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Pediatric Emergency Care Readiness in Europe

A Descriptive Survey

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Contents

List of acronyms

AAP	American Academy of Pediatrics
ACEP	American College of Emergency Physicians
DNV	Det Norske Veritas
ED	Emergency Department
EMS	Emergency Medical Services
EMSC	Emergency Medical Services for Children
EuSEM	European Society for Emergency Medicine
IFEM	International Federation of Emergency Medicine
NEDARC	National EMSC Data Analysis and Resource Center
NRC	National Resource Center
PI	Performance Improvement
PICU	Pediatric Intensive Care Unit
QI	Quality Improvement
REPEM	Research in Pediatric Emergency Medicine
WHO	World Heath Organization

Introduction

According to the European Society for Emergency Medicine "Emergency Medicine is a specialty based on the knowledge and skills required for the prevention, diagnosis and management of urgent and emergency aspects of illness and injury affecting patients of all age groups with a full spectrum of undifferentiated physical and behavioral disorders. It is a specialty in which time is critical. The practice of Emergency Medicine encompasses the pre-hospital and in-hospital triage, resuscitation, initial assessment and management of undifferentiated urgent and emergency cases until discharge or transfer to the care of another physician or health care professional. It also includes involvement in the development of pre-hospital and in-hospital emergency medical systems[1]".

Both in Europe and the United States, the use of emergency departments as a regular source for healthcare has continued to increase making it imperative that they will have the necessary equipment, staff, and policies to provide the highest quality of care for patients of all ages.[2] The European Health Report of 2005 notes that in the pediatric population of Europe, the most common diseases are non-communicable diseases (77%), external causes of injury and poisoning (14%) and communicable diseases (9%).[3] The report also emphasized on children's health, because it is known that health in childhood determines health throughout life and into the next generation.[3] The report also points out that the period between birth and 5–6 years of age is also a critical time as ill health or harmful lifestyle choices in childhood can lead to ill health throughout life, which creates health, financial and social burdens for countries today and tomorrow. The causes and rates of illness and death in children vary widely across the European Region. In particular, eastern countries have higher morbidity and mortality from respiratory

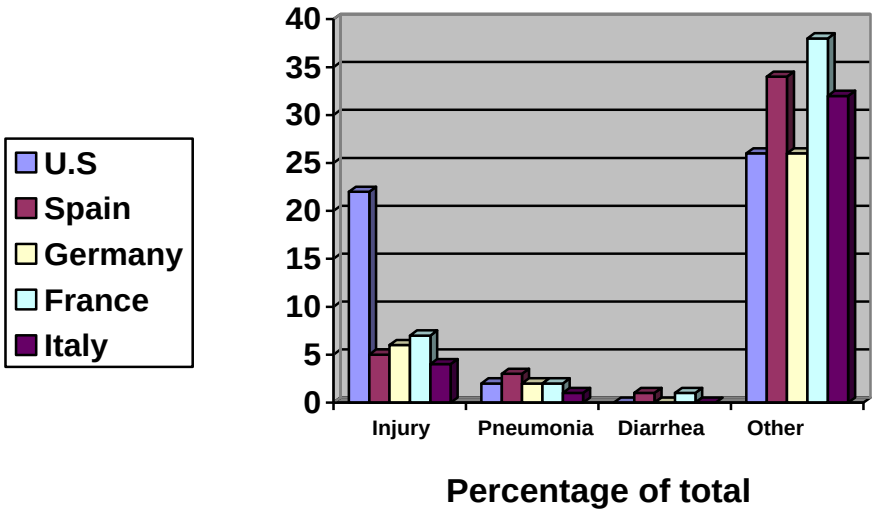
diseases and infectious diseases, injuries and poisoning. This is a different pattern than that seen in adults. In the western countries, mortality from these causes is already very low, which means a smaller disease burden overall. Children's disease patterns in western countries therefore include proportionately more non communicable diseases, such as asthma and allergies, diabetes, obesity and neuropsychiatric disorders. The report further points out that vaccine-preventable diseases, such as measles, remain a worry across the Region.[3]

It is noteworthy that threats to children's health and safety remain prevalent in European society. Injuries are the leading cause of death among those 1-19, and rates of childhood injury in the U.S. are considerably higher than those in other European countries.[4] The WHO estimates that in 2004, around 830,000 children under the age of 18 years died as a result of an unintentional injury. Community based studies by UNICEF have suggested that the number could be much higher. It is further estimated that tens of millions more children are non-fatally injured and many of these require hospital treatment. For the survivors, the impairment that injuries cause and the resulting need for care and rehabilitation have far-reaching impact on a child's future health.[5]

A child's age, the stage of their development, how the child interacts with the environment and the types of activities the child participates in is directly related to the types of injuries seen. Motor vehicle related injuries, drowning and fires account for almost two thirds of deaths in the 1-4 year old age group and a large percentage of those over 5 years of age.[5] The WHO explicitly points out that the quality, access and availability of health care services are crucial and can influence not only the likelihood of surviving an injury but also the long term consequences.[5]

This thesis focuses on those crucial emergency care services that must be available in healthcare systems across Europe to provide the highest quality of care for children with illness and injury. In countries where there have been the greatest reductions in child injury death rates, strong political commitment that has encouraged a culture of safety, a strong emphasis on education and prevention, and addressing the overall health care services for children have been successfully implemented. In 2001, the former surgeon general of the United States stated "…We cannot accept these injuries as just accidents that will happen. If a disease were killing children at the rate that unintentional injuries area, the public would be unbelievably outraged and demand that this killer be stopped."[5] (See fig 1).

Figure 1: Distribution of causes of death in children under 5 (2010)



From the Global Health Observatory at www.who.int/gho

The European health report in 2005 stated that health systems' responses need to incorporate both primary prevention and the provision of high-quality acute care to injured

children, as well as rehabilitation and support services. The principles of equity and evidence based practice should underpin these actions. These improvements should include an efficient pre-hospital care system, high-quality acute care in hospitals and clinics, the use of child-specific equipment and drugs, rehabilitation programs that address both the physical and psychological sequelae of injuries, and a holistic approach involving coordination with allied sectors.[3]

In 2006, the Institute of Medicine published a document that presents how issues affecting the emergency care system generally have an even greater impact on the outcomes of critically ill and injured children. The topics addressed include the state of pediatric readiness, pediatric training and standards of care in emergency care, pediatric medication issues, disaster preparedness for children, and pediatric research and data collection.[4] The statement “children are not little adults” is often used to convey the fact that children have unique medical needs relative to adults. In fact,

the anatomical, physiological, developmental, and emotional attributes of children impact not only their susceptibility to illness and injury, but also the ways in which providers need to assess and treat them. Caring for sick and injured children requires that providers have specialized training and skills, as well as access to specialized equipment and supplies. However, the initial development of the nation’s emergency system largely overlooked the unique needs of children. The system was originally directed by physicians trained in adult medical specialties, many of whom had little experience with pediatric patients and the unique features of pediatric care. As a result, pediatric emergency care did not advance as quickly as adult emergency care, and the performance and outcomes for children trailed those for adults.[4]

Pediatric emergency care has evolved dramatically over the past two decades but the specialized resources available to treat seriously ill or injured children vary greatly based on location. The National Hospital Ambulatory Medical Care Survey in the United States reported that in 2006, there were approximately 3833 emergency departments and most of these EDs routinely care for patients of all ages.[6-9] Of the 119 million ED visits in the United States in 2006, almost 20% were for children.[8,9] Some children have access to children's hospitals and hospitals with separate pediatric inpatient capabilities, which tend to be well prepared for pediatric emergencies; others must rely on hospitals with limited pediatric medical expertise and equipment. Some states and communities have organized trauma systems and designated pediatric facilities, while others do not. As a result, not all children have access to the same quality of care. While data on system performance are not routinely collected, it appears that where a child lives has an important impact on whether the child can survive a serious illness or injury.[4] It is also clear that EDs across Europe also see varying numbers of children with varying severity of illness.[10] None-the-less, regardless of the location, parents bring their children to the ED for a wide variety of illnesses and injury and it therefore is imperative that not just some but that every emergency department in every country that cares for children be ready twenty-four hours a day, seven days a week. The goal of this thesis is to shine a spotlight on this most vulnerable component of our population and asks if the emergency care system in Europe is prepared to care for these children.

Previous Institute of Medicine recommendations have concluded that all agencies with jurisdiction over hospitals "require that hospital emergency departments . . . have available and maintain equipment and supplies appropriate for the emergency care of

children" and that they "address the issues of categorization and regionalization in overseeing and development of EMSC and its integration into state and regional EMS systems." Subsequently, a number of guidelines were developed.[2,11-18] In 1998, a multi-organizational effort to outline guidelines for pediatric preparedness of EDs in the United States was begun, sponsored by the Maternal and Child Health Bureau and spearheaded by the American Academy of Pediatrics (AAP) and the American College of Emergency Physicians (ACEP). The result of those efforts was a joint AAP/ACEP policy statement titled "Care of Children in the Emergency Department: Guidelines for Preparedness," which was published in 2001 and was supported in concept by 17 organizations.[19,20] These guidelines were developed to provide a resource and to stimulate interest in improving preparedness of EDs to care for critically ill or injured infants and children.[14] The guidelines outlined staff qualifications, components of a quality improvement (QI) plan, support services, and required equipment, supplies, and medications for the ED. The guidelines also called for hospital EDs to identify experts in emergency care for children (ie, physician and nurse coordinators for pediatric emergency care) who could provide the needed leadership for the preparedness process within their EDs by monitoring staff competencies in the care of children, coordinating with prehospital and tertiary care services, and overseeing QI/performance improvement (PI) for children.[22] Despite promulgation of these guidelines, subsequent published data suggested that compliance with national guidelines was low and that many EDs in the United States and Canada did not have some of the basic equipment and supplies needed to care for children of all ages.[21,23,24] Middleton and Burt, in the emergency pediatric services and equipment supplement of the 2002–2003 National Hospital Ambulatory Medical Care Survey reported that only 6% of U.S. EDs had all of the recommended pediatric supplies

and equipment as outlined in previously published national guidelines.[8] Gausche-Hill et. al. reported similar results in a 2003 nationwide survey of EDs in the United States and cited reasons for the lack of equipment availability in many EDs (including lack of awareness, with only 59% of ED managers being aware of the published guidelines) and relative lack of pediatric experience among the workforce, with limited exposure to critically ill or injured pediatric patients at many U.S. hospitals.[22] In fact, 50% of EDs care for fewer than 11 pediatric patients per day; therefore, pediatric planning by these facilities is crucial.[22] The American Academy of Pediatrics stated that access to optimal emergency care for children is affected by the lack of availability of equipment, appropriately trained staff to care for children, and policies and procedures that ensure timely transfer to definitive care.[25]

Across Europe, big differences in case-mix can be seen between different countries, and even between hospitals within each country. The proportion of injury to illness varies greatly, as does the proportion of serious cases to very minor cases. Poor, inner city areas of developed countries often see a high proportion of non-serious cases. If ED and pediatric staff have not been trained to be confident in differentiating these children from those with serious conditions, they will be unable to avoid increasing hospital admission rates for children which is being seen in developed countries. By contrast, EDs in poor, rural areas will see a higher proportion of seriously ill or injured children.[26] Although in the developed world there are systems in place for deciding which EDs are available, staffed, and have equipment to care for patients with urgent and emergent conditions, the needs of the pediatric patients are often not met.[4] In the U.S. and Europe, advances that promote access to emergency care for children, improve awareness of the pediatric resources available to hospitals, in addition to the development of regionalized and

coordinated emergency and trauma care systems, may optimize access and outcomes for many acutely ill and injured children.[26,27] The Institute of Medicine, in its comprehensive report on the state of emergency care in the United States in 2006 described the care of children in emergency settings as “uneven”. The IOM specifically recommended arming the emergency care workforce with knowledge and skills, and calling for emergency medical services agencies to appoint emergency medicine coordinators. The IOM reported that only 18% of EDs in the United States appointed a physician coordinator, and 12% appointed a nursing coordinator for pediatric emergency care. Emergency departments that did appoint these positions tended to be more prepared as measured by compliance with 2001 guidelines on the care of children in the ED published by the American College of Emergency Physicians and the American Academy of Pediatrics.[22] As a result of this data, the IOM further instructed hospitals to appoint two qualified pediatric coordinators, one being a physician to provide pediatric leadership for their organizarion.[22,26]

In 2008, Santiago Mintegi[27] published a paper that focused on pediatric quality by sending an electronic questionnaire to European pediatric emergency department directors through the Research in Pediatric Emergency Medicine (REPEM) network of the European Society for Emergency Medicine (EuSEM).[26,27] Based on expert opinion (REPEM members), a 28-point questionnaire was designed to include a description of 3 category components:

1. Institution’s pediatric inpatient capabilities,
2. Scope of services,
3. Medical staff education and structure.[28,29]

Through his survey, Mintegi hoped to define the level of quality provided by European Pediatric EDs as an important step in moving toward improving pediatric emergency care. This thesis and my survey was designed to also further this effort by evaluating the compliance with U.S. and International guidelines.

Methodology

An on-line survey was developed by a national steering committee for the U.S. National Readiness Project. The project was formed as a subgroup of the National Emergency Medical Services for Children Committee convened through the U.S. Maternal Child Health Bureau and Health Resource Services Agency. This group included representatives from American College of Emergency Physicians, American Academy of Pediatrics, Emergency Nurses Association, National Resource Center (NRC), and National EMSC Data Analysis and Resource Center (NEDARC). In addition, this project has received the support of such organizations as the Joint Commission and the Healthcare Corporation of America. In order to determine the factors associated with pediatric readiness and at improving the quality of readiness to care for children in all types of emergency departments where children are seen, a web-based assessment of pediatric readiness based on 2009 national guidelines was constructed and disseminated to every hospital in the United States. Assessing baseline readiness of emergency departments across Europe with a specific emphasis on the country of France was undertaken using a similar methodology. Survey items included all components of the AAP/ACEP guidelines, demographic information about the hospital, as noted in the Mintegi study, its available pediatric resources, and the awareness of the respondent of the AAP/ACEP/IFEM guidelines. ED pediatric patient volume was assessed by using each hospital's age definition of a pediatric patient. The survey tool was modified slightly to capture more data on pediatric mental health issues and was posted on-line using Fluid Surveys 4.0 (http://fluidsurveys.com/). The survey consisted of 55 questions and was estimated to take the respondent 20 minutes to complete. A special website was

constructed with links to the survey using an on line vendor, Web.com with a domain name of www.PedsReadyInternational.org. Data were collected over a four month period. The goal was to reach as many hospitals as possible using the survey tool posted on-line and directing participants to the web site through collaboration with members of the Pediatric Research Network of the European Society of Emergency Medicine. In addition, physician and nursing professional societies across Europe were contacted and the web site information was disseminated in order to direct participants to the survey. Some of these are listed below.

College for Emergency Medicine (UK) - www.collemergencymed.ac.uk

Czech Society for Emergency and Disaster Medicine - Czech Medical Association JEP - www.urgmed.cz

Danish Society for Emergency Medicine - www.akutmedicin.org

European Society for Emergency Medicine (EuSEM) - www.eusem.org

German Association for Emergency Medicine GAfEM/DGINA - www.dgina.de

Irish Association for Emergency Medicine - www.emergencymedicine.ie

Netherlands College for Emergency Physicians - www.nvsha.nl

Polish Society for Emergency Medicine - www.medycynaratunkowa.com.pl

Sociedad Española de Medicina de Urgencia y Emergencia - www.semes.org

An incentive was also created to allow each hospital that completed the survey to receive a one year subscription to an on-line pediatric readiness software program that has been provided for free by PEMSoft. I also contacted Dr. Jean Mercier, an international pediatric emergency leader in Paris who lent his support for the project and encouraged me to reach out to the French pediatric interest group. I had the opportunity

to tour his facility at the Robert Debré Hospital. In addition, I have been able through email communication to contact multiple pediatric networks throughout the EU. The survey was translated into French and German as well as an English version to maximize the response rate.

Survey response data were entered into a Fluid Survey database. The data was then aggregated and exported into a CSV file using 2003 Microsoft Excel for analysis. A weighted preparedness score was calculated for each hospital based on the presence or absence of the 82 most critical items listed in the 2009 AAP/ACEP Guidelines. To create a single quantitative measure of overall readiness that accounted for the perceived importance of each of the seven domains in the guidelines, an expert panel was asked to weigh each of the domains listed relative to each other as part of the U.S. readiness assessment project. For simplicity, a total of 100 points was chosen as the combined value of all seven domains.

Panelists were also asked to consider results of two recently published assessments on pediatric readiness of emergency departments in considering the weighting of items on the assessment, specifically the fact that adult equipment and medications were almost universally available in emergency departments.[9,22] Panelists were also asked to consider recent recommendations from the Institute of Medicine in their report on the Future of Emergency Care in the United States, *Emergency Medical Services for Children: Growing Pains* in weighting items from the guidelines. A mean point score, averaged from all responses, was assigned to each section. For items within a section, the expert panelists assigned a relative importance low, medium and high (1-3 with 1 being most important and 3 being least important) to each of the items. Only those items with medium to high average scores (average importance <2) were weighted. The weighing system is noted in

Appendix I. A weighted preparedness score (normalized scale of 0-100) was then calculated for each of the responding hospitals in the survey, as a measure of overall degree to which the respondent believe that their ED conforms with the 2009 AAP/ACEP Guidelines.

Descriptive statistics were used to characterize the weighted preparedness scores, both across hospitals and within subgroups of hospitals. Numerical variables were summarized by using medians and interquartile ranges (IQRs) and were compared by using the Wilcoxon rank sum test. This statistical method has been chosen by investigators in previous ED surveys and the current U.S. survey and allows for a direct comparison of data.

Results

It has been reported that there are approximately 15,000 hospitals in the EU (http://www.hope.be/05eventsandpublications/docpublications/79_hospitals_in_eu/79-hospitals-in-the-eu-2009.pdf. A total of 111 (< 0.1%) responses were obtained by the on-line survey service and the completion rate for the English survey was 46% and for the French version, only 38%. Despite preparing a copy of the survey in German, there was only one response and the survey was incomplete. Finally, because some of the 55 questions in the survey required multiple responses, even completed surveys were occasionally missing some responses. The survey was most often completed by the chief of the service 30%, other staff physicians 62% and the remainder by others. Responses were obtained from a variety of countries across Europe, including France (31), Spain (12), Hungary (1), Lebanon 1), Switzerland (1) and the U.K (2). Hospitals, for the most part were accredited by the Health Ministries in their respective countries (63%) but 8% used either the Joint Commission based in the U.S. or the DNV, a Norwegian accrediting body that evaluates multi-hospital systems to community hospitals; from major teaching institutions to regional medical centers focusing on quality, innovation and continual improvement.

Similar to the 2003 U.S. survey, I found that the definition of a pediatric patient was highly variable (Table 1), with 50% of hospitals using 0 -18 years of age. Overall, 94% of respondents defined a pediatric patient as < 18 years.

Table 1. What age defines a pediatric medical patient

Age definition	Chart	Percentage	N
14 years		3%	1
15 years		11%	4
16 years		28%	10
17 years		3%	1
18 years		50%	18
Other		6%	2
	Total Responses		**36**

Results indicate that 39 of 46 (85%) of respondents see over 10,000 pediatric visits per year in the emergency department and 15% see between 5,000 and 10,000 visits per year. None of the hospitals in my sample see less than patient 5000 visits per year. Thirty three of 36 (92%) of respondents stated that children are seen either in a separate emergency department (Children's Hospital) or a separate area within a general hospital seeing adult and children and this number was divided almost evenly (44% pediatric ED, 47% separate ED in a general hospital). Only 8% of respondents reported caring for children in an emergency department that sees adults and children together. My survey found that 13% of respondents do not admit pediatric patients. Surprisingly, most of these hospitals see a pediatric ED volume of greater than 10,000 visits per year. Based upon the survey results, 19 hospitals have adult intensive care services that admit children.

The median ED volume for all patients was 31,500 patients (IQR: 19,500 – 67,500). The median pediatric (0-18 yrs) volume was 26,500 (IQR 15,000 – 45,000). I did not attempt to categorize hospitals based upon geographic location but suffice to say that hospitals seeing large pediatric volumes appear to be urban.

Of the respondents, 84% stated that they had a newborn nursery and 88% stated they had a pediatric ward. In contrast, 50% stated they had a neonatal intensive care unit, and only 57% reported having a pediatric intensive care unit. While it is unclear from the survey, some hospitals have a PICU AND an adult ICU that admits children, 18% of hospitals responding admitted having an adult ICU that admits children. Despite large pediatric volumes, 56% have written transfer agreements with other facilities to provide care not available at the transferring hospital.

Respondents were also asked whether they had identified physician and nurse coordinators for pediatric emergency medicine. My survey showed that 29 of 44 (66%) of respondents reported having a physician coordinator, and 28 of 46 (61%) reported having a nurse coordinator. There appears to be a written job description or list of responsibilities for the physician or nurse coordinator in 17 of 35 (49%) and 16 of 33 (48%) of the cases, respectively.

Either board certified or board prepared physicians trained in pediatrics make up 43 of 49 (88%) of the providers in my sample. Pediatric sub board eligible/certified physicians provide care in 18 of 49 (37%) of hospitals. Emergency medicine and family practice board eligible or certified physicians provide care in 43% and 47% of hospitals respectively. My survey also shows that regardless of the training, there is no life support course that appears to be required by the majority of providers and ranges between pediatric and adult focused courses and only 11 of 39 (28%) of respondents require specific physician competences.

Among nursing personnel, there also is not a standardized life support course that is required but almost half (48%) of hospitals report requiring pediatric competency evaluations. The use of mid-level providers such as physician assistants or nurse

practitioners continue to provide care in many hospital EDs in the U.S. but this is not the case in my survey of hospitals in Europe. Only 20% of respondents use mid-levels and of those, there is no specific life support course requirement and only 30% require specific competency evaluations.

Only 17 of 41 respondents (41%) stated that their ED had a pediatric patient care review process or QI plan. Of the 17, 11 (65%) stated they have some type of re-evaluation of performance using outcome-based measures. The majority, 12 of the 17 (71%) hospitals with a QI plan collected and analyzed some type of pediatric emergency care data such as admissions, deaths, transfers, etc. Less than 50% of the 17 hospitals have either identified specific quality indicators for children or had developed a plan for improvement of pediatric emergency care. Unfortunately 24 of the 41 (59%) respondents to this question stated they did not have pediatric patient care review process but when the data was more closely analyzed, 6 of the 24 (25%) of these same respondents stated they had developed a plan for improvement in care. Disappointingly, 18 of 41 (44%) of my sample either failed to answer the question or denied having any formal quality improvement process in place.

Hospitals were surveyed whether they had guidelines for improving pediatric patient safety in the ED (table 2). Among the major concerns is the accurate measuring and recording of the child's weight. While drug dosages are almost always calculated based upon the child's weight in kilograms, many scales in the U.S. weigh children in pounds. In addition, some electronic health records require recording the weight in pounds then it automatically converts the weight into kilograms. I sought to determine if some of these same risk factors exist in the European medical community.

Table 2. Guidelines for improving Pediatric Patient Safety in the ED

Guideline	N
Children are weighed in kilograms	40/42 (95%)
Weight recorded in medical record in kilograms only	39/41 (95%)
Children weighed in pounds and converted to kilograms	8/39 (21%)
Infants and children have a full set of vital signs recorded that includes temperature, heart rate, and respiratory rate.	29/42 (69%)
Blood pressure monitoring is available for all children	38/42 (90%)
Pulse oximetry monitoring is available for all children	44/46 (96%)
There are processes for the use of precalculated dosing for children	18/36 (50%)
There is 24/7 access to interpreter	19/46 (41%)

Surprisingly, I found that 8 of the 39 respondents (21%) have the option of weighing children in either pounds or kilograms. Of these 8 hospitals, 5 (62%) weigh children in pounds and the weight is converted into kilograms for the medical record. In addition, only 29 of 42 respondents (69%) record a full set of vital signs on all children that include, temperature, heart rate, and respiratory rate. Whereas pulse oximetry readings are recorded in 44 of 46 (96%) of EDs, blood pressure is routinely recorded in 38 of 42 (90%) of institutions. Despite the risk of medication errors in children, only 50% of EDs have a process in place for using pre-calculated drug dosing. Finally, despite the fact that most of the institutions in my survey see large pediatric volumes, only 19 of 46 respondents

(41%) have access to an interpreter 24 hours per day. This is disturbing given that ease of travel and the emergence of cross border health economies that creates the added complexity of managing patients from all over Europe if not internationally.

Hospitals were also surveyed regarding whether they had 10 of 15 specific ED policies listed in the 2009 AAP/ACEP Pediatric Guidelines that address the needs of children in the ED (Table 3). In my sample, only 13 of 46 or one half of the respondents had all ten policies in place. A mental health and child maltreatment policy was most commonly available (87%); least available was a policy that addressed radiation dosage for CT and x-ray imaging (55%). Not surprisingly, only two thirds of the respondents have a disaster plan the addresses the specific needs of children. Separate questions were asked focusing on transfer policies and procedures. Of the respondents in my survey, only 23 of 41 (56%) have a written transfer agreement with other hospitals for the transfer of children in need of care unavailable at the sending hospital. Only 19 of 46 respondents (41%) stated that they had a guideline that outlines any procedural or administrative policy with other hospitals for the transfer of children although a number of institutions are in the process for developing these (7%). Two hospitals stated that they did not have any written inter-facility guidelines for transfer but have a defined process for initiating transfer, including outlining the roles and responsibilities of the referring and receiving facilities. Both of these hospitals were located in Spain. Three other hospitals stated that they did not have any written inter-facility guidelines for transfer but had a process for selecting the appropriate care facility. Two additional hospitals have both processes in place. In summary, 35 of 47 (72%) respondents stated that their hospitals have some type of transfer process in place although written guidelines for transfer are the exception.

Thirteen of 47 (28%) of hospitals either stated they had no transfer process or did not complete the answers in that section.

In my survey, 42 of 46 respondents (91%) care for children with social and mental health issues. Of the 4 that stated they do not, 3 of 4 have policies and procedures to treat pediatric behavioral health issues in the emergency department while one hospital only provides training to its ED personnel regarding treatment of behavioral problems.

Table 3. ED Policies and Procedures that Address the Needs of Children

Policy	N
Illness and injury triage	37/46 (80%)
Pediatric patient assessment and reassessment	37/46 (80%)
There is a written procedure for notifying physicians after identifying abnormal vital signs	35/44 (80%)
Immunization assessment and management of the under-immunized child	34/46 (74%)
Child maltreatment	40/46 (87%)
Death of the child in the ED	39/46 (85%)
Reduced-dose radiation for CT and x-ray imaging based on pediatric age or weight	24/44 (55%)
Family centered care	41/46 (89%)
Hospital disaster plan that addresses issues specific to the care of children	31/46 (67%)
Mental Health needs of children	40/46 (87%)

Five of the 46 (11%) of the respondents in the survey stated they did not have any policy or procedures for managing these children in the ED or for transferring then to an impatient service either inside or outside of the hospital. One of these hospitals stated

that they do transfer these patients to an appropriate outside hospital. Thirty six of the 46 respondents (78%) stated that there are a set of policies and procedures to treat behavioral health issues in the ED but only 19 of 46 (41%) have any screening tools specifically directed toward treating pediatric behavioral health patients in the ED. One half of the respondents stated that they had a policy to safely transfer pediatric behavioral health patients to the inpatient service of the hospital and 16 of 46 respondents (35%) had a policy to safely transfer these patients to inpatient services outside of the hospital. Surprisingly, whereas 26 of 44 (59%) respondents stated that the ED providers receive regular training regarding treatment of children with behavioral health issues, only 14 of 46 (30%) stated that the ED is equipped with a designated room(s) to protect pediatric psychiatric patients from harm and provide close monitoring. Only 2/3 of the respondents stated that they have ready access to consult with a child psychologist or psychiatrist and 25 of 46 (54%) stated that spiritual care was available 24 hours per day for pediatric psychiatric patients. Five of the 46 (11%) of hospitals in my sample have a policy to transfer patients with social or mental health issues to an appropriate facility.

Hospitals were asked if their staffs were trained on the location of pediatric equipment and medications and if there was a method to verify the proper location and function of equipment on a daily basis. Of the 41 respondents, over 90% had some type of system in place. However, when hospitals were asked if there was a ready methodology to ensure proper sizing and dosing of resuscitation equipment and medications respectively, only 23 of 41 hospitals (56%) had such a methodology.

The 2009 AAP/ACEP guidelines list equipment that is recommended for immediate use by all hospitals caring for children. Table 4 lists the monitoring equipment that is considered to be essential in the survey.

Table 4. Monitoring equipment for children available for immediate use in the ED

Monitoring Equipment	Yes	No	N	
Neonatal blood pressure cuff	36 (80%)	9 (20%)	45	45
Infant blood pressure cuff	36 (100%)	0 (0%)	36	36
Child blood pressure cuff	46 (100%)	0 (0%)	46	46
Defibrillator with pediatric and adult capabilities including pads/paddles	42 (91%)	4 (9%)	46	46
Pulse oximeter with pediatric and adult probes	45 (98%)	1 (2%)	46	46
Continuous end-tidal CO2 monitoring device	21 (46%)	25 (54%)	46	46

Of the 45 respondents, 36 (80%) stated that they had a neonatal blood pressure cuff while all hospitals in the sample have blood pressure cuffs for infants and children. Almost all hospitals have a pulse oximeter with either pediatric or adult probes and most (91%) have a defibrillator with pediatric and adult pads/paddles. Continuous end tidal CO2 monitoring is considered the optimal method of assessing for and monitoring of endotracheal tube placement in the trachea; however, for low-volume hospitals, adult and pediatric CO2 colorimetric detector devices could be substituted. In my survey, only 21 of 46 (46%) of respondents have this capability.

There were 43 respiratory/airway equipment items felt to be essential by the U.S. pediatric readiness project planning group and these were recommended for immediate use in the ED. These are listed in Table 5. Only 6 of 45 respondents (13%) stated that that their EDs stocked ALL 43 of the airway equipment items recommended and only 12

of 45 (26%) had more than 90% of the equipment recommended. Another 11 of 46 hospitals have only two thirds or less of the recommended airway equipment listed.

In general, equipment for neonates or infants were most often not found in the emergency department and pediatric sized suction catheters and tracheostomy tubes of varying sizes were frequently missing. Almost 62% of respondents reported that they had laryngeal mask airways (LMAs) of all sizes and > 90% of all hospitals stated they had the smallest sizes. Of some concern was the finding that only 15 of 45 (33%) of respondents stated that they had any type of difficult airway kit.

Table 5. Essential emergency airway equipment recommended for children

Airway equipment	**No of items**	**No. with all sizes or kit**
Endotracheal tubes Sizes cuffed or uncuffed: 2.5, 3.0, 3.5, 4.0, 4.5, 5.0, 5.5, cuffed 6.0	8	41/45 (91%)
Laryngoscope blades Size 00 to size 2 (straight and curved blade)	5	38/45 (84%)
Pediatric Magill forceps	1	45/45 (100%)
Nasopharygeal airways Sizes: infant, child	2	36/45 (80%)
Oropharygeal airways Sizes: 0, 1, 2, 3	4	25/45 (60%)
Stylets for pediatric/infant sized endotracheal tubes	2	24/45 (53%)
Tracheostomy tubes Sizes 3.0 mm to 4.0 mm	3	14/45 (31%)

Bag valve mask device, self inflating, infant 450 cc	1	45/45 (100%)
Masks to fit bag-mask device adapter Sizes: neonatal, infant, child	3	44/45 (98%)
Clear oxygen masks Size standard infant, child	2	40/45 (89%)
Non-rebreather masks Sizes: infant, child	2	40/45 (89%)
Nasal cannulas Sizes: Infant, child	2	42/45 (93%)
Laryngeal mask airways Size 1, 1.5, 2, 2.5, 3	5	28/45 (62%)
Suction catheters Sizes 6-8 Fr and 10-12 Fr	2	16/45 (36%)
Difficult airway supplies/kit	1	15/45 (33%)
Total	43	6/45 (13%)

The presence of fluid resuscitation equipment was also queried in the survey. These results are noted in Table 6. It was found that 100% of hospitals have both 22g and 24g over-the-needle catheters and 43 of 46 hospitals (93%) have intraosseous needles. In addition, 42 of 46 (91%) of respondents have the ability to regulate the rate and volume of fluid infused through the use of IV administration sets using calibrated chambers or infusion devices (pumps). Finally, while 34 of 46 respondents (74%) reported that they stock central venous catheters only 24 of 46 (52%) reported stocking umbilical vein catheters.

Table 6. Fluid resuscitation equipment available for immediate use in the ED

Fluid resuscitation equipment	Yes	No	N
22 gauge catheter-over-the-needle	46 (100%)	0 (0%)	46
24 gauge catheter-over-the-needle	46 (100%)	0 (0%)	46
Pediatric intraosseus needles	43 (93%)	3 (7%)	46
IV administration sets with calibrated chambers and extension tubing and/or infusion devices with ability to regulate rate and volume of infusate	42 (91%)	4 (9%)	46
Umbilical vein catheters (3.5F or 5.0F)	24 (52%)	22 (48%)	46
Central venous catheters	34 (74%)	12 (26%)	46

Respondents were asked what they perceived to be the most important barriers to implementing the 2009 AAP/ACEP Guidelines. The survey showed that 19 of 46 (41%) of hospitals were unaware of the existence of the guidelines and another 12 of 46 (26%) stated a lack of interest in implementing the guidelines altogether. The greatest barriers appear to be the lack of educational resources, the cost of personnel, the cost of training personnel and the lack of administrative support which were stated by 67%, 61%, 76% and 61% of respondents, respectively. Other barriers to implementation of the guidelines were stated to be the lack of a pediatric specific quality improvement/performance plan, the lack of policies for pediatric emergency care, and the lack of appropriately trained nurses and physicians. These were stated by 57%, 52%, 52% and 43% of respondents respectively. Only one third of respondents felt that a lack of a disaster plan posed a barrier to implementing the guidelines.

The median weighted preparedness score overall was 64 (IQR: 52 – 80), with a range of 39 – 97. In my survey, the seven hospitals with a pediatric ED volume of 5000 – 10,000 had a median readiness score of 50 (IQR: 49 – 71). The average score in this sample was 60 but of particular note is that one hospital had a score of 95. Removing this hospital from the sample would drop the average score to 53. For the remaining hospitals seeing > 10,000 pediatric ED visits, the median readiness score was 65 (IQR: 54 – 67). For 17 of the 46 hospitals seeing on average more than 30,000 pediatric ED visits per year, the median readiness score was 71 (IQR: 55 – 80) and the average score was 67. The presence of inpatient pediatric resources was associated with higher weighted ED readiness scores. Hospitals that had pediatric intensive care services had a median readiness score of 69 (IQR 56 – 84). Hospitals without PICUs but with pediatric inpatient services had a median score of 57 (IQR 46 – 74) and those facilities without either had a median readiness score of only 48 (IQR: 41 – 74, $P < 0.5$). The weighted readiness score emphasizes the importance of the presence of a physician or a nurse coordinator as evidence of readiness, to evaluate the readiness of hospitals to comply with the 2009 AAP/ACEP guidelines. To evaluate whether the presence of a coordinator improves pediatric readiness, the readiness score was calculated with and without the presence of the coordinator. The data analysis showed that the overall median score of the hospitals with a coordinator was 65 (IQR= 55-78) and without was 62 (IQR=50-69) using a corrected 100 point scale. Although this difference was not significant, the hospitals with a physician or nurse coordinator tended to be slightly higher.

Discussion

This study is the first survey of European hospital EDs regarding overall pediatric readiness and forms the natural follow up to the pilot study performed by Santiago Mintegi in 2006. In that study, a 30-point questionnaire was distributed to European Pediatric Emergency Department directors through the Research in European Pediatric Emergency Medicine network of EuSEM. As noted previously, that study focused on three main categories. They were to provide a description of pediatric in-patient services, scope of services and a description of the professional structure. That study obtained results from 53 tertiary care medical centers from 14 countries over 90% of which had an inpatient service and pediatric intensive care unit. In evaluating the scope of services, 47 of 53 (88.7%) had triage guidelines, and 48 of 53 (90.6%) had a child maltreatment policy. The availability of social services was assessed with results indicating only 29 of 53 (54.7%) of respondents having social worker consultation available in the ED. The professional structure evaluation found that the ED medical director was most commonly a pediatrician (96.2%) with no formal training in pediatric emergency medicine (66%) and was an APLS instructor/director (60%). The majority of emergency departments were found to be staffed with pediatricians and residents (58.5%) but 20 of 53 (37.7%) respondents stated they had pediatric emergency medicine fellowship trained physicians. Mintegi points out that his study was limited by the relatively small sample, a selection bias in that only countries affiliated to EuSEM were included, his study looked at only three determinants of quality of care (triage, social services and procedural sedation), and there was no data on nursing staffing or research activity. He concluded that the availability of pediatric emergency services in tertiary European centers appear to be similar to the services

provided in the U.S. but that training programs in pediatric emergency medicine could contribute to better pediatric emergency care.[26]

In 2012, the International Federation of Emergency Medicine published International Standards of Care for Children in Emergency Departments. The document was a consensus document aimed at assisting hospitals around the world in defining minimum standards of care for children 0-18 years in the ED and focused on essential and desirable recommendations. Members of the consensus panel represented the specialty of emergency medicine from the U.K. College of Emergency Medicine, the Australasian College of Emergency Medicine, the Emergency Medicine Society of South Africa, the Society of Emergency Medicine in Singapore, the Argentine Society of Emergency Medicine, the European Society of Emergency Medicine and the American College of Emergency Medicine. The panel recognized that improvement in care can be accomplished by publishing standards but the challenge is to disseminate this knowledge to clinical personnel, hospital managers and health ministries across the globe.

The IFEM document was divided into 17 sections that outline specific recommendations. These recommendations are listed in Appendix III. The first set of essential recommendations is that countries must consider the special requirements of the pediatric patient with respect to the environment, equipment and staff skills, ensuring they meet the needs of both the pediatric and adult population of emergency patients. In addition, where EDs see patients of all ages, there must be a lead doctor and lead nurse for pediatric issues. The readiness survey addressed these issues exceptionally well with specific questions regarding the presence of guidelines, policies and procedures and

includes essential equipment lists. The survey not only inquires as to whether there is the existence of a nurse or physician coordinator but also whether there is an actual job description for these positions. The survey showed that two thirds of the hospitals in the sample had a physician coordinator and 61% had a nursing coordinator. Further analysis of the data revealed that 24 0f 46 respondents (52%) had both.

In an effort to improve the integration of care, an essential recommendation from the IFEM report is to provide clear, written guidelines for transfer criteria to specialist pediatric centers and this survey evaluated this recommendation with specific questions. The survey investigates if hospitals have established transfer agreements with and without specific policies. Surprisingly, only slightly more than one half of the respondents had such agreements in place. In part, the questions may have been problematic as it is possible that most of the respondents in the survey are more often on the receiving end of transfer than actually send patients given their high pediatric volumes.

Initial assessment essential recommendations include triage and vital sign policies as well as guidelines for accurate drug dosing. These areas are evaluated in the readiness survey with 80% of respondents having a triage policy but only 69% of respondents require a full set of vital signs to be obtained . While it seems that entering such data into the medical record would be relatively simple, as hospitals incorporate electronic health records, documentation of vital signs may be complicated by data entry issues. Transcription errors may more easily occur and optional types of weight measurement (i.e pounds vs kilograms) may create opportunity for medical dosing errors if data is entered incorrectly. Stabilization and staffing essential recommendations were investigated using

questions focused on staff competencies and equipment availability. The readiness survey found that 91% of all for the respondents have pediatricians staffing the ED but only a minority of hospitals, (28%) have any type of physician competency evaluations nor was there any particular standardized course that was required consistently to assure adequate credentials. A variety of professionals appear to provide care in European EDs that care for children and there appears to be a wide range of required competency training, and continuing medical education that is recommended. The data is somewhat more positive for non-physicians in that one half of the hospitals require specific competency evaluations for nurses. In the U.S., the use of mid-level providers has gained tremendous momentum and staff many EDs however his does not appear to be the case in the EU as these providers of care are found in only 30% of hospitals in my sample. All countries will be looking at ways to reduce healthcare costs in the future and as such, it must be anticipated that the use of mid-level providers will only increase in the future and developing these types of competencies now is critical to ensuring quality.

Quality and safety essential recommendations in the IFEM standards are addressed with focused questions in this important area. All health care systems should be designed to prevent errors. The first step in designing these systems is to identify errors and study their pattern of occurrence within delivery systems to reduce the likelihood of adverse events. In particular, institutions should take into account unique pediatric safety issues. These include particular attention to the potential for errors in care attributable to changes in patient weight and physiologic maturation, limited capacity for cooperation in young children and high levels of dependency on others, and the relative rarity of most pediatric illnesses and accordant lack of widespread familiarity with their care.[30] In the United

States, medication errors in the pediatric population continue to be a leading concern in the area of patient safety. In the environment of the hectic ED, there are a number of factors that may lead to these errors. The 2006 IOM report identified patient safety as a significant concern and made recommendations to improve hospital based and EMS system improvements.[4] Policies, procedures, and protocol essential recommendations are a key component of the IFEM document and are addressed using focused questions in this area. The readiness survey shows that most hospitals have many of the recommended policies.

In the area of disaster preparedness, the IFEM panel had several essential recommendations for EDs but many of the recommendations are extrapolations of the normal every day activities of the ED. In my survey, there is a question that asks only if there is a hospital disaster plan that address issues specific to children. The increased vulnerability of children during a disaster makes it imperative that hospitals and care providers have the capability to manage any sudden increased volume of pediatric patients. Children have higher minute ventilation rate and thinner skin making them more vulnerable to chemical or biological attack respectively. Life threatening fluid loss due to dehydration occurs more easily due to lesser fluids reserves and injuries causing blood loss result in children more easily going into shock. Finally, children are completely reliant on adult caregivers and in the event of a disaster may become separated from them.[4] These factors among others suggest that if hospitals are not prepared for the day to day emergencies that children experience then they will not be ready for a disaster involving large numbers of children.

In the areas of child death, protection and safeguarding, there were several essential recommendations but my survey has only one question that asks about a policy for child maltreatment and a policy addressing the death of a child in the ED. These two policies were the most common ones found across all of the hospitals at 87% and 85% respectively.

In the area of social and mental health, there were a number of essential recommendations by IFEM and the readiness survey included many questions to address this area. Many of the questions asked in the survey were not part of the U.S. readiness survey but were included because of the growing problem that children and adolescents are facing trying to receive mental health care in the U.S. and an area of personal interest. According to the 2006 IOM report, it is estimated that 20% of U.S. children have a mental disorder with at least mild functional impairment and between 5 and 9 percent of children have a serious emotional disturbance.[4] A number of studies have shown that visits to the ED for mental health related problems in children is on the rise and that patients with mental health disorders are getting younger and younger with earlier diagnosis of bipolar disorder and anxiety. Mintegi showed that social services were not available in 17% of the departments in his European survey.[27] My survey may suggest that these numbers are perhaps getting worse. While 87% of respondents have a policy that address the mental health needs of children, screening tools in the ED, transfer policies and access to consult with a child psychologist were found to be lacking. There was no particular weighting given to this area although it is felt that this constitutes a future growing area of importance.

Finally, although there were a number of recommendations regarding academic training and research made by IFEM, I chose not to have any questions that address this area. My survey focused on the every day readiness of EDs and while training and research is important in the academic setting, was simply beyond the scope of this project.

Like Mintegi's study, this survey has a number of limitations. First, the sample size was once again very small. Because the survey encompasses hospitals from across borders of countries throughout Europe the ability to access one EU organization to partner with to improve response to the survey tool was limited. Mintegi used the research network through EuSEM with some success and therefore provided a model. That study also was electronic. I chose this identical strategy to collect the hospital data. Early in the course of the study, it became clear that a greater promulgation of the survey tool would be needed due to a low response rate. I had also hoped to gather data from hospitals of varying sizes but my results suggest that almost all of the respondents represent large hospitals that see large volumes of emergency department patients. It is also very likely that the larger hospitals in Europe are the hospitals where most children receive emergency care. In the U.S. most children are seen in community hospitals where it has been estimated that non-children's hospital EDs see almost 90% of the estimated 29 million pediatric visits annually.[22] Given the strategy used to promulgate my survey, there was a selection bias not only toward hospitals that see large pediatric ED volumes but who are interested in contributing to research in this area. My survey saw a completion rate that was also problematic with approximately 160 overall respondents. However, closer analysis revealed a number of surveys from the same hospital completed

by different people and a large number of surveys that were so incomplete, that they were not included in the final analysis. This left 47 surveys that were used in the end.

The weighting of the questions to obtain a pediatric readiness score was consensus driven and therefore of some questionable validity. Of importance however is that the weighting strategy was incorporated into previous administrations of the survey in the U.S. Most recently, the survey was distributed as a pilot project in California and is currently being administered as part of a national effort across the U.S. The resultant readiness scores are shown in comparison in table 6.

Table 6 Basic Statistics from Completed Assessments

Annual ED Pediatric Patient Volume	**Median ED Readiness Score**
Medium Volume (5000-9999 patients)	
2012 California Readiness Study	71 (IQR 57.9 – 85.7)
2003 U.S. National Readiness Study	58.3
2013 U.S. National Readiness Study	75
2013 European Readiness Study	50 (IQR: 49 – 71)
High Volume ($\geq$ 10000 patients)	
2012 California Readiness Study	79 (IQR 65.1 – 92.8)
2003 U.S. National Readiness Study	68.9
2013 U.S. National Readiness Study	90
2013 European Readiness Study	65 (IQR: 54 – 67)

At the time of this writing, the 2013 U.S. Pediatric Readiness overall median score is 69 with medium-high and high volume hospital EDs scoring 74 and 84 versus the European EDs which score at 50 and 65 respectively. See figure 2. Further analysis of the data allowing for focus on those respondents from France (32 0f 47 hospitals) revealed similar results with the median score at 63 (IQR: 54 – 78). This score is still below the overall median U.S. score.

It is worthy of some brief discussion as why these scores seem so low for the European hospitals, especially given that most of the respondents practice in large hospitals with particularly large pediatric volumes suggesting a desire to be more ready to care for children than smaller hospitals. In my survey, I identified a number of barriers to implementing the 2009 AAP/ACEP guidelines. One obvious factor is that 19 of 49 (41%) of respondents were unaware that national guidelines existed or were unfamiliar with them. Despite being published in the Pediatric and Emergency Medicine journals of choice in the U.S., the guidelines may not have been able to reach practicing physicians in the EU. Even with the publishing of international standards by IFEM (which incorporate many of the AAP/ACEP recommendations) in 2012, there seems to be a lack of awareness that standards exist to improve the overall readiness of EDs in Europe. It is clear that resources may be needed to increase awareness in all stakeholders committed to pediatric readiness. This becomes a critical role for EuSEM and individual country health ministries. Hospital accreditation organizations can also force these recommendations to be adopted by hospitals if they choose to incorporate any number of the IFEM standards into their review processes.

Figure 2. U.S. Pediatric Readiness Assessment Scores

The following results represent a national initiative sponsored by the federal Emergency Medical Services for Children Program (EMSC) to ensure that **emergency departments (EDs)** are ready to care for children. EDs are asked to take an assessment regarding available resources for the care of children and receive a score based on a **100 point scale**. *Our goal is to have all EDs in the country score 100!* Help us get there...Get ready for kids!

Rev. 8/13/2013 - 9:20 MDT (Updated Daily)

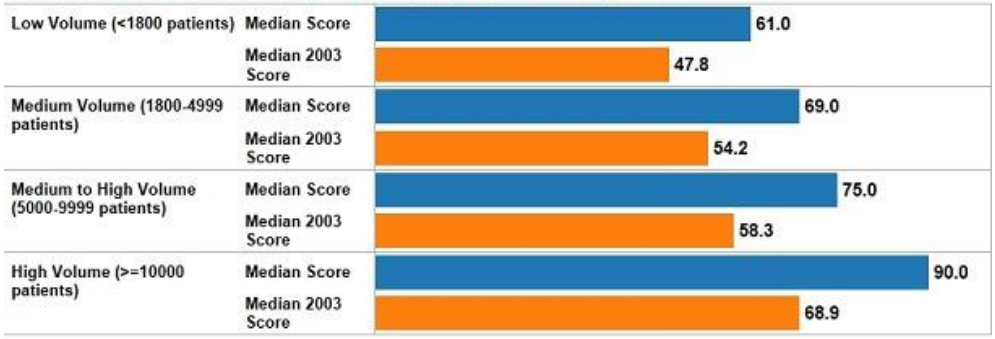
Average Pediatric Readiness Scores

Low Volume (<1800 patients)	Medium Volume (1800-4999 patients)	Medium to High Volume (5000-9999 patients)	High Volume (>=10000 patients)	All Participating Hospitals
62	70	74	84	69
n = 1,613	n = 1,217	n = 692	n = 559	n = 4,081

How are we improving? 2003 vs 2013

Overall Median Pediatric Readiness Score

Median Pediatric Readiness Score for Emergency Departments by Patient Volume



Basic Statistics from Completed Assessments

Annual ED Pediatric Patient Volume	Hospitals w/EDs	Average Score	Median Score	Minimum Score	Maximum Score
Low Volume (<1800 patients)	1,613	62	61	22	100
Medium Volume (1800-4999 patients)	1,217	70	69	29	100
Medium to High Volume (5000-9999 patients)	692	74	75	31	100
High Volume (>=10000 patients)	559	84	90	35	100
Grand Total	**4,081**	**69**	**69**	**22**	**100**

Emergency Department Approved for Pediatrics (EDAP)

Participating EDAPs	399	81.6	87.0	30.0	100.0

tableau

http://www.pedsready.org/

Another obvious factor identified by this survey was motivation. Similar to the first U.S. national survey published in 2003, 12 of 46 respondents (26%) in my survey were not interested in implementing the guidelines.[22] With the published IFEM standards, providers of care and hospital managers would seem to be more motivated to meet these recommendations yet my survey suggests that cost issues and lack of administrative support are important barriers cited by the majority of respondents.

Workforce issues, such as the availability of appropriately trained physicians and nurses were listed as a possible barrier by 43% and 52% of respondents, respectively. This is supported by the findings of Mintegi that most Pediatric ED directors in Europe do not have any formal training in Pediatric Emergency Medicine. He also found that most European PEDs are staffed by pediatricians and pediatric residents; in 17% of the departments, there was no full coverage by an attending pediatrician or PEM-trained physician. Twenty-four-hour 7-day coverage by residents without the presence of experienced personnel was an equally disturbing finding. The progress that has recently occurred in some countries (affiliated to EuSEM) by establishing formal PEM training programs,[26,32,33] and creation of the PEM section in EuSEM may lead to favorable changes in the future.

The readiness survey focused heavily on the availability of equipment and supplies and listed some 55 items that were thought by the U.S. expert committee to be the most essential. Overall, similar to the 2003 ED preparedness survey, my survey showed that only 3 of 46 (6%) of respondents had ALL of the recommended equipment and supply items. Other investigators have reported similar findings.[32,33] Previous studies in the U.S. have suggested that equipment and supplies for neonates and small infants were

most often missing which was reflected in my survey for oropharyngeal airways, suction catheters and tracheostomy tube sizes only. Overall, equipment size did not appear to be a limiting factor in my survey. My study also showed that many EDs use LMAs of all sizes and this may suggest that ED personnel are more comfortable with this equipment than previous studies have shown in the U.S.[22] While it was encouraged that respondents of the survey take the opportunity to personally do an inventory of the equipment, there was no mechanism to verify if each item was actually present. It is all too easy to think that certain equipment is readily accessible when in fact, it may not be. This limitation to the survey can only be overcome if an independent surveyor or accrediting body actually performs an on-site evaluation of the equipment list and this strategy is encouraged.

I have previous discussed the belief that a physician and/or nurse coordinator is essential to improving compliance with the recommended guidelines. The IOM report of 2006 identified that in order to improve integration, coordination and accountability in emergency care of children that pediatric issues must be represented at all levels of planning from the local to the national level.[4] The IOM therefore included pediatric emergency care coordinators in the emergency care recommendations. The 2003 U.S. ED preparedness survey also added support to this recommendation.[22] That survey showed that regardless of volume, those EDs that have both a nurse and physician coordinator are better prepared. While I was unable to show any significant difference between those EDs with and without a physician and nurse coordinator, the trend did suggest a higher readiness score if both were present. Having a coordinator likely does demonstrate a commitment of these EDs to providing the highest quality medical care. The three institutions in my survey with almost all of the recommended equipment and the

highest readiness scores had a physician and nurse coordinator. It was also observed that 2 of the 3 lowest readiness scores were observed in institutions without either a physician or nurse coordinator.

As noted in the 2003 U.S. ED preparedness survey, my survey did not collect data from the hundreds if not thousands of hospitals that did not participate in the survey. It is likely that many of these hospitals do not care for children or care for a very small number, but this number cannot be estimated accurately. Unfortunately, it is exactly this population of EDs and care providers that would be important to reach. I believe it is likely that the survey respondents in my survey are biased toward hospitals with EDs that see a larger volume of children. If this bias does exist, then it likely results in an overestimation of the true state of readiness not only with the AAP/ACEP guidelines but also with the IFEM standards. As with many surveys, variability in the ability of respondents to answer all of the questions accurately eliminated a number of the respondents and created some differences in the total responses to some of the questions. This resulted in eliminating a number or respondents from the final analysis.

Given the time frame, project objectives were very ambitious but the goal was to obtain a snapshot of the current state of pediatric readiness and I believe that this was achieved.

Finally, it is worth mentioning something about the cost for readiness as this was cited above as a potential barrier. Table 7 shows an estimate of the costs of equipment. These numbers were obtained from various medical supply companies found on the internet and represent in some cases a discounted price while in others, a full price. Further analysis of my survey data showed that the median readiness score for just the equipment component alone was 22 out of a possible 30 points. One of the most

frequently missing (20 of 46 respondents) equipment items and one of the most expensive is the continuous CO2 monitor (price approximately $1500). Also frequently missing were umbilical vein catheters 20/46 (price approximately $100), tracheostomy tubes of all sizes 31/46 (prices approximately $30.00), stylets 21/45 (prices approximately $37.00), orophanygeal airways 13/45 (prices approximately $40.00), nasal cannulas 18/45 (prices approximately $5.00), LMAs 28/45 (prices approximately $22.50 for each size) and a difficult airway kit 27/45 (price approximately $170). To almost fully stock every ED in my survey would likely cost approximately $2000 or approximately 1500 Euros.

Table 7. Cost of pediatric equipment

Monitoring Equipment	**Cost**
Neonatal blood pressure cuff	$18.49
Infant blood pressure cuff	$18.78
Child blood pressure cuff	$17.40
Defibrillator with pediatric and adult capabilities including pads/paddles	$695
Pulse oximeter with pediatric and adult probes	$315
Continuous end-tidal CO2 monitoring device	$1500
Airway equipment	
Endotracheal tubes Sizes cuffed or uncuffed: 2.5, 3.0, 3.5, 4.0, 4.5, 5.0, 5.5, cuffed 6.0	30.99
Laryngoscope blades Size 00 to size 2 (straight and curved blade)	$149.00 x 4

Pediatric Magill forceps	$10.50
Nasopharygeal airways Sizes: infant, child	$29.00
Oropharygeal airways Sizes: 0, 1, 2, 3	$39.79
Stylets for pediatric/infant sized endotracheal tubes	36.99
Tracheostomy tubes Sizes 3.0 mm to 4.0 mm	15.00 +14.39
Bag valve mask device, self inflating, infant 450 cc	$39.99
Masks to fit bag-mask device adapter Sizes: neonatal, infant, child	$39.50 x 3/10
Clear oxygen masks Size standard infant, child	$4.39 x 2
Non-rebreather masks Sizes: infant, child	$28.95
Nasal cannulas Sizes: Infant, child	$5.00
Laryngeal mask airways Size 1, 1.5, 2, 2.5, 3	22.50 x 5
Suction catheters Sizes 6-8 Fr and 10-12 Fr	2.25-2.57
Difficult airway supplies/kit	$170
Fluid resuscitation equipment	
22 gauge catheter-over-the-needle	$2.72
24 gauge catheter-over-the-needle	$2.72
Pediatric intraosseus needles	$84.00/2
IV administration sets with calibrated chambers and extension tubing and/or	$2.42

infusion devices with ability to regulate rate and volume of infusate	
Umbilical vein catheters (3.5F or 5.0F)	50.54 x 2
Central venous catheters	$66.15
Total	**$3936.31**

Most of the other factors that contribute to readiness such as the physician and nurse coordinator, the presence of competency measures, the presence of various policies and procedures as well as the quality improvement plan may take man hours to put into place, but the ongoing cost would be very small. Ultimately, based on these survey results, the costs to improve readiness in every ED both in the U.S. and across Europe would be extremely small and worthy of the investment.

Conclusion

This thesis reports on a European survey of EDs regarding their readiness to care for children with all types of illness and injuries. The questions are based upon recommendations by the American Academy of Pediatrics and the American College of Emergency Physicians but many of these recommendations have been adopted by the International Federation of Emergency Medicine and have been promulgated world wide. Overall, the weighted readiness score of EDs across Europe was quite low and in many ways mirror the results seen in the U.S. almost 12 years ago.[22] While there was no statistical difference in my survey between hospitals with a physician and nurse coordinator with regard to the hospital's readiness many of the respondents in the survey were unaware that there were published standards and many were not interested in implementing the recommendations. Almost all of the respondents in my survey were large institutions with large pediatric volumes. With so few small hospitals that participated in the survey, it is difficult to know if the actual readiness of EDs is even lower when these EDs are considered.

Few hospitals have all of the recommended equipment, appropriate quality improvement strategies and appropriate policies and procedures. It was also apparent that mental health issues continue to be a challenge both in the U.S. and across Europe. Our emergency departments must and can be better prepared to care for children on a day to day basis.

The U.S. project has followed a highly participatory methodology with high interest from many of the participants. Moreover, the project used experts in the field of pediatric emergency medicine and emergency medicine to construct the survey instrument. My

survey could be used to do a longitudinal evaluation as was done in the U.S. This could especially be performed across France using their research network to re-evaluate the 32 respondents who did complete this survey. Repeating the readiness score in the future and measuring the improvement would be invaluable as an assessment of the investment in improving the care of children across France and across Europe. Equally important is the idea that natural and man-made disasters are occurring on a regular basis world-wide and there are very high expectations that governments and health care systems will be ready to care for any surge in pediatric patients that may occur.

This survey, suggests that much work needs to be done. The barriers that exist to achieving the readiness that is desired appears to not be one of costs as the cost for readiness is minimal. The main barrier is the willpower to achieve the goal. This willpower can be achieved by the care givers on the front lines but ultimately with the support of health ministries and accrediting bodies to provide the necessary leadership.

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Appendix I – The Weighting Method

Section I. Guidelines for Administration and Coordination of the ED for the Care of Children. The relative value calculated for this section, based on the average of all responses, was 19 points. Each of the two items in the section was scored equally - questions 11 and 13 were worth 9.5 points each.

Section II. Guidelines for Physicians and Other Practitioners Staffing the ED. The relative value calculated for this section, based on the average of all responses, was 10 points. Each of the two questions within this section was scored equally, questions 17 and 20 were worth 5 points each.

Section III. Quality Improvement Guidelines for the ED. The relative value calculated for this section, based on the average of all responses, was 7 points. Based on the relative importance assigned to the items in this section, 5 points were allocated to question 26 and 0.5 points to each of the four items in question 26.

Section IV. Guidelines for Improving Patient Safety. The relative value calculated for this section, based on the average of all responses, was 14 points. Based on the relative importance assigned to the items in this section, questions 28 and 35 were worth 3.5 points each, and questions 30-33, and 35 were worth 1.4 points each.

Section V. Guidelines for Policies, Procedures, and Protocols for the ED. The relative value calculated for this section, based on the average of all responses, was 17 points. Based on the relative importance assigned to the items in this section, the following four questions received 2.12 points each (36, 39, 40, and 43) and each of the five items in question 38 were worth 1.7 points each.

Section VI. Guidelines for Support Services in the ED. The relative value calculated for this section, based on the average of all responses, was zero points.

Section VII. Guidelines for Equipment, Supplies, and Medications for Children in the ED. The relative value calculated for this section, based on the average of all responses, was 33 points. Based on the relative importance assigned to the items in this section, questions 46, 47, and 48 received 1 point each. The remaining 30 points were divided between the most valued subsections as determined by the expert panel:

Monitoring Equipment, Fluid Resuscitation and Supplies, and Respiratory/Airway Management Equipment and Supplies. In addition, only pediatric-specific equipment was weighted.

The subsections was scored as follows:

Monitoring Equipment (question 49) - Based on the relative importance assigned to the items in this subsection, items a-f received 0.55 points each. The cumulative value of the six scored items in this subsection was 3.3 points.

Fluid Resuscitation Equipment and Supplies (question 50) - Based on the relative mportance assigned to the items in this subsection, items a-f received 0.55 points each. The cumulative value of the six scored items in this subsection was 3.3 points.

Respiratory/Airway Management Equipment and Supplies (question 51) - Based on the relative importance assigned to the items in this subsection, the following items received 0.557 points each: a-pp. The cumulative value of the 42 scored items in this subsection was 23.4 points.

Appendix II – The Survey Tool

Welcome! You are being asked to participate in a nationwide quality improvement project to research hospital Emergency Department (ED) readiness to care for children based on guidelines by the International Federation of Emergency Medicine and the United States American Academy of Pediatrics.

The overall goal of this project is for hospitals to work with their country's Ministries of Health to identify areas that will lead to improvements in the emergency care of children.

Thank you for taking the time to make a difference to improve care for children. Before we begin, a couple of points to keep in mind:

- We anticipate that the electronic assessment will take 30-60 minutes to complete.

  Participation in this project is voluntary. All questions marked with a red asterisk in the electronic assessment are required for successful completion. You may, however, exit the assessment at any point you wish.

- **If you cannot finish the assessment in one sitting, you will be able to resume your progress from any page by clicking on the "Save and Exit" button. This will take you to a page where you must supply your email address to receive an email with a link to YOUR assessment. When you are ready to resume the assessment, click on the web address from the email message and you will be directed to the page where you exited.**

- At the completion of the electronic assessment, you will receive a score for your hospital ED regarding pediatric readiness and an analysis of areas for potential improvement. You will also be able to compare your hospital's score against results from similar hospitals across Europe.

- Your answers will be kept confidential. Your assessment results will be combined with those from other emergency departments for reporting purposes.

We greatly appreciate your time in completing this assessment.

Please provide us with the following information, in case we need to contact you to clarify any of your responses:

Name: _____

Title/Position: _____

Phone number: _____

Email: _____

These first few questions will tell us about the infrastructure of your hospital and emergency department.

1. What is the name of your hospital? _____

2. In what city is your hospital located? _____

3. In what country is your hospital located? _____

4. Does your hospital have an emergency department (ED) that is open 24/7?

☐ Yes
☐ No → (You do not need to complete the assessment…thanks for your time.)

5. Is each of the following organizations used for accreditation of your hospital? (Check Yes or No for each)

a.	The Joint Commission (TJC)	Yes ☐ No ☐
b.	Centers for Medicare and Medicaid Services (CMS)	Yes ☐ No ☐
c.	DNV (Det Norske Veritas)	Yes ☐ No ☐
d.	Other	Yes ☐ No ☐

You marked "Other" to the previous question. Please indicate the organizations used for accreditation of your hospital:_____

6. Which <u>one</u> of the following is the best description of your ED configuration for the care of children (children as defined by your hospital)?
(Choose one)

a. ☐ Pediatric ED in a Children's hospital (hospital cares ONLY for children)

b. ☐ Separate pediatric ED in a general hospital (adult and children within one hospital)

c. ☐ General ED (pediatric and adult patients seen in same area)

d. ☐ Stand-by ED (physician on call)

e. ☐ Free-standing ED (ED unattached to a hospital with inpatient services)

f. ☐ Other

You marked "Other" to the previous question. Please describe your ED configuration for the care of children:_____

7. Are any children admitted to your inpatient services (NICU, PICU, adult ICU, nursery, pediatric inpatient unit, and/or adult inpatient unit)?

☐ Yes
☐ No ⟶ **Go to 9**

8. If yes, which of the following inpatient services may admit children? (Check Yes or No for each)

a. Neonatal intensive care unit	Yes ☐	No ☐
b. Pediatric intensive care unit	Yes ☐	No ☐
c. Adult intensive care unit	Yes ☐	No ☐
d. Newborn nursery	Yes ☐	No ☐
e. Pediatric inpatient unit	Yes ☐	No ☐
f. Adult inpatient unit	Yes ☐	No ☐

9. What is the upper age that your ED uses to define a pediatric <u>medical</u> patient? (Choose one)

a. 12 years ☐
b. 13 years ☐
c. 14 years ☐
d. 15 years ☐
e. 16 years ☐
f. 17 years ☐
g. 18 years ☐
h. 19 years ☐
i. 20 years ☐
j. 21 years ☐
k. Other ☐

You marked “Other” to the previous question. Please indicate the age your ED uses to define pediatric medical patients:_____

10. What is the upper age that your ED uses to define a pediatric trauma patient? (Choose one)

a. 12 years ☐
b. 13 years ☐
c. 14 years ☐
d. 15 years ☐
e. 16 years ☐
f. 17 years ☐
g. 18 years ☐
h. 19 years ☐
i. 20 years ☐
j. 21 years ☐
k. Other ☐

You marked "Other" to the previous question. Please indicate the age your ED uses to define pediatric trauma patients:_____

Answers to the following questions will help us to better understand the resources available for the care of children in your ED.

Physician Administration/Coordination

11. Does your hospital have a physician coordinator who is assigned the role of overseeing various administrative aspects of pediatric emergency care (e.g., oversees quality improvement, collaborates with nursing, ensures pediatric skills of staff, develops and periodically reviews policies)?

Note: The physician coordinator for pediatric emergency care may have additional administrative roles in the ED.

☐ Yes
☐ No → **Go to 13**

12. If yes, is there a job description or written list of responsibilities for this physician coordinator?

☐ Yes
☐

No

Nurse Administration/Coordination

13. Does your hospital have a nurse coordinator who is assigned the role of overseeing various administrative aspects of pediatric emergency care (e.g., facilitates continuing education, facilitates quality improvement activities, ensures pediatric-specific elements are included in orientation of staff)?

    Note: The nurse coordinator for pediatric emergency care may have additional administrative roles in the ED.

    ☐ Yes
    ☐ No ⟶ **Go to 15**

14. If yes, is there a job description or written list of responsibilities for this nurse coordinator?

    ☐ Yes
    ☐ No

The following assessment questions refer to personnel, quality improvement, and patient safety in the ED. If you have a separate pediatric ED, then answer based on resources for that area; if you do not have a separate pediatric ED, then answer based on the overall ED resources.

Personnel – Physicians

15. Thinking of the physicians who currently staff your ED and care for children, what types of training are represented?
    (Check Yes or No for each)

    a. Emergency medicine board eligible/certified — Yes ☐ No ☐
    b. Family medicine board eligible/certified — Yes ☐ No ☐
    c. Pediatrics board eligible/certified — Yes ☐ No ☐
    d. Pediatric emergency medicine board eligible/certified — Yes ☐ No ☐
    e. Physician with other training — Yes ☐ No ☐

    You marked “Other” to the previous question. Please describe the other levels of training the physicians who currently staff your ED and care for children have:_____

16. Thinking of the physicians who care for children in your ED, but are not board certified in Pediatric Emergency Medicine or by the American Board of Emergency Medicine/American Osteopathic Board of Emergency Medicine, which of the following life support courses are required by your hospital as part of credentialing? (Check Yes or No for each)

a.	Basic Life Support (BLS)	Yes ☐ No ☐
b.	Advanced Cardiac Life Support (ACLS)	Yes ☐ No ☐
c.	Pediatric Basic Life Support (PBLS)	Yes ☐ No ☐
d.	Pediatric Advanced Life Support (PALS)	Yes ☐ No ☐
e.	APLS: The Pediatric Emergency Medicine Resource (APLS)	Yes ☐ No ☐
f.	Neonatal Resuscitation Program (NRP)	Yes ☐ No ☐
g.	International Trauma Life Support (ITLS; formerly Basic Trauma Life Support)	Yes ☐ No ☐
h.	Advanced Trauma Life Support (ATLS)	Yes ☐ No ☐
i.	Other	Yes ☐ No ☐

You marked "Other" to the previous question. Please describe other life support courses your hospital requires of physicians caring for children in the ED:_____

17. Does your hospital require specific pediatric competency evaluations of physicians staffing the ED (e.g., sedation and analgesia)?

☐ Yes
☐ No

Personnel – Nurses

18. Does your institution's staff policy for nurses include requirements for each of the following?
(Check Yes or No for each)

a.	Continuing education requirements in pediatric emergency care	Yes ☐ No ☐
b.	Maintenance of specialty certification for nurses (e.g., CEN, CPEN)	Yes ☐ No ☐

19. Does your hospital require nurses caring for children in the ED to complete each of the following life support courses as a part of employment?

(Check Yes or No for each)

a.	Basic Life Support (BLS)	Yes ☐ No ☐
b.	Advanced Cardiac Life Support (ACLS)	Yes ☐ No ☐
c.	Pediatric Basic Life Support (PBLS)	Yes ☐ No ☐
d.	Emergency Nursing Pediatric Course (ENPC)	Yes ☐ No ☐
e.	Pediatric Advanced Life Support (PALS)	Yes ☐ No ☐
f.	APLS: The Pediatric Emergency Medicine Resource (APLS)	Yes ☐ No ☐
g.	Neonatal Resuscitation Program (NRP)	Yes ☐ No ☐
h.	International Trauma Life Support (ITLS; formerly Basic Trauma Life Support)	Yes ☐ No ☐
i.	Trauma Nursing Core Course (TNCC)	Yes ☐ No ☐
j.	Other	Yes ☐ No ☐

You marked “Other” to the previous question. Please describe other life support courses your hospital requires of nurses caring for children in the ED:

_____

20. Does your hospital require specific pediatric competency evaluations of nurses staffing the ED (e.g., triage, pain assessment)?

☐ Yes
☐ No

Personnel – Mid-level Practitioners (Nurse Practitioners, Physician Assistants)

21. Does your hospital have mid-level practitioners (nurse practitioners and/or physician assistants) that provide care for children in the ED?

☐ Yes
☐ No → **Go to 25**

22. If yes, does your institution's staff privileges policy for mid-level practitioners include requirements for each of the following?

(Check Yes or No for each)

a. Continuing education requirements in pediatric emergency care ☐ Yes ☐ No

b. Maintenance of specialty certifications ☐ Yes ☐ No

23. Does your hospital require mid-level practitioners caring for children in the ED to complete each of the following life support courses as a part of employment? (Check Yes or No for each)

a. Basic Life Support (BLS) ☐ Yes ☐ No

b. Advanced Cardiac Life Support (ACLS) ☐ Yes ☐ No

c. Pediatric Basic Life Support (PBLS) ☐ Yes ☐ No

d. Emergency Nursing Pediatric Course (ENPC) ☐ Yes ☐ No

e. Pediatric Advanced Life Support (PALS) ☐ Yes ☐ No

f. APLS: The Pediatric Emergency Medicine Resource (APLS) ☐ Yes ☐ No

g. Neonatal Resuscitation Program (NRP) ☐ Yes ☐ No

h. International Trauma Life Support (ITLS; formerly Basic Trauma Life Support) ☐ Yes ☐ No

i. Trauma Nursing Core Course (TNCC) ☐ Yes ☐ No

j. Other ☐ Yes ☐ No

You marked "Other" to the previous question. Please describe other life support courses your hospital requires of mid-level practitioners caring for children in the ED: _____

24. Does your hospital require specific pediatric competency evaluations of mid-level practitioners staffing the ED (e.g., triage, pain assessment)?

☐ Yes
☐ No

Quality Improvement

25. Does your ED have a pediatric patient care-review process? (This may be a separate Quality Improvement/Performance Improvement Plan for pediatric patients or integrated into the overall ED Quality Improvement/Performance Improvement Plan.)

☐ Yes
☐ No → **Go to 27**

26. If yes, is each of the following components included in the Quality Improvement/ Performance Improvement Plan?
(Check Yes or No for each)

a. Identification of quality indicators for children (e.g., performing lumbar puncture on febrile neonates) — Yes ☐ No ☐

b. Collection and analysis of pediatric emergency care data (e.g., admissions, transfers, death in the ED, or return visits) — Yes ☐ No ☐

c. Development of a plan for improvement in pediatric emergency care (e.g., process to ensure that variances in care are addressed through education or training and reassessed for evidence of improvement) — Yes ☐ No ☐

d. Re-evaluation of performance using outcomes-based measures (e.g., how often pain was rapidly controlled or fever properly treated) — Yes ☐ No ☐

Pediatric Patient Safety in the ED

27. Are all* children seen in the ED weighed in kilograms (without conversion from pounds)?

**Note: This includes critical situations when a child might bypass triage and have his/her weight estimated in kilograms.*

☐ Yes
☐ No → **Go to 29**

28. Is the weight recorded in the ED medical record in kilograms only?

☐ Yes → **Go to 30**
☐ No

29. If no, how are children in the ED weighed, and how is the weight recorded in the medical record?

(Choose one)

a. ☐ Weighed in pounds and converted to kilograms for recording in the medical record

b. ☐ Weighed in either pounds or kilograms with an option to record in either pounds or kilograms in the medical record

30. Are temperature, heart rate, and respiratory rate recorded on all children? Yes ☐ No ☐

31. Is blood pressure monitoring available for children of all ages based on severity of illness? Yes ☐ No ☐

32. Is pulse oximetry monitoring available for children of all ages based on severity of illness? Yes ☐ No ☐

33. Is a written procedure in place for notification of physicians when abnormal vital signs are found in all children? Yes ☐ No ☐

34. Is a process in place for the use of pre-calculated drug dosing in all children? Yes ☐ No ☐

35. Is a process in place that allows for 24/7 access to interpreter services in the ED? Yes ☐ No ☐

Next we wish to know about policies and/or procedures that your ED has to address the needs of children. These pediatric policies may be integrated into the overall ED policy manual or may be listed separately. They should also be written and available to staff in the ED.

Policies and Procedures

36. Does your ED have a triage policy that specifically addresses ill and injured children?

☐ Yes
☐ No → **Go to 38**

37. If yes, do you use a validated pediatric triage tool? Yes ☐ No ☐ Unsure ☐

38. Does your ED have each of the following listed policies and procedures? (Check Yes or No for each)

a. Pediatric patient assessment and reassessment Yes ☐ No ☐

b. Immunization assessment and management of the under-immunized child Yes ☐ No ☐

c. Child maltreatment Yes ☐ No ☐

d. Death of the child in the ED Yes ☐ No ☐

e. Reduced-dose radiation for CT and x-ray imaging based on pediatric age or weight Yes ☐ No ☐

39. Does your ED have a policy for promoting family-centered care? (e.g., family presence, family involvement in clinical decision making, etc.)

☐ Yes
☐ No

40. Does your hospital disaster plan address issues specific to the care of children?

☐ Yes
☐ No

Now we would like to know about your hospital's mental health capabilities?.

41. Does your hospital care for children with social and mental health issues?

☐ Yes
☐ No

a. Are there set policies and procedures to treat pediatric behavioral health issues in the Emergency Department? Yes ☐ No ☐

b. Are there screening tools specifically directed toward treating pediatric behavioral health patients in the Emergency Department? Yes ☐ No ☐

c. Do you have a policy to safely transfer pediatric behavioral health patients to inpatient services within your hospital? Yes ☐ No ☐

d. Do you have a policy to safely transfer pediatric behavioral health patients to inpatient services outside of your hospital? Yes ☐ No ☐

e. On average, how long do your pediatric behavioral health patients stay in the Emergency Department before being placed to inpatient services? < 12 hrs ☐ >12 hrs ☐

f. Do your Emergency Department care providers receive regular and current training regarding the pharmacological and non-pharmacological treatment of pediatric behavioral patients? Yes ☐ No ☐

g. Is your Emergency Department equipped with designated rooms for pediatric psychiatric patients which protect against self harm and provide close monitoring? Yes ☐ No ☐

h. Do you have readily access to consult with Child Psychologists and Psychiatrists? Yes ☐ No ☐

i. Does your hospital provide twenty-four hour spiritual care for pediatric psychiatric patients? Yes ☐ No ☐

42. Does your hospital have a written guideline for the transfer of children with social and mental health issues out of your facility to an appropriate facility?

☐ Yes
☐ No

Next we would like to know about your hospital's inter-facility transfer guidelines.

43. Does your hospital or medical facility have written inter-facility **guidelines** that outline procedural and administrative policies with other hospitals for the transfer of patients of all ages including children in need of care not available at your hospital?

The guidelines may be a separate document or part of an inter-facility transfer agreement document.

☐ Yes ⟶ **Go to 44**
☐ No ⟶ **Go to 45**
☐ We currently do not have written guidelines, but are in the process of developing them.

If you are in the process of developing guidelines, when do you anticipate the guidelines to be ready? Month/Year (mm/yyyy): _____ → **Go to 45**

44. You answered that your facility has written inter-facility transfer **guidelines**.

Please indicate whether the guidelines include the information specifically for the transfer of patients for each item below.
(Check Yes or No for each)

a. Defined process for initiation of transfer, including the roles and responsibilities of the referring facility and referral center (including responsibilities for requesting transfer and communication) — Yes ☐ No ☐

b. Process for selecting the appropriate care facility — Yes ☐ No ☐

c. Process for selecting the appropriately staffed transport service to match the patient's acuity level (level of care required by patient, equipment needed in transport, etc.) — Yes ☐ No ☐

d. Process for patient transfer (including obtaining informed consent) — Yes ☐ No ☐

e. Plan for transfer of copy of patient medical record — Yes ☐ No ☐

f. Plan for transfer of copy of signed transport consent — Yes ☐ No ☐

g. Plan for transfer of personal belongings of the patient — Yes ☐ No ☐

h. Plan for provision of directions and referral institution information to family — Yes ☐ No ☐

Now we would like to know about your hospital's inter-facility transfer agreements.

45. Does your hospital or medical facility have written inter-facility **agreement(s)** with other hospitals for the transfer of patients of all ages including children in need of care not available at your hospital?

☐ Yes
☐ No
☐ We currently do not have written agreements, but are in the process of developing them.

↳ If you are in the process of developing agreements, when do you anticipate the agreements to be ready? Month/Year (mm/yyyy):_____

We would like to know about the equipment and supplies for children in your ED and how they are stored and resupplied. If you have not already printed the entire assessment, we recommend printing this portion of the assessment and taking it to your equipment and supply areas to complete to ensure accurate reporting.

Equipment and Supplies

46. Is the ED staff trained on the location of all pediatric equipment and medications?

☐ Yes
☐ No

47. Is there a daily method used to verify the proper location and function of pediatric equipment and supplies?

☐ Yes
☐ No

48. Is a medication chart, length-based tape, medical software, or other system readily available to ensure proper sizing of resuscitation equipment and proper dosing of medications?

☐ Yes
☐ No

49. Is each of the following monitoring equipment items available for immediate use in the ED?
(Check Yes or No for each)

a. Neonatal blood pressure cuff	☐ Yes	☐ No
b. Infant blood pressure cuff	☐ Yes	☐ No
c. Child blood pressure cuff	☐ Yes	☐ No
d. Defibrillator with pediatric and adult capabilities including pads/paddles	☐ Yes	☐ No
e. Pulse oximeter with pediatric and adult probes	☐ Yes	☐ No
f. Continuous end-tidal CO2 monitoring device	☐ Yes	☐ No

50. Is each of the following fluid resuscitation equipment items available for immediate use in the ED?
(Check Yes or No for each)

a. 22 gauge catheter-over-the-needle	☐ Yes	☐ No
b. 24 gauge catheter-over-the-needle	☐ Yes	☐ No
	☐	☐

c. Pediatric intraosseus needles Yes No

d. IV administration sets with calibrated chambers and extension tubing and/or infusion devices with
ability to regulate rate and volume of infusate Yes ☐ No ☐

e. Umbilical vein catheters (3.5F or 5.0F) Yes ☐ No ☐

f. Central venous catheters
(any two sizes in range, 4F-7F) Yes ☐ No ☐

51. Is each of the following respiratory/airway management equipment items available for immediate use in the ED?
(Check Yes or No for each)

a. Endotracheal tubes: cuffed or uncuffed 2.5 mm Yes ☐ No ☐
b. Endotracheal tubes: cuffed or uncuffed 3.0 mm Yes ☐ No ☐
c. Endotracheal tubes: cuffed or uncuffed 3.5 mm Yes ☐ No ☐
d. Endotracheal tubes: cuffed or uncuffed 4.0 mm Yes ☐ No ☐
e. Endotracheal tubes: cuffed or uncuffed 4.5 mm Yes ☐ No ☐
f. Endotracheal tubes: cuffed or uncuffed 5.0 mm Yes ☐ No ☐
g. Endotracheal tubes: cuffed or uncuffed 5.5 mm Yes ☐ No ☐
h. Endotracheal tubes: cuffed 6.0 mm Yes ☐ No ☐
i. Laryngoscope blades: straight, size 00 Yes ☐ No ☐
j. Laryngoscope blades: straight, size 0 Yes ☐ No ☐
k. Laryngoscope blades: straight, size 1 Yes ☐ No ☐
l. Laryngoscope blades: straight, size 2 Yes ☐ No ☐
m. Laryngoscope blades: curved, size2 Yes ☐ No ☐
☐ ☐
n. Pediatric-sized Magill forceps Yes ☐ No ☐
o. Nasopharyngeal airways: infant-sized Yes ☐ No ☐
p. Nasopharyngeal airways: child-sized Yes ☐ No ☐
q. Oropharyngeal airways: size 0 (50mm) Yes ☐ No ☐
r. Oropharyngeal airways: size 1 (60mm) Yes ☐ No ☐
s. Oropharyngeal airways: size 2 (70mm) Yes ☐ No ☐
t. Oropharyngeal airways: size 3 (80mm) Yes ☐ No ☐
u. Stylets for pediatric/infant-sized endotracheal tubes Yes ☐ No ☐
v. Tracheostomy tubes: size 3.0 mm Yes No

w. Tracheostomy tubes: size 3.5 mm Yes No

x. Tracheostomy tubes: size 4.0 mm Yes No

y. Bag-mask device, self inflating: infant, 450 ml	Yes ☐ No ☐
z. Masks to fit bag-mask device adaptor: neonatal	Yes ☐ No ☐
aa. Masks to fit bag-mask device adaptor: infant	Yes ☐ No ☐
bb. Masks to fit bag-mask device adaptor: child	Yes ☐ No ☐
cc. Clear oxygen masks: standard infant	Yes ☐ No ☐
dd. Clear oxygen masks: standard child	Yes ☐ No ☐
ee. Non-rebreather masks: infant-sized	Yes ☐ No ☐
ff. Non-rebreather masks: child-sized	Yes ☐ No ☐
gg. Nasal cannulas: infant	Yes ☐ No ☐
hh. Nasal cannulas: child	Yes ☐ No ☐
ii. Laryngeal mask airways: size 1	Yes ☐ No ☐
jj. Laryngeal mask airways: size: 1.5	Yes ☐ No ☐
kk. Laryngeal mask airways: size: 2	Yes ☐ No ☐
ll. Laryngeal mask airways: size: 2.5	Yes ☐ No ☐
mm. Laryngeal mask airways: size: 3	Yes ☐ No ☐
nn. Suction catheters: at least one in range 6-8F	Yes ☐ No ☐
oo. Suction catheters: at least one in range 10-12F	Yes ☐ No ☐
pp. Supplies/kit for pediatric patients with difficult airways (supraglottic airways of all sizes, needle cricothyrotomy supplies, surgical cricothyrotomy kit)	☐ ☐

Answers to the following question will help us to better understand barriers to the care of children in your ED.

Barriers

52. Do you perceive each of the following as a barrier or not a barrier in implementing national guidelines for pediatric readiness in your ED?
(Check Yes or No for each)

a. Cost of personnel	Yes ☐ No ☐
b. Cost of training personnel	Yes ☐ No ☐
c. Lack of educational resources	Yes ☐ No ☐
d. Lack of appropriately trained physicians	Yes ☐ No ☐
e. Lack of appropriately trained nurses	Yes ☐ No ☐

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f. Lack of administrative support Yes ☐ No ☐

g. Lack of policies for pediatric emergency care Yes ☐ No ☐

h. Lack of a Quality Improvement/Performance Improvement Plan for children Yes ☐ No ☐

i. Lack of a disaster plan for children Yes ☐ No ☐

j. Lack of interest in meeting the guidelines Yes ☐ No ☐

k. Unaware that national guidelines existed and/or unfamiliar with national guidelines Yes ☐ No ☐

l. Other Yes ☐ No ☐

You marked "Other" to the previous question. Please describe other barriers in meeting national guidelines for pediatric readiness in your ED:_____

Finally, please provide actual data or estimations of ED patient volume for the following:

53. List the total number of patients (adult and pediatric) seen in your ED in the last year. (Numeric data only, e.g., 5000, not "five thousand")
Number of Total Patients _____

54. Estimate the number of pediatric patients (as defined by your hospital) seen in your ED in the last year.
(Choose one)

a. Low: <1,800 pediatric patients (average of 5 or fewer a day)

b. Medium: 1,800 – 4,999 pediatric patients (average of 6-13 a day)

c. Medium to High: 5,000 – 9,999 pediatric patients (average of 14-26 a day)

d. High: >=10,000 pediatric patients (average of 27 or more a day)

55. If you know the actual number or a more precise estimate of pediatric patients seen in your ED in the last year, please record below. (Numeric data only, e.g., 500, not "five hundred")

Number of Pediatric Patients _____

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If you have any comments, please note them here:

_____

_____

_____

_____

Appendix III - IFEM ED Readiness Checklist

Chapter 3: General

ESSENTIAL

As emergency healthcare systems mature, countries must consider the special requirements of the pediatric patient with respect to environment, equipment and staff skills, ensuring they meet the needs of both the pediatric and adult population of emergency patients

Where EDs see patients of all ages, there must be a lead doctor and lead nurse for pediatric issues

CHAPTER 4: An integrated service design

ESSENTIAL

Pre-hospital, primary care and hospital services for emergency pediatric care must be integrated, and the role and capabilities of each ED within the regional network should be clear and understood

Clear, written guidelines for transfer criteria to specialist pediatric centres must exist, and mechanisms for swift and expert transfer agreed

All EDs must be prepared at all times to deal with initial resuscitation of a child brought in unexpectedly

The ED must be staffed and equipped to deal with the full range of ages and clinical presentations of children that it normally receives.

Access to specialist pediatric advice to the ED must exist 24 hours a day (by telephone, telemedicine, internet or in person)

DESIRABLE

Managerial documents governing regional networks of emergency care should specify which arrangements apply to pediatric patients

Core specialities should be available to assist the ED; these include anaesthesia for all ages of child, critical care, general pediatric medicine, emergency surgery, orthopaedics, and radiology and pathology services

CHAPTER 5: Child- and family-friendly care

ESSENTIAL

Child and family centered care (CFCC) must be a priority for staff and managers through clinical practice, staffing, and environmental design

Children must be separated from distressing sights and sounds of other patients, with some separation from the main waiting area for adults

The option of family-member presence must be encouraged for all aspects of ED care.

The ED must contain enough child-orientated treatment rooms (depending on the proportion of child ED attenders) with sufficient space to accommodate family members

The ED environment must be safe for children

Younger children must have access to nutrition (this includes provision for breast-feeding)

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 ongoing healthcare

DESIRABLE

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

The pediatric areas should look attractive to children, and provision of toys, books etc and employment of play specialists should be considered, to facilitate high quality care

Timely access to qualified interpretive services should be available 24 hours a day

Services provided should reflect the cultural context of the family, and encourage families to be involved in patient care decisions.

Communication barriers such as literacy and the educational level of the family should be taken into account when giving health information.

Written information should be available for common conditions, and written in simple language, using diagrams where appropriate, to aid understanding

CHAPTER 6: Initial assessment of an ill or injured child

ESSENTIAL

Every child arriving at an ED must have a rapid visual inspection very soon after arrival

All staff members (including non-healthcare qualified) must be trained and empowered to alert others to the arrival of a seriously ill child

All ED clinical staff must be highly competent in recognizing the seriously ill or injured child, and recognizing a deterioration in a child's condition

A critically ill or injured child must be moved immediately to a suitable resuscitation area

There must be no barriers to accessing immediate initial assessment by a qualified staff member trained in the recognition of serious illness in children

All patients presenting for emergency care must receive a full initial assessment by suitably staff within 15 minutes of arrival

The choice of an efficient model of initial assessment for children must take into consideration time available, staff skills, case mix and current workload

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

Drug dosages must be based on an accurate weight

All patients in moderate or severe pain must be have pain relief provided within 30 minutes of arrival

DESIRABLE

In countries where malnutrition is prevalent – children should also be visually inspected for signs of severe malnutrition at triage.

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 prioritized as they are vulnerable

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

CHAPTER 7: Stabilizing and treating an ill or injured child

ESSENTIAL

There must be a defined ‘Resuscitation Team’ of clearly identified staff from within the ED or hospital

All ED clinical staff must be highly competent in basic pediatric life support

At least one member of staff on each shift must be competent in advanced pediatric life support skills

Staff able to provide advanced airway management must be available within 5 minutes of the need being identified

Trained staff must stay with a critically ill child until moved to a dedicated critical care environment or recovery happens

Resuscitation algorithms and equipment should be available in resuscitation areas

A method for estimating weight for children too unstable to be weighed must be used

There must be a system for 24-hour consulting with key specialists either on site or remotely, including toxicology information

The ED must be supported by 24-hour basic radiology and laboratory services

At discharge, caregivers must have advice which they understand, for managing their child's condition and recognizing deterioration

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

Following any major pediatric resuscitation a system should be in place for staff and family to be offered debriefing and if required counseling

A"difficult airway" cart should be available

Parents and family should be given the opportunity to remain present during resuscitation of a child

CHAPTER 8: Staffing

ESSENTIAL

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.

Staff numbers must be adequate to allow safe coverage of all areas of the ED where pediatric patients are being cared for, at all times

DESIRABLE

A core body of medical and nursing should be contracted specifically to the ED full time, for smooth running and high quality of care

In larger EDs for mixed-age patients, there should be a core team of staff skilled in pediatric patients

Staff rosters should take into account peaks and troughs of pediatric arrivals, the need for supervision of junior doctors, and the pediatric skill sets of the staff on any given shift

CHAPTER 9: Staff training and competence

ESSENTIAL

All ED staff must be competent to deal with the full range of illnesses, injuries and age-groups that they are expected to see and understand the differences from adult patients

Refresher training must be available for staff to maintain their knowledge and skills in pediatric resuscitation

ED staff must learn to work as a team

Senior staff must be physically present and available to teach junior ED staff (medical and nursing) while they work.

Senior staff who teach juniors whilst they work must not have a full clinical load, so they can ensure that supervision and education occurs in the busy ED environment

A senior ED doctor and ED nurse must be designated to have the role of creating and managing the ED's education and training programs

DESIRABLE

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

Individual ED's should program their learning activities to maximize attendance of ED staff whilst maintaining quality care in the ED at all times

The education program should incorporate best practice in education, and be delivered by a team of ED staff

Teaching of all team members should occur as a team, teaching both doctors and nurses together (inter-professional education)

CHAPTER 10: Equipment, supplies and medications

ESSENTIAL

Every ED must be well equipped and organized with easy access the necessary equipment, supplies and medications needed for the care of acutely ill or injured children of all ages on a 24 hour basis

Equipment and medications must have a standardized and logical layout, to ensure familiarity for staff, and should ideally match those used in associated departments (eg operating theatres, intensive care unit)

Pre-calculated resources for common or emergency drug doses and equipment sizes for children of all ages must be accessible, as well as dilution guidelines and charts for the preparation and administration of medications and IV fluids

Resuscitation medications, supplies and equipment must be reviewed with each revision of international guidelines

DESIRABLE

Mobile pediatric resuscitation trolleys should be immediately accessible wherever a child could deteriorate

Staff should be familiarized with the departments equipment and medications

Checklists for equipment, supplies and medications should be used, to reduce the risk of missing items

Resources to aid preparation of medications should be readily available.

Other centers in the regional network should provide expertise and support to their affiliated EDs, in harmonizing equipment and medications

Medications and equipment should ideally match those used in associated departments (eg operating theatres, intensive care unit)

CHAPTER 11: Quality and safety

ESSENTIAL

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, which covers the high risk and high volume areas of pediatric emergency care practice

Children must be weighed in kilograms, with the exception of children who require emergency stabilization, and the weight should be recorded with the vital signs

Patient chart reviews must be conducted to identify gaps in knowledge
which result in risks to patients; education of staff must take place to close those gaps

For children who require resuscitation or emergency stabilization, a standard method for estimating weight in kilograms must be used (eg, length-based system)

The quality improvement plan of the ED must include pediatric patient and disease-specific indicators

DESIRABLE

Processes for safe medication storage, prescribing, and delivery should be established and should include the use of pre-calculated dosing guidelines for children of all ages

Infection-control practices, including hand hygiene and use of personal protective equipment, should be implemented and monitored

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

Components of the ED pediatric quality improvement plan should interface
with pre-hospital, inpatient pediatric, and hospital-wide quality improvement activities

CHAPTER 12 : Policies, procedures and protocols

ESSENTIAL

Policies, procedures and protocols must include the issues specific to the
clinical care of pediatric patients in the ED

ED staff must have access to relevant policies, procedures and protocols, for example those of the depart, hospital, regional network or international guidelines

DESIRABLE

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

Policies should be compatible across the regional network

Clinical policies should be symptom based unless there is a high degree of pediatric emergency medicine expertise available

CHAPTER 13: Information systems and data analysis

ESSENTIAL

The lead doctor and lead nurse with the lead role for pediatric emergency care must be integrally involved in the development and implementation of ED information systems in ED's which manage children

ED information systems must include special adaptations to meet the needs of pediatric patients

ED information systems must have the ability to connect to health information outside the ED

Prescribing alerts must be built in to guard against pediatric dosing errors

DESIRABLE

ED's should exploit information technology to achieve full computerization for cost effective patient care, reduce medical errors, and promote patient safety

Full electronic connectivity for all ED work should ideally be integrated,
from patient arrival to discharge

In fully electronic clinical systems pediatric specific templates for history and physical findings should be considered

Computerized clinical guidelines and pathways should include information about common pediatric specific conditions

The ED computer system should collect sufficient data for disease and injury surveillance

Pediatric specific data should be generated to aid clinical quality improvement and research.

CHAPTER 14: Pre-hospital care

ESSENTIAL

Pre-hospital (EMS) services must define the level of pediatric skills expected by responding staff

All pre-hospital staff should be trained to safely assess, manage, and transport common pediatric emergencies to a pre-defined level within the pre-hospital (EMS) network; this includes scene awareness and calming

All pre-hospital responders must be competent in first aid and BLS for infants, children and adolescents.

Pre-hospital responders with advanced training must be competent in advanced life support for infants, children and adolescents

All EMS vehicles must carry basic equipment suitable for children of all Ages

DESIRABLE

All pre-hospital staff should have access to memory aids for drugs and treatment algorithms

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

ED staff should support EMS services in quality improvement and education for pediatric emergencies

CHAPTER 15 : Disaster incidents and patient surges involving children

ESSENTIAL

All pre-hospital responders who might attend a disaster scene must be trained to effectively triage and manage children as well as adults

Disaster planning must consider children when making hazard vulnerability assessments and case scenarios

Designated sites within the hospital for decontamination and management of patients in disasters must consider child casualties

There must be pre-planned process to identify and treat unaccompanied children

Equipment for disaster victims must include appropriate types and size ranges and quantities for children

Emergency medications for disaster victims must include appropriate formulations, administration devices and dosing calculation aids for children, including antidotes and vaccines

DESIRABLE

Disaster care processes should try to keep children and families together if feasible, and support identification, tracking and timely reunification of unaccompanied children with family

Staff training programs for pre-hospital and hospital personnel should include coping with surges in pediatric patients

The principles of management of adults in patient surges / disasters should form the basis of pediatric casualty management, recognising the additional psychological difficulties

The regional network should collaborate to promote preparedness, and disaster drills involving sufficient numbers of children should test readiness

CHAPTER 16: Child protection and safeguarding

ESSENTIAL

Where there is the possibility of child abuse or neglect the first responsibility of ED staff must be to attend to the child's needs including treatment of injuries and analgesia
ED information systems must be configured to identify children attending frequently, and those with known safeguarding concerns

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

All doctors and nurses must be trained in child protection – this includes recognition, initial management, and notification of the right authorities, according to established protocols in the ED the local area

Patients must be managed in a culturally appropriate and sensitive manner; if language barriers exist, a translator must be used in safeguarding cases

Potentially vulnerable children and young adults should not be discharged
from the ED until a place of safety is identified

The lead doctor for pediatric 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

DESIRABLE

Clear protocols, supported by simple flowcharts and checklists, should be available in the ED. This will improve awareness, identification and documentation of cases

Forensic photographs should not be delayed (within the confines of local policy) as injuries may change in appearance

The ED should have access to sources of information about the child's welfare

CHAPTER 17: Adolescents, mental health and substance abuse

ESSENTIAL

EDs must consider the needs of adolescent patients as distinct from those of young children and of adults

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 stabilization

Staff involved in using restraint must be trained to do so, specifically for pediatric patients

All ED staff must be familiar with legislation surrounding consent, confidentiality and mental capacity of patients under the legal age of adulthood

DESIRABLE

Education programs should include causes, signs and symptoms and optimal management of children with mental ill-health/substance misuse

Adequate space should be available for children/families in crisis; and should include a private room with suitable supervision by emergency staff

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

Protocols, pathways and assessment tools to improve care for young people in mental health crisis should be established clinical

CHAPTER 18: Death of a child in the emergency department

ESSENTIAL

EDs must consider the needs of adolescent patients as distinct from those of young children and of adults

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 stabilization

All ED staff must be familiar with legislation surrounding consent, confidentiality and mental capacity of patients under the legal age of adulthood

Staff involved in using restraint must be trained to do so, specifically for pediatric patients

DESIRABLE

Education programmes should include causes, signs and symptoms and optimal management of children with mental ill-health/substance misuse

Adequate space should be available for children/families in crisis; and should include a private room with suitable supervision by emergency staff

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

Protocols, pathways and assessment tools to improve care for young people in mental health crisis should be established clinical

CHAPTER 19: Advanced training and academic research

ESSENTIAL

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

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 no to initiate CPR or other forms or life saving treatment

ED senior staff and managers must ensure that their staff members are prepared for and helped with the emotional consequence of dealing with child

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

EM staff should respect parents´ desire to remain at the child´s bedside during resuscitation

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

Families should be given the opportunity of seeing and holding the deceased child.

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

An ED or pediatric doctor should notify the child's primary care physician of the death, and liaise with him/her in follow-up of postmortem examination results

Policies and checklists for the ED should be available to ensure the taking
of adequate records, which are important for medical and legal reasons.

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

JOHNSON	Ramon W	September 26th, 27th 2013

EHMBA

Class of: 2012 - 2013

Pediatric Emergency Care Readiness in Europe
A descriptive Survey

University partnership : ESCP Europe, Columbia University

Abstract :

1 OBJECTIVES:

2 My goal was to assess the degree of pediatric readiness of emergency departments in Europe but especially in the country of France.

3

4 METHODS:

An on-line survey based on the 2009 American Academy of Pediatrics/American College of Emergency Physicians joint policy statement, "Care of Children in the Emergency Department: Guidelines for Preparedness," was developed as part of the National Pediatric Readiness Project. The survey also incorporated recommendations from the 2012 International Federation of the Emergency Medicine "International Standards of Care for Children in Emergency Departments". A link to this survey was disseminated to members of the Pediatric Research Network of the European Society of Emergency Medicine in addition to professional societies of Pediatrics and Emergency Medicine across Europe over four month period. A weighted preparedness score (scale of 0-100) was calculated for each emergency department. The total costs for implementing compliance with the guidelines was calculated.

5 RESULTS:

A total of 47 useable surveys were received, with 30% completed by the emergency department chief of service. Eighty-five percent of pediatric (age: 0-18 years) emergency department visits occur in hospitals seeing greater that 10,000 pediatric visits per year. The vast majority of visits (92%) occur in either an emergency department with a children's ED or in an ED with a separate pediatric emergency area (44%). The seven domains of the pediatric guidelines were evaluated. My survey found that 66% had a physician coordinator but with only 49% having a job description. Only 41% stated that their ED had a pediatric patient care review or QI process. Only half of my sample had 10 of 15 policies listed in the guidelines with a similar number having appropriate transfer policies and procedures in place. Mental health issues were evaluated in some depth and policies in this area were equally lacking. Only 13% of emergency departments had all recommended equipment and supplies. Emergency departments frequently lacked difficult airway supplies (67%), laryngeal mask airways for children (38%) and neonatal or infant equipment. Few respondents had a disaster plan that incorporated the needs or children and 59% of respondents were aware of the American Academy of Pediatrics/American College of Emergency Physicians guidelines. The median pediatric-preparedness score for all emergency departments was 64. Pediatric-preparedness scores were higher for facilities with higher pediatric volume, with only slightly higher scores for facilities with physician and nursing coordinators for pediatrics. The total cost of equipping each ED with all of the necessary recommended equipment would be about $1500 Euros.

6 CONCLUSION:

Pediatric readiness of hospital emergency departments in Europe were found to be lower than expected and resemble the previous level of EDs scores in the U.S. in 2001. Not only does this demonstrate opportunities for improvement but at a minimal cost.

Key words :