible to avoid admission and/or unnecessary investigations in a child by

undertaking a period of observation. Such facilities in an ED are usually known as 'Short Stay Unit' or 'Observation Ward'.⁷⁻¹⁰ There is wide variation in the number of hours a child may be permitted to stay in these areas, but usually it is between 6-24 hours. There needs to be clear criteria for the type of children to be admitted, the team or doctor responsible for the child's care, the objective of the observation period and a defined review time.

Specialist Input and Other Services

There must be a system for 24-hour consulting with paediatricians and other key specialists such as paediatric surgeons, neurosurgeons, ENT, orthopaedics etc. whether by telephone, telemedicine, internet or on-site. Staff in the ED should clearly understand how to access help, and the regional network should co-operate in providing assistance (see Chapter 4).

In particular, EDs require a high volume of radiology services (plain radiography, CT, MRI). If these are not available on-site there must be a system for transferring to the nearest facility with the required imaging. Ideally all images should be reviewed and reported in a timely fashion by a trained radiologist with paediatric experience; this can be done remotely (digital link transfer). Medical imaging policies should be in place, consistent with ALARA (as low as reasonably possible) principles^{11,12} to minimise the potential cumulative dose of lifelong radiation.

Commonly used laboratory services (such as haematology, biochemistry, microbiology, transfusion) must be available. There should be a reliable out-of-hours laboratory service for essential tests.

A trained play specialist is a valuable asset to any ED where children are seen – in particular for helping to reduce fear by preparing children for procedures such as insertion of intravenous lines, suturing etc. (see Chapter 5).

Discharging a child

The nature of work practices in the ED is that patient assessment is rapid, efficient and timely, however it is clearly possible that mistakes in diagnosis will occur or that the condition of the child might deteriorate after discharge. For this reason parents must be encouraged to return if they think the child's condition has worsened.

Clear communication is essential (see Chapter 5). Parents should be given written information about their ED visit including as a minimum the presumed diagnosis, any imaging and lab tests results and all treatment given.

Information which the family / careers need to understand and which should ideally be provided in writing on discharge, includes:

- the usual natural progression of the condition
- what the parent can do to help their child
- administration of medications (doses, timing)
- advice on signs and symptoms of potential worsening for the condition
- what to do if child's condition worsens or if they are worried

Also, the telephone numbers to call if they need further advice or help should be provided as well as when to contact Emergency Medical Services (EMS), as system allow. Follow-up clinics in the ED may be helpful for minor injury review, self-limiting medical illness (where the child needs a single further assessment) or for follow-up of results (e.g. urine culture). ED clinics are not suitable for children who will need multiple on-going follow-up appointments.



STABILISING AND TREATING AN ILL OR INJURED CHILD:
ESSENTIAL RECOMMENDATIONS

1. There must be a defined 'Resuscitation Team' of clearly identified staff from within the ED or hospital.
2. All ED clinical staff must be highly competent in basic paediatric life support.
3. All ED staff on each shift must be competent in resuscitating until therapeutic goals of hypoxia, shock, cardiac dysfunction and status epilepticus are resolved. .
4. Staff able to provide advanced airway management must be available within 5 minutes of the need being identified.
5. Trained staff must stay with a critically ill child until moved to a dedicated critical care environment or recovery happens.
6. Resuscitation algorithms and equipment should be available in resuscitation areas and ideally practiced regularly with ED staff.
7. A method for estimating weight for children too unstable to be weighed must be used.
8. A ready reckoner for estimating weight based drug dosages (without the need to calculate) should be available.
9. There must be a system for 24-hour consulting with key specialists either on site or remotely, including toxicology information.
10. The ED must be supported by 24-hour basic radiology and laboratory services.
11. At discharge, carers must have advice which they understand, for managing their child's condition and recognising deterioration.
12. All children seen in the ED must be discharged with a discharge letter to keep, and/or a letter sent to their General Practitioner.

DESIRABLE RECOMMENDATIONS

1. Following any major paediatric resuscitation, a system should be in place for staff and family to be offered debriefing and if required, further counselling should be available.
2. A "difficult airway" cart should be available.
3. Parents and family should be given the opportunity to remain present during resuscitation of a child.

REFERENCES:

1. Santhanam I, editors. Status epilepticus. In: Paediatric Emergency Medicine Course. 2nd ed. New Delhi: JAYPEE Brothers; 2013. p. 198-212.
2. Advanced Paediatric Life Support: the practical approach. 5th edition. Advanced Life Support Group. BMJ Books - Publ John Wiley & Sons (Wiley-Blackwell) ISBN: 978-1- 4443-3059-5
3. Lubitz DS, Seidel JS, Chameides L, Luten RC, Zaritsky AL, Campbell FW. A rapid method for estimating weight and resuscitation drug dosages from length in the paediatric age group. *Ann Emerg Med*. 1988 Jun;17(6):576-81.
4. Wells M. The PAWPER tape: a more accurate form of tape-based weight estimation. *Sanguine* 2011;1(2):4-6.
5. Craig. S Paediatric Emergency Medication Book.2017
6. GC Geelhoed, EA Geelhoed. Positive impact of increased number of emergency consultants. *Arch Dis Child* 2008;93:62-64
7. M W Cooke, J Higgins, P Kidd Use of emergency observation and assessment wards: a systematic literature review *Emerg Med J* 2003;20:138-142
8. Short Stay Paediatric Assessment Units: Advice for Commissioners and Providers, RCPCH, 2009. <http://www.rcpch.ac.uk/sites/default/files/Short%20Stay%20Paediatric%20Assessment%20Units.pdf>
9. Levett I, Berry K, Wacogne I. Review of a paediatric emergency department observation unit. *Emerg Med J*. 2006 Aug; 23(8):612-3.
10. Lamireau T, Llanas B, Dommange S, Genet C, Fayon M. A short-stay observation unit improves care in the paediatric emergency care setting. *Eur J Emerg Med*. 2000 Dec;7(4):261-5.
11. Frush D, Donnelly L, Rosen N: Computed Tomography and Radiation Risks: What Paediatric Health Care Providers Should Know. *Paediatrics* 2003;112:951-957.
12. Frush D: Paediatric CT: practical approach to diminish the radiation dose. *Paediatr Radiol* 2002;32:714-717.

The Staffing of an **EMERGENCY DEPARTMENT**

***Paediatric Emergency Medicine Special Interest
Group: IFEM***



Introduction

An Emergency Department (ED) must be able to service their local population. The profile of ED attendances will influence its size, design and the services it can provide. The ED should employ the appropriate number of qualified doctors, nurses and nursing assistants to



“

To maintain safe 24-hour cover, a critical mass of trained staff is needed, which may require investment into hiring and training staff with paediatric skills.

provide timely, high quality care for its patients. In addition, appropriate numbers of ancillary staff need to be employed to perform tasks such as patient registration, stocking of departmental supplies, and the general upkeep of the department, so that the clinical work of doctors and nurses is supported and protected.

Staff who are employed by the ED vary greatly between and within different countries. In more advanced ED systems, it is common that:

- There are certified emergency medicine physicians who work only in the ED.
- Training and certification in emergency medicine, and its subspecialty paediatric emergency medicine in some countries, are guided by core content specified by certifying bodies.¹⁻³
- Senior physicians are present to supervise junior doctors at all times.
- All ED staff (doctors, nursing and allied health professionals) work in a team, with fewer boundaries between their roles compared to their in-patient colleagues.
- ED staff are trained to perform many specific roles (e.g. triage, resuscitation roles), but work together with flexibility and teamwork.
- ED staff can safely manage all types of paediatric emergency (illness, injury, drug overdose, mental health).

In less advanced systems, it is common that:

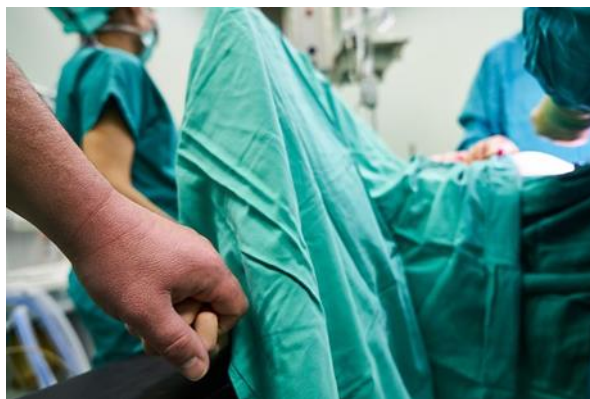
- Staff work both in the ED and other areas of the hospital, leading to variable junior ED staff supervision.
- The majority of ED doctors have no specific EM training, resulting in ED staffing being more heavily dependent on senior nurses.
- Doctors and nurses spend considerable time performing tasks that could be done by ancillary staff.
- ED doctors and nurses have to modify roles frequently because the ED has fluctuating staffing.
- Roles are often poorly defined for ED staff members, thus teamwork becomes more difficult.

Experience shows that more full-time dedicated ED staff members make departments run more smoothly, resulting in better standards of clinical care. If ED staff numbers include many who work on a temporary or occasional basis, then the staffing quality and skill levels become unpredictable as teamwork falters.

Differences between adult and paediatric ED staffing

On the whole ED staffing issues are the same, regardless of the age mix of the patients. However, it is important to have the right numbers of staff with skills for paediatric patients. Employment of such staff may be limited by availability of clinicians suitably trained in paediatric emergency medicine (see Chapter 3). Therefore, in establishing the staffing on a

shift-by-shift basis, providing safe coverage for children can be challenging. To maintain safe 24-hour cover, a critical mass of trained staff is needed, which may require investment into hiring and training staff with paediatric skills (see Chapter 9).



In paediatric practice, nurse staffing is more time consuming for tasks such as assisting procedures, and medication administration. However, ongoing basic care can be provided by family members with appropriate instruction and some supervision. Less qualified staff – such as Nursing Assistants or voluntary staff are also particularly valuable in paediatric practice to help with caring for the general welfare of children. All staff who are in close contact with children should have been screened for criminal history, if this screening is available.

The peaks and troughs of paediatric patient arrivals by hour of day tend to be more exaggerated than for adult patients. In most countries paediatric attendances have two peaks: late morning / early afternoon, and early evening, with low attendances from midnight to 8 a.m. Depending on average patient length of stay in ED (variable worldwide) this may affect staffing levels.

A well-functioning staffing model

Leadership for Service Provision

A well-functioning ED will have a senior lead doctor (e.g. Medical Director) and a senior lead nurse (e.g. Nurse Manager) with explicit responsibilities to lead and manage the department/centre. Where the age mix is both adult and children, there must be a designated senior doctor and nurse with authority and responsibility for ensuring best practice in paediatric emergency medicine, the paediatric emergency care co-ordinator (PECC See Chapter 3). In larger mixed ED's the paediatric lead doctor and lead nurse may lead a core team of ED nurses and doctors with paediatric and general ED skills.

In any ED, the lead clinical staff require protected management time, when they are free from clinical duties, to allow them to strategically plan and implement tasks such as to:

- Advise on the right numbers of staff and the right skill-mix (adult and paediatric) for the ED
- Lead education in paediatric emergency care to junior medical and nursing staff
- Lead quality projects to continually improve department wide paediatric emergency care; e.g. the creation of paediatric clinical guidelines and policies
- Advocate for resources required to treat children e.g. equipment, drugs, and patient discharge education leaflets
- Foster ongoing relationships with non-ED paediatric specialties. Examples include:
 - Inpatient specialties (e.g. paediatric medicine, paediatric surgery)
 - Outpatient clinics
 - Community services, including child protection agencies/local health care centres

Specific roles and areas in ED

ED staff are usually allocated specific roles in different areas of the department. There are specific paediatric considerations within these roles. All areas must be covered safely, by staff with the correct skills.¹⁻⁴

Triage / initial assessment Staff

All developed EDs have a system to assess patients on arrival. Chapter 6 describe the process and skills needed. In some countries, it is done by medical staff; in others by nursing staff. When children arrive in the triage area, there should be a member of staff competent to perform a paediatric assessment within 15 minutes of arrival. This means matching staffing to the typical patient arrival times (described above).

Resuscitation Staff

All EDs must be staffed with personnel specifically trained and competent to deal with severe and critical injuries and illnesses in children, 24 hours a day (Chapter 9). This means, at a minimum, skills for resuscitation of respiratory or cardiac arrest. In mixed ED's, there may be a combined resuscitation team of adult and paediatric trained clinicians (nursing and medical), and the team may include clinicians trained in both adult and paediatric emergency medicine.

Specific considerations for the allocation of team members include:

- Core team members: who are familiar with the layout in the ED, practice resuscitation frequently, and have paediatric skills; often the best solution is a combination of the core ED team with additional expert personnel from within the main hospital, but who are familiar with the ED.
- Assisting staff: who are able to calculate paediatric drug doses, and able to prepare and deliver boluses and infusions rapidly and safely (Chapter 10); ideally all medication calculations are done based on a standard formulary, or calculated

- electronically using age and weight-based decision support tools.⁵
- Family support: Additional experienced members of staff with specific training and experience who can be allocated to solely support the family (if present) by explaining and reassuring them about the resuscitation process (chapters 5, 18).

During resuscitation, additional non-ED clinicians with specific paediatric expertise may arrive to assist. Others may also arrive as observers, such as students. Whilst learning is welcomed, resuscitation must not be hampered by the presence of too many people in the resuscitation area.

Core ED Staff

The number of core ED staff will depend on the following factors:

- The floor plan of the department
- The typical severity of illness or injuries of the patients who attend the ED
- The number of patients at that time of day (including those awaiting a hospital bed)
- The need for supervision and training of junior staff

Different ED's will have different floor plans, with the main department either one unit, or divided into areas with monitored beds, unmonitored beds, ambulatory assessment rooms, procedural rooms, or in mixed departments there may be areas which are adult-only or child-only. Staff with appropriate skills should be allocated to those areas.

Patient: staff ratios will depend on case-mix and typical length of stay (this has a large variation worldwide). An analysis of these two factors should determine numbers of nursing and medical staff (Chapter 13). Standards from some countries recommend one senior paediatric emergency physician for every 11,000 to 16000 annual patient visits.^{1,6}

Observation Ward Staff

Use of short-stay or observation units are particularly useful for looking after children in emergency department⁷ as children often recover more quickly than adults, allowing for quicker discharge when compared to full inpatient stays. Staffing this area should include physicians and nurses trained in paediatric observational medicine, which is becoming a specialised skill in paediatric medicine and general emergency medicine. The number and training of the providers in the unit should be in accordance with the volume and case-mix of patients. This generally means more frequent senior doctor reviews than for in-patients in order to enable early discharge.

Careful ED staff rostering

The number of patients arriving to the ED is often dependent on the time of day (described above) and predictable to some degree. The number of both junior and senior ED staff

should attempt to match this pattern, paying particular attention to the predictable surge of paediatric patient presentations in the afternoon and evening and also taking account of anticipated seasonal variations. In larger, mixed adult and paediatric ED the staffing model can allow for movement of staff between different areas when arrival surges happen at different times of day for different age groups. Staffing these peaks and troughs of arriving patients is easier if the majority of staff have crossover skills (both emergency medicine/trauma and general paediatrics/paediatric internal medicine), balanced with more specialist staff with careful rostering.

The effect of over-crowding

Overcrowding of EDs is clearly associated with increased morbidity and mortality.⁸ Queuing of patients requires constant re-triaging and searching for consultation and treatment space, and distracts staff from core clinical care, and therefore may require higher staffing levels, if commonplace. Hospitals should have clear policies to ensure that senior ED staff are involved in bed management and patient flow to prevent overcrowding as best as possible, and when crowding occurs, that management support is supplied, to free up clinical staff to deliver clinical care.

Nurses with extended skills

In some countries Emergency Nurse Practitioners or Advanced Nurse Practitioners and other advanced non-medical clinicians are employed to complement medical staffing. These clinicians have a specific scope of practice that defines their role in the ED. When employing them, a balance must be achieved between a proven increase in ED efficiency, and allowing junior doctors the opportunity to develop competence in seeing and managing the same type of patients.

Allied Health Professionals

Play specialists (child life specialists) are very valuable in paediatric emergency care. Their roles are described in Chapter 5. If resources do not allow them to be employed full time, then they should be targeted at peak times, especially evenings and weekends. If there is no play specialist available, access to another staff member who is trained to perform these skills should be available.

Large ED's will need other allied health professionals dedicated to ED work (such as respiratory therapists, phlebotomists, nursing assistants, plaster technicians, etc.). All such staff should know the differences of how to perform their roles for paediatric patients as compared to adult patients.

Training and supervision

The numbers of senior staff should take into account the need to supervise junior staff. In a mixed ED, the supervision workload for paediatric patients is often greater than for junior staff seeing adult patients.

Sustainable staffing

ED work is busy, tiring and often stressful. Working long continuous shifts increases the risk of making errors in patient care and decision-making. To minimise this risk, management should aim to roster separate medical and nursing teams for day and night shifts, with adequate recovery time between shifts e.g. maximum 12 continuous hours. If staff members also work elsewhere in the hospital, the shift duration should take account of that time. If shifts are long, an option to reduce fatigue is for staff to rotate to another less busy area of the ED during their shift.

Whilst the main responsibilities of ED staff are focused on direct clinical care, it is necessary that in academic institutions that all staff members also have sufficient protected non-clinical time for other aspects of their job, such as research, education and training, and safety/quality improvement activities. Time dedicated to these activities improves staff satisfaction and retention, and enables the ED to develop and improve patient care.



It is well recognised that work in ED is highly pressured and can be stressful. Older, experienced staff may leave for less pressurised jobs, which is a great loss to the ED. The ways in which this effect can be minimised⁹ include:

- Flexibility in shift patterns, as different people often have different preferences
- Adequate baseline staffing levels
- Protected time for project development / leadership within the ED predictable working diary (protected non-clinical time, rosters prepared a few months in advance)
- Mentorship and support systems, which value optimising physical and mental health
- Professional development, appraisal and career planning

THE STAFFING OF AN EMERGENCY DEPARTMENT:

ESSENTIAL RECOMMENDATIONS

1. ED staff must not work long continuous shifts e.g. more than 12 hours, as fatigue leads to patient care errors and decision-making errors; there must also be adequate recovery time between shifts.
2. Staff numbers must be adequate to allow safe coverage of all areas of the ED where paediatric patients are being cared for, at all times.
3. Appropriate organisation of paediatric specific equipment, supplies and medications that allows for staff to quickly and safely access them during resuscitations.
4. Staff in EDs should have access to decision support tools which assist in correct medication dosing, equipment sizing, and in clinical pathways for paediatric illness and injury.
5. In academic institutions clinical staff members must have sufficient protected non-clinical time for other aspects of their job, such as research, education and training, and safety/quality improvement activities.

DESIRABLE RECOMMENDATIONS

1. A core body of medical and nursing should be contracted specifically to the ED full time, for smooth running and high quality of care.
2. In larger EDs for mixed-age patients, there should be a core team of staff skilled in providing emergency care for sick and injured paediatric patients.
3. Staff rosters should take into account peaks and troughs of paediatric arrivals, the need for supervision of junior doctors, and the paediatric skill sets of the staff on any given shift.
4. ED staff mental health and welfare needs to be considered a priority and the ED should have staff retention policies in place to prevent loss of experienced staff due to stress and fatigue.

REFERENCES:

1. Counselman FL, Babu K, Edens MA, Gorgas DL, Hobgood C, Marco CA, Katz E, Rodgers K, Stallings LA, Wadman MC, for the 2016 EM Model Review Task Force; Beeson MS, Keehbauch JN, for the American Board of Emergency Medicine. The 2016 model of the clinical practice of emergency medicine. J Emerg Med 2017 March 25;pii: S0736-4679(17)30108-7. <https://www.abem.org/public/publications/em-model/reference>
2. Content Outline for the Specialty of Paediatric Emergency Medicine, the American Board of Paediatrics; https://www.abp.org/sites/abp/files/pdf/paediatric_emergency_medicine_content_outline.pdf
3. Standards for Children and Young People in Emergency Care Settings (third edition) 2012. Royal College of Paediatrics and Child Health. www.rcpch.ac.uk/emergencycare
4. American Academy of Paediatrics policy statement on Care of Children in Emergency Departments, 2009, Krug S, Gausche-Hill M. Guidelines for care of children in emergency departments. Paediatrics 2009;124:1233-1243. <http://aappolicy.aappublications.org/cgi/content/full/paediatrics;107/4/777>
5. Kaushal R, Bates DW, Landrigan C, McKenna KJ, Clapp MD, Federico F, Goldmann DA. Medication errors and adverse drug events in paediatric inpatients. JAMA 2001 April 25; 285(16):2114-20.
6. Bello O., Sehabiague G., Prego J., de Leonardis D. Paediatría, Urgencias y Emergencias 3° ed. 2009. Chapter 1: Organización de un Departamento de Emergencia Pediátrica. Ed Bibliomédica. Montevideo, Uruguay.
7. Intercollegiate Committee for Standards for Children and Young People in Emergency Care Settings. Facing the Future: Standards for children in emergency care settings June 2018 Available from https://www.rcpch.ac.uk/sites/default/files/2018-06/ffc_emergency_standards_digital_-_website_version.pdf
8. Institute of Medicine. IOM Report: The Future of Emergency Care in the United States Health System. Acad Emerg Med. 2006 Oct;13(10):1081-5.
9. International Federation for Emergency Medicine. Creating Sustainable Working Conditions for the Emergency Physician. April 2015. Available from <https://www.ifem.cc/wp-content/uploads/2016/03/Creating-Sustainable-Working-Conditions-for-the-Emergency-Physician-April-2015-1.pdf>
10. Guidelines on constructing an Emergency Medicine Medical Workforce. Australasian College for Emergency Medicine www.acem.org.au
11. Guidelines for Paediatric Emergency departments seeking training accreditation: minimum requirements Australasian College for Emergency Medicine www.acem.org.
12. Creating Sustainable Working Conditions for the Emergency Physician, IFEM 2015 <https://www.ifem.cc/wp-content/uploads/2016/03/Creating-Sustainable-Working-Conditions-for-the-Emergency-Physician-April-2015-1.pdf>

Staff Training and
COMPETENCIES

***Paediatric Emergency Medicine Special Interest
Group: IFEM***



“

Investigations and treatments are more difficult to perform in children and may require a different approach.

Introduction

The Emergency Department (ED) should be staffed by trained personnel that are used to working in acute care settings (see Chap 8) and able to deal with the full range of paediatric patients presenting with varying symptoms. Training and competency should include:

- Performing efficient and effective resuscitation based on local guidelines and best

practices, utilising using appropriate Crisis Resource Management (CRM) teamwork skills.

- Assessment and management of paediatric patients who present to an ED with an undifferentiated illness or injury including: mental health emergencies, poisonings and social problems (see Chaps 6,7, 16,17).
- The use of clinical reasoning, best available evidence and risk stratification skills to generate age-appropriate differential diagnoses and management plans in ED settings (often in the context of incomplete information and the need for fast decisions).
- Use of safe practices for minimising error, using resources such as local clinical guidelines, weight or age-based drug dosing aids (print or electronic aids), e-books, etc.
- A working knowledge of related allied areas of practice as it pertains to Emergency Medicine. This includes, but is not limited to: disaster medicine, child abuse and forensic medicine, public health and preventative medicine, quality improvement, research and medical education.

In this document the arrangements of provision of care between primary care, other forms of health and social care, and the different hospitals neighboring each other, are referred to as the “regional network”.

- Use of appropriate technology, specifically ultrasound, based on local availability.

In countries with established certification and training programs, there are usually:

- Well defined training programs in both general emergency and paediatric emergency medicine.
- A multitude of learning courses designed to teach the knowledge and skills listed above.
- Recognised licensing and accrediting organisations tasked with certification and monitoring of continuing education.

In less developed countries, it is more likely that:

- The specialty of emergency medicine is still being established, and the specialty of paediatric emergency medicine is even less developed.
- There will be limited support for clinicians for acquiring these skills and competencies in a formalised training program that is focused on ED practice.

- There will be a lack of local courses to learn the knowledge and skills to resuscitate seriously ill children, but online courses can support training.
- There is a lack of a central licensing or accreditation organisation for professional staff.

Differences between training pathways in the treatment of children and adults

The staff who treat children in EDs around the world vary between those from an adult-trained background and those from a paediatric background. In many departments children are seen by paediatricians if they have an illness, but will be seen by mainly adult-trained orthopaedic and surgical specialists if they have an injury. Generally speaking, the more advanced the specialty of Emergency Medicine is within a country, the more likely it is that the ED staff will have the formal training in all aspects of paediatric emergencies, and often adult patients too.

In many parts of the world, ED doctors and nurses have had much more exposure to adult patients than to children. However, in some countries such as the United States, United Kingdom, Australia, New Zealand, and Canada, paediatric emergency training is available for either general emergency medicine or general paediatric physicians / nurses, for the entire range of childhood conditions.



In an ED staffed by nurses and doctors trained exclusively in paediatrics, knowledge, skills and confidence may be lacking in handling presentations more frequently seen in adults and adolescents, including but not limited to: trauma, resuscitation, and mental health presentations (see also Chap 17). Furthermore, they may not have been exposed to the management of patients with substance abuse or alcohol abuse in the same way as in the adult ED. They also may lack knowledge of how to organise the ED for major incidents. (see Chap 17).

Conversely, in an ED staffed by adult-trained doctors and nurses may have limitations in knowledge, skills and confidence for treating less common paediatric or neonatal illness, dealing with child protection issues, performing practical procedures for smaller children, and communication with children and their families.

Paediatric Emergency Medicine training and competence

Specific training in Paediatric Emergency Medicine (PEM) is well developed in a few countries, (see Chapter 19), usually stemming from one of two training programs: Emergency Medicine and/or Paediatrics, whereas in other countries the specialty is still evolving. Completing a recognised training in PEM, within either general EM and general paediatric medicine creates a focus and expertise within these training programs. The following describes some of the recommendations that are needed to attain a high degree of competence in the practice of PEM.

Training activities

Training must include typical EM skills e.g. triage, airway skills, resuscitation, teamwork, observation, medication delivery, procedures, but with reference to children of all ages. The use of simulation can help bridge the gap in meeting some of these skills in children such as airways skills and procedures. By the nature of ED work, which is usually 24 hours a day and busy, thought must be given to supplying education in a way that maximises attendance whilst maintaining staffing in the emergency department.¹

Resuscitation skills

Given the low frequency of paediatric resuscitations, it is imperative that resuscitation skills be practiced regularly. This can be in the form of formal courses (PALS, APLS, PEMC²), or through mock resuscitations or simulations. Fortunately, children needing resuscitation are less common than adults but resuscitation skills deteriorate over time, if not practiced frequently. Maintenance of resuscitation skills can be achieved with educational courses and frequent practice.^{3,4} A recent study suggests good retention rates if CPR is practiced every 3 months or more often.⁵ Resuscitation of children is highly emotive (see Chapter 18) and when combined with the relative infrequency of such occurrences, creates a highly stressful environment for all involved in the resuscitation of children. Well-rehearsed resuscitation skills improve confidence. Also, teaching skills to manage staff emotions and behavior will lead to better staff retention and job satisfaction. Specific skills in debriefing after every case are beneficial and will aid in troubleshooting any issues during the case as well as manage emotions.

Teamwork skills

The importance of working as a team cannot be overstated. Studies have shown that better team skills result in better outcomes in the fields of aviation and the military, as well as EM.⁶ Team building training should include colleagues from different backgrounds practicing together.

One method of teaching team skills is simulation training using mannequins as patients. This can be done in a simulation or education centre or at the point of care (i.e. physically in the ED). Team training may be done to improve clinical knowledge or skills but it is also very important to observe and learn 'human factors' i.e. how well does the ED respond to the scenario as a team. In addition, point of care simulation with real ED teams can help identify simple but important problems resulting from use of language, equipment issues etc. This method also aids in teaching leadership and communication skills, qualities essential in the ED.

Core PEM clinical knowledge and skills

In most EDs, Children may present with either illness or injury. It is more efficient if ED physicians and nurses⁷ are able to manage either type of emergency, If the two streams are separated and different clinicians see different types of patients, there is a risk that a holistic view of the patient may be lost e.g. child protection issues missed in injured children (see Chapters 1, 5).

Core clinical teaching must include the following: (as highlighted in other chapters of this document):

- The differences between normal children and adults with regard to their physical, physiological, and psychosocial characteristics.
- The changes in these characteristics as the child grows.
- Child-specific diagnoses, e.g. Bronchiolitis, intussusception, congenital abnormalities presenting as emergencies (cardiac, metabolic), and diagnoses that have varied age dependent presentations such as urinary tract infection.
- The method of initial assessment and management of all children who present to the ED (see Chapters 7, 8).
- Common illnesses and injuries (serious and minor).
- The rapid identification of potentially seriously ill children.
- The selection and expertise involving age appropriate equipment, and the calculation of medications and fluids. (see Chapter 10).
- Child and family centered care (see Chapter 5).
- Medico legal factors specific for the assessment and management of children. E.g. consent, refusal to treat, confidentiality, parental responsibility etc.
- Awareness of child protection issues, recognition of risk factors for child abuse (see Chapter 16) and actions taken if these factors are identified.
- Knowledge of primary prevention of paediatric illness and injury such as promotion of healthy diets, active lifestyles, use of safety devices such as child car seats and bike helmets, prevention of drug abuse, shielding children from harmful images in the media, etc.

Creating the underpinning Education Program

High quality training is inter-disciplinary and inter-professional, with identified lead staff to create a rolling program. In mixed-age ED's, it may be more feasible for a single lead person to co-ordinate both adult and paediatric education, with inputs from the paediatric emergency physician or team. In large departments, a lead paediatric doctor and lead nurse may delegate a specific staff member to deliver training, their own role being to have an overview, maintain quality, and supervise, for example:

- Reviewing individual staff for competencies and skills in addition to the department as a whole, a relevant education program can be created. Once this is completed, learning outcomes can be created to structure the local program (see below).
- Liaising with the consultants (paediatricians, sub-specialists) to identify gaps in management of patients in the ED.
- Liaising with allied health care workers to identify ways to improve patient care from their perspective.
- Identifying experienced clinicians available to teach in the education program. Ideally, these teachers should also possess expertise in teaching techniques (see below).
- Organising a combination of different learning activities and styles (ideally that are inter-professional) to make the education program effective and enjoyable.
- Ensuring that some training is compulsory e.g. child protection awareness, paediatric resuscitation updates and refresher sessions.
- Knowledge of external courses and ensuring protected time for staff to attend them e.g. advanced Paediatric life support courses, which supplement in-house educational programs.
- Creating a culture of continuous quality improvement of the education program

Applying Education Theory to your program.

Adult learners are self-directed and goal-oriented, and they seek information that they can readily apply.⁸ When designing your program, utilise the adult learner's desire for what they want to learn to maximise the program's success. This pedagogical framework will provide the best learning outcomes. After reviewing the individual and department's educational needs, one can create learning outcomes that are clear.

A number of learning activities exist which includes: ⁹

- Small group presentations.
- Semi-directed small group discussions, which are better at keeping the learner focused.
- Skills stations, useful for learning procedural skills.
- Mock scenario and simulation teaching, particularly useful for learning teamwork and leadership.¹⁰
- Case based discussions that help teaching in the context. These are done in

- paediatric resuscitation case reviews, paediatric mortality and morbidity audits.¹¹
- Using e-learning modalities to supplement face to face learning.^{12,13}
- Learning whilst simultaneously working, e.g. bedside teaching and the use of manikins for practicing skills in the resuscitation room; this is very effective, but can only be done if sufficient senior staff are also working to provide ongoing supervision of juniors.

It is desirable that supervising senior staff should not be responsible for the entire clinical load such that they can provide adequate educational supervision.

Though the ED environment can be a challenging environment to provide lengthy teaching to learners. Finding opportunities or providing simple pearls around cases, followed by a self-directed education can be a powerful method. Other education as it relates to is seldom comfortable for learning, educators must be capable of identifying opportunities for learning. Seniors in the ED should be aware that interpersonal skills, communication and good relationships are very important in the process of learning and that they are always role models for juniors leading by example provides a good role model for young physicians/other members of the medical team.

The use of inter-professional education, where both nursing, medical and other members of staff attend the same educational session, has been shown to be beneficial in certain situations, especially in mock scenario and simulation teaching.

Applying education theory to teachers

Staff who teach PEM should have training in how to teach. Several pedagogical frameworks are available to assist in disseminating knowledge. Having the basic educational principles and knowing different modalities of dissemination is helpful in creating a program (e-learning, hand on practical session, didactic, small group, etc.)

The following points should be considered:

- Time provided for senior staff to learn how to supervise and teach.
- Instruction on how to prepare lectures/presentations and deliver small or large group discussions (seminars/grand rounds).
- Instruction on how to prepare and co-ordinate whole PEM education courses and programs.
- Learning how to evaluate and provide effective feedback in educational activities.

STAFF TRAINING AND COMPETENCIES:

ESSENTIAL RECOMMENDATIONS

1. All ED staff must be competent to deal with the full range of illnesses, injuries in all age-groups and understand the differences between children and adults.

2. Refresher training must be available and timely in order for staff to retain their knowledge and skills in paediatric resuscitation.
3. ED staff must focus effort to coordinate, learn and work as a team.
4. Senior staff must be physically present and available to teach junior ED staff (medical and nursing) while they work.
5. Senior staff who teach juniors whilst they work must not have a full clinical load, so that they are able to ensure supervision and education occurs in the busy ED environment.
6. A senior ED doctor and ED nurse must be designated to have the role of creating.

DESIRABLE RECOMMENDATIONS

1. Staff should also complete educational courses that deal specifically with all aspects of ED work, including advanced resuscitation, teamwork skills, risk management and evidence-based practice.
2. Individual ED's should program their learning activities to maximise attendance of ED staff whilst maintaining quality care in the ED at all times.
3. The education program should incorporate best practice in education, and be delivered by a team of ED staff.
4. Teaching of all team members should occur as a team, teaching both doctors and nurses together (inter-professional education).

REFERENCES:

1. Quinn A, Brunnett P. Service versus education: Finding the right balance: A consensus statement from the Council of Emergency Medicine Residence Directors 2009 Academic Assembly "Question 19" working group. *Academic Emergency Medicine*. 2009; 16 Suppl 2: S15-18.
2. Santhanam I. *Paediatric emergency Medicine Course*. 2nd Ed 2013. Jaypee Brothers Medical Pub. ISBN 978-93-5090-694-1.
3. Blewer AL, Leary M, Esposito EC, Gonzalez M, Riegel B, Bobrow BJ, Abella BS. Continuous chest compression cardiopulmonary resuscitation training promotes rescuer self-confidence and increased secondary training: a hospital-based randomized controlled trial. *Crit Care Med*. 2012 Mar;40(3):787-92.
4. Roy KM, Miller MP, Schmidt K, Sagy M (2011). Paediatric residents experience a significant decline in their response capabilities to simulated life-threatening events as their training frequency in cardiopulmonary resuscitation decreases. *Paediatric Critical Care Medicine*. May 2011;12(3):e141-e144
5. Sutton RM, Niles D, Meaney PA, Aplenc R, French B, Abella BS, Lengetti EL, Berg RA, Helfaer MA, Nadkarni V (2011). Low-dose, high-frequency CPR training improves skill retention of in-hospital paediatric providers. *Paediatrics*. 2011 Jul;128(1):e145-51.
6. Rosen MA, Salas E, Wu TS, Silvestri S, Lazzara EH, Lyons R, Weaver SJ, King HB. Promoting Teamwork: An Event-based Approach to Simulation-based Teamwork Training for Emergency Medicine Residents. *Academic Emergency Medicine* 2008; 15:1190-1198
7. Maximising nursing skills in caring for children in emergency departments, RCN / RCPCH, 2010. http://www.rcn.org.uk/_data/assets/pdf_file/0009/323577/003821.pdf
8. Rogers RL, Mattu A, Winters M, Martínez J (2009). *Practical Teaching in Emergency Medicine*. Wiley-Blackwell Ltd.
9. Waisman, Y (2012). Establishing Paediatric Emergency Medicine in Israel: Reflections and Lessons. *Clinical Paediatric Emergency Medicine*. Volume 13, Issue 1, Pages 18- 24, March 2012
10. Stefan MS, Belforti RK, Langlois G, Rothberg MB. A simulation-based program to train medical residents to lead and perform advanced cardiovascular life support. *Hosp Pract (Minneap)*. 2011 Oct;39(4):63-9.
11. Kaddan W, Poznansky O, Amir L, Mimouni M, Waisman Y. (2006). Medical education and quality of care in the paediatric emergency department setting: a combined model. *Eur J Emerg Med*. 2006;13:139-143
12. Spotting the Sick Child (UK Department of Health e-learning package) <http://spottingthesickchild.com>
13. Ruiz JG, Mintzer MJ, Leipzig RM. The Impact of E-Learning in Medical Education. *Academic Medicine*: 2006, 81(3):207-212

Resources:

Readers are asked to look at Appendix 2 (Useful Resources) for further information to aid in creating their education programs.

Emergency Department
EQUIPMENT, SUPPLIES & MEDICATIONS

***Paediatric Emergency Medicine Special Interest
Group: IFEM***



Introduction

Emergency Departments must be equipped with all the necessary equipment, supplies and medications needed for the care of the acutely ill or injured patient, on a 24-hour basis, for both adults and children.^{1,2} These should be easily accessible, clearly labelled, and safely organised, maintained and stocked, even during peak activity. Staff may be specially assigned for this task.

Differences between children and adults



“

One of the many challenges for treating patients of all ages in an ED is ensuring availability of equipment and medications in sizes and formulations suitable for different ages and body weights and abilities.

One of the many challenges for treating patients of all ages in an ED is ensuring availability of equipment and medications in sizes and formulations suitable for different ages and body weights and abilities (for example liquid formulations for infants who cannot swallow tablets). Whilst adults often vary in weight (especially in body fat rather than in height), standard dosages tend to be used most of the time. Children however need to have their doses titrated according to weight. Neonates have special needs and caution is needed in ordering their medications.

Since there is a wide range of different sized equipment and supplies for children, accurate identification and sizing can be difficult – especially in time-pressured situations such as resuscitation. Paediatric emergency equipment and supplies should be stored and labelled in such a manner as to minimise the risk of making errors. There are tools available to help select the right-sized equipment in an emergency (ex. Broselow, Pauper, various Apps)³

Choosing the right equipment, supplies and medications.

Equipment and supplies

Stringent quality control is essential for safe and accurate use of paediatric equipment and medications. As this is a challenge, EDs that cater to both adults and children will tend to store the paediatric supplies in a specific area, so that it is easily identified and differentiated from adult supplies. For daily use, mobile carts may be employed. The number of areas where paediatric equipment is available should be based on “the worst-case scenario” for a busy day. For mass casualties however, a different approach will be needed.

The ED should form part of a larger, well-developed and organised regional network in terms of equipment and medications (for example, the ambulance service and the hospital paediatric wards). This means keeping up to date with new resources, and ensuring that if patients are transferred, the differences in equipment between services, for example infusion equipment, are minimised. The problem of lack of uniformity of equipment is made worse if medical or nursing teams work in more than one ED, or work in the ED and also in-patient areas.

Standardising the layout and stocks will reduce confusion, delay in treatment, and medical errors. All staff must be familiar with the department’s equipment and medications (e.g. during staff orientation programs) and refresh their knowledge at frequent intervals. Ideally the layout of supplies should be mirrored when those supplies are stocked in different areas. ED’s serving different localities must cater to their own case-mix and review usage of their supplies for the expected amount and degree of complexity of patients seen.

Mobile resuscitation trolleys or “crash” carts organised to cater to the needs of paediatric

patients of all ages should be immediately accessible in various strategic areas within the ED. ED staff should be educated on the location of all items and the organisation of paediatric specific mobile trolleys. This often requires frequent review or re-orientation since paediatric resuscitation equipment may be complex and infrequently used. Learning can be enhanced by in-situ simulation training (see Chapter 9) whereby simulations take place within the ED using medications and equipment from its usual location.

For a list of recommended equipment: Appendix 1. Based on local needs, each ED may decide on what may be stocked. Checklists should be used, to reduce risk of human error when re-stocking.

The layout of equipment should be logical. Equipment of various sizes must be labelled clearly. If there are many compartments or drawers to separate the different sizes and types of equipment, it may help to have transparent compartments with photographs of how things are meant to be stored for ease of recognition.

Medications

An appropriate selection of medications must be readily available. The lists should be reviewed at least annually based on safety and efficacy information (see Chapter 11). In many countries there are local, regional or national formularies specific for paediatric use. If these exist, they must be available in the ED. A list of recommended medications needed for management of paediatric emergencies can be found in Appendix 1. Each ED needs to make an informed and agreed decision about how extensive the list should be. In particular, EDs in resource-limited countries need to make rational decisions on alternative medications if certain recommended items are not available in their country, ideally this should be done in conjunction with regional and national health department guidance. Checklists should be used, in order to reduce risk.^{3,4}

Pre-calculated dose guidelines and size of medical equipment for children of all ages must be made accessible in the form of charts, length-based drug dosage tapes, pre-marked length based resuscitation trolleys, or medical software. Where IT packages exist, safety checks should be built in (see Chapter 13).³ Similarly, dilution guidelines, charts or calculation apps for the preparation and administration of medications and IV fluids suitable for the paediatric patient, should be readily available. Where more than one dilution or formulation exists, clarity is needed to avoid errors. The use of charts or calculation apps for drug dilution helps prevent error. Where the number of options can be reduced, this should be encouraged. The availability of a pharmacist, familiar with paediatric medications, is invaluable to the ED.

Tertiary centers should provide expertise and support to their affiliated EDs. Close liaison with the paediatric department within the hospital, and the other hospitals in the network can help simplify common issues such as off-label or off-licence use of certain drugs.

Resuscitation medications, supplies and equipment must be reviewed with each revision of the Paediatric and Neonatal Basic and Advanced Life Support guidelines released by the International Liaison Committee on Resuscitation (ILCOR) Paediatric Task Force.⁵

EQUIPMENT, SUPPLIES & MEDICATIONS:

ESSENTIAL RECOMMENDATIONS

1. Every ED must be well equipped and organised with easy access to the necessary equipment, supplies and medications needed for the care of acutely ill or injured children of all ages on a 24-hour basis.
2. Equipment and medications must have a standardised and logical layout, to ensure familiarity for staff. It should also ideally match those used in allied departments (e.g. operating theatres, intensive care unit).
3. Pre-calculated resources for common or emergency drug doses and equipment sizes for children of all ages must be accessible. This includes dilution guidelines and charts for the preparation and administration of medications and parenteral fluids.
4. Resuscitation medications, supplies and equipment must be reviewed and updated as necessary with each revision of international guidelines.
5. In developing countries where the recommended paediatric emergency equipment or medications are not available, informed and rational decisions need to be made regarding suitable alternatives. Ideally this should be done in conjunction with regional and national health departments.
6. Staff should be familiar with the department's equipment and medications.

DESIRABLE RECOMMENDATIONS

1. Mobile paediatric resuscitation trolleys should be immediately accessible in any location in which a child could deteriorate.
2. Checklists for equipment, supplies and medications should be used, to reduce the risk of missing items.
3. Resources to aid preparation of medications should be readily available.
4. Other centers in the regional network should provide expertise and support to their affiliated EDs in developing consistency of equipment and medications.
5. Medications and equipment should ideally match those used in allied departments (e.g. operating theatres, intensive care unit).

REFERENCES:

1. Standards for Children and Young People in Emergency Care Settings (third edition) 2012. Royal College of Paediatrics and Child Health. www.rcpch.ac.uk/emergencycare
2. American Association of Paediatrics policy statement on Care of Children in Emergency Departments, 2009, Krug S, Gausche-Hill M. Guidelines for care of children in emergency departments. Paediatrics 2009;124:1233-1243.
3. PEMSIG resources <https://www.ifem.cc/pemsig-resources>
4. Access to Optimal Emergency Care for Children <http://aappolicy.aappublications.org/cgi/content/full/paediatrics;107/4/777>
5. 2015 International Consensus on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science with Treatment Recommendations. Circulation. 2015;132:S1

Resources:

Readers are asked to look at Appendix 2 (Useful Resources) for further information to aid in creating their education programs.

CHAPTER ELEVEN

Quality & SAFETY

Paediatric Emergency Medicine Special Interest Group: IFEM



Introduction

Improving the quality of care and reducing risk can be especially challenging in ED settings due to high volume and acuity. Achieving optimal patient outcomes requires a sustained commitment to improving care quality and patient safety by healthcare professionals.

While patient safety is related to care quality, the two concepts are not identical. A consensus conference on quality in emergency medicine defined quality as the care health professionals would expect to receive if they were themselves ill.¹ The US Institute of Medicine (IOM) has defined quality as “the degree to which healthcare services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge”.² The six



“

***Patient safety** is a concern in all EDs, due to the nature of the environment, such as competing demands for staff, high patient acuity, rapidly changing situations, overcrowding, multiple interruptions, lack of patient familiarity, literacy or language barriers, clinician fatigue and numerous human factors.*

domains of quality, as defined by the IOM include:

- Effective – evidence-based care that leads to better outcomes than alternatives.
- Efficient – optimal utilisation of available resources, avoiding waste.
- Timely – accessible and operationally efficient.
- Safe – no harm to patients, reduction of medical error
- Equitable – equal access to care and care quality, regardless of demographics.
- Patient-centred – involve patients (and families) in **medical decision-making** within the hospital itself. Senior staff from the ED (clinical and managerial staff) should be involved in these conversations and agreements.

Patient safety is defined as “the avoidance, prevention and amelioration of adverse outcomes or injuries stemming from the processes of healthcare”.³ Patient safety is a concern in all EDs, due to the nature of the environment, such as competing demands for staff, high patient acuity, rapidly changing situations, overcrowding, multiple interruptions, lack of patient familiarity, literacy or language barriers, clinician fatigue and numerous human factors.

The ED therefore needs underpinning processes and “safety net systems” to ensure the individual patient receives high quality, safe care at all times. It is not acceptable to accept a high level of risk or variation in care quality, just because it occurs in an ED. Occasions for medical error and harm to ill or injured patients can often be predicted, or will follow a pattern that can be seen by learning from experience. Policies, procedures and protocols for ED care can improve quality and decrease risk (see Chapter 12).

Differences between children and adults

Caring for children in the ED brings some additional challenges that can increase error⁴⁻⁶

- Children possess distinct anatomic, physiologic, and developmental characteristics, and may present with conditions that are unique to specific paediatric age groups.
- Variation in weight-based medication dosing, age-related vital signs.
- Deficiencies in day-to-day readiness in many EDs, such as the absence of key equipment for children of all ages.
- Staff in many EDs may have less training and/or on-going experience in paediatric care (see Chapter 4). This gap may require special consideration, over and above the operating framework for adult patients.

It is important that paediatric emergency medicine skills and competencies are a component of continuing professional education, that ED staff have timely access to paediatric specialists for advice, and that guidelines for high-frequency and high-risk conditions exist (see Chapter 12).⁷ Staff education should incorporate gaps in knowledge

which result in risks to paediatric patients.



Continuous Quality Improvement

Quality Assurance

In the 2006 publication "Emergency Care for Children: Growing Pains," the IOM recommended that the delivery of care should be based on a foundation of scientific evidence.⁸ This was based on a review which demonstrated unacceptable variability between EDs, even in a developed country (the U.S.A.). In the ideal model, PEM data are collected⁹ so that care providers may then learn from prior experience and improve their performance (See Chapter 13). This data collection allows the on-going monitoring of emergency care to ensure quality. However, in paediatric emergency care, there is no widely accepted, organised and comprehensive method of measuring quality or collecting relevant data.¹⁰

Many studies have demonstrated wide variation in clinical practice, even in paediatric academic centers. The growing evidence base in paediatric care has resulted in the publication of evidence-based guidelines. These guidelines can serve to reduce unnecessary variation in care, foster operational efficiency and cost reduction, and improve patient outcomes. Poor awareness and failure to adopt guidelines by practitioners remains an important barrier in implementing current guidelines.

All ED facilities should have a plan for the ongoing monitoring of care quality, and goals for quality improvement through regular cyclical change-and-review programs. The review of ED patient care (e.g. unexpected patient care outcomes), care quality monitoring and plans

for quality improvement should include services provided for children. Paediatric diagnosis and paediatric patient specific performance measures are tools that can be used to drive quality improvement.⁹⁻¹¹

Patient safety

A common root cause of error and poor emergency care outcomes is failed communication between healthcare providers and gaps in provider-patient/family communication (see Chapter 5). Structured formats for information handoffs and other key communication events (e.g. subspecialty consultation), along with efforts to reduce interruptions during these important processes, can reduce error.

Awareness, that patients may have limited health literacy and language translation barriers will improve communication with patients and families. Finally, a commitment to family-centred care will also assist efforts to improve care quality and reduce medical error. This is especially true when caring for children with complex health problems.

Studies suggest, that medication dosing in children is prone for errors^{5,7}, whether performed manually or electronically, unless safeguards are built in (see Chapter 10).

1. EDs must have a described and implemented program of continuous quality improvement with regular review of patient safety and quality of care. On a cyclical basis, it must cover high risk and high volume areas of paediatric emergency care practice.
2. Children must be weighed in kilograms, with the exception of children who require emergency stabilisation, and the weight should be recorded with the vital signs.
3. Patients emergency medical notes (documentation) must be reviewed on a regular basis to identify gaps in knowledge which result in risks to patients. Education of staff must take place to close those gaps.
4. For children who require resuscitation or emergency stabilisation, a standard method for estimating weight in kilograms must be used (e.g. length-based system).
5. The quality improvement plan of the ED must include paediatric patient and disease- specific indicators.

DESIRABLE RECOMMENDATIONS

1. Processes for safe medication storage, prescribing, and administration should be established and should include the use of pre-calculated dosing guidelines for children of all ages.
2. Infection-control practices, including hand hygiene and use of personal protective equipment, should be implemented and monitored.
3. Policies for reporting and evaluating of patient safety events, including medical error or unanticipated outcomes should be implemented and monitored; training should be given to those who are assigned this responsibility.
4. Components of the ED paediatric quality improvement plan should interface with pre- hospital, in-patient paediatric, and hospital-wide quality improvement activities.

REFERENCES:

1. Graff L, Steves C, Spaite D, et al. Measuring and improving quality in emergency medicine. *Acad Emerg Med* 2002; 9:1091-107.
2. Institute of Medicine Committee to Design a Strategy for Quality Review and Assurance in Medicare. *Medicare: a strategy for quality assurance*, Vol. 2. Washington, DC: National Academy Press, 1990.
3. National Patient Safety Foundation. *Agenda for Research and Development in Patient Safety*. NPSF, 2000. www.npsf.org/pdf/r/researchagenda.pdf
4. Mahajan P. Quality in paediatric emergency medicine: a learning curve and a curveball. *Clin Paediatr Emerg Med* 2011; 12:80-9.
5. Frush K, Krug S. American Academy of Paediatrics Committee on Paediatric Emergency Medicine. Patient safety in the paediatric emergency care setting. *Paediatrics* 2007; 120:1367-75.
6. American Academy of Paediatrics Steering Committee on Quality Improvement and Management, Committee on Hospital Care. Policy statement – principles of paediatric patient safety: reducing harm due to medical care. *Paediatrics* 2011; 127:1199-210.
7. Gausche-Hill M, Krug S, American Academy of Paediatrics Committee on Paediatric Emergency Medicine, American College of Emergency Physicians, Emergency Nurses Association. Guidelines for care of children in the emergency department. *Paediatrics* 2009; 124:1233-43.
8. Institute of Medicine Committee on Paediatric Emergency Medical Services. *Emergency medical services for children: growing pains*. Washington, DC: National Academies Press, 2006.
9. Indicadores pediátricos para medir los criterios de calidad de la atención sanitaria. Sociedad Española de Urgencias de Paediatría. <http://www.seup.org/seup/pdf/publicaciones/indicadoresCalidad.pdf>
10. Alessandrini EA, Knapp J. Measuring quality in paediatric emergency care. *Clin Paediatr Emerg Med* 2011; 12:102-12.
11. Alessandrini E, Gorelick M, Shaw K, Kennebeck S, et al. Using performance measures to drive improvement in paediatric emergency care. Maternal and Child Health Bureau, Emergency Medical Services for Children Webinar, 11/2/2010. Available at: <http://learning.mchb.hrsa.gov/archivedWebcastDetail.asp?id=239>.

Policies, Procedures &
GUIDELINES

***Paediatric Emergency Medicine Special Interest
Group: IFEM***



Introduction

Emergency Departments are high-risk and complex areas, which relate to many different parts of a broader health system. The principles of quality improvement and safe practice oversight are covered in Chapter 11. This chapter focuses on the importance of pre-prepared documents which cover different situations, and give



“

To manage risk in this high volume, diverse part of the hospital, it is useful to have policies, procedures and guidelines written with ED patients in mind.

staff a framework to work within, in order to reduce error or harm on a patient-by-patient basis.

To manage risk in this high volume, diverse part of the hospital, it is useful to have policies, procedures and guidelines written with ED patients in mind. Policies are high level documents which define the concepts and a framework and describe what an organisation wants to achieve. Procedures (also known as standard operating procedures or protocols) are more directive in terms of practical instructions to be taken to complete tasks, including recommended steps for specific situations, and they fit within policies. Clinical guidelines (also known as clinical care guidelines) are used to guide staff in assessment and management of specific clinical conditions. All ED staff should be familiar with the policies relating to their work, but knowledge of these is especially important for staff who do not usually work in the ED, and cover high risk or difficult areas of patient care.

Policies are most useful if they are locally relevant, feasible and practical, and kept up to date with responsible person contact details and review dates. Policies should be up to date with local and international (evidence-based) practice. Compliance with policies should be monitored and they should be updated by their author, to reflect recent medical advances or changes in the way the hospital does things.

Differences between children and adults

In many areas of practice, policies can apply to both children and adults. It can be useful to use the word “patients” and in brackets, make it clear that the policy is relevant to both, i.e. patients (adults and children). However, specific policies that reflect the unique needs of infants and children are sometimes needed and thus written separately.

Useful Paediatric emergency care policies include diseases that affect mainly children not adults, and those where age and size make a difference, such as paediatric vital sign assessment thresholds, triage assessment, drug doses, pain assessment scales, child protection and of course, clinical guidelines pertaining to paediatric-specific conditions.

A useful list of specific practice areas where policies are useful can be found in Appendix 2 (Useful Resources). Policies should be up to date with local and international (evidence-based) practice.

Developing policy documents

Initial Priorities for Policy Development

For developing countries with poorly developed emergency care systems, policies and

procedures on the following areas should be created first:

- ED staffing policies including minimum competencies & training (see Chapter 8-9).
- ED patient flow systems.
- Illness and injury triage / initial assessment (see Chapter 6).
- Pain assessment and management.
- Vital sign assessment.
- Resuscitation and emergency management of commonly presenting acute illness conditions.
- Neonatal presentations.
- Infectious disease (antibiotic guidelines, prevention of cross-infection).
- Referral and transfer policies and procedures for critically ill and injured children (see Chapters 4, 7).
- Access and transfer to appropriate level of care (see resources on stabilisation and rapid transport in Appendix 2).

It should be noted, that even in developing countries who do not have well developed emergency care systems, there may well be relevant policies (at local, regional &/or national level) which should be consulted and adhered to as appropriate. Where possible, it is ideal to work with local, regional and national health authorities to develop and strengthen policies, procedures and guidelines at all levels of the health system.

For developed emergency care systems, more comprehensive policies and procedures on more advanced care should be created, as recommended by their local organisations or by national and international professional bodies. Within a regional network, policies should be as comparable as possible (see Chapter 4). It is preferable that procedures be created in a collaborative manner and be applicable to all services in the regional network.

Developing Clinical Care Guidelines

Whilst policies and procedures are generally concerned with how an emergency department runs, clinical guidelines are used to describe how clinical care should be conducted. There are numerous evidenced-based clinical care or practice guidelines that have been developed for children with various medical and surgical conditions that can promote equitable and effective patient care for children. A full discussion of clinical care or practice guidelines is beyond the scope of this document but as emergency care systems mature, staff should be educated on these guidelines and monitored for compliance. A list of resources is available on the PEMSIG website.¹

In ED practice (where children arrive without a diagnosis) and in especially in EDs with less paediatric expertise, guidelines should focus on presenting symptoms rather than diagnoses, for example a guideline on “fever”, or on “petechiae and purpura”, and should be careful to be age-specific, for example “difficulty in breathing in children under 2 years” or “fractures in the non-walking infant”. This is particularly so if the content of the guideline

is about clinical assessment as non-paediatric trained doctors will need more guidance to reach the correct initial diagnosis. For example, a simple algorithmic approach to a child presenting with headache – will help a junior or non-paediatric trained doctor to consider factors suggestive of meningitis, space occupying lesion, migraine etc. whereas they may not consider these possibilities without the guidance and just leap to using the meningitis guideline.

In EDs with more paediatric expertise, specific guidelines related to diagnosis are more common. These types of guidelines are best suited when the content of the guideline is about clinical management. However, in mixed EDs there is less of a need for standalone child specific guidelines where adult patient treatment is similar (for example asthma, procedural sedation). A statement on paediatric care in a general guideline is appropriate. Child specific guidelines are required for paediatric-specific conditions such as croup, bronchiolitis, intussusception etc.

The Creation Process

Several stages are common in the creation process. The following is a summary of the stages:

1. Identify and define the need and content for the policy, procedure, or guideline document
2. Research what is best practice for the content of the document.
3. Write the document in a format that is approved by that health system. Usually that includes definitions, to whom the policy is relevant, who signs off the document, and the date for the document to be reviewed.
4. Approve the first draft of the document.
5. Send the document for comment to all specialties or services that may be involved.
6. Review all feedback, and amend the document.
7. Final review by the people responsible for implementing the document.
8. Publishing the document, with clear authorship and future review date.

POLICIES, PROCEDURES & GUIDELINES:

ESSENTIAL RECOMMENDATIONS

1. Policies and procedures must include the issues about the general assessment and management of paediatric patients in the ED.
2. ED staff must have access to relevant policies and procedures, based on departmental, hospital, regional or international references.
3. As the emergency care system matures, emergency care managers should incorporate evidenced-based clinical care/practice guidelines for children, and educate and monitor their staff on their use.

DESIRABLE RECOMMENDATIONS

1. Policies should be compatible and preferably collaborative across the regional network.
2. Clinical guidelines should be symptom based unless there is a high degree of paediatric emergency medicine expertise available.

REFERENCES:

1. PEMSIG resources <https://www.ifem.cc/pemsig-resources>
2. Barfield WD, Krug SE, Kanter RK, Gausche-Hill M, Brantley MD, Chung S, Kisson N: Neonatal and paediatric regionalized systems in paediatric emergency mass critical care. *Paediatr Crit Care Med* 2011; 12:S
3. Burkle FM, Argent AC, Kisson N: The reality of paediatric mass critical care in the developing world. *Paediatr Crit Care Med* 2011; 12:S169-S179.

Note: For clinical practice guidelines, most of the major national colleges have fully accessible guidelines on their websites, e.g. American College of Emergency Physicians, College of Emergency Medicine (UK), Canadian Association of Emergency Physicians, Australasian College for Emergency Medicine

Information System and
DATA ANALYSIS

***Paediatric Emergency Medicine Special Interest
Group: IFEM***



Introduction

Around the world, hospitals have a wide variation in the degree of computerisation available to help clinical practice. For an ED to function efficiently, it needs to know key information such as: how many patients are in the ED, how many are high priority, how long have individual patients been waiting etc. There needs to be a system to create a medical record quickly and/or easily access an existing one. These functions may be performed on paper or on computer-based systems.

In developed systems, comprehensive computerised ED information systems [EDIS] serve to streamline operational workflows and service delivery (e.g. patient process tracking, clinical guidelines and decision making, electronic prescribing, investigation orders).



“

For an ED to function efficiently, it needs to know key information such as: how many patients are in the ED, how many are high priority, how long have individual patients been waiting etc.

Computerisation also helps recording and analysis of basic demographic and episode-related information. This helps to facilitate audit, research and good clinical practice. Likewise, this has the potential to substantially reduce medical error.^{1,2}

Many ED's currently only achieve partial computerisation. It should be cautioned that partial adoption of information technology "may actually be counterproductive, leading to decreased efficiency and threaten patient safety" (Note: 'patient safety' here means provision of safe, error-free, good quality healthcare).³

Differences between paediatric and adult information systems and adapting ED information systems for paediatric patients

A lead doctor and lead nurse with experience in paediatric emergency care must be integrally involved in the development and implementation of ED information systems in ED's which manage children. While many functions are shared, there is a need for special attention to meet the unique needs of paediatric care.

There should be a minimum dataset, which incorporates the specific needs of children. It is usually possible to build paediatric capabilities to existing ED information systems incrementally.

There are core functions as stated by the Institute of Medicine (IOM)⁴, namely:

- obtaining demographic data
- health information
- disease or injury surveillance
- electronic communication with health care partners
- connectivity for the clinical functions of the ED
- research database
- clinical quality improvement

Beyond this standard data, paediatric specific recommendations for ED information systems that are of particular importance and that might facilitate ED functions and processes includes:

Patient identification and demographic information

- The name of the child and the person(s) with legal parental responsibility and guardianship, or official responsible adult.
- the name of person accompanying child to the ED on this episode.
- names of primary/secondary health care staff responsible for the child (important for family- centered care, and may also indicate use of health services).

Risk management information



Automatic alert systems should be built in for high-risk patients, for example:

- repeat ED attendances (either re-attendance following recent episode which is associated with deterioration / missed diagnosis, or an above average rate of ED presentations which is associated with welfare concerns)
- high risk complex medical problems
- those requiring specific treatments
- children in the care of welfare or child protection agencies or with previous highlighted welfare concerns

Triage

Paediatric triage scores (e.g. vital signs) and pain scales should be incorporated into the triage data and assist patient flow. Chapter 6 describes the information which should be incorporated.

Order management, decision support and patient support

Children require different clinical decision support guidelines from adults, as they may have different diseases. Even emergency conditions presenting in both children and adults (e.g. diabetes mellitus) maybe managed differently. Information specific for paediatric patients should be available for commonly encountered conditions like fever, febrile seizures, gastroenteritis, croup and bronchiolitis. Decision support can be integrated into ED computer systems, but if unavailable, linkage or signposting to online information is useful. Chapters 11, 12 describe how IT can be integrated into policies and guidelines, and contain references and resources for evidence-based guidelines.

If history and physical examination templates are used in the ED, paediatric fields are useful to highlight important points in the history or clinical examination These can be useful prompts for those who are inexperienced in paediatric care.

Help with age/size specific drugs and equipment (see Chapter 10) reduces risk, and due to

the complexity of this task, electronic support can save time and improve accuracy. Electronic auto-calculation of drug and intravenous fluids dosages based on age and weight in kilograms is especially useful, particularly in a resuscitation situation. Physician alerts should be built in to warn the prescriber if drug dosage is not within the therapeutic range, or if a drug that is contraindicated in children is prescribed. More complex systems which can contribute to safe electronic prescribing will allow the child's medical history and allergies to be taken into account. The design should be carefully considered, as when dealing with EDIS alert notification in children, alert miss or fatigue is common.

Results management

Ordering of investigations and results management should be integrated in order to avoid errors and improve information access. Paediatric normal values for laboratory test results should be included.

Research and quality improvement

Some paediatric emergency conditions are unique to children, so ED disease codes must include these. In some ED software systems it is possible to customise diagnostic codes. The International Classification of Disease (ICD) codes are available but cumbersome for practical use in an ED, but other resources exist in English⁵ and Spanish.⁶ The emergency department's paediatric case-mix characteristics, attendance patterns, prescription patterns, and ED resource utilisation, can be analyzed through the collection and analysis of paediatric specific data in the ED IT system. This will aid continuous quality improvement (see Chapter 11).

Public Health Case Reporting/ Disease or Injury Surveillance

The ED IT system can be a useful surveillance tool for infectious diseases prevalent in children e.g. measles, influenza or hotspots for accidents in the locality. Many injuries in children are preventable. Data on injury causation (how, when, what, why, where) according to the WHO Injury Surveillance Guidelines⁷ should be incorporated where possible, as surveillance data on injury epidemiology is crucial to guide the promotion and advocacy for childhood injury prevention, which is a major cause of death in children. The ED data on these parameters can be used to feed into trauma registries and motor vehicle accident databases.⁸ Environmental diseases may also be tracked through the system e.g. pollution and asthma. Automated electronic reporting to the relevant public health agency may also be built in. Access to other demographic data e.g. child's school, may also aid public health agencies to identify outbreaks of disease.

Electronic communication with other health care partners

The ED systems should be able to connect with other systems within the hospital and local

healthcare facilities, such as the pre-hospital care system, in-patient information and the child's primary care team. Information sharing with organisations outside the ED can be difficult, and those relevant for children may need separate links from those routinely used for adult patients. This is important for integrated health care. In countries with advanced infrastructure for information technology, this is achievable with individual local health networks or clusters, as a starting point.

In the absence of data linkage and accessibility, families themselves should be encouraged to keep information about the child's health. The American Academy of Paediatrics and American College of Emergency Physicians have jointly developed such forms downloadable from the web.⁹ This type of information can exist in the simplest form as a medical alert pocket sized card listing the patient's chronic medical problems and relevant medications.

INFORMATION SYSTEMS AND DATA ANALYSIS:

ESSENTIAL RECOMMENDATIONS

1. Sufficient attention should be given to both the design and implementation of an EDIS in a planned and stepwise process.
2. The design and implementation of an EDIS should be integrated within the overall ED organisation (processes, planning, workflow).
3. A structured review process and audit cycle should be instituted early on in view of ongoing performance improvement.
4. The doctor and nurse with the lead roles for paediatric emergency care must be integrally involved in the development and implementation of EDIS in ED's which manage children.
5. EDIS must include special adaptations to meet the basic needs of paediatric patients e.g. prescribing alerts must be built in to guard against paediatric dosing errors.
6. EDIS must have the ability to connect to health information outside the ED.

DESIRABLE RECOMMENDATIONS

1. ED's should exploit information technology to achieve full computerisation for cost effective patient care, reduce medical errors, and promote patient safety.
2. Full electronic connectivity for all ED work should ideally be integrated, from patient arrival to discharge.
3. In fully electronic clinical systems paediatric specific templates for history and physical findings should be considered.
4. Computerised clinical guidelines and pathways should include information about common paediatric specific conditions.
5. Paediatric specific formularies and order sets should assist daily practice.
6. The ED computer system should collect sufficient data for disease and injury surveillance.
7. Paediatric specific data should be generated to aid clinical quality improvement and research.

REFERENCES:

1. Farley HL, Baumlin KM, Hamedani AG, et al. Quality and Safety implications of Emergency Department Information Systems. *Ann Emerg Med* 2013; 62: - doi: 10.1016/j.annemergmed.2013.05.019
2. Taylor BT. Information management in the emergency department. *Emerg Med Clin N Am* 2004; 22: 241-257
3. Gerry Fairbrother and Lisa A. Simpson. It Is Time! Accelerating the Use of Child Health Information Systems to Improve Child Health. *Paediatrics* 2009;123;S61
4. Institute of Medicine. Key capabilities of an electronic health record system: letter report. Washington DC: The National Academies Press; 2003.
5. ICD-Based Diagnosis Grouping System (DGS) for child ED visits. Paediatric Emergency Care applied Research Network. <http://www.pecarn.org/tools/index.html>
6. Codificación diagnóstica en urgencias de Paediatría. Sociedad Española de Urgencias pediátricas. <http://www.analesdepediaatria.org/es-codificacion-diagnostica-urgencias-pediatria-articulo-S1695403300774558>, accessed March 07th, 2019
7. Krug E. Injury Surveillance Guidelines. 2012. http://www.who.int/violence_injury_prevention/publications/surveillance/surveillance_guidelines/en/index.html (accessed 8 June 2012).
8. Alan R. Hinman and Arthur J. Davidson. Linking Children's Health Information Systems: Clinical Care, Public Health, Emergency Medical Systems, and Schools. *Paediatrics* 2009;123;S67
9. Alan E. Zuckerman, MD. The Role of Health Information Technology in Quality Improvement in Paediatrics. *Paediatr Clin N Am* 56 (2009) 965–973

CHAPTER FOURTEEN

Pre-Hospital

CARE

Paediatric Emergency Medicine Special Interest Group: IFEM



Introduction

Pre-hospital or out-of-hospital care relates to the ambulance-based or emergency medical services (EMS) phase of patient care. Emergency physicians are inevitably involved in pre-hospital care, either by:

- Providing oversight or medical direction of pre-hospital care.
- Providing education and training to pre-hospital staff.
- Being a member of the pre-hospital team.
- Being part of the receiving ED team when a patient is brought by ambulance.
- Being involved with inter-facility patient transfers either as referring or receiving clinician.

For the care in the ED to happen effectively, close communication and integration of care pathways between pre-hospital and ED teams is desirable. Chapter 4 describes how the different parts of the network in each region should integrate with each other.

This chapter will discuss only those aspects of pre-hospital care directly related to individual ED patient care. Chapter 15 discusses the special circumstances of mass casualty incidents.

Differences between adults and children

Children with serious illness or injury are less likely to arrive by ambulance than adults of similar case severity. This is because they are easier to transport, so caregivers often feel they will arrive at the hospital more quickly if they bring the child themselves. pre-hospital staff are exposed to relatively fewer paediatric cases than adult ones because there are more adults than children in the general population and a lower incidence of serious illness and injury in children compared with adults. Paediatric calls constitute only 5-30% of ambulance activations (depending on the country). Also, the need for more complex life-saving procedures such as cardio-pulmonary resuscitation (CPR), endotracheal intubation or initial trauma stabilisation are less common in children.

In addition, most pre-hospital providers usually receive much less training in the care of children than they receive for adults. As a result, confidence, and skill mastery, is less. This is, particularly true for common diseases which affect only children e.g. bronchiolitis, croup,



“

For the care in the ED to happen effectively, close communication and integration of care pathways between pre-hospital and ED teams is desirable.

Equipment and medication issues often arise because of the different sizes, doses and formulations needed depending on the child's age, while carrying space and weight are usually limited in the pre-hospital setting.

Ensuring safe paediatric pre-hospital care

Children spend a lot of time in nursery or school, so staff in those facilities should be trained in providing first aid (for example, seizures or minor trauma) and in activation of pre-hospital services.

There are different types of pre-hospital clinicians found in international pre-hospital services. Examples include Emergency Medical Technicians, Paramedics, Intensive Care Paramedics, Physicians (pre-hospital care doctors). EMS services must define levels of knowledge and skills required to assess and manage sick children across all staff, and provide paediatric training.

On arrival at the scene, pre-hospital staff should be able to recognise safety and supervision issues, and be alert to any clues of child abuse (scene awareness). This may include lack of information or misinformation, to explain events. These skills should be encouraged and reporting systems for safeguarding issues should be taught to pre-hospital staff, as well as encouragement to promote primary prevention of paediatric illness and injuries.



When describing a pre-hospital service, the specific needs for children include the following basic components: Clinical assessment skills, provision of medical treatment, and communication between services. In some countries there are nominated people to ensure adequate pre-hospital paediatric capability and to liaise with acute hospitals.¹⁻³

Clinical Assessment Skills

The principles of initial assessment are similar to those described in Chapter 6. Assessment often leads to allocation of a triage category on arrival at the ED – Chapter 6 describes various models of triage relevant for children. The American Academy of Paediatrics defined the assessment of a child in the prehospital setting in its Paediatric Education for Prehospital Professionals (PEPP) Course.⁴ The Paediatric Assessment Triangle was introduced as a part of this course with the goal of training pre-hospital personnel to recognise a sick child rapidly and determine the pathophysiology which will drive initial management priorities. The Paediatric Assessment Triangle (PAT)⁵⁻⁸ provides a useful framework and includes Appearance, Work of Breathing, and Circulation to the Skin. For more advanced pre-hospital staff, a more complete assessment can take place such as the “3-minute toolkit”.⁹

The core skills needed for paediatric management are:

- Performing the PAT to form a general impression and determining the need for immediate interventions to support, oxygenation, ventilation or perfusion.
- Eliciting a history from the family or caregivers and from the child, using age appropriate language.
- Performing a physical examination appropriate to the age of the child (e.g. a neurological assessment or measuring vital signs).
- Dealing calmly with parents or caregivers, who are often under stress or may be emotional, and calming the child, to optimise assessment.
- Good scene awareness skills to detect situations where a child has been inappropriately put at risk (see Chapter 16).
- Competence in providing first aid and BLS to infants, children and adolescents.
- Competence in providing ALS skills and the safe delivery of medications to infants, children and adolescents.
- Recognition and treatment of common paediatric emergencies and painful conditions.
- Safe administration of medications.
- Skills to transport children safely and comfortably to an appropriate destination. Recent guidelines from the National Association of State EMS Officials (NASEMSO) in the United States provides steps in the evaluation and appropriate transport of children of all ages.¹⁰ (see Chapter 4).

To maintain skills, ongoing refresher training must be available, because paediatric emergencies are less common than in adults. Multiple courses are available to train physicians interested in prehospital medicine as well as for EMT or paramedics interested in focused education for the care of children.^{4,11,12}

Provision of Medical Treatment

All providers of pre-hospital services must define the level of medical treatment their organisation expects different levels of staff to provide. Factors to be taken into consideration will include: level of provider training (e.g. technician, paramedic, physician), travel time and logistics such as space in the vehicle / aircraft. Good clinical decision support algorithms should take these variables into consideration. NASEMSO has developed a National Model EMS Guidelines which include some paediatric conditions.¹³ Other EMS systems in the United States and elsewhere have published protocols that can be accessed.

Children usually have drugs doses and fluid regimes calculated on patient's weight, making rapid calculations difficult. Therefore, for safety, memory aids should be available to assist pre-hospital staff in these calculations, e.g. Broselow® paediatric emergency tape³ and pocket charts (electronic or printed folders). These should contain common resuscitation and sedating drug dosages and paediatric treatment protocols. Standardising the formulary within a prehospital system can allow for pre-calculating doses of medication for children in milligrams and milliliters. An example of such a formulary with reference guide of medications by weight is referenced here from Los Angeles County EMS Agency.¹⁴ Chapters 6,7 and 10 refer to resources for triage and treatment. 'Apps' to assist in this process also exist for smartphones and tablets.

Equipment also needs to be varied according to size (but the amount of equipment carried must not compromise patient safety.) Most important are correct sizes of devices for airway / breathing management, administration of electricity (defibrillation devices), circulation access (including intraosseous devices), equipment for monitoring the patient's vital signs, and trauma stabilisation devices such as cervical spine collars and spinal boards. The American College of Surgeons, American College of Emergency Physicians and the American Academy of Paediatric have published "Equipment for Ambulances" which outlines the equipment to be carried by prehospital providers.¹⁵

Communication between Services

Clear communication channels between pre-hospital and hospital sites are vital when transporting sick children to a healthcare facility. This communication includes the following aspects:

- Transport contracts or agreements between the pre-hospital service and the receiving hospitals. These should be based on the local paediatric capabilities available at each destination within the local network, i.e. which receiving facilities have the right staff and facilities for the child with that condition e.g. trauma, psychiatry, critical care needs (see Chapter 4).
- Easy to follow protocols for staff on scene to understand which is the best receiving facility for the child.
- Pre-agreed variations from the ideal patient pathway – to be used if resources are

overwhelmed. This usually requires real time information of paediatric capacity across the network.

- Standardised formats of relaying clinical information (e.g. advance warning calls to receiving ED's, in what order the information is relayed such as history, vital signs, and treatment given).
- Documentation of prehospital care provided, ideally available electronically, which can be shared with the receiving facility for immediate patient care and later stored and analyzed for quality improvement activities.
- Sharing of information, research evidence, educational activities, quality assurance with ED colleagues, who in turn should proactively support local EMS services.

PREHOSPITAL CARE:

ESSENTIAL RECOMMENDATIONS

1. Pre-hospital (EMS) services must define the level of paediatric skills expected of responding staff.
2. All pre-hospital staff should be trained to safely assess, manage, and transport common paediatric emergencies to a pre-defined level within the pre-hospital (EMS) network; this includes scene awareness and family reassurance.
3. All pre-hospital responders must be competent in first aid and BLS for infants, children and adolescents.
4. Pre-hospital responders with advanced training must be competent in advanced life support for infants, children and adolescents.

5. All EMS vehicles must carry equipment suitable for children of all ages.

DESIRABLE RECOMMENDATIONS

1. All pre-hospital staff should have access to memory aids for drugs and treatment algorithms and ideally have a standardised formulary so that all medications for care of children of variable weights can be pre-calculated so that the provider will have easy access to appropriate doses immediately and without the need for calculation.
2. EMS services should standardise and agree with the hospitals in the network, how they will share patient information and which facilities should receive the spectrum of patients they transport.
3. ED staff and/or EMS physicians should support EMS services in quality improvement and education for paediatric emergencies.
4. A paediatric emergency care coordinator (PECC) should work collaboratively with EMS system administrators to ensure paediatric readiness of the prehospital care system.

REFERENCES:

1. Remick K, Gross T, Adelgais K, Shah MI, Leonard JC, Gausche-Hill M. Coordination of paediatric emergency care in EMS systems; submitted Prehosp Emerg Care 2017;6:1-9.
2. Institute of Medicine. Committee of the Future of Emergency Care in the U.S. Health System. Emergency

- Medical Services at the Crossroads. Washington, DC: National Academy Press, 2006.
3. Institute of Medicine. Committee of the Future of Emergency Care in the U.S. Health System. Emergency Care for Children: Growing Pains. Washington, DC: National Academy Press, 2006.
4. American Academy of Paediatrics Paediatric Education for Prehospital Professions, <http://www.peppsite.com> ; accessed 1-02-18
5. Dieckmann RA, Brownstein D, Gausche-Hill M. The paediatric assessment triangle: a novel approach for the rapid evaluation of children. Paediatr Emerg Care. 2010 Apr;26(4):312-5.
6. Gausche-Hill M, Eckstein M, Horeczko T, McGrath N, Kurobe A, Kaji AH, Lewis RJ: Paramedic accurately apply the paediatric assessment triangle to drive management. Prehosp Emerg Care 2014;18:520-530.
7. Fernandez A, Benito J, Mintegi S: Is this child sick? Usefulness of the Paediatric Assessment Triangle in emergency settings. J Paediatr (Rio J) 2017;Aug 25, Epub ahead of print.
8. Lubitz DS, Seidel JS, Chameides L, Luten RC, Zaritsky AL, Campbell FW. A rapid method for estimating weight and resuscitation drug dosages from length in the paediatric age group. Ann Emerg Med. 1988 Jun;17(6):576-81.
9. Spotting the Sick Child (UK Department of Health e-learning package) <http://spottingthesickchild.com>
10. National Association of State EMS Officials, "Safe transport of children" <https://www.nasemso.org/Committees/STC/documents/Safe-Transport-of-Children-by-EMS-InterimGuidance-08Mar2017-FINAL.pdf> ; accessed 1-06-18.
11. Emergency Medical Services for Paediatric Emergency Physicians, <http://www.moodlemedce.com/pem-education/login/index.php> ; accessed 1-01-18
12. National Association of EMTs Emergency Paediatric Course <https://www.naemt.org/education/epc>
13. National Association of State EMS Officials, National Model EMS Guidelines, <https://www.nasemso.org/documents/National-Model-EMS-Clinical-Guidelines-2017-Distribution-Version-05Oct2017.pdf> ; accessed 12-31-18
14. The Los Angeles County EMS Agency, Medical Control Guideline Color Code Doses LA County Kids, http://file.lacounty.gov/SDSInter/dhs/1004352_1309-ColorCodeDrugDosesLACountyKids11-01-2016.pdf ; access 1-07-18
15. American College of Surgeons, Committee on Trauma, American College of Emergency Physicians, National Association of EMS Physicians, Paediatric Equipment Guidelines Committee – EMS for Children Partnership for Children Stakeholder Group, and the American Academy of Paediatrics, Equipment for Ambulances, <https://www.facs.org/~media/files/quality%20programs/trauma/publications/ambulance.ashx>; accessed 1-6-18

Mass Casualty Incidents and **PATIENT SURGES INVOLVING CHILDREN**

Paediatric Emergency Medicine Special Interest Group: IFEM



Introduction

There are times when an ED operates under high pressure due to a large volume of patients. A patient surge is a phrase describing higher than normal arrivals. An example of this for children would be very busy days during bronchiolitis or gastroenteritis season.

A less ordinary situation, which can be described as a local incident, may involve sudden arrival of patients from an unusual event such as a house fire or bus crash. In more extreme cases, a regional incident may occur, as might occur during floods. This may escalate to a “mass casualty incident” (MCI) as a result of natural disasters, disease epi/pandemics, or man-made. A “Major Incident” is defined when an extraordinary response is needed, rather than by an exact number of patients. A “mass casualty incident” is declared when the number of patients is higher than the local network can cope with, and requires regional/national/international help. Most countries have detailed plans for hospitals and for local/regional services such as police, fire and rescue and pre-hospital (ambulance/helicopter) services. This includes planning for manpower, communication, equipment, transfer capacity, etc.

The goal for medical services managing patient surges is “to do the greatest good for the



“

A “mass casualty incident” is declared when the number of patients is higher than the local network can cope with, and requires regional/national/international help.

greatest number". To achieve this goal, normal priorities may need to be changed if resources are stretched, e.g. extent of resuscitation versus deferred treatment, "damage-control surgery" versus expert surgery, threshold for hospitalisation, extent of bloods/imaging, ability to stretch staff beyond their normal scope of practice, and movement of patients to other hospitals to spread the workload.

Differences between children and adults

If children are involved as patients in these types of surges or incidents, it is clear that specific planning is needed, in order to deliver optimal care. There will be different requirements for equipment, triage skills and patient assessment, and sometimes different hospital sites to receive or transfer child casualties.¹

Unique physiological, physical, and psychological differences in children make them vulnerable during MCI/Major incident. Children have significantly higher mortality rates in MCI/Major incident when compared to adults; this risk increases further for children under five years. Important differences making children more vulnerable in disasters / MCIs include:²⁻⁸

- Children lack the mental, physical or cognitive ability to react to the situation in the best way.
- Their small size increases their chances of sustaining serious head and multisystem organ injuries from blunt trauma.
- Children have more rapid respiratory and heart rates that increase their susceptibility to airborne chemical and biological agents.
- Children have greater skin permeability and a relatively larger body surface area to mass ratio that increase their susceptibility to chemical and biological agents contacting their skin; this also makes children more susceptible to heat and fluid loss.
- Children can exhibit an incredible potential for resiliency in the immediate aftermath of a disaster, however the effect of witnessing injury or loss of a close relative can have a profound, life-long effect^{9,10}
- If separated from parents, children become distressed, difficult to triage and treat, difficult to identify and challenging to reunite with their families.

Unfortunately, evidence shows that MCI/Major incident plans often fail to address paediatric issues¹¹, and that emergency services both at the pre-hospital and hospital levels often lack the knowledge, skills and equipment to provide optimal care for children. Yet on the other hand, there exists an expectation that during emergencies children should receive at least the same level of care (or greater) as that provided for adults. Many disasters involve children, so they must be incorporated into every stage of disaster planning.

Managing paediatric patient surges / MCI/Major incident

Successful planning

The key for successful management of paediatric victims is appropriate preparedness. This should include the following components:

- Pre-hospital and hospital preparedness at all levels (local, regional, national, international), for all potential hazards.
- Clear identification of facilities that either will or will not receive infants, children and / or adolescents.
- Adequate resources (especially equipment and medications) for children of all ages.
- In advance preparation of designated paediatric sites, including healthcare personnel role assignments, for each one of the treatment areas within or outside the ED, such as for paediatric sites for immediate or delayed care patients.
- In advance preparation of electronic or hand written short and simple medical records, specifically tailored for disaster situations (for more efficient patient care/management).
- Medical and paramedical skills.
- Conduction of practice disaster drills with sufficient paediatric victims to test readiness.
- Caring for unaccompanied or orphaned children requires planning considerations for identification, tracking and reunification with family members or other trusted parties.

Clinical management

Triage assessment

The normal challenges of communication and assessment of injuries and physiological parameters (see Chapter 6) are magnified during a MCI/Major incident. In particular, accurate triage is difficult because conventional scoring systems use adult-based physiologic parameters and may rely upon cognitive and developmental abilities beyond those of young children. An ED may need to use a MCI triage tool that has been modified to reflect unique vital sign ranges, developmental capabilities, and resuscitation recommendations in children, e.g.JumpSTART.¹¹

When overwhelmed, experience from some centres shows that a rapid visual inspection (see Chapter 6) by a senior member of staff, promotes appropriate casualty triage to the resuscitation area versus a secondary area, and this may have to substitute for measurements such as vital signs in the first instance. The Paediatric Assessment Triangle has been proposed as one such tool which uses visual inspection and can help rapidly

triage children.¹²

Clinical assessment and emergency treatments

On-scene clinical personnel should have the knowledge and skills for the initial assessment and stabilisation of children (see Chapter 14), although in most MCI situations speed of transfer is paramount.

The normal pre-hospital equipment for children (see Chapter 14) may become depleted if a cohort of similar aged children is affected (e.g. a school class). Regional networks must have systems to escalate the situation and access stockpiles of paediatric equipment and drugs. The demand for trauma stabilisation devices such as neck collars and spinal boards may require adaptive solutions using adult equipment.





MASS CASUALTY INCIDENTS & PATIENT SURGES INVOLVING CHILDREN:

ESSENTIAL RECOMMENDATIONS

1. All pre-hospital responders who might attend a MCI/Major incident scene must be trained to effectively triage and manage children as well as adults.
2. Staff training programs for pre-hospital and hospital personnel should include coping with surges and MCI/Major incident in paediatric patients.
3. MCI/Major incident planning must consider children when making hazard vulnerability assessments and case scenarios.
4. Designated sites within the hospital for decontamination and management of patients in MCI/Major incident must consider child casualties.
5. There must be pre-planned process to identify and treat unaccompanied children.
6. Equipment for MCI/Major incident victims must include appropriate types and size ranges and quantities for children.
7. Emergency medications for MCI/Major incident victims must include appropriate.

DESIRABLE RECOMMENDATIONS

1. MCI/Major incident care processes should try to keep children and families together if feasible, and support identification, tracking and timely reunification of unaccompanied children with family.
2. The principles of management of adults in patient surges / MCI/Major incident should form the basis of paediatric casualty management, recognising the additional psychological difficulties.
3. The regional network should collaborate to promote preparedness, and disaster drills involving sufficient numbers of children should test readiness.

REFERENCES:

1. Shirm S, Liggin R, Dick R, Graham J. Pre-hospital preparedness for paediatric mass- casualty events. *Paediatrics* 2007; 120:756-761.
2. Waisman Y, Aharonson-Daniel L, Mor M, Amir A, Peleg K. The impact of terrorism on children- A two-year experience. *Prehosp Disaster Med* 2003; 18:242-248.
3. Brown L. Peds patients are more vulnerable in terror attack. *ED Management* 2003; 15: 105-106.
4. Allen GM, Parrillo SJ, Will J, Mohr JA. Principles of disaster planning for the paediatric population. *Prehosp Disaster Med* 2007; 22:537-540.
5. Waisman Y, Amir L, Mor M, Feigenberg Z, Aharonson L, Peleg K, Blumenfeld A. Prehospital response and field triage in paediatric mass casualty incidents: The Israeli Experience. *Clin Paediatr Emerg Med* 2006; 7:52-58.
6. Johnston C, Redlener I. Critical concepts for children in disasters identified by hands- on professionals: summary of issues demanding solutions before the next one. *Paediatrics* 2006; 117(5 pt 3):S458-S461
7. Aharonson-Daniel L, Waisman Y, Dannon YL, Peleg K. Epidemiology of terror-related versus non-terror-related traumatic injury in children. *Paediatrics* 2003;112:e280
8. American Academy of Paediatrics, Committee on Environmental Health and Committee on Infectious Diseases. Chemical-biological terrorism and its impact on children: a subject review. *Paediatrics* 2000; 105:662-670.
9. Gaffney DA. Families, schools and disaster: The mental health consequences of catastrophic events. *Fam Community Health* 2008; 31:44-53.
10. American Academy of Paediatrics. Poll: Children's Needs Should Be Prioritised In Disaster Hagan JF Jr; American Academy of Paediatrics, Committee on Psychosocial Aspects of Child and Family Health; Task Force on Terrorism. Psychosocial implications of disaster or terrorism on children: a guide for the paediatrician. *Paediatrics* 2005; 116:787-795
11. The JumpSTART Paediatric MCI Triage Tool. Available at: http://www.jumpstarttriage.com/JumpSTART_and_MCI_Triage.php
12. Dieckmann RA, Brownstein D, Gausche-Hill M. The paediatric assessment triangle: a novel approach for the rapid evaluation of children. *Paediatr Emerg Care*. 2010 Apr;26(4):312-5.

Safeguarding
CHILDREN & YOUNG PEOPLE

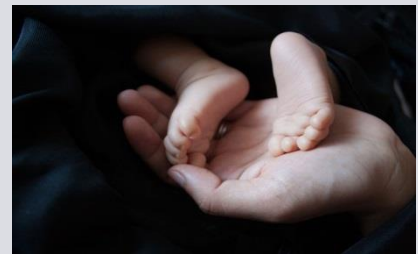
***Paediatric Emergency Medicine Special Interest
Group: IFEM***



Introduction

Child abuse is a serious problem worldwide and can affect any child regardless of age, gender, culture, or socio-economic status. Prevention, protection, early identification, suitable interventions and comprehensive treatment of child abuse victims remain challenging for the world medical community.

As a consequence of how difficult it can be to detect some cases of potential child maltreatment, emergency staff must be able to recognize and manage children presenting



“

Despite the difficulty in detecting cases of potential child maltreatment, emergency staff must be able to recognise and manage children presenting as a result of abuse or neglect.

as a result of abuse or neglect.

Differences between children and adults

The welfare of children is of paramount importance. Health and social care professionals should put the welfare of children at the centre of all decision-making related to the child and act in the best interests of children in all of their interactions with children, young people, families, policy-makers and other professionals. The same principles apply to vulnerable adults, but the laws and agencies relating to adult and child age groups may be different, depending on the country of practice. Within the limits of local resources, senior clinicians and managers should ensure that there is a culture of helping children, and an awareness of services in their own area to help such patients who may have suffered from child abuse or neglect.

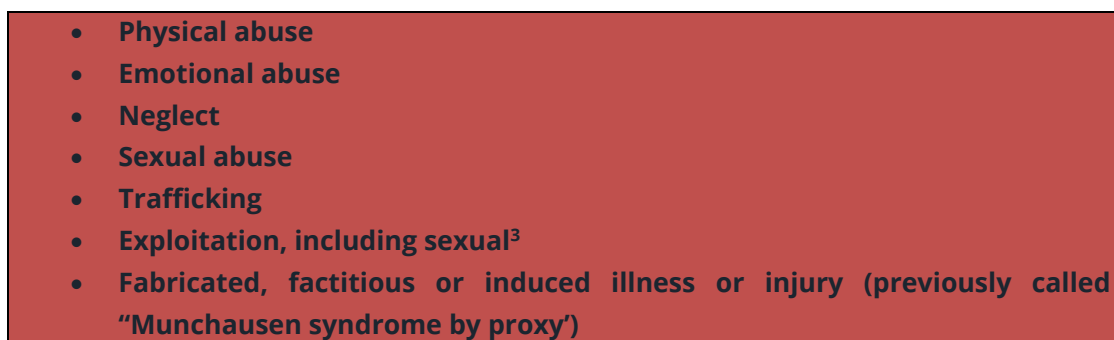
In comparison with detecting welfare concerns in adults, children in need of protection are more likely to be “concealed” – in other words an adult may accompany the child and give a false account of events, or may have convinced the child to remain quiet about the real aetiology of their condition.

Article 19 of the United Nations (UN) Convention on the Rights of the Child enshrines the child’s right to be protected from all forms of physical or mental violence, injury, abuse or neglect.¹ No violence against children is justifiable; all violence against children is preventable.

The World Medical Association (WMA) Statement on Child Abuse and Neglect (October 2017) sets out recommendations for physicians around the world to enable them to better identify children and young people at risk of abuse or who have suffered from abuse. This chapter incorporates the main recommendations from the WMA Statement.²

Definitions of child abuse vary from culture to culture however whatever the cultural definition all children, worldwide, are entitled to be protected from all forms of maltreatment including those listed in Figure 1.

Figure 1: Forms of maltreatment from which children need to be protected

- 
- **Physical abuse**
 - **Emotional abuse**
 - **Neglect**
 - **Sexual abuse**
 - **Trafficking**
 - **Exploitation, including sexual³**
 - **Fabricated, factitious or induced illness or injury (previously called “Munchausen syndrome by proxy”)**

- **Forced marriage**
- **Female Genital Mutilation**
- **Negative effects of poor parenting, domestic violence, parental drug misuse or parental mental health problems**

In some countries extremes of abused basic human rights⁴⁻⁵ may also be seen, and this should never be tolerated. There are wide societal and cultural variations in the degree of acceptable behaviours towards children, however in most countries abusive relationships and/or circumstances towards children, are not accepted as tolerable. Cultural rationalisations for harmful behaviour towards children should not be accepted.

Detection of child abuse cases

Compared to other health care settings, EDs more often see patients in crisis circumstances, which are situations when child abuse can be more evident. Clinicians working in Emergency Departments (EDs) must be able to recognise and manage children presenting as a result of abuse or neglect⁶⁻⁸. This may require a high awareness of the problem at all times, and may require some detective work to establish facts.

Clinicians should be alert to the fact that children can be subject to more than one type of maltreatment. Identification of some types of abuse can be challenging (Figure 2).

Figure 2: Key learning points

Children can be subjected to more than one type of maltreatment and some are more difficult to identify than others. For example:

- **Sexual abuse should be suspected if there are injuries around the genitalia, inappropriate sexual behavior, unexplained pregnancy, or sexually transmitted diseases, although sexual abuse frequently presents with no visible evidence⁹.**
- **Fabricated or induced illness should be considered if there is a discrepancy with a recognized clinical picture or response to treatment.**

The ED may be the first opportunity for professionals to detect children needing protection. Although child abuse can be encountered in any child, staff should also be particularly vigilant for families in circumstances with a higher risk¹⁰⁻¹¹, including those listed in Figure 3.

Figure 3: High risk circumstances for child abuse

- **Poverty**
- **Overcrowding**
- **Drug or alcohol misuse**
- **Chronic illness amongst family members or in the child**
- **Mental health problems, including post-natal depression**
- **Domestic violence**
- **Poor parenting skills**
- **Family dysfunction**
- **Social isolation**
- **Children with physical, developmental or emotional/behavioural disabilities or special needs**

Roles and responsibilities

Clinicians working in Emergency Departments (EDs) have both a unique and special role in identifying and helping abused children and their families.¹²

Prompt action to safeguard vulnerable children is an essential part of ED practice. Each ED should have a lead doctor and lead nurse with the specific responsibility for advocating the safeguarding of children and young people within the ED. This role may be separate or in conjunction with adult safeguarding.

The emotional, behavioural and social manifestations of child maltreatment and neglect may not be immediately apparent in the context of the busy ED and therefore ED staff should be specifically trained to identify the manifestations of possible child maltreatment. In addition, ED staff should also be vigilant to identify risk factors which may become obvious in the ED including, for example, harmful caregiver-child interactions such as hostility, excessive anxiety, argumentative interactions with family or staff, threatening to remove the child from the ED before medical evaluation is complete, and excessive disciplining of the child in the ED.

Emergency Department systems and linking with external agencies

ED information systems must highlight recurrent ED attendances or “at risk” children (see Chapter 13) as many children who go on to experience more serious forms of abuse will often have had previous contact with health and/or social services.

If an up-to-date child protection register (a list of names of children who are at risk of, or who have suffered from, maltreatment) is held by the authorities, that information should be accessible to ED staff. If there is a register this information should be used as an additional piece of information to aid in understanding the circumstances surrounding the child's presentation to the ED. Absence of a child's name on such a list should not in itself reassure staff. Access to social services, as applicable within emergency care systems, should be readily available to staff for onsite consultation or referral.

Some EDs throughout the world have sophisticated systems in place designed to detect welfare concerns, and refer to appropriate agencies¹³. In other EDs such systems may be less clear or in some cases may not exist at all. ED clinicians should play a role in advocating for robust, reliable mechanisms to be in place to assist in reporting and investigating cases of suspected child abuse.

Legislation relating to the ability of a child to consent to treatment, or to access healthcare without a parent, differs throughout the world. However, what is common is that legally a child is often still in the custody of an adult, so if the child does not have the ability to consent to their own treatment, ¹⁴ all decisions affecting their welfare will need to involve an appropriate adult or other legal authority. It is crucial to listen to the voice of the child and to ensure, by whatever means the child can communicate by, the child's view have been taken into account in relation to the proposed management plan.

Often, where a dispute occurs, or where it is suspected that the care-givers may have failed to protect the child from abuse or neglect or may be involved in that abuse or neglect, a Court of Law will need to be involved. Many countries have legal obligations regarding the recognition and reporting of suspected children at risk of maltreatment. Both detection and management of vulnerable children require a special set of skills as well as liaison work and coordination with multiple agencies.

Whilst patient confidentiality is one of the fundamental tenants of health professionals' work, if it is in the interests of the child, patient confidentiality may be waived in cases of suspected child abuse. The first duty of a clinician is to protect his or her patient if harm or risk of harm is suspected.

No matter what the type of abuse (including physical abuse, emotional abuse, sexual abuse, trafficking, exploitation or neglect), an official report must be made to the appropriate authorities.

Multi-disciplinary team collaboration

Collaboration with an experienced multidisciplinary team¹⁵ is strongly recommended, in order to better identify those children who are at risk of abuse or those who have suffered from abuse.

Such a team is likely to include nurses, physicians, social workers, child and adult psychiatrists, developmental specialists, psychologists and attorneys (lawyers). When participation in a team is not possible or such a team is not available, the clinician must consult with other relevant medical, social, law enforcement and mental health personnel when child maltreatment is suspected.

Clinicians who treat children must acquire knowledge and skills in the physical, psychological and emotional assessment of child abuse in all its forms, the assessment of child development and parenting skills, the utilisation of community resources, and the clinician's legal responsibilities relating to child abuse in the specific country in which the clinician works.

All clinicians who treat children, and those adults with caring responsibilities for children, should be aware of the principles of the UN Convention on the Rights of the Child as well as relevant national protective legal provisions applying to children and young people.

Case management of possible, suspected or probable cases of child abuse

A full discussion of case management is beyond the scope of this text but ED staff should be trained and vigilant to suspect cases based on evidence-based reviews.¹⁶ For any child attending the ED, the first responsibility of medical and nursing staff is to attend to the child's needs including treatment of injuries and analgesia administration. These aspects should not be delayed because of concerns of possible child abuse.

It is important to gain the history in a non-accusatory, clear and open manner, including taking whatever history is possible from the child¹⁷. If language barriers exist, a translator must be used. Family members alone should not be relied upon, in case of concealment of the truth. Staff should also invite the opportunity for the child to speak to them alone, and similarly the carers. This may yield useful information.

In many countries, after the initial emergency care has been provided by the ED clinician, detailed workup and follow-up is provided by a specialised child protection team or trained police professionals. Internal vaginal and rectal examinations are not performed by ED staff in most developed countries. In countries where designated child protection teams do not exist, child assault examinations and report writing may have to be completed by ED staff, therefore physical findings consistent with child abuse as well child abuse mimics should be part of the training of all emergency clinicians.

Detailed history and clinical examination needs to be coordinated with care and discretion, so that the patient is not subjected to repeated questioning and examination, or that the legal case is not jeopardised by possible distortion of the history or examination which could destroy forensic evidence.

The medical evaluation of children who are suspected of having been abused should be performed by clinicians skilled in both paediatrics or paediatric emergency medicine and child abuse evaluation. The medical evaluation needs to be tailored to the child's age, injuries, and condition and may include blood testing, a trauma radiographic survey, and developmental and behavioural screenings. Follow up radiographs are strongly urged in some children who present with serious, apparently abusive injuries.¹⁸

The medical assessment and management of sexually abused children includes a complete history and physical examination, as physical and sexual abuse often occurs together; examination of the genitalia and anus; the collection and processing of evidence, including photographs; and the treatment and/or prevention of pregnancy and venereal disease.¹⁹ Specific attention should be paid to the child's right to privacy.

It is essential for the clinician to understand and be sensitive to the following:

- the quality of relationships between care-givers;
- disciplinary actions or styles used within the child's home;
- economic stresses on the family;
- emotional stresses or issues experienced by members of the family;
- mental health problems exhibited by any members of the family;
- violence between the care-givers or other members of the family;
- substance use and abuse, including alcohol and legal and illegal drugs; and
- any other forms of stress that could relate to child abuse in all its forms.

All clinicians need to be aware that all forms of abuse of children by other children can occur. Recognition that this may be a result of prior or current abuse of the alleged abuser must be at the forefront of the clinician's mind when such situations are suspected or encountered.

The signs of abuse are often subtle, and the diagnosis may require comprehensive, careful interviews with the child, parent(s), care-givers, and siblings. Inconsistencies among explanation(s) and characteristics of the injury(s), such as the severity, type and age, should be documented and further investigated.



Identification of suspected cases

Staff must be trained to identify cases where child abuse should enter their differential diagnosis (see Chapter 9). This includes history (especially mechanism of injury), examination and radiological signs. Senior or expert advice should be sought in the context of:

- repeated injuries/ingestions, and repeated apparent life-threatening events without a medical explanation;
- delay in seeking medical help;
- unexplained or vague account of injury or injury not matching the child's developmental capability;
 - for this good communication between health care professionals and the child and their families is essential; the child's physical, sensory and learning disabilities should also be taken into account. False histories tend to lack detail, or vary each time they are told however they can also be very fixed which may give clinicians suspicion that the account is learned rather than reality.
- poor general hygiene or nutrition;
- injuries that are multiple or of apparently different ages;
- injuries on areas less commonly injured in true accidents, signs of which include linear bruising patterns and scalds which are not in a typical splash pattern; or
- children in cardiac arrest or peri-arrest with no pre-existing illness.

Policies and Procedures

It is essential that the clinician records the history and examination findings in the ED medical chart contemporaneously during the evaluation process. Injuries should be

documented using photographs, illustrations, and detailed descriptions. The medical record often provides critical evidence in court proceedings.

If ED staff suspect abuse or neglect, local procedures must be followed, and police or social services informed. It is not the responsibility of ED clinicians to prove a case of child abuse but there is a duty of care to report suspicions. Such procedures should comply with both national and local guidelines allowing for consistency in standards but also ensuring they are locally relevant. Parent(s) or the child's guardian(s) should have the reasons for further referral explained in a non-threatening manner.

Clear protocols, supported by simple flowcharts and staff training will improve awareness, identification and documentation of cases (see Chapter 12). Checklists can be used to prompt questions and aid detection amongst staff. Photographs may only be taken according to local policies.

Keeping forensic samples of, for example, vaginal/rectal fluids, hairs, or underclothes is important as part of the forensic examination but only by an appropriately trained and authorized clinician, be this a nurse or physician.

ED clinicians should participate by identifying problems in child-rearing and parenting, and providing appropriate referrals for counseling, where necessary.

Appropriate referral sources should be available to emergency clinicians. These may include public health and family physicians or paediatricians. Clinicians should recognise that child abuse and neglect is a complex problem and more than one type of treatment or service may be needed to help abused children and their families. The development of appropriate treatment requires contributions from many professions, including medicine, law, nursing, education, psychology and social work.

Clinicians should promote the development of innovative programs that will advance medical knowledge and competence in the field of child abuse and neglect. Inclusion of on-going reviews of knowledge, skills and competency in relation to protecting the rights of children and young people, promoting their health and well-being and the recognition of and response to suspected cases of child abuse and neglect is crucial in professional educational programs. Clinicians should obtain education on child neglect and abuse in all its forms during training as medical students.

In difficult situations involving consent, confidentiality and sharing of medical information, the ED clinician should be able to access senior advice to cover ethical and legal matters appropriate to the ED environment and the state/country's laws.

Senior ED staff should strive to overcome anxieties and discomfort amongst more junior

staff, as part of training and case reflection. The possible challenges may include:

- Lack of confidence in their own knowledge & skills to be able to correctly identify child abuse;
- Concern about missing a medical disorder which explains the presentation;
- Discomfort of disbelieving or suspecting a parent or caregiver; or
- Fear of complaints and their own personal safety.

Inclusion of on-going reviews of knowledge, skills and competency in relation to protecting the rights of children and young people, promoting their health and well-being and the recognition of and response to suspected cases of child abuse in all its forms and neglect is crucial in professional educational programs.

The undergraduate curriculum must include a mandatory course on child abuse, in all its forms, within the paediatrics program, that can be developed within postgraduate and continuing medical education for those intending to work within this field.

Patient discharge from the ED

In cases where there are no medical indications for admission to in-patient care, the child or young person must not be discharged to an environment where he or she would have continued contact with the suspected person, unless a full risk assessment (ideally involving police and social services) has been undertaken. Where such resources are not available, the ED needs to work closely with the child's caregivers or extended family to arrange for the most optimal care arrangement.

For patients in need of medical care, there should be clear procedures for admission to a ward, which should include a full handover and transfer of responsibility.

A referral and notification system should be established for efficient information exchange to multidisciplinary teams and the relevant agencies including, for example, the police, medical social workers, school health visitor or nurse, primary health care team, and child protection officers. Such a system should function 24 hours a day, seven days per week.



SAFEGUARDING CHILDREN & YOUNG PEOPLE:

ESSENTIAL RECOMMENDATIONS

1. All clinicians should be educated about the paramount importance of the welfare of children.
2. All clinicians who treat children, and those adults with caring responsibilities for children, should be aware of the principles of the UN Convention on the Rights of the Child ¹ as well as relevant national protective legal provisions applying to children and young people.
3. All clinicians should be educated about child protection and child abuse including:
 - a. Recognition of possible child abuse
 - b. The clinical assessment of a child
 - c. Initial management of a child with possible or suspected abuse
 - d. The appropriate authorities to notify about a case of possible or suspected child abuse
4. Clinicians must be aware of and observe local laws regarding consent to undertake examinations of children.
5. All clinicians must act in the best interests of children in all of their interactions with children, young people, families, policy-makers and other professionals.
6. Where there is the possibility of child abuse the first responsibility of ED staff must

- be to attend to the child's needs including treatment of injuries and the provision of analgesia.
7. ED information systems must be configured to identify children attending frequently, and those with known safeguarding concerns.
 8. A referral and notification system must exist, which is compliant with legal / regional guidelines, and ED staff must be mandated to refer suspected child protection cases via this system.
 9. Clinicians must be aware of and observe local laws regarding consent to undertake examinations of children.
 10. Patients must be managed in a culturally appropriate and sensitive manner; if language barriers exist, a translator must be used in safeguarding cases.
 11. Potentially vulnerable children and young adults should not be discharged from the ED until a place of safety is identified.
 12. The lead doctor for paediatric issues in the ED must have overall responsibility for ensuring that safeguarding issues are identified by staff and notified correctly; this should be included in the ED's continuous quality improvement program.
 13. Clinicians who treat children must acquire knowledge and skills in the physical, psychological and emotional assessment of child abuse in all its forms, the assessment of child development and parenting skills, the utilisation of community resources, and the clinician's legal responsibilities relating to child abuse in the specific country in which the clinician works.
 14. All clinicians need to be aware that all forms of abuse of children by other children can occur. Recognition that this may be a result of prior or current abuse of the alleged abuser must be at the forefront of the clinician's mind when such situations are suspected or encountered.
 15. It is essential that the clinician record the history and examination findings in the Emergency Department medical chart contemporaneously during the evaluation process. Any injuries present should be documented using photographs, illustrations, and detailed descriptions.
 16. Clinicians should recognise that child abuse and neglect is a complex problem and more than one type of treatment or service may be needed to help abused children and their families. The development of appropriate treatment requires contributions from many professions, including medicine, law, nursing, education, psychology and social work.

DESIRABLE RECOMMENDATIONS

1. Clear protocols, supported by simple flowcharts and checklists, should be available

- in the ED. This will improve awareness, identification and documentation of cases.
2. Forensic photographs should not be delayed (within the confines of local policy) as injuries may change in appearance.
 3. The ED should have access to sources of information about the child's welfare.
 4. Collaboration with an experienced multidisciplinary team is strongly recommended, in order to better identify those children who are at risk of abuse or those who have suffered from abuse.
 5. The medical evaluation of children who are suspected of having been abused should be performed by clinicians skilled in both paediatrics or paediatric emergency medicine and child abuse evaluation.
 6. Clinicians should participate at all levels of prevention by providing prenatal and postnatal family counselling, identifying problems in child-rearing and parenting, and advising about family planning and birth control.
 7. Public health measures such as home visits by nurses and other health professionals, anticipatory guidance by parents, and well-infant and well-child examinations should be encouraged by clinicians, where appropriate, working in Emergency Departments. Programs that improve the child's general health also tend to prevent child abuse in all its forms and should be supported by clinicians.
 8. The undergraduate curriculum must include a mandatory course on child abuse, in all its forms, within the paediatrics program, that can be developed within postgraduate and continuing medical education for those intending to work within this field.

REFERENCES:

1. United Nations (November 1989). Convention on the Rights of the Child
https://www.unicef.org.uk/wp-content/uploads/2010/05/UNCRC_united_nations_convention_on_the_rights_of_the_child.pdf
2. World Medical Association (October 2017). Statement on Child Abuse and Neglect
<https://www.wma.net/policies-post/wma-statement-on-child-abuse-and-neglect/>
3. UK Department for Education (February 2017). Child Sexual Exploitation: definition and guide for practitioners
<https://www.gov.uk/government/publications/child-sexual-exploitation-definition-and-guide-for-practitioners>
4. United Nations (December 1948). Universal declaration of human rights
<http://www.un.org/en/universal-declaration-human-rights/>
5. Council of Europe (November 1950). Convention for the Protection of Human Rights and Fundamental Freedoms
http://www.echr.coe.int/Documents/Convention_ENG.pdf
6. Royal College of Paediatrics and Child Health (2013). Child Protection Companion
<https://pcouk.org/companion>
7. Royal College of Paediatrics and Child Health. Child Protection Evidence Reviews.
<https://www.rcpch.ac.uk/key-topics/child-protection/evidence-reviews>
8. The National Institute for Health and Care Excellence (NICE). Child abuse and neglect. NICE: London (2017)
<https://www.nice.org.uk/guidance/ng76>
9. Royal College of Paediatrics and Child Health (May 2015). The physical signs of child sexual abuse
<https://www.rcpch.ac.uk/shop-publications/physical-signs-child-sexual-abuse-evidence-based-review>
10. Cleaver, H., Unell, I. and Aldgate, J. Children's needs: parenting capacity: child abuse: parental mental illness, learning disability, substance misuse, and domestic violence. London: The Stationery Office (2011)
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/182095/DFE-00108-2011-Childrens_Needs_Parenting_Capacity.pdf
11. NSPCC. Risk factors for Child Abuse and Neglect.
<https://www.nspcc.org.uk/preventing-abuse/child-abuse-and-neglect/neglect/who-is-affected-by-neglect/>
12. Flaherty SJ. Clinical Report – the Pediatrician's Role in Child Maltreatment Prevention. Pediatrics 2010; 126: 833-841
13. Woodman J, Pitt M, Wentz R, Taylor B, Hodes D, Gilbert RE. Performance of screening tests for child physical abuse in accident and emergency departments. Health Technology Assessment 2008;12(33)
14. General Medical Council (2018). Ethical guidance for doctors: 0-18 years
<https://www.gmc-uk.org/ethical-guidance/ethical-guidance-for-doctors/0-18-years>
15. HM Government (2018). Working together to safeguard children.
<https://www.gov.uk/government/publications/working-together-to-safeguard-children--2>
16. Royal College of Paediatrics and Child Health. Guidance and Resources for Child Protection Evidence.
<https://www.rcpch.ac.uk/resources/guidance-resources-child-protection-evidence>
17. Peach D, Rowland AG, Bates D et al. (2018). Not Just a Thought... Salford (UK): The University of Salford, St Anne's High School, Stockport, The Pennine Acute Hospitals NHS Trust & NHS England (North).
<https://www.salford.ac.uk/research/care/research-groups/cyp@salford/accordion/not-just-a-thought-a-communication-model>
18. Royal College of Radiologists (November 2018). The radiological investigation of suspected physical abuse in children
https://www.rcr.ac.uk/system/files/publication/field_publication_files/bfcr174_suspected_physical_abuse.pdf
19. Royal College of Paediatrics and Child Health & Faculty of Forensic and Legal Medicine (October 2012).

Guidelines on Paediatric Forensic Examinations in relation to possible Child Sexual Abuse
https://www.rcpch.ac.uk/sites/default/files/Guidelines_on_paediatric_forensic_examinations_in_relation_to_possible_child_sexual_abuse.pdf

Adolescents, Mental Health &

SUBSTANCE MISUSE

***Paediatric Emergency Medicine Special Interest
Group: IFEM***



Introduction

Adolescents are a low user age group of Emergency Departments, but are an often-neglected group of patients. ED's often cater for small children and for adults, but adolescents lie in-between, both physically and psychologically. They need care specific to their development and understanding, respecting their autonomy while remembering that they are not fully mature.

In many developing countries the upper age limit for being considered a child is 12-14 years and so the adolescent age group falls into the adult domain. Regardless of whether



“

Adolescents are vulnerable because they can be perceived as self-reliant, reluctant to accept help, and independent.

they are classified as children or adults - adolescents should be acknowledged as having specific issues and needs and these should be addressed and catered for by the ED.^{1,2} Adolescence also represents a time when mental health, substance misuse, sexual activity, injuries sustained in reckless acts, and abusive situations (bullying, family violence, neglect, etc.) often culminate in ED attendance. At this developmentally sensitive time, skillful input and intervention from ED staff may help prevent future problems. In many circumstances, such presentations can be challenging to the flow throughout the ED and often require more resources than typical childhood illness or injury presentations.³

Differences between adolescents and other age groups

Adolescents are vulnerable because they can be perceived as self-reliant, reluctant to accept help, and independent. Some adolescents who are lonely, depressed, living in unsatisfactory families or peer groups, may be reluctant to admit they are not coping with stressors. Their need for help and protection often goes unnoticed (see Chapter 16). They often present to ED's if their behaviour or actions become unmanageable by the adults who are deemed responsible to care for them.

Services specific to this age group can be scarce, as sometimes neither paediatric nor adult services take responsibility for them, and in many countries specific services are usually under-funded and hard to source.⁴⁻⁶ As a result, many adolescents wait for many hours for specialist input, be discharged home with inadequate follow up, or transferred to adult facilities inappropriately, particularly in the areas of mental health or drug / alcohol misuse.¹ The busy and immediate environment of ED impairs the ability of staff to meet these patients' needs. Assessment and management are time-consuming and adolescents often lack patience.

Adolescents with chronic disease often become unstable during these years and present frequently to the ED. This may be due to rapid growth and hormonal changes, or because of non- or poor compliance with treatment. It is also common for them to resent and rebel against their disease (e.g. diabetes, asthma) because of the impact it has on their lifestyle, and in comparing themselves with their healthy peers.

Improving the care of adolescents in emergency departments.

Assessment of adolescents

If there is space, the ED environment should ideally provide a waiting area specifically for 10-17-year-olds, providing some refuge from small, noisy children but protection from any potentially distressing sights and sounds of adult patients. Age appropriate books, magazines, health promotion leaflets should be provided (see Chapter 5).

Clinicians need to combine adult and paediatric skills for this age group (see Chapter 9). During this time of great change, there is an opportunity to influence adolescents in taking

care of their health. Maximising this unique opportunity requires ED clinicians to recognise the challenges but respond in a positive, age-appropriate way.

ED staff must be trained to understand their country's laws, local policies and practical tips for dealing with situations in the ED with respect to:

- Legal, social and professional responsibilities in dealing with this age group.
- Legal guardianship / responsible adult, and the rights of the child to consent to or refuse treatment.
- Confidentiality of medical information and sharing information with other agencies.
- How to manage safeguarding, welfare or child protection issues (see Chapter 16).

Often specific training for medical and nursing staff is useful, for example to deal with issues of consent / refusal of treatment, and managing difficult issues in the right way (see Chapter 9). Respecting the patient's opinion and wish for autonomy, while balancing their immaturity in making decisions about their health, requires skills in both listening and responding. Adolescents will tend to have higher expectations and less patience than adult patients. They may identify with and communicate better with one staff member, so it is useful to welcome input from any member of the ED team, if this improves communication.

It is important to talk to the child as well as the parent or accompanying adult. During assessment, staff should be respectful of the adolescent's wish to be regarded and conversed with as an adult, while recognising the immaturity they may have in understanding medical information, seeing consequences of decisions or behaviour, and unexpressed fears about medical treatments.

It is usually in the best interests of the child to involve family members in their care, but the circumstances of each case should be considered in a balanced way, and the legal framework for this should be understood (see below). In many countries, adolescents are permitted to seek and receive healthcare without parental involvement and EDs must maintain confidentiality, except if this is clearly not in the child's best interests.

Even in quite simple situations, it is important to remember that the child may not clearly understand the situation or the facts, and to check their understanding and to engage them in their own care. They may not see longer-term consequences or the impact of their health decisions on other people, or the wider society.

For those patients who frequently present to EDs, care plans have been shown to improve care by ensuring a consistent and appropriate approach. It is important to use the expertise of the multidisciplinary team (hospital specialist, mental health worker, ED staff, primary care and social services). An electronic alert can be added to the ED computer system to alert staff to the crisis plan (see Chapter 13).

Mental health, behavioural issues, and substance abuse

These issues are grouped together because they are often a factor in the presentation of an adolescent to an ED. A holistic approach in considering all aspects of the problem will lead to a better outcome, both short-term and long-term. The type and standard of the assessment will depend on the organisation of the department, local protocols and access to specialist opinion.

Underneath the primary problem presented to the ED there may lay underlying problems which staff should be alert to. Typical examples in emergency medicine include:

- Injuries such as a fractured 5th metacarpal or hand wound may represent a punch resulting from anger management issues, frustration, isolation, bullying, family problems.
- Recurrent headache, abdominal pain, collapses, panic attacks, false pregnancy scares etc. may signify stress, or abuse.

The HEADSS assessment⁷ is a useful screening tool for conducting a comprehensive psychosocial history and health risk assessment with a young person. It provides valuable information about the young person's functioning in key areas of their life. It is shown in table 2.

Table 2 the HEADSS assessment tool⁷

H	Home
E	Education / Employment / Eating Exercise
A	Activities and Peer relationships
D	Drug use/cigarettes/alcohol
S	Sexuality
S	Suicide/depression/mood

In a busy ED, it is also often easy to dismiss an adolescent's experience with alcohol as "normal adolescent behaviour" but recurrent episodes of intoxication should prompt evaluation for underlying issues such as social /welfare issues (see Chapter 16) or depression. Alcohol and drug intoxication may be "experimental" but if there is a pattern of substance misuse, there are usually underlying causes, which require intervention according to the specific circumstances and the age of the child.

Acute drug ingestion presents specific challenges and requires emergency clinicians to integrate standard resuscitation measures with psychosocial management by medical staff, social workers, mental health specialists and security personnel.

A comprehensive assessment should balance identification of both medical and psychosocial issues. Staff dealing with this age group must be trained for awareness of the symptoms and signs of recreational drugs and alcohol. Measurement of vital signs is

important, as acute presentations such as diabetic ketoacidosis, hypoglycaemia or encephalitis in this age group may present as behavioural problems and be mis-diagnosed by inexperienced pre-hospital and hospital staff.

Issues such as drug toxidromes, or pregnancy may have to be dealt with before mental health or child protection issues can be fully addressed. However, a brief mental health assessment to determine the patient's capacity to make their own decisions, and a risk assessment of the level of supervision needed (e.g. nursing or security staff or police) should be part of the initial medical assessment.

The benefits of tranquility and privacy must be balanced against the need for close observation, and in severe circumstances, restraint. The physical or chemical (e.g. benzodiazepine) restraint of any patient is often avoidable, but may be deemed necessary in the uncooperative or violent patient to prevent injury and/or distress to the patient, staff and everyone in the ED. Most situations can be managed by through verbal redirection including a calm and friendly manner with active listening and validation of the adolescent's feelings. Restraint should be regarded as a last resort and clear guidelines must be available, as it carries physical risk to the patient and can be psychologically traumatising. The patient must be continuously monitored with time limited and specific orders.¹

All episodes of restraint must be clearly documented and include the indications, benefits and that consent could not be obtained because of incapacitation. If medication is used, psychiatric assessment is often delayed so that sedating effects of medications can wear off.

Onward referral to other services

Each hospital will have its own age limit for admission to paediatric ward areas. In large hospitals, areas specifically designed for adolescents may be available. If the child is discharged from the ED full communication with professionals already involved with the child must occur. This includes the primary care, mental health and social care teams.

In many countries, admission to appropriate facilities for mental health or drug / alcohol misuse is more difficult to organise. Some countries have a policy for all children under 16 years who present with self-harm to be admitted to a facility where a full thorough psychosocial assessment can be completed. Other countries have a method of urgent outpatient follow-up of these patients. If hospital admission occurs this may be to a general paediatric ward where a specialist child or adolescent mental health team will see the child, and obtain information about their social situation. It is preferable for this age group not to be admitted to an adult mental health or general ward. The regional network should strive to ensure rapid access to a suitable facility, 24 hours a day. If transfer to another facility is needed, guidelines for safe transfer must exist.

The ED should be aware of and provide advice to adolescents about local support in the form of government and non-government / charitable agencies as well as information (e.g. sexual health, drugs / alcohol, common health problems) available to them (e.g. leaflets, websites).

ADOLESCENTS, MENTAL HEALTH & SUBSTANCE MISUSE:

ESSENTIAL RECOMMENDATIONS

1. EDs must consider the needs of adolescent patients as distinct from those of young children and of adults.
2. Patients who arrive with a mental health/substance misuse problem must receive a timely response by experienced staff to determine the severity of illness, degree of stress and provide medical stabilisation.
3. All ED staff must be familiar with legislation surrounding consent, confidentiality and mental capacity of patients under the legal age of adulthood.
4. Staff involved in using restraint must be trained to do so, specifically for paediatric patients.

DESIRABLE RECOMMENDATIONS

1. Education programs should include causes, signs and symptoms and optimal management of children with mental ill-health/substance misuse.
2. Adequate space should be available for children/families in crisis; and should include a private room with suitable supervision by emergency staff.
3. If a child/young person needs to remain in the ED due to an absence of inpatient facilities there should be clear parameters for maintaining comfort and safety of the patient, staff and public.
4. Protocols, clinical pathways and assessment tools to improve care for young people in mental health crisis should be established.

REFERENCES:

1. Stewart C, Spicer M, Babl FE (2006) Caring for adolescents with mental health problems: Challenges in the emergency department. *Journal of Paediatrics and Child Health* 42: 726-730.
2. Dolan MA, Mace SE. Paediatric mental health emergencies in the emergency medical services system. *Ann Emerg Med* 2006; 48:484-486.
3. American Academy of Paediatrics (2011) Technical Report- Paediatric and Adolescent Mental Health Emergencies in the Emergency Medical Services System, *Paediatrics*, April 25: e1356-1366
4. Baren, J.M, Mace S.E, Hendry P.L, Dietrich A.M, Grupp-Phelan J, Mullin J (2008) Children's Mental Health Emergencies- Part 1, Challenges in Care: Definition of the Problem, Barriers to Care, Screening, Advocacy, and Resources. *Paediatric Emergency Care*, 24(6):399- 408.
5. Baren, J.M, Mace S.E, Hendry P.L, Dietrich A.M, Goldman R.D, Warden C.R. (2008) Children's Mental Health Emergencies- Part 2, Emergency Department Evaluation and Treatment of Children with Mental Health Disorders. *Paediatric Emergency Care*, 24(7):485-498.
6. Baren J.M, Mace S, E, Hendry P.L. (2008) Children's Mental Health Emergencies-Part 3, Special Situations: Child Maltreatment, Violence, and Response to Disasters. *Paediatric Emergency Care*, 24(8): 569-577.
7. Chin R, Fairley M (2012) Paediatric psychiatric emergencies in Cameron P, Jelinek G, Everitt I, Brown G, Raftos J (ed) *Textbook of Paediatric Emergency Medicine* (2nd ed), Churchill Livingstone: London
8. Cohen E, Mackenzie RG, Yates GL (1991) HEADSS, a psychosocial risk assessment instrument: implications for designing effective intervention programs for runaway youth. *Journal of Adolescent Health*, 12(7): 539-544.

Death of a child in the
EMERGENCY DEPARTMENT

Paediatric Emergency Medicine Special Interest Group: IFEM



Introduction

The death of a child is one of the hardest situations for ED and other staff to deal with and requires skill, sympathy, and composure. There are many issues to take into account when considering the termination of resuscitation efforts and the management of death in the ED.

The ED staff have to support the family, and physicians have to give clear information about the death. Adequate record taking is important for medical and/or legal investigations. ED physicians must notify authorities of deaths that may be due to abuse, neglect or any criminal act.

Differences between the death of a child and an adult in ED

Although staff manage death quite frequently in the ED, the circumstances that surround the death of a child constitute one of the most stressful situations in the practice of EM, and one in which not all staff members in EDs have had adequate training.^{1, 2}

ED staff members must be able to recognise the adverse effects which the death of a child may have on them and take measures to reduce their impact on both themselves and the ED team as a whole.³

Presence of family members in the room during resuscitation is more likely to be encouraged for a paediatric cardiac arrest than in an adult, and is normal practice in some countries. This situation requires planning and managing (see below).

Resuscitation attempts are often more prolonged in paediatric than in adult cardiac arrest but with no evidence to support this practice. Recent guidelines recommend that after 20 minutes of resuscitation, the resuscitation team leader should consider whether or not to stop, based on patient's history, clinical data including any ROSC (return of spontaneous circulation) at any time, ETCO₂ value, and type of rhythm (shockable / non- shockable).⁴

Dealing with paediatric death in the ED



“

The circumstances that surround the death of a child constitute one of the most stressful situations in the practice of EM, and one in which not all staff members in EDs have had adequate training.

Immediate management of death

When a child arrives at the ED in cardiac arrest, then unless the patient has signs of irreversible death, such as rigor mortis and lividity, CPR should always be performed, while accurate facts are obtained. This is because the event is usually unexpected and often sudden.

The way in which ED staff handle a child with a chronic illness and in whom death is expected soon is different to a child with a sudden unexpected cardiac arrest. In chronically ill children, the reason for expecting treatment needs to be determined and handled sensitively. If deterioration occurs during an ED care episode some terminal patients or their families may express the wish to have CPR withheld and though it may be difficult for ED physicians, this wish should be respected in the resuscitation plan.⁵ However, advanced directives to withhold CPR are subject to the laws of each country or state and hospitals should develop policies accordingly. ED staff members are well advised to know these policies and appreciate their implications in practice.⁶

Except in cases of sudden profound hypothermia (usually snow / icy water), resuscitation should not be sustained for longer than 20-30 minutes in the absence of cardiac activity at any stage. The general prognosis for cardiac arrest is worse for children than for adults. Even if cardiac output is restored for a few hours, a good neurological outcome is very unlikely.

Family presence during CPR is increasingly accepted at many EDs. Although some staff may be reluctant to allow parents to stay by their child during CPR at first, most EDs that have normalised this practice actually find family presence easy to manage. It is unusual for parents to disrupt the resuscitation team's efforts.⁷

Decision about presence during CPR is a personal and private decision, deeply influenced by cultural and social opinions about life and death. There is research evidence which indicates that parents (in retrospect) would have preferred to be with their child during resuscitation, even when the outcome was death.⁸ Parents who were present during CPR have been reported to feel less anxiety and to better accept the child's death. During CPR, families should be periodically informed of the status of their child. This is a responsibility which must be explicitly incorporated into the team's roles. A designated staff member should be with the parents at all time, responding to their questions and explaining what is happening in simple terms. Parents should not be asked to make the decision to cease resuscitation efforts. This is something the ED staff must do. Neither must the staff member allocated to the parents give them false hope. After death is medically declared, the family should be informed in a sympathetic but clear manner.^{9, 10}

In some cases, where death is not sudden but imminent, “end of life care” provision should be offered to these children. There have been advances in the knowledge and skills to perform “end of life care” for adults with terminal illness. The same should be offered to children so that the child’s final hours, if this occurs in the ED, are painless, anxiety free, and the child’s dignity is maintained in the presence of the caregivers. A website listing resources to help this is included in the resources appendix.

Management after death is declared

After death, staff must give clear information to the family about its potential causes, and be willing to answer, patiently and compassionately; any questions the family might have.¹¹ This should be done in a quiet closed area with comfortable seating, avoiding overloading the family with too much information. It is advisable that a member of the staff (ideally a nurse or social worker) accompany the family all the time they stay in the ED. Families should be given the opportunity of seeing and holding the deceased child, and the staff should respect social, religious, and cultural diversity.^{1,6,10}

Adequate record taking of the history, physical examination and management of resuscitation is important for understanding the cause of death and to facilitate medical and/or legal investigations in cases of unexpected death or when abuse is suspected. This is particularly true for children in the 0-5 age group, in which the incidence of physical abuse is high. When there is no obvious cause of death (by preceding events or patient medical history), clinicians must take a detailed history of events, which includes the position of the body, the person who found the child, the circumstances surrounding the death, when the victim was last seen alive, etc. Although clinicians do not usually ask such questions, they are important in these cases. It can be difficult to remember all the relevant history, examination and investigations, so guidelines and checklists are useful in this complex situation.^{12,13}

ED physicians are responsible for informing the family of the need for an autopsy as well as for notifying authorities (as per the country’s legal requirements), and following child protection policies (when relevant).^{6,14}

The ED staff should also help the family with information on funeral arrangements. Finally, it is important to notify the child’s primary care physician of the death, and work with him/her in follow-up of autopsy results. Hospital administration should be notified, in case there are future appointments pending which should be cancelled.

In countries and hospitals that have organ donation programs, emergency physicians should know their country’s legislation and services, be able to discuss the possibility of organ donation with the family of the deceased patient and to notify organ procurement organisations.¹⁴ This can be achieved through workshops and training sessions.

ED staff must be aware of the potential emotional impact of a patient's death on themselves, and be able to take some time off from the ED when this impact becomes too stressful.^{3, 10} Child death review teams exist in many countries. These are multidisciplinary meetings including relevant police, social services, hospital and primary care representatives. The purpose is to review cases and autopsy results, and make recommendations of causality as well as any learning from the event for any agencies involved with the child pre-death.⁶



DEATH OF A CHILD IN THE EMERGENCY DEPARTMENT:

ESSENTIAL RECOMMENDATIONS

1. EM physicians must be familiar with the laws of their country and state, in addition to the policies of their institutions, regarding the death of a child.
2. CPR must be administered initially (until information is verified) unless there are unmistakable signs of death or there is a legally valid written directive stating not to initiate CPR or other forms of life saving treatment.
3. ED senior staff and managers must ensure that their staff members are prepared for and helped with the emotional consequence of dealing with child death.
4. EM staff must report on any case where death is suspected to be the result of neglect or abuse, to the relevant authorities (Police or other) within the country's law and institutional policy.

DESIRABLE RECOMMENDATIONS

1. EM staff should respect parents desire to remain at the child's bedside during resuscitation.
2. Staff physicians should give families every consideration at the moment of informing them of their child's death; the place where this is done should be quiet and free of other people.
3. Families should be given the opportunity of seeing and holding the deceased child.
4. A member of the staff should accompany the family while they stay in the ED and help them with funeral arrangements, respecting social, religious, and cultural diversity.
5. An ED representative should notify the child's primary care physician of the death, and liaise with him/her in follow-up of postmortem examination results.
6. Policies and checklists for the ED should be available to ensure the taking of adequate records, which are important for medical and legal reasons.
7. Staff training sessions and clinical case discussions should include resuscitation scenarios resulting in death, and ensure staff are confident with death notification, organ donation laws and procedures.

REFERENCES:

1. Ahrens W. Death of a child in the Emergency Department. In: Paediatric Emergency Medicine. Strange G, Ahrens W, Shafermeyer R, Wiebe R. Mc Graw Hill Medical, 3^{ed}, 2009
2. Knapp J and Mulligan-Smith D. Death of a Child in the Emergency Department. - Paediatrics 2005;115;1432. DOI: 10.1542/peds.2005-0317.
<http://paediatrics.aappublications.org/content/115/5/1432.full.html>
3. Farrell, M., Ryan, S, Langricle, B. Breaking bad news within a paediatric setting: an evaluation report of a collaborative education workshop to support health professionals, Journal of Advanced Nursing. 36: 765-775,2001
4. Biarent D, Bingham R, Eich C, López-Herce J, Maconochie I, Rodríguez-Núñez A, Rajka T, Zideman D. European Resuscitation Council Guidelines for Resuscitation 2010. Section 6. Paediatric life support. Resuscitation 2010; 81:1364-1388
5. Freyer D. Care of the Dying Adolescent: Special Considerations. Paediatrics 2004;113;381. DOI:

- 10.1542/peds.113.2.381. In: <http://paediatrics.aappublications.org/content/113/2/381.full.html>
6. Death of a child in the Emergency Department. Joint Statement by the American Academy of Paediatrics and the American College of Emergency Physicians. Paediatrics Volume 110, Number 4 October 2002, pp 839-840
7. Dudley NC, Hansen KW, Furnival RA, Donaldson AE, Van Wagenen KL, Scaife ER. The effect of family presence on the efficiency of paediatric trauma resuscitations. Ann Emerg Med 2009;53:777-84, e3.
8. Tinsley C, Hill JB, Shah J, et al. Experience of families during cardiopulmonary resuscitation in a paediatric intensive care unit. Paediatrics 2008;122: e799-804.
9. Henderson D, Knapp J. Report of the National Consensus Conference on Family Presence During Paediatric Cardiopulmonary Resuscitation and Procedures. Paediatr Emerg Care. 2005 Nov;21(11):787-91.
10. Protocolo de actuación ante el niño que fallece en Urgencias. Servicio de Urgencias de Hospital Cruces, Bilbao, España. In: http://urgenciaspaediatrica.hospitalcruces.com/doc/generales/proto/Cap18.14_protocol_o_nino_fallecido.pdf
11. Cook P, White D, Ross-Russell R. Bereavement support following sudden and unexpected death: guidelines for care. Arch Dis Child 2002;87(1):36-8.
12. Sudden unexpected death in infancy: A multi-agency protocol for care and investigation. The report of a working group convened by The Royal College of Pathologists and The Royal College of Paediatrics and Child Health, 2004 <http://www.rcpath.org/NR/rdonlyres/30213EB6-451B-4830-A7FD-4EEFF0420260/0/SUDIreportforweb.pdf>
13. Model Paediatric Protocols 2003 Revision. EMSC Partnership for Children. Paediatrics Committee. National Association of EMS Physicians. In: http://www.kdheks.gov/cphp/download/cacs_template/ModelPaediatricProtocols.pdf
14. Selbst S, De Piero A. Medico-Legal considerations. In: APLS The Paediatric Emergency Medicine Resource. Chapter 20. American Academy of Paediatrics & American College of Emergency Physicians. Jones and Bartlett Publishers. 4th edition 2004, revised 2007. Boston

Advanced Training and
ACADEMIC RESEARCH

***Paediatric Emergency Medicine Special Interest
Group: IFEM***



Introduction

Where Emergency Medicine is developed as a speciality in its own right¹, it is underpinned by academic activity. By this, we mean research to improve patient care, and teaching and training to improve staff competencies. In several countries in North America, Australasia, Europe and elsewhere there are now full academic departments of Paediatric Emergency Medicine (PEM), which combine the provision of high level clinical care, teaching of advanced trainees, the supervision of higher degree students and the pursuit of high level research. PEM is a relatively new sub-speciality within EM, and in the past development of academic PEM lagged behind EM in general and other paediatric specialities. Over the past 10-15 years individual EM researchers, specific emergency departments (EDs) and in particular national and regional research networks now attract high level competitive grant funding and achieve publications in high level journals.^{2,3}



“

In several countries in North America, Australasia, Europe and elsewhere there are now full academic departments of Paediatric Emergency Medicine (PEM), which combine the provision of high level clinical care, teaching of advanced trainees, the supervision of higher degree students and the pursuit of high level research.

Differences between Paediatric and Adult Academia and Research

The goal of academic PEM is to achieve the advancement of emergency care through education and research, advocacy, and professional development. In the past academic PEM lagged behind general (adult) EM (see Chapter 3).^{4,5} This was for several reasons:

- There are fewer clinicians and academics practising PEM than adult EM.
- Serious outcomes and adverse events are rare.
- Data collected at tertiary institutions are not necessarily generalisable to other settings.
- Ethics applications and consent / confidentiality issues are more complex in PEM.
- Difficulties in obtaining informed consent from families to participate in research.
- Practical difficulties in obtaining objective measures or outcomes (e.g. pain scoring, symptom rating, physiological parameters, invasive monitoring or blood tests).
- Finding a niche in existing journals and conferences: PEM falls between the 2 areas of paediatrics and EM, and academic and research support can therefore be more challenging to access.

Despite these handicaps, however, PEM has now developed a strong academic track record in many countries. The recognition that one third or more of ED patients in many settings are children has led to an increase in available resources for academic work including the development of advanced specialised training and quality research. Future investment in, and commitment to, education, teaching and research in PEM has a high potential to improve care and save lives worldwide.

Creating high quality education and research in paediatric emergency medicine

Basic education in Paediatric Emergency Medicine

Chapter 9 refers to aspects of education and training for EDs to train all staff to attain a basic competence in paediatric emergency knowledge and skills. At a higher training level EDs in many countries offer extensive curricula and courses for fellowship training (see Chapter 9).

National and international conferences for EM routinely include paediatric tracks and workshops. In a number of countries PEM designated conferences or educational updates are available.

Specialised PEM training programs

These are programs that offer specific curricula in PEM. The goal of these programs is to train paediatric EM specialists who can provide expert paediatric emergency care, supervise others who provide such care, and teach and conduct research focused on improving the care of acutely ill and injured children. In the United States alone there are over 50 PEM subspecialty or fellowship training programs. There are PEM fellowship and

training programs available in many countries outside of the United States including programs in Canada, Australia, New Zealand and the United Kingdom, and in non-speaking English countries, such as Israel or Turkey.

Clinical Education in the workplace

Within the ED, education often occurs during the period of employment, in order to ensure the full range of skills needed (see Chapter 9). This may be presented by PEM faculty in larger departments in developed countries, offering EM residents / junior doctors and medical students the opportunity to learn and discuss issues related to various topics in PEM. Where hospitals have PEM trained senior staff, PEM faculty may also provide teaching outside the ED.

Examples include:

- "Grand Rounds". An educational activity that provides the general hospital staff a forum to present topics in their subspecialty. It also provides the ED an opportunity to communicate what PEM is, as well as discuss controversial issues in PEM, present practice guidelines being developed, and present research projects of the department.
- PEM seminars. PEM focused education as part of a formal or informal teaching curriculum of PEM topics.
- Computer-based educational programs. Self-education created by PEM specialists using specific software developments or internet access to web-based courses or lectures as well as web forums.
- Formal PED rotations for Fellows, Residents, Medical Students and Junior Nurses. These rotations provide for training staff additional exposure to paediatric emergencies and to improve management and technical skills. Formal rotations have prescribed learning outcomes in PEM that are expected to be achieved by the end of the rotation, as agreed by PEM specialists.
- Open access web-based resources and weblinks. There are several free open access resources available through some major hospitals, EM and PEM organisations and not-for-profit EM and PEM organisations. PEM clinical practice guidelines and parent/patient handouts are available through major hospital departments (e.g. from the Royal Children's Hospital in Melbourne Australia www.rch.org.au/cpg). Examples of websites with open access PEM relevant content and blogs are Don't Forget the Bubbles (<http://dontforgetthebubbles.com>). An example of an international listserv with active and archived discussions about PEM topics is the PED-EM-L@LISTSERV.BROWN.EDU. An example of a PEM emergency database is the Paediatric Emergency Medicine Database (www.pemdatabse.org) which provides a weekly journal review for PEM related papers as well as links to worldwide research groups, EM and PEM organisations and conferences.

Teaching Opportunities in PEM

As described in Chapter 9, senior staff with a mandate for education require sufficient protected (non-clinical) time to carry out this duty. They must also have a high standard of teaching skills, and be able to use these skills in a variety of ways such as didactic, informal or opportunistic teaching. There should also be a mechanism to evaluate and provide effective feedback to educational activities provided, and monitor the skills gained by the learners. In some settings, such as in the UK this process is highly regulated through relevant colleges, such as the Royal College of Emergency Medicine, and tracked through on-line monitoring.

Advanced paediatric life support (APLS) courses are provided by several independent organisations such as Paediatric Advanced Life Support (PALS) (http://cpr.heart.org/AHA/ECC/CPRAndECC/Training/HealthcareProfessional/Paediatric/UCM476258_PALS.jsp), APLS courses in the UK (<http://www.alsg.org/uk/APLS>), APLS in the US (<http://www.aplsonline.com/>). They are designed to enable expert care in paediatric resuscitation; these courses should be available to medical and nursing personnel who treat children in any ED. In some settings these courses are mandatory as part of local or national curricula in EM or PEM.

Research in Paediatric Emergency Medicine

While still less in volume compared with adult EM research⁶ the number and quality of publications in PEM has increased over the last 10-15 years. In many settings the path to improved research output and quality in PEM required a broad based effort including:

- Identification of a local champion with an interest in PEM research.
- The improvement of research skills and methodology through the attendance of research education courses which may be available through local universities or as workshops as part of conferences.
- Use of free research resources available via EM and other journals, e.g. the virtual edition on research education in Emergency Medicine Australasia (Babl EMA 2016).
- Research expertise can also be gained through collaboration with more experienced researchers in related fields.
- Certification in Good Clinical Practice (GCP)/Good Clinical Research Practice (GCRP), which provide minimum competency in ethical research practice and may be available through local or national courses or through internationally recognised international online courses.
- Use of free resources for reporting guidelines to develop different types of studies and report them at the highest possible level as available on the EQUATOR website (<https://www.equator-network.org/reporting-guidelines>).
- Obtaining a higher degree by members of the EM or PEM faculty through a university which provides broad based research education and, depending on the local organisation, usually leads to the ability to in turn supervise higher degree

students.

- Using available resources and staff, such as interested medical and nursing students as volunteer research assistants.

If unable to join an existing research team, starting out in research in PEM often requires a step wise approach to gain research experience and skills by progressing from retrospective cohort studies, to understand current practice and practice variation and for example set the stage for improving care; to prospective cohort studies, which allow a more detailed understanding of current care and allow the introduction of new therapies in a controlled fashion; to interventional studies where a new or experimental therapy is explored in a particular setting.

Creating a track record of research achievements through publications, presentations at conferences, the supervision of research students and success at obtaining small grants is key to success at undertaking more sophisticated studies and obtaining competitive grants. Ultimately, the goal of local PEM research efforts may be the establishment of part time or full time academic posts, often in conjunction with local universities or research institutes.

Single centre PEM research is often hampered by small numbers of patients with serious outcomes, a lack of generalisability as research is often conducted at tertiary centres, limited research expertise and limited research resources. While there are projects that can and should be conducted through single centre studies, in PEM to achieve a paradigm shift in practice requires the collaboration of researchers across multiple EDs.

While some large studies may be based at multiple centres collaborating ad hoc and focused on a specific project in the past 10-15 years generalisable and clinically important results in PEM have been developed in networks of EDs where many centres collaborate across multiple projects and over longer time periods. Multicentre research in general and networked research in particular can overcome the major draw backs of single centre research – access to large patient numbers, the pooling of resources and expertise, and an increased generalisability of the findings beyond specific EDs. In addition research networks provide the optimal nidus for students and generational growth.

Examples of established large networks are Paediatric Emergency Research Canada (PERC)-Canada⁷, Paediatric Emergency Care Applied Research Network (PECARN)⁵ or Paediatric Emergency Medicine Collaborative Research Committee (PEM CRC) – USA, and Paediatric Research in Emergency Departments International Collaborative (PREDICT)⁸ – Australia/New Zealand. In addition to Research in European Paediatric Emergency Medicine (REPEM) across several European countries, networks have formed in individual European countries such as in the United Kingdom and Ireland (PERUKI) and in Spain. Several networks have undertaken Delphi type studies to assess what topics should be researched and prioritised.^{9,10} Depending on the network set up individual clinicians can approach the

network with suggestions for research projects even if they are not part of the specific network.

Recently the Paediatric Emergency Research Network (PERN)¹¹ was formed as a global collaboration of national or regional PEM research networks. This network of networks aims to tackle PEM problems that affect clinicians across countries and create appropriately powered and generalisable knowledge concerning the emergency treatment of children.

For further information see **Appendix 2** (Useful Resources).

One of the major issues in PEM research is the question of how to ethically conduct studies when formal informed consent cannot be obtained during the critical early phase in the ED stay. In many countries there is ethical guidance that recognises the need for emergency care studies and enables research in emergency situations^{12,13} The World Medical Association Declaration of Helsinki says “if the research cannot be delayed, the study may proceed without informed consent”.¹⁴



ADVANCED TRAINING AND ACADEMIC RESEARCH:
ESSENTIAL RECOMMENDATIONS

1. To achieve academic status, the ED should foster education in PEM, and participate in creating publishable research, usually under the umbrella of a university.
2. All PEM staff in established PEM training programs must have basic knowledge of best practice in education and research concepts, to further develop PEM as a distinct specialty of medicine.

DESIRABLE RECOMMENDATIONS

1. Development of international PEM research networks should be supported to increase the capacity for high level research performed worldwide.
2. PEM staff should be given support to learn skills to lead both educational and research activities.
3. Senior staff leading research should receive formal training in research design and statistics.
4. Countries with established PEM training programs should assist in training physicians in the specialty worldwide and share best practice.
5. Countries with established EM training programs should incorporate PEM training programs modeled after existing programs (e.g. the United States, Canada, the UK, Australia and New Zealand).

REFERENCES:

1. Curry C. A perspective on developing emergency medicine as a speciality. *International Journal of Emergency Medicine*. 2008; 1(3): 163-167.
2. Plint AC, Johnson DW, Patel H, Wiebe N, Correll R, Brant R, Mitton C, Gouin S, Bhatt M, Joubert G, Black KJ, Turner T, Whitehouse S, Klassen TP; Pediatric Emergency Research Canada (PERC). Epinephrine and dexamethasone in children with bronchiolitis. *N Engl J Med*. 2009 May 14;360(20):2079-89
3. Kuppermann N, Ghetti S, Schunk JE, Stoner MJ, Rewers A, McManemy JK, Myers SR, Nigrovic LE, Garro A, Brown KM, Quayle KS, Trainor JL, Tzimenatos L, Bennett JE, DePiero AD, Kwok MY, Perry CS 3rd, Olsen CS, Casper TC, Dean JM, Glaser NS; PECARN DKA FLUID Study Group. Clinical Trial of Fluid Infusion Rates for Pediatric Diabetic Ketoacidosis. *N Engl J Med*. 2018 Jun 14;378(24):2275-22874.
4. Klassen TP, Acworth J, Bialy L, Black K, Chamberlain JM, Cheng N, Dalziel S, Fernandes RM, Fitzpatrick E, Johnson DW, Kuppermann N, Macias CG, Newton M, Osmond MH, Plint A, Valerio P, Waisman Y; PERN. Paediatric emergency research networks: A global initiative in paediatric emergency medicine. *Paediatric Emergency Care*. 2010; 26(8): 541-543. Review.
5. Paediatric Emergency Care Applied Research Network. The Paediatric Emergency Care Applied Research Network (PECARN): Rationale, development, and first steps. *Paediatric Emergency Care*. 2003; 19(3): 185-193.
6. Coats TJ. Future research in emergency medicine: explanation or pragmatism? Large or small? Simple or complex? *Emerg Med J*. 2011; 28(12):1004-7
7. Paediatric Emergency Research Canada (PERC). Available from URL: <http://www.perc-canada.ca> [Accessed 2 November 2017].

8. Babl FE, Borland M, Ngo P, Acworth J, Krieser D, Pandit S, Pitt R, Cotterell E, Jamison S. The paediatric research in emergency departments international collaborative (PREDICT): First steps towards the development of an Australian and New Zealand research network. *Emerg Med* 2006;18:143-147.
9. Deane HC, Wilson CL, Babl FE et al. PREDICT Prioritisation Study: Establishing the Research Priorities of Paediatric Emergency Medicine Physicians in Australia and New Zealand. *Emerg Med J*. 2017 Aug 30. pii: emermed-2017-206727. doi: 10.1136/emermed-2017-206727. [Epub ahead of print]
10. Hartshorn S, O'Sullivan R, Maconochie IK, Bevan C, Cleugh F, Lyttle MD; Establishing the research priorities of paediatric emergency medicine clinicians in the UK and Ireland. *Paediatric Emergency Research in the UK and Ireland (PERUKI)*. *Emerg Med J*. 2015 Nov;32(11):864-8
11. Klassen T, Acworth K et al. Paediatric Emergency Research Networks: a global initiative in paediatric emergency medicine. *European Journal of Emergency Medicine* 2010, 17:224–227
12. Coats TJ, Goodacre S. Consent in emergency and resuscitation research. *European Journal of Emergency Medicine*. 2009; 16(5): 242-3.
13. Goodacre S, Coats T, Clancy M. Commentary: Good clinical practice in clinical trials: core knowledge for emergency physicians. *Emerg Med J* 2008; 25: 789
14. World medical Association Declaration of Helsinki
<http://www.wma.net/en/30publications/10policies/b3/17c.pdf>

CHAPTER TWENTY

Recommendations

ESSENTIAL RECOMMENDATIONS

Paediatric Emergency Medicine Special Interest Group: IFEM



Chapter Three: Challenges facing Paediatric Emergency Medicine

1. As emergency healthcare systems mature, countries must consider the special requirements of the paediatric patient with respect to environment, equipment and staff skills & training, ensuring they meet the needs of both the paediatric and adult population of emergency patients.
2. Where EDs see patients of all ages, there must be a lead doctor and lead nurse for paediatric issues, this Paediatric Emergency Care Coordinator or “paediatric champion” would lead the efforts in raising awareness of the specific needs of children in their individual setting.

Chapter Four: An Integrated Service Design

1. Pre-hospital, primary care and hospital services for emergency paediatric care must be integrated, and the role and capabilities of each ED within the regional network should be clear, communicated to stakeholders within the network, and coordinated with Emergency Medical Service (EMS).
2. Clear, written guidelines for transfer criteria to specialist paediatric centers must exist, and mechanisms for swift and expert transfer agreed.
3. All EDs must be prepared at all times to deal with the initial resuscitation of a child brought in unexpectedly.
4. The ED must be staffed and equipped to deal with the full range of ages and clinical presentations of children that it normally receives.
5. Access to specialist paediatric advice to the ED must exist 24 hours a day (by telephone, telemedicine, internet or in person).

Chapter Five: Child and Family Centered Care

1. Child and family centred care (CFCC) must be a priority for staff and managers through clinical practice, staffing, and environmental design.
2. The ED environment must be safe for children.
3. Children must be separated from distressing sights and sounds of other patients, with some separation from the main waiting area for adults.
4. The option of family-member presence must be encouraged for all aspects of ED care.
5. The ED must contain enough child-orientated treatment rooms (depending on the

- proportion of child ED attenders) with sufficient space to accommodate family members.
6. Younger children must have access to nutrition (this includes provision for breast-feeding).
 7. ED staff must give health advice and explanations in clear language and ensure they have been understood, being considerate that the family will usually have responsibility for delivering on going healthcare.
 8. Guidelines for medical treatment should be available for balancing the wishes of the child, legal responsibility of the guardian and the child's best interests.

Chapter Six: Initial Assessment of an Ill or Injured Child

1. Every child arriving at an ED must have a rapid visual inspection very soon after arrival.
2. All staff members (including non-healthcare qualified) must be trained and empowered to alert others to the arrival of a seriously ill child.
3. All ED clinical staff must be highly competent in recognising the seriously ill or injured child, and recognising a deterioration in a child's condition.
4. A critically ill or injured child must be moved immediately to a suitable resuscitation area – there should not be delays to complete triage processes in the triage area.
5. There must be no barriers to accessing immediate initial assessment by a qualified staff member trained in the recognition of serious illness in children.
6. All patients presenting for emergency care must receive a full initial assessment by suitably trained staff within 15 minutes of arrival.
7. The choice of an efficient model of initial assessment for children must take into consideration time available, staff skills, case mix and current workload.
8. All children must have vital signs (temperature, respiratory rate and heart rate) measured at initial assessment; blood pressure and oxygen saturations should be included if the child is seriously ill, but unstable or critically-ill looking children should not be delayed in triage to measure vital signs, these can be measured in the resuscitation area.
9. Drug dosages must be based on an accurate weight, but weight can be estimated using standard tools for very sick or unstable children.
10. All patients in moderate or severe pain must have pain relief provided within 30 minutes of arrival.

Chapter Seven: Stabilising and Treating an Ill or Injured Child

1. There must be a defined 'Resuscitation Team' of clearly identified staff from within the ED or hospital.
2. All ED clinical staff must be highly competent in basic paediatric life support.

3. All ED staff on each shift must be competent in resuscitating until therapeutic goals of hypoxia, shock, cardiac dysfunction and status epilepticus are resolved.
4. Staff able to provide advanced airway management must be available within 5 minutes of the need being identified.
5. Trained staff must stay with a critically ill child until moved to a dedicated critical care environment or recovery happens.
6. Resuscitation algorithms and equipment should be available in resuscitation areas and ideally practiced regularly with ED staff.
7. A method for estimating weight for children too unstable to be weighed must be used.
8. A ready reckoner for estimating weight based drug dosages (without the need to calculate) should be available.
9. There must be a system for 24-hour consulting with key specialists either on site or remotely, including toxicology information.
10. The ED must be supported by 24-hour basic radiology and laboratory services.
11. At discharge, carers must have advice which they understand, for managing their child's condition and recognising deterioration.
12. All children seen in the ED must be discharged with a discharge letter to keep, and/or a letter sent to their General Practitioner.

Chapter Eight: The Staffing of an Emergency Department

1. ED staff must not work long continuous shifts e.g. more than 12 hours, as fatigue leads to patient care errors and decision-making errors; there must also be adequate recovery time between shifts.
2. Staff numbers must be adequate to allow safe coverage of all areas of the ED where paediatric patients are being cared for, at all times.
3. Appropriate organisation of paediatric specific equipment, supplies and medications that allows for staff to quickly and safely access them during resuscitations.
4. Staff in EDs should have access to decision support tools which assist in correct medication dosing, equipment sizing, and in clinical pathways for paediatric illness and injury.
5. In academic institutions clinical staff members must have sufficient protected non-clinical time for other aspects of their job, such as research, education and training, and safety/quality improvement activities.

Chapter Nine: Staff Training and Competencies

1. All ED staff must be competent to deal with the full range of illnesses, injuries in all age-groups and understand the differences between children and adults.
2. Refresher training must be available and timely in order for staff to retain their knowledge and skills in paediatric resuscitation.
3. ED staff must focus effort to coordinate, learn and work as a team.
4. Senior staff must be physically present and available to teach junior ED staff (medical and nursing) while they work.
5. Senior staff who teach juniors whilst they work must not have a full clinical load, so that they are able to ensure supervision and education occurs in the busy ED environment.
6. A senior ED doctor and ED nurse must be designated to have the role of creating.

Chapter Ten: Emergency Department Equipment, Supplies & Medications

1. Every ED must be well equipped and organised with easy access to the necessary equipment, supplies and medications needed for the care of acutely ill or injured children of all ages on a 24-hour basis.
2. Equipment and medications must have a standardised and logical layout, to ensure familiarity for staff. It should also ideally match those used in allied departments (e.g. operating theatres, intensive care unit).
3. Pre-calculated resources for common or emergency drug doses and equipment sizes for children of all ages must be accessible. This includes dilution guidelines and charts for the preparation and administration of medications and parenteral fluids.
4. Resuscitation medications, supplies and equipment must be reviewed and updated as necessary with each revision of international guidelines.
5. In developing countries where the recommended paediatric emergency equipment or medications are not available, informed and rational decisions need to be made regarding suitable alternatives. Ideally this should be done in conjunction with regional and national health departments.
6. Staff should be familiar with the department's equipment and medications.

Chapter Eleven: Quality & Safety

1. EDs must have a described and implemented program of continuous quality improvement with regular review of patient safety and quality of care. On a cyclical basis, it must cover high risk and high volume areas of paediatric emergency care practice.
2. Children must be weighed in kilograms, with the exception of children who require emergency stabilisation, and the weight should be recorded with the vital signs.
3. Patients emergency medical notes (documentation) must be reviewed on a regular

basis to identify gaps in knowledge which result in risks to patients. Education of staff must take place to close those gaps.

4. For children who require resuscitation or emergency stabilisation, a standard method for estimating weight in kilograms must be used (e.g. length-based system).
5. The quality improvement plan of the ED must include paediatric patient and disease-specific indicators.

Chapter Twelve: Policies, Procedures & Guidelines

1. Policies and procedures must include the issues about the general assessment and management of paediatric patients in the ED.
2. ED staff must have access to relevant policies and procedures, based on departmental, hospital, regional or international references.
3. As the emergency care system matures, emergency care managers should incorporate evidenced-based clinical care/practice guidelines for children, and educate and monitor their staff on their use.

Chapter Thirteen: Information System and Data Analysis

1. Sufficient attention should be given to both the design and implementation of an EDIS in a planned and stepwise process
2. The design and implementation of an EDIS should be integrated within the overall ED organisation (processes, planning, workflow).
3. A structured review process and audit cycle should be instituted early on in view of ongoing performance improvement
4. The doctor and nurse with the lead roles for paediatric emergency care must be integrally involved in the development and implementation of EDIS in ED's which manage children.
5. EDIS must include special adaptations to meet the basic needs of paediatric patients e.g. prescribing alerts must be built in to guard against paediatric dosing errors.
6. EDIS must have the ability to connect to health information outside the ED.

Chapter Fourteen: Pre-Hospital Care

1. Pre-hospital (EMS) services must define the level of paediatric skills expected of responding staff.

2. All pre-hospital staff should be trained to safely assess, manage, and transport common paediatric emergencies to a pre-defined level within the pre-hospital (EMS) network; this includes scene awareness and family reassurance.
3. All pre-hospital responders must be competent in first aid and BLS for infants, children and adolescents.
4. Pre-hospital responders with advanced training must be competent in advanced life support for infants, children and adolescents.
5. All EMS vehicles must carry equipment suitable for children of all ages.

Chapter Fifteen: Mass Casualty Incidents and Patient Surges Involving Children

1. All pre-hospital responders who might attend a MCI/Major incident scene must be trained to effectively triage and manage children as well as adults.
2. Staff training programs for pre-hospital and hospital personnel should include coping with surges and MCI/Major incident in paediatric patients
3. MCI/Major incident planning must consider children when making hazard vulnerability assessments and case scenarios.
4. Designated sites within the hospital for decontamination and management of patients in MCI/Major incident must consider child casualties.
5. There must be pre-planned process to identify and treat unaccompanied children.
6. Equipment for MCI/Major incident victims must include appropriate types and size ranges and quantities for children.
7. Emergency medications for MCI/Major incident victims must include appropriate.

Chapter Sixteen: Safeguarding Children & Young People

1. All clinicians should be educated about the paramount importance of the welfare of children.
2. All clinicians who treat children, and those adults with caring responsibilities for children, should be aware of the principles of the UN Convention on the Rights of the Child ¹ as well as relevant national protective legal provisions applying to children and young people.
3. All clinicians should be educated about child protection and child abuse including:
 - a. Recognition of possible child abuse.
 - b. The clinical assessment of a child.
 - c. Initial management of a child with possible or suspected abuse.
 - d. The appropriate authorities to notify about a case of possible or suspected child abuse.
4. Clinicians must be aware of and observe local laws regarding consent to undertake examinations of children.
5. All clinicians must act in the best interests of children in all of their interactions with

- children, young people, families, policy-makers and other professionals.
6. Where there is the possibility of child abuse the first responsibility of ED staff must be to attend to the child's needs including treatment of injuries and the provision of analgesia.
 7. ED information systems must be configured to identify children attending frequently, and those with known safeguarding concerns.
 8. A referral and notification system must exist, which is compliant with legal / regional guidelines, and ED staff must be mandated to refer suspected child protection cases via this system.
 9. Clinicians must be aware of and observe local laws regarding consent to undertake examinations of children.
 10. Patients must be managed in a culturally appropriate and sensitive manner; if language barriers exist, a translator must be used in safeguarding cases.
 11. Potentially vulnerable children and young adults should not be discharged from the ED until a place of safety is identified.
 12. The lead doctor for paediatric issues in the ED must have overall responsibility for ensuring that safeguarding issues are identified by staff and notified correctly; this should be included in the ED's continuous quality improvement program.
 13. Clinicians who treat children must acquire knowledge and skills in the physical, psychological and emotional assessment of child abuse in all its forms, the assessment of child development and parenting skills, the utilisation of community resources, and the clinician's legal responsibilities relating to child abuse in the specific country in which the clinician works.
 14. All clinicians need to be aware that all forms of abuse of children by other children can occur. Recognition that this may be a result of prior or current abuse of the alleged abuser must be at the forefront of the clinician's mind when such situations are suspected or encountered.
 15. It is essential that the clinician record the history and examination findings in the Emergency Department medical chart contemporaneously during the evaluation process. Any injuries present should be documented using photographs, illustrations, and detailed descriptions.
 16. Clinicians should recognise that child abuse and neglect is a complex problem and more than one type of treatment or service may be needed to help abused children and their families. The development of appropriate treatment requires contributions from many professions, including medicine, law, nursing, education, psychology and social work.

Chapter Seventeen: Adolescents, Mental Health & Substance Misuse

1. EDs must consider the needs of adolescent patients as distinct from those of young children and of adults.
2. Patients who arrive with a mental health/substance misuse problem must receive a timely response by experienced staff to determine the severity of illness, degree of stress and provide medical stabilisation.
3. All ED staff must be familiar with legislation surrounding consent, confidentiality and mental capacity of patients under the legal age of adulthood.
4. Staff involved in using restraint must be trained to do so, specifically for paediatric patients.

Chapter Eighteen: Death of a Child in the Emergency Department

1. EM physicians must be familiar with the laws of their country and state, in addition to the policies of their institutions, regarding the death of a child.
2. CPR must be administered initially (until information is verified) unless there are unmistakable signs of death or there is a legally valid written directive stating not to initiate CPR or other forms of life saving treatment.
3. ED senior staff and managers must ensure that their staff members are prepared for and helped with the emotional consequence of dealing with child death.
4. EM staff must report on any case where death is suspected to be the result of neglect or abuse, to the relevant authorities (Police or other) within the country's law and institutional policy.

Chapter Nineteen: Advanced Training and Academic Research

1. In order for an ED to be seen as academic, the ED must foster education in PEM, and participate in creating publishable research, usually under the umbrella of a university.
2. All PEM staff in established PEM training programs must have basic knowledge of best practice in education and research concepts, to further develop PEM as a distinct specialty of medicine.

Recommendations

DESIRABLE RECOMMENDATIONS

Paediatric Emergency Medicine Special Interest Group: IFEM



Chapter Three: Challenges Facing Paediatric Emergency Medicine

1. Access to established guidelines and recommendations, such as this document, to use as a resource when attempting to implement change, to ensure buy-in from leadership in your workplace settings.

Chapter Four: An Integrated Service Design

1. Managerial documents governing regional networks of emergency care should specify which arrangements apply to paediatric patients.
2. Core specialties should be available to assist the ED; these include anesthesia for all ages of child, critical care, general paediatric medicine, emergency surgery, orthopaedic, and radiology and pathology services.

Chapter Five: Child and Family Centered Care

1. The paediatric areas should look attractive to children and aid in distraction from the stressful environment. The provision of toys, books etc. and employment of play specialists should be considered, to facilitate high quality care.
2. Timely access to qualified interpretive services should be available 24 hours a day.
3. Services provided should reflect the cultural context of the family and encourage families to be involved in patient care decisions.
4. Communication barriers such as literacy and the educational level of the family should be considered when giving health information.
5. Written information should be available for common conditions and written in simple language and languages relevant for the patient population, using diagrams where appropriate, to aid understanding.

Chapter Six: Initial Assessment of an Ill or Injured Child

1. In countries where malnutrition is prevalent, at risk children should also be visually inspected for signs of severe malnutrition at triage.
2. For children with special needs, chronic diseases or complex conditions, initial

assessment should include a request for priority access to hospital notes and clinical management plans and these children should be prioritised as they are vulnerable.

3. Initial assessment should include modifications for children presenting with mental health problems, complex disabilities or chronic disease, or suspected child abuse.

Chapter Seven: Stabilising and Treating an Ill or Injured Child

1. Following any major paediatric resuscitation, a system should be in place for staff and family to be offered debriefing and if required, further counselling should be available.
2. A “difficult airway” cart should be available.
3. Parents and family should be given the opportunity to remain present during resuscitation of a child.

Chapter Eight: The Staffing of an Emergency Department

1. A core body of medical and nursing should be contracted specifically to the ED full time, for smooth running and high quality of care.
2. In larger EDs for mixed-age patients, there should be a core team of staff skilled in providing emergency care for sick and injured paediatric patients.
3. Staff rosters should take into account peaks and troughs of paediatric arrivals, the need for supervision of junior doctors, and the paediatric skill sets of the staff on any given shift.
4. ED staff mental health and welfare needs to be considered a priority and the ED should have staff retention policies in place to prevent loss of experienced staff due to stress and fatigue.

Chapter Nine: Staff Training and Competencies

1. Staff should also complete educational courses that deal specifically with all aspects of ED work, including advanced resuscitation, teamwork skills, risk management and evidence-based practice.
2. Individual EDs should program their learning activities to maximise attendance of ED staff whilst maintaining quality care in the ED at all times.
3. The education program should incorporate best practice in education, and be delivered by a team of ED staff.
4. Teaching of all team members should occur as a team, teaching both doctors and nurses together (inter-professional education).

Chapter Ten: Emergency Department Equipment, Supplies & Medications

1. Mobile paediatric resuscitation trolleys should be immediately accessible in any

- location in which a child could deteriorate.
2. Checklists for equipment, supplies and medications should be used, to reduce the risk of missing items.
 3. Resources to aid preparation of medications should be readily available.
 4. Other centers in the regional network should provide expertise and support to their affiliated EDs in developing consistency of equipment and medications.
 5. Medications and equipment should ideally match those used in allied departments (e.g. operating theatres, intensive care unit).

Chapter Eleven: Quality & Safety

1. Processes for safe medication storage, prescribing, and administration should be established and should include the use of pre-calculated dosing guidelines for children of all ages.
2. Infection-control practices, including hand hygiene and use of personal protective equipment, should be implemented and monitored.
3. Policies for reporting and evaluating of patient safety events, including medical error or unanticipated outcomes should be implemented and monitored; training should be given to those who are assigned this responsibility.
4. Components of the ED paediatric quality improvement plan should interface with pre-hospital, in-patient paediatric, and hospital-wide quality improvement activities.

Chapter Twelve: Policies, Procedures & Guidelines

1. Policies should be compatible and preferably collaborative across the regional network.
2. Clinical guidelines should be symptom based unless there is a high degree of paediatric emergency medicine expertise available.

Chapter Thirteen: Information System and Data Analysis

1. ED's should exploit information technology to achieve full computerisation for cost effective patient care, reduce medical errors, and promote patient safety.
2. Full electronic connectivity for all ED work should ideally be integrated, from patient arrival to discharge.
3. In fully electronic clinical systems paediatric specific templates for history and physical findings should be considered.
4. Computerised clinical guidelines and pathways should include information about common paediatric specific conditions.
5. Paediatric specific formularies and order sets should assist daily practice

6. The ED computer system should collect sufficient data for disease and injury surveillance.
7. Paediatric specific data should be generated to aid clinical quality improvement and research.

Chapter Fourteen: Pre-Hospital Care

1. All pre-hospital staff should have access to memory aids for drugs and treatment algorithms and ideally have a standardised formulary so that all medications for care of children of variable weights can be pre-calculated so that the provider will have easy access to appropriate doses immediately and without the need for calculation.
2. EMS services should standardise and agree with the hospitals in the network, how they will share patient information and which facilities should receive the spectrum of patients they transport.
3. ED staff and/or EMS physicians should support EMS services in quality improvement and education for paediatric emergencies.
4. A paediatric emergency care coordinator (PECC) should work collaboratively with EMS system administrators to ensure paediatric readiness of the prehospital care system.

Chapter Fifteen: Mass Casualty Incidents and Patient Surges Involving Children

1. MCI/Major incident care processes should try to keep children and families together if feasible, and support identification, tracking and timely reunification of unaccompanied children with family.
2. The principles of management of adults in patient surges / MCI/Major incident should form the basis of paediatric casualty management, recognising the additional psychological difficulties.
3. The regional network should collaborate to promote preparedness, and disaster drills involving sufficient numbers of children should test readiness.

Chapter Sixteen: Safeguarding Children & Young People

1. Clear protocols, supported by simple flowcharts and checklists, should be available in the ED. This will improve awareness, identification and documentation of cases.
2. Forensic photographs should not be delayed (within the confines of local policy) as injuries may change in appearance.
3. The ED should have access to sources of information about the child's welfare.
4. Collaboration with an experienced multidisciplinary team is strongly recommended, in order to better identify those children who are at risk of abuse or those who have suffered from abuse.

5. The medical evaluation of children who are suspected of having been abused should be performed by clinicians skilled in both paediatrics or paediatric emergency medicine and child abuse evaluation.
6. Clinicians should participate at all levels of prevention by providing prenatal and postnatal family counselling, identifying problems in child-rearing and parenting, and advising about family planning and birth control.
7. Public health measures such as home visits by nurses and other health professionals, anticipatory guidance by parents, and well-infant and well-child examinations should be encouraged by clinicians, where appropriate, working in Emergency Departments. Programs that improve the child's general health also tend to prevent child abuse in all its forms and should be supported by clinicians.
8. The undergraduate curriculum must include a mandatory course on child abuse, in all its forms, within the paediatrics program, that can be developed within postgraduate and continuing medical education for those intending to work within this field.

Chapter Seventeen: Adolescents, Mental Health & Substance Misuse

1. Education programs should include causes, signs and symptoms and optimal management of children with mental ill-health/substance misuse.
2. Adequate space should be available for children/families in crisis; and should include a private room with suitable supervision by emergency staff.
3. If a child/young person needs to remain in the ED due to an absence of inpatient facilities there should be clear parameters for maintaining comfort and safety of the patient, staff and public.
4. Protocols, clinical pathways and assessment tools to improve care for young people in mental health crisis should be established.

Chapter Eighteen: Death of a child in the Emergency Department

1. EM staff should respect parents desire to remain at the child's bedside during resuscitation.
2. Staff physicians should give families every consideration at the moment of informing them of their child's death; the place where this is done should be quiet and free of other people.
3. Families should be given the opportunity of seeing and holding the deceased child.
4. A member of the staff should accompany the family while they stay in the ED and help them with funeral arrangements, respecting social, religious, and cultural diversity.
5. An ED representative should notify the child's primary care physician of the death, and liaise with him/her in follow-up of postmortem examination results.

6. Policies and checklists for the ED should be available to ensure the taking of adequate records, which are important for medical and legal reasons.
7. Staff training sessions and clinical case discussions should include resuscitation scenarios resulting in death, and ensure staff are confident with death notification, organ donation laws and procedures.

Chapter Nineteen: Advanced Training and Academic Research

1. Development of international PEM research networks should be supported to increase the capacity for high level research performed worldwide.
2. PEM staff should be given support to learn skills to lead both educational and research activities.
3. Senior staff leading research should be receive formal training in research design and statistics.
4. Countries with established PEM training programs should assist in training physicians in the specialty worldwide and share best practice.
5. Countries with established EM training programs should incorporate PEM training programs modeled after existing programs (e.g. the Unites States, Canada, the UK and Australia).

Abbreviations

LIST OF ABBREVIATIONS

Paediatric Emergency Medicine Special Interest Group: IFEM



ALARA:	As Low As Reasonably Possible
ALS:	Advanced Life Support
APLS:	Advanced Paediatric Life Support Course
BLS:	Basic Life Support
CBRNE:	Chemical-Biological-Radiological-Nuclear-Explosive
CFCC:	Child and Family-Centred Care
CPR:	Cardiopulmonary resuscitation
CRM:	Crisis Resource Management
CT:	Computed Tomography
ED:	Emergency Department

EDIS:	Emergency Department Information System
EM:	Emergency Medicine
EMJ:	Emergency Medicine Journal
EMS:	Emergency Medical Service
EMT:	Emergency Medical Technician
ENT:	Otolaryngologist (Ear, Nose, Throat)
ETAT:	Emergency Triage Assessment and Treatment
ETAT:	World Health Organisation Emergency Triage Assessment & Treatment
ETCO²:	End Tidal Carbon Dioxide
GCP:	Good Clinical Practice
GCRP:	Good Clinical Research Practice
HEADSS:	H ome, E ducation (Employment, Eating Exercise), A ctivities and Peer Relationships, D rug use (Cigarettes/Alcohol), S exuality, S uicide (Depression/Mood)
HIC:	High-Income Countries
ICD:	International Classification of Disease
IFEM:	International Federation for Emergency Medicine
ILCOR:	International Liaison Committee on Resuscitation
IMCI:	Integrated Management of Childhood Illnesses
IOM:	(report US) Institute of Medicine
IOM:	Institute of Medicine
IOM:	The United State Institute of Medicine
IT:	Information Technology
IV:	Intra Venous
LMIC:	Low and Middle-Income Countries
MCI:	Mass Casualty Incident
MDG:	Millennium Development Goal
MRI:	Magnetic Resonance Imaging
NAEMSO:	National Association of State EMS Officials
PALS:	Paediatric Advanced Life Support Course
PAT:	Patient Assessment Triangle
PAWPER:	The Paediatric Advanced Weight Prediction in the Emergency Room
PECARN:	Paediatric Emergency Care Applied Research Network
PEC:	Paediatric Emergency Care
PECC:	Paediatric Emergency Care Coordinator
PEM CRC:	Paediatric Emergency Medicine Collaborative Research Committee
PEM:	Paediatric Emergency Medicine
PEMC:	Paediatric Emergency Medicine Course
PEMSIG:	Paediatric Emergency Medicine Special Interest Group
PEPP:	Paediatric Education for Prehospital Professionals
PERC:	Paediatric Emergency Research Canada
PERN:	Paediatric Emergency Research Network

PERUKI: Paediatric Emergency Research in the United Kingdom & Ireland

PH: Public Health

PHC: Primary Health Care

PREDICT: Paediatric Research in Emergency Departments International Collaborative

Regional Network: The arrangements of provision of care between primary care, other forms of health and social care, and the different hospitals neighboring each other.

REPEM: Research in European Paediatric Emergency Medicine

ROSC: Return of Spontaneous Circulation

SATS: South African Triage Scale

SDG: Sustainable Development Goal

UK RCPCH: United Kingdom Royal College of Paediatrics and Child Health

UN: United Nations

USA: United State of America

WHO: World Health Organization

WMA: The World Medical Association

medications

Paediatric Emergency Medicine Special Interest Group: IFEM



*The following lists are suggestions compiled from several sources.
Other lists do exist (see Appendix 2 Useful Resources).*

Paediatric specific medications and equipment are underlined italic.

Drugs and equipment for resuscitation and stabilisation areas.

Immediate Availability in Standardised Resuscitation Carts

- Epinephrine (Adrenaline) 1:10,000
- Epinephrine (Adrenaline) 1:1,000
- Adenosine
- Atropine sulphate
- Lidocaine 1% (lignocaine)
- Amiodarone
- Calcium chloride 10%
- Sodium bicarbonate 4.2% and 8.4%
- Nebulisable beta agonist (salbutamol, albuterol, or terbutaline)
- Nebulised Budesonide
- Hydrocortisone
- Furosemide (frusemide)
- Antibiotics customised to local microbiology
- Rectal diazepam 5mg and 10mg
- diazepam, lorazepam and/or midazolam
- phenytoin sodium
- fosphenytoin
- IM paraldehyde
- Dextrose 10%, 50%
- Naloxone

Drugs for procedural sedation and analgesia, and rapid sequence intubation

- Etomidate
- Midazolam
- Thiopental (thiopentone)
- Suxamethonium
- Propofol
- Rocuronium, Vecuronium, Atracurium Ketamine
- Morphine
- Nitrous oxide

Drugs for post –resuscitation stabilisation

- Adenosine
- Alprostadil (prostaglandin E1)
- Aminophylline
- Amiodarone
- Dobutamine
- Dopamine
- Digoxin
- Diuretic- Frusemide
- Flumazenil
- Soluble Insulin
- Beta Agonist eg. salbutamol
- Mannitol 10% and 20%
- Midazolam
- Norepinephrine (noradrenaline)
- Propranolol
- Magnesium sulphate
- Procainamide
- Parenteral antibiotics
- phenytoin
- phenobarbitone
- Antidiotes*
- Antihypertensives

High Alert Medications Kept Separately

- KCL 7.45%
- NACL 20%
- MGS04 49.3%
- NACL 3%
- HEPARIN 1000U/ML

- Hemostatics – systemic, topical, Factor 8, 9, Fresh Frozen Plasma/ Platelets

Drugs for treatment in the ED

- Note: These medicines may need not be stocked within the ED, but should be readily available when needed on a 24-7 basis.
- Antidotes (e.g. N Acetylcysteine, Glucagon, Calcium Gluconate)
- Antivenins (with charts and administration and preparation dilution guides to guide infrequent usage)
- Antihistamines
- Anti-infective agents – systemic/ topical - may also include;
 - paediatric formulations of post –exposure prophylaxis (PEP) for presumptive treatment of sexually transmitted infections, including *Neisseria gonorrhoeae* (cefixime) and *Chlamydia trachomatis* (Azithromycin), and prevention of transmission of HIV (zidovudine and lamivudine)
- Antimalarials in endemic areas. Fixed-dose antimalarial combination artemether + lumefantrine (20 mg + 120 mg tablets for infants and children weighing 5–14 kg), artemether injection (20 mg/ml), for the treatment of malaria due to *Plasmodium falciparum*
- Anti-inflammatories – steroidal and non –steroidal
- Anaesthetics – topical, infiltrative,
- Antiemetics: Ondansetron/Domperidone
- Activated charcoal
- Antacids
- Analgesics - topical, oral and parenteral – narcotic and non narcotic
- Antipyretics
- Benztropine/ Diphenhydramine IV for oculogyric crisis
- Bowel evacuants/ laxatives
- Bronchodilators
- Emergency contraception (PEP for victims of sexual assault)
- Haloperidol
- Oral Replacement Solutions
- Proton pump inhibitors
- Zinc sulfate (20 mg dispersible, tablets), and oral rehydration salts (ORS) sachets (developing countries)
- Vaccines and Toxoids e.g. tetanus toxoid, Rabies vaccine and immunoglobulin*
- IV infusion fluids – various types, including electrolyte replacements, including compound solution of sodium lactate

- **EYE / ENT / External Preparations**
- Amethocaine 1% (minims)
- Oxymetazoline
- Sodium Chloride 0.9% eye drops
- Co-phenylcaine Forte spray (50ml)
- Fluorescein
- Chlorotetracycline 1% eye ointment / Chloramphenicol eye drops
- Chlorhexidine 0.05% (100ml)
- Chlorhexidine 4% scrub (500ml)
- Chlorhexidine handrub (500ml)
- Blood Glucose test strips
- Lignocaine 2% jelly
- Povidone iodine solution
- Surgical lubricant 42g
- Silver nitrate sticks
- Silver Sulphadiazine
- Topical anaesthetic cream (EMLA 5%/ Amethocaine)

Equipment

General Equipment

- APLS/good practice algorithms
- Organised emergency trolley / cart
- Printed drug doses/ equipment size tape or tables.
- Clock with second hand
- Weighing scale for infants and children (preferably electronic, in kilograms only, without concurrent readings in pounds to minimise risks of errors)
- Paediatric Specific Resuscitation and monitoring charts: vital signs, GCS scores, Equipment, Drugs stat doses and infusion.
- Pain scale assessment tools appropriate for age.
- Patient warming device
- Intravenous blood/ fluid warmer
- XRay view box or PACS computer system
- Eye chart
- Pliers and Wire cutters – for removal of rings and stuck zippers

Equipment for secondary and tertiary level ED

- Slit lamp with tonometer – handheld portable, and standing non-

- portable Portable ultrasound with vascular Doppler
- Fluoroscopy for fracture reduction
- Continuous nitrous oxide equipment with scavenger capabilities

Monitoring equipment

- ECG monitor/defibrillator with paediatric paddles and pads, 0–400 joules, external cardiac pacing capabilities and hard copy capabilities
- Pulse oximeter (with adult/paediatric probes)
- Noninvasive blood pressure monitoring with appropriate sized cuffs (infant, child, adult, thigh)
- Digital Axillary, rectal and tympanic membrane thermometer. (+Hypothermia thermometer for ED's in temperate countries)
- Otoscope, ophthalmoscope
- Stethoscope
- Cardiopulmonary monitor
- Access to 12 lead ECG
- Portable continuous end tidal CO₂ monitoring device*
- Doppler Ultrasound devices*
- Arterial/capillary blood glucose monitor*
- Access to blood gas machine*
- Bedside blood gas / electrolyte test machine
- Rapid diagnostic tests (RDTs) for suspected malaria in endemic areas

Airway Control/Ventilation Supplies and Equipment

- Self inflating Bag-valve-mask device: paediatric (500 mL), and adult (1000/2000 mL) with oxygen reservoir, infant, child, and adult masks
- Oxygen delivery device with flow meter
- Clear oxygen masks, standard and non-rebreathing (infant, child, adult)
- Nebuliser masks child and adult)
- Space chamber for delivery of metred dose inhaler medications with appropriate size masks
- Nasal cannula (infant, child, adult)
- Oropharngeal airways (sizes 0–5)
- Suction devices-catheters 6–14 fr yankauer-tip
- Nasopharngeal airways (infant, child, adult)
- Nasogastric tubes (sizes 6- 18 fr)
- Laryngoscope handle and blades: curved 2,3; straight or Miller 0,1,2,3
- Endotracheal tubes: uncuffed (2.5 and 3.0), cuffed or uncuffed (3.5 – 5.5), cuffed (6.0 – 8.0)

- Stylets for endotracheal tubes (paediatric, adult)
- Lubricant, water soluble
- Magill forceps (various sizes)
- Laryngeal masks airway (size 1, 1.5, 2, 2.5, 3, 4, and 5)
- Tracheostomy tubes (shiley sizes 0–6)
- Oxygen hoods
- Oxygen blender
- Paediatric ventilators*
- Closed Chest drainage set
- Emergency thoracotomy instruments and supplies, chest tube sizes infant : 10-12 F, children 16/24F, adult 28-40F
- Cricoidotomy set

Vascular Access Supplies and Equipment:

Note: All vascular access supplies should be disposable, single use.

- Butterflies (19–25 gauge)
- Needles (18–27 gauge)
- Intraosseous needles (paediatric and adult sizes)
- NOTE:
 - 1st choice needle for intraosseous infusion is a purpose-made IOL needle but if these are not available – alternatives must be present.
 - 2nd choice is the 18G bone-marrow aspiration needle
 - 3rd choice is the 18G short spinal needle
 - Last choice is 18-21G plain needle.
- Catheters-over-the-needle devices for intravenous lines (14–24 gauge)
- Cardiac compression board
- Arm boards for immobilisation of IV site (infant, child and adult sizes)
- IV administration sets and extension tubing with calibrated chambers, with ability to regulate rate and volume of infusate.
- Umbilical vein catheters (3.5F and 5.0F)
- Central Venous Catheters (4.0 – 7.0 Fr) and kits
- Paediatric infusion pumps
- Syringe drivers
- I.V. fluids
- Lumbar puncture set
- Urinary catheters: Foley 6–18 Fr

Fracture immobilisation:

- Cervical Collars – hard and soft, paediatric sizes
- Spinal board (child/adult)

- Femur splint (child/ adult)
- Extremity splints
- Cast and splint application supplies and equipment (various sizes)
- Cast cutter, cast spreader
- Crutches(various sizes)

Sterile procedure sets and instruments:

- Lumbar Puncture sets with infant and paediatric (22 gauge), and adult (18-21 gauge) lumbar puncture needles *(LP's not done in the ED setting in some places)
- Difficult airway : laryngeal mask airways, needle cricothyrotomy supplies, surgical thyrotomy kits (various sizes)
- Tube thoracostomy tray.
- Urinary catheterisation kits and urinary catheters (in dwelling) : 6-22 French
- Newborn delivery kits, including equipment for initial resuscitation of the new born, umbilical clamp, scissors, bulb syringe, towel, transparent cling wrap (for maintenance of body temperature in premature infants during transportation)
- Incision and Drainage sets
- Dressing sets
- Toilet and Suture Sets (standard, and fine instruments for repair of facial and finger wounds)
- Sexual assault evidence-collection kits
- Dental sets – complexity of equipment depending on the level of paediatric dental capabilities and support
- Eye Speculums (various sizes)
- Demarre eye Retractors
- Tarsal Cyst forceps
- Jobsen's ear probes
- Nasal speculums (various sizes)
- Squire's Hook
- Magill's suction tubes
- Frazer Suction Tubes (size 3- 10 Fr)
- Tilleys' forceps – various sizes for removal of foreign bodies
- Laryngoscopic mirror (also known as Dental mirror)

Appendix 2
Useful Resources

Paediatric Emergency Medicine Special Interest Group: IFEM



CHAPTER 3 Challenges Facing Paediatric Emergency Medicine

Standards for Children and Young People in Emergency Care Settings (third edition) 2012. Royal College of Paediatrics and Child Health.
www.rcpch.ac.uk/emergencycare

American Association of Paediatrics policy statement on Care of Children in Emergency Departments, 2009, Krug S, Gausche-Hill M. Guidelines for care of children in emergency departments. Paediatrics 2009;124:1233-1243.
<http://aappolicy.aappublications.org/cgi/content/full/paediatrics;107/4/777>

Krug S, Gausche-Hill M. Guidelines for care of children in emergency departments. American Association of Paediatrics policy statement on Care of Children in Emergency Departments Ann Emerg Med 2009; 54:543-52.

Policy Statement: Care of Children in the Emergency Department: Guidelines for Preparedness. Ann Emerg Med 2001;37:423-428.

Luaces Cubells C, Ortis Rodriguez J, Trenchs Sainz de la Maza V, Pou Fernández J y Grupo de trabajo de calidad de la Sociedad Española de Urgencias de Paediatría (SEUP). Encuesta nacional sobre las urgencias pediátricas. Aspectos organizativos y funcionales. Emergencias 2008;20: 322-327.
<http://www.seup.org/seup/html/pub/publicaciones.htm>

CHAPTER 4 An Integrated Service Design

Emergency Care Framework for Children and young people in Scotland. Scottish Executive, Edinburgh 2006

<http://www.scotland.gov.uk/Publications/2006/09/19153348/>

Normas y estándares de acreditación para servicios de urgencias pediátricas y centros de instrucción en Medicina de urgencias pediátricas. SOCIEDAD ESPAÑOLA DE URGENCIAS PAEDIATRICAS (SEUP).

www.seup.org/seup/pdf/publicaciones/estandar_acreditacion.pdf

Unidad de urgencias hospitalaria Estándares y recomendaciones.

https://seup.org/pdf_public/gt/mejora_acred_seup.pdf

www.seup.org/seup/pdf/publicaciones/er.urgencias.pdf

CHAPTER 5 Child and Family Centered

American Academy of Paediatrics Steering Committee on Quality Improvement and Management and Committee on Hospital Care. Principles of paediatric patient safety: reducing harm due to medical care. Paediatrics 2011; 127:1199-210.

Frush K, Krug SE. American Academy of Paediatrics, Committee on Paediatric Emergency Medicine. Patient safety in the paediatric emergency care setting. Paediatrics 2007;120:1367-75.

Gausche-Hill M, Krug S, American Academy of Paediatrics, Committee on Paediatric Emergency Medicine, American College of Emergency Physicians, Paediatric Committee and Emergency Nurses Association Paediatric Committee. Guidelines for care of children in the emergency department. Paediatrics 2009; 124:1233-43.

Institute of Medicine Committee on Paediatric Emergency Medical Services.

Emergency care for children: growing pains. Washington, DC: National Academies Press, 2006.

Emergency Nurses Association. Family-centered care tool for the emergency department. <http://www.ena.org/IQSIP/Practice/Pages/PedCare.aspx>

Woodward T. Communication involving paediatric patients and their families in the ED and beyond, in Krug SE. Paediatric Patient Safety in the Emergency Department.

Oakbrook Terrace, IL: Joint Commission Resources, 2010.

Yamamoto LG. Treating children with special health care needs in the ED, in Krug SE. Paediatric Patient Safety in the Emergency Department. Oakbrook Terrace, IL: Joint Commission Resources, 2010.

Child Life Services. Child Life Council, American Academy of Paediatrics Committee on Hospital Care. Paediatrics 2006; 118(4):1757-63.

CHAPTER 6 Initial Assessment of an Ill or Injured Child

Dieckmann RA, Brownstein D, Gausche-Hill M. The paediatric assessment triangle: a novel approach for the rapid evaluation of children. *Paediatr Emerg Care*. 2010 Apr;26(4):312-5.

Manchester Triage Group Staff; Windle Jill, Mackway-Jones, Kevin; Marsden, Janet (2006). *Emergency triage*. Cambridge, MA: Blackwell Pub. ISBN 0-7279-1542-8.
South African Triage Scale: <http://emssa.org.za/sats/>

World Health Organisation Emergency Triage Assessment and Treatment (ETAT) Course
[http://www.who.int/child_adolescent_health/documents/9241546875/en/index.ht](http://www.who.int/child_adolescent_health/documents/9241546875/en/index.html)

ml

Canadian Paediatric Triage and Assessment Scale. <http://caep.ca/resources/ctas>

College of Emergency Medicine (UK) Guideline for the Management of Pain in Children, 2010 <http://www.collemergencymed.ac.uk/Shop-Floor/Clinical%20Guidelines>

Spotting the Sick Child (UK Department of Health e-learning package)
<http://spottingthesickchild.com>

CHAPTER 7 Stabilising and Treating and Ill or Injured Child

Advanced Paediatric Life Support: the practical approach. 5th edition. Advanced Life Support Group. BMJ Books - Publ John Wiley & Sons (Wiley-Blackwell) ISBN: 978-1- 4443-3059-5

Short Stay Paediatric Assessment Units: Advice for Commissioners and Providers, RCPCH, 2009.
<http://www.rcpch.ac.uk/sites/default/files/Short%20Stay%20Paediatric%20Assessment%20Units.pdf>

Spotting the Sick Child (UK Department of Health e-learning package)
<http://spottingthesickchild.com>

CHAPTER 8 The Staffing of an Emergency

Standards for Children and Young People in Emergency Care Settings (third edition) 2012. Royal College of Paediatrics and Child Health.
www.rcpch.ac.uk/emergencycare

American Association of Paediatrics policy statement on Care of Children in Emergency Departments, 2009, Krug S, Gausche-Hill M. Guidelines for care of children in emergency departments. Paediatrics 2009;124:1233-1243.
<http://aappolicy.aappublications.org/cgi/content/full/paediatrics;107/4/777>

Bello O., Sehabiague G., Prego J., de Leonardis D. Paediatría, Urgencias y Emergencias 3° ed. 2009. Chapter 1: Organización de un Departamento de Emergencia Pediátrica. Ed Bibliomédica. Montevideo, Uruguay.

Guidelines on constructing an Emergency Medicine Medical Workforce.
Australasian College for Emergency Medicine www.acem.org.au

CHAPTER 9 Staff Training and Competencies

Maximising nursing skills in caring for children in emergency departments, RCN / RCPCH, 2010. http://www.rcn.org.uk/_data/assets/pdf_file/0009/323577/003821.pdf

Rogers RL, Mattu A, Winters M, Martínez J (2009). Practical Teaching in Emergency Medicine. Wiley-Blackwell Ltd.

Spotting the Sick Child (UK Department of Health e-learning package)
<http://spottingthesickchild.com>

Resuscitation courses and online resources about resuscitation

- <http://www.apls.org.au/index.htm>
- <http://www.alsg.org/en/?q=apls>
- http://www.heart.org/HEARTORG/CPRAndECC/HealthcareTraining/Paediatrics/Paediatric-Advanced-Life-Support-PALS_UCM_303705_Article.jsp
- http://www.heartandstroke.com/site/c.ikiQLcMWJtE/b.3484049/k.9A5F/CPR_courses.htm#PALS
- http://www.advancedlifesupport.co.za/course04_PALS.cfm
- <http://www.aplonline.com>
- <http://www.ena.org/coursesandeducation/catnii-enpc-tncc/enpc/Pages/Default.aspx>
- http://www.resus.org.au/policy/guidelines/section_10/bls_training.htm
- <http://resuscitation-guidelines.articleinmotion.com/article/S0300-9572%2810%2900440-5/aim/>

“How to Teach” resources

Barnes BE (1998). Creating the practice-learning environment: using information technology to support a new model of continuing medical education. Academic Medicine: 1998, 73(3):278-81]

Barrows HS, Tamblyn RM (1980). Problem-based learning: an approach to medical education . Springer Publishing Company Inc.

Jordan RK, Spencer JA (1999). Learner centred approaches in medical education. BMJ 1999;318:1

Mancini ME, Soar J, Bhanji F, Billi JE, Dennett J, Finn J, Ma M, Perkins GD, Rodgers DL, Hazinski MF, Jacobs I, Morley PT; on behalf of the Education, Implementation, and Teams Chapter Collaborators. Part 12: education, implementation, and teams: 2010 International Consensus on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science With Treatment Recommendations. Circulation. 2010;122(suppl 2):S539 –S581.

CHAPTER 10 Equipment, Supplies and Medications (see also Appendix 1)

Joint Commission International Accreditation Standards for Hospitals 4th Edition. Effective 1 January 2011. © 2010 Joint Commission International. ISBN: 978-1-59940-434-9

Emergency Department Planning and Resource Guidelines. Ann Emerg Med. 2008;51:687-695.

Standards for the Care of Critically Ill and Critically Injured Children in the West Midlands. Version2. West Midlands Strategic Commissioning Group. May 2004.

The Interagency Emergency Health Kit 2011. Medicines and medical devices for 10 000 people for approximately three months. World Health Organisation, International Committee of the Red Cross, International Federation of Red Cross and Red Crescent Societies, Médecins Sans Frontières, United Nations Children's Fund, United Nations Population Fund, United Nations High Commissioner for Refugees.

WHO web site (www.who.int). ISBN 978 92 4 150211 5

CHAPTER 11 Quality and Safety

Frush K, Krug S. American Academy of Paediatrics Committee on Paediatric Emergency Medicine. Patient safety in the paediatric emergency care setting. Paediatrics 2007; 120:1367-75.

American Academy of Paediatrics Steering Committee on Quality Improvement and Management, Committee on Hospital Care. Policy statement – principles of paediatric patient safety: reducing harm due to medical care. Paediatrics 2011; 127:1199-210.

Indicadores pediátricos para medir los criterios de calidad de la atención sanitaria. Sociedad Española de Urgencias de Paediatría.

<http://www.seup.org/seup/pdf/publicaciones/indicadoresCalidad.pdf>

CHAPTER 12 Policies, Procedures and Guidelines

<http://www.acep.org>

<http://www.acem.org.au>

<http://www.collemergencymed.ac.uk>

<http://www.caep.ca>

CHAPTER 13 Information Systems and Data Analysis

ICD-Based Diagnosis Grouping System (DGS) for child ED visits. Paediatric Emergency Care applied Research Network.

<http://www.pecarn.org/tools/index.html>

Codificación diagnóstica en urgencias de Paediatría. Sociedad Española de Urgencias pediátricas.

http://seup.org/seup/html/gtrabajo/cod_diagnostica.htm

Krug E. Injury Surveillance Guidelines. 2012.

http://www.who.int/violence_injury_prevention/publications/surveillance/surveillance_guidelines/en/index.html (accessed 8 June 2012).

<http://www.analesdepediatria.org/es-codificacion-diagnostica-urgencias-pediatria-articulo-S1695403300774558>, accessed March 07th, 2019

CHAPTER 14 Pre-Hospital Care

Schwartz D, Amir LD, Krieger D, Waisman Y. "Paediatric Care in EMS".(2010). In, EMS: A Practical Global Guidebook. Eds. Tintinelli JE, Cameron P, Holliman CJ, People's Medical Publishing House, Shelton, CT, USA.

Trauma, A. C. o. S. C. o., A. C. o. E. Physicians, et al. (2009). "Equipment for Ambulances." Paediatrics 124(1): e166-e171.

Spotting the Sick Child (UK Department of Health e-learning package)

<http://spottingthesickchild.com>

CHAPTER 15 Mass Casualty/Patients Surges

AAP Disaster Website. Children & Disasters. Disaster preparedness to meet children's needs. Available at: <http://www.aap.org/disasters/index/cfm>

National Commission on Children and Disasters. 2010 Report to the President and Congress. Available at: <http://archive.ahrq.gov/prep/nccdreport/>

Hirschberg A, Stein M. Trauma care in mass casualty incidents. In Feliciano DV, Mattox KL, Moore EE, ed. Trauma, ed. 6, New York, NY: McGraw Hill, 2008.

Planning, Response, and Recovery Efforts. Available at:
<http://www.aap.org/advocacy/releases/opinionpoll102210.htm>

EMSC Paediatric Disaster Guidelines for Hospitals,
<http://www.emsa.ca.gov/pubs/docs/EMSA198.pdf>, accessed 6-12-2012.

The JumpSTART Paediatric MCI Triage Tool. Available at:
http://www.jumpstarttriage.com/JumpSTART_and_MCI_Triage.php

CHAPTER 16 Safeguarding/Protecting Children & Young People

FACT SHEET: A summary of the rights under the Convention on the Rights of the Child www.unicef.org/crc/files/Rights_overview.pdf

National Institute of Clinical Excellence (NICE) Clinical Guideline 89. When to suspect Child Maltreatment. <http://guidance.nice.org.uk/CG89>

Systematic reviews of bruising, fractures, head and spinal injuries, oral injuries and bites. Cardiff Child Protection Systematic Reviews (Core Info). <http://www.core-info.cf.ac.uk>

CHAPTER 17 Adolescents, Mental Health and Substance Abuse

Chin R, Fairley M (2012) Paediatric psychiatric emergencies in Cameron P, Jelinek G, Everitt I, Brown G, Raftos J (ed) Textbook of Paediatric Emergency Medicine (2nd ed), Churchill Livingstone: London

Cohen E, Mackenzie RG, Yates GL (1991) HEADSS, a psychosocial risk assessment instrument: implications for designing effective intervention programs for runaway youth. Journal of Adolescent Health, 12(7): 539-544.

CHAPTER 18 Death of a Child in the Emergency Department

Biarent D, Bingham R, Eich C, López-Herce J, Maconochie I, Rodríguez-Núñez A, Rajka T, Zideman D. European Resuscitation Council Guidelines for Resuscitation 2010. Section 6. Paediatric life support. Resuscitation 2010; 81:1364-1388

Death of a child in the Emergency Department. Joint Statement by the American Academy of Paediatrics and the American College of Emergency Physicians. Paediatrics Volume 110, Number 4 October 2002, pp 839-840

Sudden unexpected death in infancy: A multi-agency protocol for care and investigation. The report of a working group convened by The Royal College of Pathologists and The Royal College of Paediatrics and Child Health, 2004
<http://www.rcpath.org/NR/rdonlyres/30213EB6-451B-4830-A7FD-4EEFF0420260/0/SUDIreportforweb.pdf>

CHAPTER 19 Advanced Training and Academic Research

ACEM/RACP joint training program in paediatric emergency medicine for Aust/NZ
<http://www.racp.edu.au/index.cfm?objectid=C97BF599-942C-CFCB-6EECCC3C6B861A12> (accessed 29 Sep 2011).

ACGME Program Requirements for Graduate Medical Education in Paediatric Emergency Medicine in USA
http://www.acgme.org/acWebsite/downloads/RRC_progReq/114_pr707.pdf
(accessed 11 Dec 2011).

Royal College of Physicians and Surgeons of Canada: Subspecialty Training Requirements in Paediatric Emergency Medicine:
http://rcpsc.medical.org/residency/certification/training/pedemerg_e.pdf (accessed 11 Dec 2011)

UK College of Emergency Medicine: Paediatric subspecialty training curriculum
<https://secure.collemergencymed.ac.uk/code/document.asp?ID=5615> (accessed 11 Dec 2011)

Curriculum for Paediatric Training Paediatric Emergency Medicine Level 1, 2 and 3 Training, CEM and RCPCH, 2010.
<http://www.rcpch.ac.uk/sites/default/files/2010%20Paediatric%20Emergency%20Medicine%20curriculum.pdf>

A Framework of competences for Level 3 training in paediatric emergency medicine, RCPCH, 2008.
<http://www.rcpch.ac.uk/sites/default/files/Framework%20of%20Competences%20Level%203%20-%20Emergency%20Medicine.pdf>
International Federation for emergency medicine model curriculum for emergency medicine specialists. Canadian Journal of Emergency Medicine. 2011;13(2):109-121.

Research networks for PEM

PERC – www.perc.srv.ualberta.ca
PERCARN – www.pecarn.org
PREDICT – www.pems-aunz.org/PREDICT
REPEM – www.eusem.org/paediatric section

PEM - CRC – www.pemcrc.org

Appendix 3

Authors

Paediatric Emergency Medicine Special Interest Group: IFEM



Prof. Franz Babl MD, MPH, DMedSc, FRACP, FAAP, FACEP

Professor of Paediatric Emergency Medicine, University of Melbourne
Paediatric Emergency Physician, Royal Children's Hospital
Head, Emergency Research, Murdoch Children's Research Institute
Vice-chair, PREDICT

Dr. Heloise Buys

Head of Clinical Unit
Ambulatory and Emergency Paediatrics
Red Cross War Memorial Children's Hospital
Department of Paediatrics and Child Health
University of Cape Town

Dr. Liliana Caceres, MD

Chief Pediatric Clinics
Hospital J. P. Garrahan
Past-President Argentine Emergency Medicine Society

Dr. Baljit Cheema, MD

Emergency Medicine Society of South Africa – SOUTH AFRICA
Clinical Lead, Specialised Paediatric Retrieval Including Neonatal Transfer (SPRINT) Team
Paediatric Emergency Senior Specialist, METRO EMS, Western Cape Health
Senior Lecturer, Division of Emergency Medicine, University of Cape Town

Dr. Simon Chu, MBBS, DCH, FACEM, MMed

Senior Lecturer, Faculty of Health and Medical Sciences, University of Adelaide
Senior Emergency Medicine Consultant, Lyell McEwin Hospital, Elizabeth Vale. South Australia

Dr. Ffion Davies, FRCPCH, FRCM

Emergency Physician
Chair, Clinical Practice Committee IFEM
University Hospitals of Leicester, UK

Dr. Sashikumar Ganapathy MB, BCh, BAO, MRCPCH (UK)

Consultant, Emergency Medicine, KK Women's and Children's Hospital
Adjunct Assistant Professor at Duke-NUS Medical School
Adjunct Assistant Professor at YLL School of medicine, NAtional University of Singapore
Adjunct Assistant Professor at LKC School of Medicine, NTU Singapore

Dr. Marianne Gausche-Hill, MD, FACEP, FAAP, FAEMS

Professor of Emergency Medicine and Pediatrics, David Geffen School of Medicine at UCLA
Harbor-UCLA Medical Center, Departments of Emergency Medicine and Pediatrics
American College of Emergency Medicine- USA

Dr. Camilo E Gutierrez MD, FACEP, FAAEM

Chair, PEMSIG
Director, Global Health Programs
Children's National Medical Center
Division of Emergency Medicine
George Washington University School of Medicine and Health Sciences

Felix Hay RNC, Bsc Hons, MMed Sci

Paediatric Advanced Nurse Practitioner in Children's Emergency Medicine
Leicester Royal Infirmary
England
United Kingdom

Dr. Rodrick Lim, MD, FRCPC, FAAP

Medical Director - Paediatric Emergency Department - Children's Hospital/ London Health Sciences Centre
Associate Professor of Paediatrics, Schulich School of Medicine, London, Ontario Canada
Past Chair – Paediatric Section/ Canadian Association of Emergency Physicians
Vice Chair – Royal College of Physicians and Surgeons Subspecialty Committee Paediatric Emergency Medicine
Standards Lead – PEMSIG at IFEM

Dr. Zaw Lwin

MBBS, MRCPCH(UK), FRCP(Edin)
Adjunct Asst Professor, Duke-NUS Medical School
Clinical Senior Lecturer, YLL School Of Medicine, NUS

Clinical Teacher, LKC School Of Medicine, NTU

Dr. Brianna McKelvie MD, Msc

Medical Director of Patient Safety and Quality Improvement - Children's Hospital/ London Health Sciences Centre

Assistant Professor of Paediatrics, Schulich School of Medicine, London, Ontario Canada

Dr. Prinetha Moodley MBChB(Natal) FCPaeds(SA)

Advanced Health Management (cum laude)

Consultant: Department of Paediatrics - Paarl Hospital

Western Cape, South Africa

Dr. Ed Oakley MBBS

Chief of Critical Care and Emergency Physician - Royal Children's Hospital Melbourne

Clinical Associate Professor - University of Melbourne

Honorary Research fellow at Murdoch Children's Research Institute

Lead Researcher Paediatric Emergency Medicine Centre of Research Excellence

Prof. Andrew Rowland

BMedSci(Hons), BMBS(Hons), MFMLM, MAcadMed, FRCER, FRCPC, FRSA

Honorary Professor (Paediatrics), the University of Salford, UK

Consultant in Paediatric Emergency Medicine, The Pennine Acute Hospitals NHS Trust, Manchester, UK

Dr. Indumathy Santhanam MD, DCH,

Professor of Pediatrics,

Head of Department,

Pediatric Emergency Department,

Institute of Child Health and Hospital for Children, Madras Medical College, Chennai-600008,

State Nodal officer for Pediatric Resuscitation and Emergency Medicine (PREM)

National Health Mission-TN,

Hospital Trauma Nodal Officer,

Tamil Nadu Accident and Emergency Initiative

National Health Mission,

Tamil Nadu

Dr. Teng Sung Shin

MBBS, MRCPCH(UK)

Adjunct Instructor, Duke-NUS Medical School

Clinical Lecturer, YLL School Of Medicine, NUS

Clinical Teacher, LKC School Of Medicine, NTU

Dr. Javeed Sukhera, MD, PhD, FRCPC

Interim Chair & Assistant Professor

Division of Child/Adolescent Psychiatry - Western University

Senior Designate Physician Lead - Child/Adolescent Psychiatry
London Health Sciences Centre

Dr. Rahim Valani, CCFP(EM), FRCP, MBA, M Med Ed

Associate Professor
University of Toronto
Toronto, Ontario, Canada

Prof. Dr. Patrick Van de Voorde, MD, PhD, FERC

Clinical Head Emergency Medicine, University Hospital Ghent, Belgium
Docent Paediatric Emergency Medicine, Ghent University
Medical Director Emergency Dispatch Centre 112 Eastern-Flanders
Co-chair Paediatric Life Support Committee European Resuscitation Council ERC - ILCOR TF member
Board member - Treasurer Belgian Society Emergency & Disaster Medicine BESEDIM

Prof. Yehezkel (Hezi) Waisman

Chief of Emergency Medicine at Schneider Children's Medical Center
Emergency Medicine and Pediatrician, Assoc. Professor at the Tel Aviv University,
Director of Clalit Pediatricians On-line Telemedicine Service, Israel

Dr. Adriana Yock-Corrales MD MSc

Emergencióloga Pediatra, Epidemióloga
Jefe de Clínica, Servicio de Emergencias
Hospital Nacional de Niños "Dr. Carlos Saenz Herrera"
Secretary, IFEM PEMSIG

