Academic Emergency Medicine Education and Training (AEM E&T): Original Contribution

A modified Delphi study for development of a pediatric curriculum for emergency medicine residents

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ABSTRACT

Introduction. Emergency Medicine trainees are expected to learn to provide acute care for patients of all ages. The American Council for Graduate Medical Education provides some guidance on topics related to caring for pediatric patients; however, education about pediatric topics varies across residency programs. The goal of this project was to develop a consensus curriculum for teaching pediatric emergency care.

Methods. We recruited 13 physicians from six academic health centers to participate in a three-round electronic modified Delphi project. Participants were selected on the basis of expertise with both emergency medicine resident education and pediatric emergency care.

The first modified Delphi survey asked participants to generate the core knowledge, skills, and experiences needed to prepare EM residents to effectively treat children in an acute care setting. The qualitative data from the first round was reformulated into a second round questionnaire. During the second round, participants used rating scales to prioritize the curriculum content proposed during the first round. In round three, participants were asked to make a determination about each curriculum topic using a three-point scale labeled: required, optional or not needed.

Results. The first modified Delphi round yielded 400 knowledge topics, 206 clinical skills, and 44 specific types of experience residents need to prepare for acute pediatric patient care. These were narrowed to 153 topics, 84 skills, and 28 experiences through elimination of redundancy and two rounds of prioritization. The final lists contain topics classified by highly recommended, partially recommended, and not recommended. The partially recommended category is intended to help programs tailor their curriculum to the unique needs of their learners as well as account for variability between three and four-year programs and the amount of time programs allocate to pediatric education.

Conclusion. The modified Delphi process yielded the broad outline of a consensus core pediatric emergency care curriculum.

A modified Delphi study for development of a pediatric curriculum for emergency medicine residents

INTRODUCTION

Emergency Medicine (EM) physicians acquire proficiency in the emergent management of all patients including pediatric patients during their training. Despite the growth of pediatric emergency medicine as a sub-specialty, Pediatric Emergency Medicine (PEM) sub-specialists only care for 10-20% of the pediatric patients in the emergency setting across the U.S.[7] The remaining 80-90% of pediatric emergency care patients are cared for by emergency medicine

physicians, and/or general-practice pediatricians.[1,2,5,6] The Accreditation Council for Graduate Medical Education (ACGME) requires EM residents to have approximately 20% of their patient encounters with patients less than 18 years of age, including the critical care of infants and children.[3] While time dedicated to pediatrics has increased in recent years,[4] concerns remain as to whether this allows sufficient experience to develop the mastery level competency for the EM physician to effectively care for children.[4,5]

Although the type of clinical experiences available is beyond the scope of this study, many studies support the need for a curriculum that does not solely rely on patient experiences for knowledge acquisition. Despite accreditation requirements designed to ensure sufficient pediatric education, concerns have been raised over the effectiveness of standards. A recent survey of EM residency directors, revealed that EM residents spend 13% of their time on dedicated pediatric emergency medicine at tertiary care children's hospitals while the other requirements were met through rotations that treat both children and adults.[8] In a related single site study, Chen, et al. found that EM residents were sent to a tertiary pediatric hospital to increase their pediatric experience, only to encounter such a saturated learning environment that they averaged three patients per shift. Additionally, Chen, et al. found that EM residents were more likely to treat older pediatric patients, perform only minor procedures, and see fewer critically ill patients compared to their non-EM peers.[9-10] Similarly, Langhan et al. reports that EM residents feel uncomfortable with pediatric and neonatal resuscitations.[11] While we recognize that these individual reports of deficiencies in EM resident education might be attributable to individual systems problems, we believe that collectively they demonstrate the need for a more rigorous core pediatrics curriculum to guide emergency medicine resident education.

Pediatric emergency care is taught to EM residents in a variety of clinical environments by a mix of both EM and PEM trained faculty members. The goal of this study was to create a consensus, pediatric emergency medicine curriculum that can be implemented by EM/PEM teaching faculty regardless of clinical training and practice site. By providing educational leaders with this framework, they can begin to develop competency and milestone based assessments, create didactics, and build simulations to minimize the gaps in the clinical experiences of their individual learners.

Aside from the EM Model of Clinical Practice, there is no up-to-date standard curriculum of pediatric emergency medicine for the education of EM residents. In the late 1980s and early 1990s some examples of standardized PEM curricula and objectives were proposed.[12-15] The Society for Academic Emergency Medicine (SAEM) through CORD-EM (Council of Emergency Medicine Residency Directors) regularly publishes recommended core content areas including pediatrics, however these are limited to lists of general disease topics.[16] Recently, a set of best practices for PEM education of EM residents was published which highlighted teaching a generalized approach to pediatric patients, focusing on the importance of child development and congenital illnesses. They also called for the establishment of a standard competency assessment.[4] Interestingly, a consensus PEM clerkship curriculum for medical students was just recently published.[17-19]

The objective of this study was to engage an expert panel to establish a contemporary, consensus pediatric emergency medicine curriculum and prioritize the broad spectrum of pediatric emergency care topics. This study is intended to supplement, not replace, the EM Model of Clinical Practice while providing an additional level of granularity and focus on important pediatric content. Furthermore, the effort was intended to be customized specifically for the education of emergency medicine residents. A consensus curriculum will establish foundational core knowledge and skills for emergency medicine learners and be the initial steps in the movement from process-based to competency-based education in pediatric emergency care.

METHODS

The Delphi method is a well-established method for generating curriculum content, solving problems, creating research agendas, conducting needs assessments, and other purposes.[19-25] This process represents expert consensus and can be considered an evidence-based process in educational research. For this study, we implemented a three round modified Delphi technique to generate a recommended core curriculum for EM residency programs- designed to teach care of the pediatric patient in the acute care setting. Our modified Delphi methods, including data

processing, were modeled from those recommended by Witkin and Altschuld.[21] Specific features included: content generated by panelists, medium to small size groups of individuals with specialized knowledge (experts), up to four iterative rounds, and anonymity of panelist's contributions. This study was determined to be exempt research by the Nationwide Children's Hospital.

Selection of expert panelists. The original research team was comprised of individuals from the Departments of Emergency Medicine at The Ohio State University and Nationwide Children's Hospital. This group recruited and selected participants who were representative of both three and four year residency programs; and academic programs housed in three different care-delivery settings: free-standing children's hospitals, children's emergency departments housed within adult emergency departments, and emergency departments in community hospitals. Panelists were identified and recruited based on their individual expertise with both resident education and pediatric care (see Tables 1 and 2). Panelists included emergency medicine boarded educators and PEM physicians whose initial board certifications were a mix of emergency medicine and pediatrics. This selection was deliberate to ensure the voice of emergency medicine educators was not lost to the sub-specialist's voice.

We gathered preliminary content material during modified Delphi round 1 through an open-ended questionnaire which asked panelists to provide the core knowledge topics and clinical skills required of a resident in order to provide care to a child in the acute care setting. We also asked panelists to suggest the experiences that residents needed in order to achieve their recommended core knowledge and skills. And finally, we asked participants to provide the resources they used to generate their content materials (see Supplemental Tables).

We aggregated the results of modified Delphi Round 1 into a prioritization survey and fed this back anonymously to the participants during Round 2. We provided the number of times the content topic or item had been "nominated" by the participants during Round 1 and asked participants to use that information to rate each topic using a five-point Likert-type scale (with options labeled from 1=Not Important, to 5=Very Important). For organizational purposes, we presented the content material to participants in systems representing: organ systems;

developmental, psychological or sociological typologies; or skill sets (see Supplemental Tables). Using a technique for prioritization recommended by Altschuld and Thomas, round 2 items were scored for strength of "importance" by multiplying the frequency of each rating by the rating value for each item.[21,25] For example, an item that was rated a "5" by all 13 participants was scored a "65." We also calculated the percentage of respondents who endorsed a topic by rating it "very important." The items were then sorted by score, and percentage of "very important" and assigned a rank.

We presented the results of modified Delphi Round 2 to participants in a final modified Delphi Round 3 survey. During this round, we presented the content topics by rank order. We also provided the other scoring information and additional comments gathered during Round 2. The instructions for Round 3 asked participants to sort the content material into categories: 1) Highly recommended or Must Teach Topics: i.e. content which is highly recommended for an emergency medicine residency curriculum; 2) Partially recommended or May Teach Topics: i.e. content which is considered optional based on local needs and time in the curriculum; and 3) Not recommended or *Don't Teach Topics*: i.e. content which is not recommended because it is material that is more appropriate for other levels of education (i.e. fellowship level training), can be taught in the context of adult care, or were felt to be irrelevant in contemporary medical practice. (see Supplemental Tables).

RESULTS

Twelve of 13 panelists contributed curriculum topics covering core knowledge, skills, and requisite experiences during the first modified Delphi round. All 13 panelists participated in the prioritization of topics during Rounds 2and 3. Participants represented academic faculty across six emergency medicine residency programs. Physician participants were involved in EM resident and/or PEM fellowship education, leadership positions in EM or Pediatrics EM administration, and have been involved in pediatric care. All participants were trained and board certified in Emergency Medicine or Pediatrics with one participant in both. Some participants were PEM Fellowship trained and board certified which is consistent with the types of faculty teaching pediatric emergency medical care to residents.

Panelists generated 400 knowledge topics and 206 clinical skills during Round 1. We reduced the original list of 400 knowledge items to 153 unique topics by eliminating redundancy, and moving some of the topics to the list of core skills. In similar fashion, the 206 clinical skills were reduced to 84. Participants responded to the lists of rank-ordered revised items during Round 3. Comments provided during Round 3 contributed to item placement in one of the final three lists (Highly recommended-Must Teach Topics-recommended curriculum items, Partially recommended-May Teach Topics-optional curriculum items, and Not recommended-*Don't Teach* Topics-items reserved for PEM or other specialists). The Highly Recommended or Must Teach curriculum content included 63 knowledge topics and 41 clinical skills (see Table 3). The Partially Recommend or May Teach curriculum content included 65 knowledge topics and 21 clinical skills (see Table 4). The *Don't Teach* curriculum content included 25 knowledge topics and 22 clinical skills (see Supplemental Tables). Most of these items were eliminated due to the participant's belief that these topics could be covered through the regular EM curriculum, or because their significance is reduced due to improved access to reference materials. A few items were combined or eliminated due to redundancy.

Recommended Experiences

We asked panelist to provide experiences residents needed in order to learn to care for children. Their responses were classified into: experience with children who have specific illness presentations, off-service rotations, clinical or simulated experiences, and types of facilities, time allocation, and other miscellaneous suggestions. These experiences were rated during Round 2, and because there was agreement among panelists, we did not ask about experiences during Round 3.

The panel recommended that residents need to experience children of all age levels (newborns to adolescents) and all levels of acuity; including common, non-emergent conditions. They went on to recommend experience with specific patient presentations such as: neonatal fever, septic shock, asthma, epilepsy, diabetic ketoacidosis, hematology/oncology patients with fever or neutropenia, and sickle cell disease. They also recommended specific sets of skill that should be covered.

In addition to receiving pediatric training from both emergency medicine and pediatric faculty, the panelists felt it important that residents also receive training from Pediatric EM boarded physicians and that skills training incorporate simulation. They emphasized specific skill sets that needed to be taught and practices. These included airway management and medical and trauma resuscitation. Finally, the panelists suggested that all EM residents do ancillary rotations on pediatric specialty units like intensive care (PICU), anesthesiology, and orthopedics (see Table 5)

We asked panelists to estimate the proportion of curriculum time allocated to pediatric topics (see Table 2). The average percentage of learning time that programs dedicate to pediatric topics and experiences was about 20%. Participants said that within this 20%, the breakdown of educational experiences was 75% in the clinical environment and 25% in formal teaching sessions: i.e. didactics, small groups, simulations, or procedures training. With regard to how clinical time for pediatrics was allocated, the panelists had two specific recommendations. First, panelists highly recommended that learners experience pediatrics across all seasons so that they see the full spectrum of seasonal variation of illness. They also suggested that it was very important not to package clinical pediatric experiences into one level of education (program year), or into experiences within only one setting. In other words, panelists recommended that pediatric experiences be longitudinal across the entire residency program and that they experience care in places that treat high acuity as well as low acuity patients. They particularly emphasized a need to experience a Pediatric ED that serves a large population of patients.

Literature resources

We asked the expert panel to provide the literature they used to guide their work. Many of them mentioned their involvement with developing the EM pediatric curriculum for their own institution. Those individuals cited their institution's curriculum documents as a resource and suggested that they had used the ACGME Program Requirements,[3] The Emergency Medicine Milestone Project[26] and the content outline for the Pediatric Emergency Medicine Subspecialty examinations.[27] Also cited were two journal articles[14,17] and two textbooks, one on clinical procedures[28] and one dedicated to pediatric emergency medicine.[29]

DISCUSSION

This curriculum project aimed to create a standard pediatric curriculum that emergency medicine program leaders can use to develop their own custom curriculum. This work is intended to supplement the EM Model of Clinical Practice with an additional level of granularity and focus on important pediatric related content. Variable clinical training environments inevitably lead to variability in learner education. A core, consensus curriculum will assist educators in prioritizing the requisite pediatric content for an already dense emergency medicine curriculum. The core pediatric curriculum also enables training programs to critically evaluate their clinical environment and assess deficiencies in their current training programs. We hope that the results of this effort lays the foundation for subsequent efforts to develop competency-based education covering pediatric content for emergency medicine residents.

We have categorized knowledge topics and clinical skills into recommended, optional, and unnecessary so that program leaders can integrate our standards with topics important to their circumstances in order to build the curriculum that best suits their needs. Our core consensus curriculum is applicable to learners taught by both EM and PEM faculty members. Although this curriculum was specifically designed for EM residents, there are likely components applicable to anyone caring for pediatric emergencies including pediatric residents and PEM fellows.

We intentionally did not address how to teach these topics as this will vary widely based on patient populations, resources, expert availability and institutional practice. Panelists did however recommend the experiences they think residents need in order to achieve the knowledge and skills derived from this project. Future work should be performed to develop best practices for delivering this core content material; generating related competencies, and developing assessments for measuring competency achievement.

The lists we created are substantial and may be daunting upon first review. There was significant variability in the list of topics generated by panelists during the initial round of the modified Delphi. Although the final recommendations did not reach complete consensus, we feel that the

final product is a step towards reducing the variability in pediatric education that currently exists throughout emergency medicine programs throughout the U.S.

We also captured some disagreement, due to recent paradigm shifts in patient care which is represented by some of the topics that unexpectedly ended up on the dropped items list. For example, the last curriculum document took place before our current vaccination policies were in place.[14] As a result, our standard curriculum outline contains far fewer items related to vaccine preventable illnesses than do previous curricula. Medication doses were another area of major shift. Generations of emergency medicine providers have memorized life-saving dosages of acute resuscitation medications, however, many of our educators felt that in the current day of electronic resources, memorizing dosages is no longer necessary.

Through the use of the modified Delphi method solely through electronic communications, we were able to generate a standard, consensus curriculum in a timely manner with limited expenditure of resources for travel and meeting facilities. The asynchronous participation yielded nearly 100% participation across all phases of the study. In retrospect, we believe one in-person or electronically supported live meeting (such as a webinar or Skype meeting) to engage participants in more deliberate conversation about the curriculum topics as they were evolving would have been beneficial.

LIMITATIONS

The panelists generated and prioritized a large amount of content material. We did not receive any complaints, however the possibility exists that fatigue was involved during the modified Delphi process. Additionally, the entire modified Delphi was completed through electronic communication. The lack of at least one face-to-face meeting may have contributed to the lack of consensus and wider variability in responses.

The study was limited by the number of individual experts we were able to involve. Front-line experts with experience in both pediatric care and resident education were recruited from a cross section of training site types around the U.S. The size of our panel was based upon the quantity of learning material we anticipated receiving and on suggestions from the literature.[20-21]

Consequently, we consider this to be a preliminary step towards drafting a core pediatric curriculum for EM residents and plan subsequent investigations to account for regional and demographic variation. Furthermore, we have merely provided the content outline and recommendations for experiences required to cover this content, leaving the task of instructional design up to individual programs.

Our basic objective was to provide a consensus curriculum outline for preparing emergency medicine physicians to treat children in the acute care setting. The panel represented considerable career expertise in Emergency Medicine and Pediatric Emergency Medicine. We believe that the resulting curriculum is slightly more ambitious or dense than can be easily covered in a three-year program. Accordingly, we have provided as much guidance as possible to help program leaders to prioritize topic coverage from most to least important.

CONCLUSIONS

The materials that accompany this article provide the basic structure and content for teaching emergency medicine residents about caring for the special population of children in the acute care setting. While the panel generally believed that there is some transference of skills and knowledge that is gleaned from experience with adult patients, the curriculum content and experiences presented here are considered to be most important for learning the nuances of caring for children.

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TABLES

Table 1. Demographic profiles and qualifications of Delphi panelists

Panelist	Board Certifications	Institution Name	Roles & Responsibilities
Rebecca Fastle, MD	PEDS/PEM	University of New Mexico School of Medicine	PEM PD Asst. Prof.
Andrew M. King, MD	EM	The Ohio State University Wexner Medical Center & Nationwide Children's Hospital	EM APD Asst. Prof
Laura Hopson, MD	EM	University of Michigan health System/St. Joseph Mercy Hospital	EM PD Asst. Prof.
John D. Hoyle, MD	EM/PEDS	Western Michigan University Homer	APD Prof.

		Stryker School of Medicine-Bronson /Borges Hospital	
Kelly Levasseur, DO	PEDS/PEM	Oakland University-Beaumont Health System	PEM PD Asst. Prof.
Michael Mitchell, MD	PEDS/PEM	Wake Forest University School of Medicine-Baptist Medical Center	PEM APD Asst. Prof.
Jennifer Mitzman, MD	EM/PEM	The Ohio State University Wexner Medical Center & Nationwide Children's Hospital	Lead Pediatric Educator EM Residency Asst. Prof.
James O'Neill MD	EM/PEM	Wake Forest University School of Medicine-Baptist Medical Center	Former - EM APD Current - PEDS/EM Fellowship PD Ass. Prof.
Philip Pazderka, MD	EM	Western Michigan University Homer Stryker School of Medicine-Bronson /Borges	Former – EM APD Current – EM PD Asst. Prof.

		Hospital	
Marcia Perry, MD	EM	University of Michigan health System/St. Joseph Mercy Hospital	EM APD Asst. Prof
Payal Shah, MD	EM	Oakland University-Beaumont Health System	EM APD Asst. Prof.
Sara Skarbek-Borowska, MD	PEDS/PEM	University of New Mexico School of Medicine	EM APD PEM Education Director Asst. Prof.
Rachel Stanley, MD	PEDS/PEM	The Ohio State University Wexner Medical Center & Nationwide Children's Hospital	Division Chair Ass. Prof.

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445 Table 2. Demographic profiles of Delphi participants

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Institution Name	Institution Type	Type of Residency Program	Residency Program Size	Pct of Time om Curriculum Allocated to Pediatrics
Oakland University-Beaumont Health System	Pediatric unit within adult	3-Year Program	14 residents per class	20.5%

	emergency department			
The Ohio State University Wexner Medical Center & Nationwide Children's Hospital	Free-standing children's hospital	3-Year Program	16 EM & 2 EM-IM residents per class	20.0%
University of Michigan health System/St. Joseph Mercy Hospital	Free-standing children's hospital	4-Year Program	16 residents per class	17.5%
University of New Mexico School of Medicine	Pediatric unit within adult emergency department	3-Year Program	14 residents per class	20.0%
Wake Forest University School of Medicine-Baptist Medical Center	Pediatric unit within adult emergency department	3-Year Program	15 residents per class	22.5%
Western Michigan University Homer Stryker School of Medicine-Bronson /Borges Hospital	Community hospital(s)	3-Year Program	20 residents per class	19.5%

Table 3. Highly recommended curriculum content for teaching pediatrics to Emergency Medicine Residents: Both Knowledge and Skills Topics

Knowledge Topics		
· Recognize a sick child	· Detecting physical abuse	· Diagnosis and management of

	through history & physical examination	Neisseria
· Acute DKA & hyperglycemia	· Major traumatic brain injury	· Recognition of emergencies in febrile Sickle Cell Disease
· Intussusception	· Assessing child for aspirated foreign bodies	· Recognition of normal vital signs based on age and stage of development
· The approach to the febrile or septic neonate	· Respiratory distress	· Indications for emergent blood transfusions in patients with shock
· Malrotation/ volvulus	· Laws pertaining to medical personnel responsibility for child abuse & neglect	· Ability to trouble shoot common pediatric medical devices-tracheostomy
· Common signs and symptoms of physical abuse in children	· Febrile seizures	· Common traumatic conditions-Head injury, blunt head trauma, concussion with return to play instructions
· Neonatal congenital cardiovascular presentations	· Retropharyngeal abscess*	· Myocarditis
· Pediatric sepsis	· Altered mental status	· Slipped capital femoral epiphysis (SCFE)
· Meningitis	· Minor head injury	· Ingested foreign bodies
· Asthma	· Supraventricular Tachycardia (SVT)	· Recognition of the “high stakes” milieu of pediatric emergencies
· Recognition of fracture patterns that suggest abuse	· Application of rules for fluid resuscitation in children 4.2.1	· Pharyngitis

	rule for maintenance of IV fluid resuscitation	
· Discriminate between patients who can be sent home and those who need admission to the hospital	· Unique patterns of injury in the pediatric spine	· Pyloric stenosis
· Discrimination between common and deadly rashes	· Fever and neutropenia	· Epidural hematoma
· Diagnosis and stabilization involving small dose ingestions dangerous or fatal to toddlers	· Know signs & symptoms of Kawasaki's Disease	· Management of sickle cell pain crisis
· Application of rules for fluid resuscitation in children · 20 ml/kg bolus	· Preseptal/orbital cellulitis	· Recognition of pediatric heart failure
· Bronchiolitis	· Intra-abdominal surgical emergencies	· Radiology-Determination of when to use imaging: risks & benefits
· Appendicitis	· Diagnosis of children with a pediatric (or toddler) limp	· Diagnosis and management of sexual abuse
· CAH shock in neonates	· Vomiting -by age group	· Post-op congenital heart disease child
· Jaundice	· Acute otitis media (AOM)	· Pediatric dosages Acetaminophen (Tylenol)
· Croup	· Anaphylaxis	· Post-op tonsillectomy
· Recognize patients who need higher levels of care than the	· Resources for evaluation of children suspected of suffering	· Diagnosis and management of Rocky Mountain Spotted Fever

ED, i.e. NICU or PICU (1)	child abuse & neglect	(RMSF)
Clinical Skills Topics · Basic airway maneuvers, including appropriate positioning based on pediatric anatomy	· Lumbar puncture	· Laceration repair (suturing) with consideration for child's age
· Endotracheal intubation of infants	· Laryngeal mask airway	· How to take a peds specific hx including pertinent positives such as: birth hx/birth weight/loss
· Endotracheal intubation of young children	· Lumbar puncture in neonate	· Establish rapport with children of different ages
· Pediatric Advanced Life Support (PALS)	· How to successfully perform a physical examination on pediatric patients of varying ages	· Interpretation of Chest X-Ray
· Place an intraossesous line	· Needle crichothyrotomy	· Immobilize common pediatric fractures using splinting
· Pediatric trauma resuscitation	· Reduction of radial head subluxation (nurse maid's elbow)	· Foreign body removal from-Nose
· Airway management for respiratory failure	· Age appropriate neuro assessment	· Tracheostomy tube placement
· Bag Valve Mask ventilation (Stress over ETI)	· Cervical spine clearance based on age	· Mobilizing resources for non-accidental trauma
· Pediatric airway adjuncts	· Pediatric burn management	· Ventilator management

· Resuscitation strategies involving blood, fluids & glucose	· Use of Computerized Tomography for scans of the head	· Matching appropriate agent for the procedure
· Calculate bolus and maintenance fluids for children based on age	· Needle decompression of a pneumothorax	· Foreign body removal from-Ear
· Cardioversion/defibrillation	· Neonatal resuscitation (NRP)	· Place an Intravenous line
· Non-invasive airway management HFNC, nasal cpap, optiflow, BiPAP	· Pediatric Basic Life Support (PBLS)	· Using succinylcholine for ketamine for laryngospasm rescue
· Conversion of Supraventricular Tachycardia (SVT)	· Effective communication with parents	

Table 4. Partially recommended or optional curriculum content for teaching pediatrics to Emergency Medicine Residents: Both Knowledge and Skills Topics

Knowledge Topics		
· Constipation	· Anatomic & physiologic differences of pediatric patients based on developmental stages: neonate, infant, toddler, preschooler, grade schooler, adolescent/teenager	· Pediatric dosing for Adenosine
· Use of Fracture rules such as Salter-Harris	· Key decision rules-Kocher criteria for septic joint	· Neuro emergencies-Stroke

· Common traumatic conditions-Blunt abdominal trauma	· Chest pain	· Manage of Ocular Emergencies-Trauma
· Pyelonephritis	· Recognition of uncommon but serious hematologic disorders	· Pediatric devices- g tube
· Use of Head/cervical spine rules	· Recognize & Manage-Viral exanthems	· Manage of Ocular Emergencies-Foreign bodies
· Conditions/criteria for transfer to specialty care	· Viral syndromes	· Glomerulonephritis
· Headache	· Peds dosage of Epinephrine (anaphylaxis)	· Management of ocular emergencies-Tips and tricks for examining a child's eyes
· Musculoskeletal injuries by age group	· Peds dosage of Ketamine	· Weakness or failure to thrive
· Acute presentations-Pneumonia, viral & bacterial	· Peds dosage of Epinephrine (code)	· Treatment of acute presentations of cystic fibrosis
· Neonatal hypoglycemia	· Upper & lower urinary tract infections	· ENT Emergencies-Epistaxsis
· Gastroenteritis	· Persistent fever over 7 days	· Peds dosage of Morphine
· Suicide	· Idiopathic hypertrophic sub-aortic stenosis (hypertrophic cardiomyopathy)	· Antibiotic stewardship
· Common traumatic conditions-penetrating trauma	· Encephalitis	· Common problems of NICU Graduates-Bronchopulmonary dysplasia (BPD): chronic lung dz from no surfactant
· Stabilization of caustic ingestion (Tide pods)	· Initial management of metabolic diseases	· Meckel's diverticulum

・Higher risk for medical error in pediatric patients vs. adults	・Manage special needs children- Cerebral Palsy	・Knowledge of vaccination schedules and what illnesses children are vaccinated against
・Leukemia	・Syncope	・Red stool
・Ataxia	・Biliary atresia	・Pediatric dosages for polypharmaceutical ingestions in adolescents
・Discrimination between MSK patients who need urgent consult vs. those who can be referred to outpatient care	・Recognition of how pediatric emergencies provoke higher levels of anxiety among ED physicians	・Pediatric devices- insulin pump
・Common problems of NICU Graduates- Necrotizing enterocolitis (NEC): medical & surgical	・Environmental emergencies- Heat stroke/heat exhaustion	・Psycho-social differences of pediatric patients based on developmental milestones
・General administrative, legal and ethical issues involved with treating children in an ED	・Environmental emergencies- hypothermia	・Manage special needs children- Autism
・Recognize & Manage- Henoch-Schonlein Purpura (HSP)	・Stabilization involved with common pediatric overdose/poisoning-Propofol	・Pediatric dosing for Amoxicillin (high dose)
・EMS transport of children	・Pediatric dosages for Ibuprofen	
Clinical Skills Topics		
・Incision and drainage of abscess	・Foreign body removal from- Soft tissue	・Wound management
・Reduction of paraphimosis	・Diagnostic US- FAST Scan	・Complete eye examination (including slit lamp exam)
・Pericardiocentesis	・Chest tube placement on young children	・Nasal packing

· Interpretation of radiographs of MSK	· Anticipatory guidance to parents	· Nasal agents-fentanyl/versed
· Delivering bad news	· Install Umbilical artery or vein catheters	· Application of strategies for performing accurate PE on a difficult child
· External cardiac pacing	· Gastrostomy tube replacement	· Chest tube placement on infants
· Effective communication with consultants	· Invasive airway rescue options-transtracheal jet	· Interpretation of radiographs of soft tissue neck

Table 5. Results from Delphi Rounds 1-2 on resident experiences for learning how to care for pediatric patients.

Recommended Experiences **Experiences & (nominations)***	**Mean†**	**Strength Score‡**	**Pct Endorsed§**	**Rank‖**	**Status¶**
Experience managing children with specific presentations or diseases…					
1. Neonatal fever (1)	5.00	65	100	1.17	Must
2. Septic shock (1)	5.00	65	100	1.17	Must
3. Severe asthma (1)	5.00	65	100	1.17	Must
4. Severe status epileptics (1)	5.00	65	100	1.17	Must
5. Diabetic ketoacidosis (DKA) (1)	4.92	64	92.3	5	Must
6. Heme/onc patients with fever and/or neutropenia (1)	4.69	61	69.2	6	Must
7. Sickle cell disease (1)	4.31	56	38.5	7	Optional
8. Chest pain (1)	3.77	49	23.1	8	Optional

Off-service or ancillary clinical rotations: Dedicated 1-month clinical rotations on or with…						
1.	Pediatric Intensive Care Unit (PICU) (7)	4.92	64	92.3	1	Must
2.	Pediatric anesthesiology (2)	4.46	58	61.5	2	Must
3.	Pediatric orthopedics (3)	4.15	54	53.8	3	Must
4.	Pediatric morbidity and mortality cases by EM residents at educational conference (1)	3.92	51	38.5	4	Optional
5.	Child abuse response team (1)	3.15	41	7.7	5	Optional
6.	Neonatal Intensive Care Unit (NICU) (5)	3.25	40	7.7	6.5	Optional
7.	Inpatient pediatrics (1)	3.00	39	7.7	6.5	Optional
8.	Outpatient pediatrics (1)	4.00	34	0.0	7	Optional
Experience with dedicated topics of skills…						
1.	Airway experience (2)	5.00	65	100	1.5	Must
2.	Medical Resuscitation (3)	5.00	65	100	1.5	Must
3.	Trauma resuscitation (3)	4.92	64	92.3	3	Must
4.	Neonatal Resuscitation (2)	4.77	62	84.6	4	Must
5.	Establishing a comprehensive differential diagnosis (1)	4.38	57	46.2	5	Must
6.	History taking skills (1)	4.23	55	38.5	6.5	Must
7.	Physical examination (2)	4.23	55	38.5	6.5	Must
8.	Pain management (1)	4.15	54	30.8	8	Must
9.	Ordering labs and studies (1)	4.00	52	23.1	9	Must
10.	Learning techniques for distracting children (1)	3.62	47	15.4	10	Optional
Case Mix:						

1.	Need to see patients in entire spectrum of ages (newborns to adolescents) (3)	4.77	62	76.9	1	Must
2.	Experience treating children across all levels of acuity (6)	4.69	61	76.9	2	Must
3.	Experience treating children for both common, non-emergent conditions and medical emergencies (1)	4.62	60	69.2	3	Must
Time Allocation: Pediatric ED rotations designed as follows…						
1.	Shifts or rotations scheduled different seasons to experience seasonal variation in illness	4.33	53	46.2	1	Must
2.	A minimum of 2-3 months working in a pediatric ED with PEM Physicians	3.83	47	38.5	2	Optional
3.	A minimum of a 2 month block of shifts for each year of residency	3.83	47	23.1	3	Optional
4.	4-5 shifts per month in the pediatric ED	3.83	47	15.4	4	Optional
5.	3 month clinical rotations on pediatric emergency medicine	3.58	44	15.4	5	Optional
6.	Equivalent numbers of shifts in a pediatrics ED as residents would have in the adult ED	2.58	32	7.7	6	Optional
Experience at specific types of facilities:						
1.	Experience at a Peds ED that serves a large population of pediatric patients (1)	4.46	58	69.2	1	Must
2.	Experience at a Peds ED that is at least a Level 2 Trauma Center (1)	4.31	56	61.5	2	Must

Special Certification Courses					
1. Pediatric advanced life support (PALS) (1)	4.46	58	61.5	1	Must
2. Neonatal resuscitation program (NRP) (1)	3.85	50	30.8	2	Optional
Including additional sub-specialists in training emergency medicine residents…					
1. Pediatric EM boarded physicians (1)	4.31	56	69.2	1	Must
2. SANE nurses (1)	2.85	37	15.4	2	Optional
Scope of training….					
1. Pediatric rotations at each level of training (PGY1-3) with emphasis on building skills to attain mastery (1)	4.23	55	46.2	1	Must
2. Competence at running an area or managing all pediatric patients who come through by Senior Year (1)	3.92	51	23.1	2	Optional
Miscellaneous Experiences…					
1. Simulation: Practice pediatric specific skills through simulation (3)	4.54	59	53.8		Must
2. Procedure heavy shifts so residents become adept at core procedural skills like Lumbar Puncture, Incision and Drainage, suture repair (3)	3.69	48	30.8		Optional

Abbreviations and Notes:

- DKA= Diabetic Ketoacidosis
- Heme/Onc= Hematology/Oncology
- PICU= Pediatric Intensive Care Unit
- NICU= Neonatal Intensive Care Unit
- PEM= Pediatric Emergency Medicine Fellowship Trained

- ED= Emergency Department
- SANE= Sexual Assault Nurse Examiner
- Notes:
  - *Nominations= The frequency of times that item was suggested (nominated) during Round 1.
  - †Mean= Mean rating of items from Round 2 from a Likert-type scale labeled: 5=Very important, 4=Considerable importance, 3=Moderate importance, 2=Minimal importance, 1=Not at all important.
  - ‡Strength Score= The sum of weighted frequencies, (total points) resulting from multiplying the number of participants selecting a rating (frequency of occurrence) by the Value of the rating from the Likert-type scale.[21]
  - §Pct. Endorsed= The percentage of panelists out of 13 from Round 2 and 12 from Round 3 who endorsed the item by selecting the highest rating: "Very important" from Round 2, and "Must Teach" from Round 3.
  - ||Rank= The rank assigned to items based on the rank order of their strength score and percentage of panelists endorsing that item with the highest rating.
  - ¶Status= Recommendations from the panel: Must= Highly recommended experiences; Optional= May be offered.

TABLES

Table 1. Demographic profiles and qualifications of Delphi panelists

Panelist	Board Certifications	Institution Name	Roles & Responsibilities
Rebecca Fastle, MD	PEDS/PEM	University of New Mexico School of Medicine	PEM PD Asst. Prof.
Andrew M. King, MD	EM	The Ohio State University Wexner Medical Center & Nationwide Children's Hospital	EM APD Asst. Prof
Laura Hopson, MD	EM	University of Michigan health System/St. Joseph Mercy Hospital	EM PD Asst. Prof.
John D. Hoyle, MD	EM/PEDS	Western Michigan University Homer Stryker School of Medicine-Bronson /Borges Hospital	APD Prof.
Kelly Levasseur, DO	PEDS/PEM	Oakland University-Beaumont Health System	PEM PD Asst. Prof.

Michael Mitchell, MD	PEDS/PEM	Wake Forest University School of Medicine-Baptist Medical Center	PEM APD Asst. Prof.
Jennifer Mitzman, MD	EM/PEM	The Ohio State University Wexner Medical Center & Nationwide Children's Hospital	Lead Pediatric Educator EM Residency Asst. Prof.
James O'Neill MD	EM/PEM	Wake Forest University School of Medicine-Baptist Medical Center	Former - EM APD Current - PEDS/EM Fellowship PD Ass. Prof.
Philip Pazderka, MD	EM	Western Michigan University Homer Stryker School of Medicine-Bronson /Borges Hospital	Former – EM APD Current – EM PD Asst. Prof.
Marcia Perry, MD	EM	University of Michigan health System/St. Joseph Mercy Hospital	EM APD Asst. Prof
Payal Shah, MD	EM	Oakland University-Beaumont Health	EM APD Asst. Prof.

		System	
Sara Skarbek-Borowska, MD	PEDS/PEM	University of New Mexico School of Medicine	EM APD PEM Education Director Asst. Prof.
Rachel Stanley, MD	PEDS/PEM	The Ohio State University Wexner Medical Center & Nationwide Children's Hospital	Division Chair Ass. Prof.

Table 2. Demographic profiles of Delphi participants

Institution Name	Institution Type	Type of Residency Program	Residency Program Size	Pct of Time om Curriculum Allocated to Pediatrics
Oakland University-Beaumont Health System	Pediatric unit within adult emergency department	3-Year Program	14 residents per class	20.5%
The Ohio State University Wexner Medical Center & Nationwide Children's Hospital	Free-standing children's hospital	3-Year Program	16 EM & 2 EM-IM residents per class	20.0%
University of Michigan health System/St. Joseph	Free-standing children's	4-Year Program	16 residents per class	17.5%

Mercy Hospital	hospital			
University of New Mexico School of Medicine	Pediatric unit within adult emergency department	3-Year Program	14 residents per class	20.0%
Wake Forest University School of Medicine-Baptist Medical Center	Pediatric unit within adult emergency department	3-Year Program	15 residents per class	22.5%
Western Michigan University Homer Stryker School of Medicine-Bronson /Borges Hospital	Community hospital(s)	3-Year Program	20 residents per class	19.5%

Table 3. Highly recommended curriculum content for teaching pediatrics to Emergency Medicine Residents: Both Knowledge and Skills Topics

Knowledge Topics		
・Recognize a sick child	・Detecting physical abuse through history & physical examination	・Diagnosis and management of Neisseria
・Acute DKA & hyperglycemia	・Major traumatic brain injury	・Recognition of emergencies in febrile Sickle Cell Disease
・Intussusception	・Assessing child for aspirated foreign bodies	・Recognition of normal vital signs based on age and stage of development

· The approach to the febrile or septic neonate	· Respiratory distress	· Indications for emergent blood transfusions in patients with shock
· Malrotation/ volvulus	· Laws pertaining to medical personnel responsibility for child abuse & neglect	· Ability to trouble shoot common pediatric medical devices-tracheostomy
· Common signs and symptoms of physical abuse in children	· Febrile seizures	· Common traumatic conditions- Head injury, blunt head trauma, concussion with return to play instructions
· Neonatal congenital cardiovascular presentations	· Retropharyngeal abscess*	· Myocarditis
· Pediatric sepsis	· Altered mental status	· Slipped capital femoral epiphysis (SCFE)
· Meningitis	· Minor head injury	· Ingested foreign bodies
· Asthma	· Supraventricular Tachycardia (SVT)	· Recognition of the "high stakes" milieu of pediatric emergencies
· Recognition of fracture patterns that suggest abuse	· Application of rules for fluid resuscitation in children 4.2.1 rule for maintenance of IV fluid resuscitation	· Pharyngitis
· Discriminate between patients who can be sent home and those who need admission to the hospital	· Unique patterns of injury in the pediatric spine	· Pyloric stenosis
· Discrimination between common and deadly rashes	· Fever and neutropenia	· Epidural hematoma

· Diagnosis and stabilization involving small dose ingestions dangerous or fatal to toddlers	· Know signs & symptoms of Kawasaki's Disease	· Management of sickle cell pain crisis
· Application of rules for fluid resuscitation in children · 20 ml/kg bolus	· Preseptal/orbital cellulitis	· Recognition of pediatric heart failure
· Bronchiolitis	· Intra-abdominal surgical emergencies	· Radiology-Determination of when to use imaging: risks & benefits
· Appendicitis	· Diagnosis of children with a pediatric (or toddler) limp	· Diagnosis and management of sexual abuse
· CAH shock in neonates	· Vomiting -by age group	· Post-op congenital heart disease child
· Jaundice	· Acute otitis media (AOM)	· Pediatric dosages Acetaminophen (Tylenol)
· Croup	· Anaphylaxis	· Post-op tonsillectomy
· Recognize patients who need higher levels of care than the ED, i.e. NICU or PICU (1)	· Resources for evaluation of children suspected of suffering child abuse & neglect	· Diagnosis and management of Rocky Mountain Spotted Fever (RMSF)
Clinical Skills Topics · Basic airway maneuvers, including appropriate positioning based on pediatric anatomy	· Lumbar puncture	· Laceration repair (suturing) with consideration for child's age
· Endotracheal intubation of infants	· Laryngeal mask airway	· How to take a peds specific hx including pertinent positives

		such as: birth hx/birth weight/loss
· Endotracheal intubation of young children	· Lumbar puncture in neonate	· Establish rapport with children of different ages
· Pediatric Advanced Life Support (PALS)	· How to successfully perform a physical examination on pediatric patients of varying ages	· Interpretation of Chest X-Ray
· Place an intraossesous line	· Needle crichothyrotomy	· Immobilize common pediatric fractures using splinting
· Pediatric trauma resuscitation	· Reduction of radial head subluxation (nurse maid's elbow)	· Foreign body removal from- Nose
· Airway management for respiratory failure	· Age appropriate neuro assessment	· Tracheostomy tube placement
· Bag Valve Mask ventilation (Stress over ETI)	· Cervical spine clearance based on age	· Mobilizing resources for non-accidental trauma
· Pediatric airway adjuncts	· Pediatric burn management	· Ventilator management
· Resuscitation strategies involving blood, fluids & glucose	· Use of Computerized Tomography for scans of the head	· Matching appropriate agent for the procedure
· Calculate bolus and maintenance fluids for children based on age	· Needle decompression of a pneumothorax	· Foreign body removal from- Ear
· Cardioversion/defibrillation	· Neonatal resuscitation (NRP)	· Place an Intravenous line

・Non-invasive airway management HFNC, nasal cpap, optiflow, BiPAP	・Pediatric Basic Life Support (PBLS)	・Using succinylcholine for ketamine for laryngospasm rescue
・Conversion of Supraventricular Tachycardia (SVT)	・Effective communication with parents	

Table 4. Partially recommended or optional curriculum content for teaching pediatrics to Emergency Medicine Residents: Both Knowledge and Skills Topics

Knowledge Topics		
・Constipation	・Anatomic & physiologic differences of pediatric patients based on developmental stages: neonate, infant, toddler, preschooler, grade schooler, adolescent/teenager	・Pediatric dosing for Adenosine
・Use of Fracture rules such as Salter-Harris	・Key decision rules-Kocher criteria for septic joint	・Neuro emergencies-Stroke
・Common traumatic conditions-Blunt abdominal trauma	・Chest pain	・Manage of Ocular Emergencies-Trauma
・Pyelonephritis	・Recognition of uncommon but serious hematologic disorders	・Pediatric devices- g tube
・Use of Head/cervical spine rules	・Recognize & Manage-Viral exanthems	・Manage of Ocular Emergencies-Foreign bodies
・Conditions/criteria for transfer to specialty care	・Viral syndromes	・Glomerulonephritis

· Headache	· Peds dosage of Epinephrine (anaphylaxis)	· Management of ocular emergencies-Tips and tricks for examining a child's eyes
· Musculoskeletal injuries by age group	· Peds dosage of Ketamine	· Weakness or failure to thrive
· Acute presentations-Pneumonia, viral & bacterial	· Peds dosage of Epinephrine (code)	· Treatment of acute presentations of cystic fibrosis
· Neonatal hypoglycemia	· Upper & lower urinary tract infections	· ENT Emergencies-Epistaxsis
· Gastroenteritis	· Persistent fever over 7 days	· Peds dosage of Morphine
· Suicide	· Idiopathic hypertrophic sub-aortic stenosis (hypertrophic cardiomyopathy)	· Antibiotic stewardship
· Common traumatic conditions-penetrating trauma	· Encephalitis	· Common problems of NICU Graduates-Bronchopulmonary dysplasia (BPD): chronic lung dz from no surfactant
· Stabilization of caustic ingestion (Tide pods)	· Initial management of metabolic diseases	· Meckel's diverticulum
· Higher risk for medical error in pediatric patients vs. adults	· Manage special needs children- Cerebral Palsy	· Knowledge of vaccination schedules and what illnesses children are vaccinated against
· Leukemia	· Syncope	· Red stool
· Ataxia	· Biliary atresia	· Pediatric dosages for polypharmaceutical ingestions in adolescents

・Discrimination between MSK patients who need urgent consult vs. those who can be referred to outpatient care	・Recognition of how pediatric emergencies provoke higher levels of anxiety among ED physicians	・Pediatric devices- insulin pump
・Common problems of NICU Graduates- Necrotizing enterocolitis (NEC): medical & surgical	・Environmental emergencies- Heat stroke/heat exhaustion	・Psycho-social differences of pediatric patients based on developmental milestones
・General administrative, legal and ethical issues involved with treating children in an ED	・Environmental emergencies- hypothermia	・Manage special needs children- Autism
・Recognize & Manage- Henoch-Schonlein Purpura (HSP)	・Stabilization involved with common pediatric overdose/poisoning-Propofol	・Pediatric dosing for Amoxicillin (high dose)
・EMS transport of children	・Pediatric dosages for Ibuprofen	
Clinical Skills Topics		
・Incision and drainage of abscess	・Foreign body removal from- Soft tissue	・Wound management
・Reduction of paraphimosis	・Diagnostic US- FAST Scan	・Complete eye examination (including slit lamp exam)
・Pericardiocentesis	・Chest tube placement on young children	・Nasal packing
・Interpretation of radiographs of MSK	・Anticipatory guidance to parents	・Nasal agents-fentanyl/versed
・Delivering bad news	・Install Umbilical artery or vein catheters	・Application of strategies for performing accurate PE on a difficult child
・External cardiac pacing	・Gastrostomy tube replacement	・Chest tube placement on infants

· Effective communication with consultants	· Invasive airway rescue options-transtracheal jet	· Interpretation of radiographs of soft tissue neck

Table 5. Results from Delphi Rounds 1-2 on resident experiences for learning how to care for pediatric patients.

Recommended Experiences **Experiences & (nominations)***	**Mean†**	**Strength Score‡**	**Pct Endorsed§**	**Rank‖**	**Status¶**
Experience managing children with specific presentations or diseases…					
1. Neonatal fever (1)	5.00	65	100	1.17	Must
2. Septic shock (1)	5.00	65	100	1.17	Must
3. Severe asthma (1)	5.00	65	100	1.17	Must
4. Severe status epileptics (1)	5.00	65	100	1.17	Must
5. Diabetic ketoacidosis (DKA) (1)	4.92	64	92.3	5	Must
6. Heme/onc patients with fever and/or neutropenia (1)	4.69	61	69.2	6	Must
7. Sickle cell disease (1)	4.31	56	38.5	7	Optional
8. Chest pain (1)	3.77	49	23.1	8	Optional
Off-service or ancillary clinical rotations: Dedicated 1-month clinical rotations on or with…					
1. Pediatric Intensive Care Unit (PICU) (7)	4.92	64	92.3	1	Must
2. Pediatric anesthesiology (2)	4.46	58	61.5	2	Must
3. Pediatric orthopedics (3)	4.15	54	53.8	3	Must

4.	Pediatric morbidity and mortality cases by EM residents at educational conference (1)	3.92	51	38.5	4	Optional
5.	Child abuse response team (1)	3.15	41	7.7	5	Optional
6.	Neonatal Intensive Care Unit (NICU) (5)	3.25	40	7.7	6.5	Optional
7.	Inpatient pediatrics (1)	3.00	39	7.7	6.5	Optional
8.	Outpatient pediatrics (1)	4.00	34	0.0	7	Optional
Experience with dedicated topics of skills…						
1.	Airway experience (2)	5.00	65	100	1.5	Must
2.	Medical Resuscitation (3)	5.00	65	100	1.5	Must
3.	Trauma resuscitation (3)	4.92	64	92.3	3	Must
4.	Neonatal Resuscitation (2)	4.77	62	84.6	4	Must
5.	Establishing a comprehensive differential diagnosis (1)	4.38	57	46.2	5	Must
6.	History taking skills (1)	4.23	55	38.5	6.5	Must
7.	Physical examination (2)	4.23	55	38.5	6.5	Must
8.	Pain management (1)	4.15	54	30.8	8	Must
9.	Ordering labs and studies (1)	4.00	52	23.1	9	Must
10.	Learning techniques for distracting children (1)	3.62	47	15.4	10	Optional
Case Mix:						
1.	Need to see patients in entire spectrum of ages (newborns to adolescents) (3)	4.77	62	76.9	1	Must
2.	Experience treating children across all levels of acuity (6)	4.69	61	76.9	2	Must
3.	Experience treating children for both common, non-emergent conditions and medical emergencies (1)	4.62	60	69.2	3	Must
Time Allocation: Pediatric ED rotations						

designed as follows…					
1. Shifts or rotations scheduled different seasons to experience seasonal variation in illness	4.33	53	46.2	1	Must
2. A minimum of 2-3 months working in a pediatric ED with PEM Physicians	3.83	47	38.5	2	Optional
3. A minimum of a 2 month block of shifts for each year of residency	3.83	47	23.1	3	Optional
4. 4-5 shifts per month in the pediatric ED	3.83	47	15.4	4	Optional
5. 3 month clinical rotations on pediatric emergency medicine	3.58	44	15.4	5	Optional
6. Equivalent numbers of shifts in a pediatrics ED as residents would have in the adult ED	2.58	32	7.7	6	Optional
Experience at specific types of facilities:					
1. Experience at a Peds ED that serves a large population of pediatric patients (1)	4.46	58	69.2	1	Must
2. Experience at a Peds ED that is at least a Level 2 Trauma Center (1)	4.31	56	61.5	2	Must
Special Certification Courses					
1. Pediatric advanced life support (PALS) (1)	4.46	58	61.5	1	Must
2. Neonatal resuscitation program (NRP) (1)	3.85	50	30.8	2	Optional
Including additional sub-specialists in training emergency medicine residents…					
1. Pediatric EM boarded physicians (1)	4.31	56	69.2	1	Must

2.	SANE nurses (1)	2.85	37	15.4	2	Optional
Scope of training….						
1.	Pediatric rotations at each level of training (PGY1-3) with emphasis on building skills to attain mastery (1)	4.23	55	46.2	1	Must
2.	Competence at running an area or managing all pediatric patients who come through by Senior Year (1)	3.92	51	23.1	2	Optional
Miscellaneous Experiences…						
1.	Simulation: Practice pediatric specific skills through simulation (3)	4.54	59	53.8		Must
2.	Procedure heavy shifts so residents become adept at core procedural skills like Lumbar Puncture, Incision and Drainage, suture repair (3)	3.69	48	30.8		Optional

Abbreviations and Notes:

- DKA= Diabetic Ketoacidosis
- Heme/Onc= Hematology/Oncology
- PICU= Pediatric Intensive Care Unit
- NICU= Neonatal Intensive Care Unit
- PEM= Pediatric Emergency Medicine Fellowship Trained
- ED= Emergency Department
- SANE= Sexual Assault Nurse Examiner
- Notes:
    - *Nominations= The frequency of times that item was suggested (nominated) during Round 1.
    - †Mean= Mean rating of items from Round 2 from a Likert-type scale labeled: 5=Very important, 4=Considerable importance, 3=Moderate importance, 2=Minimal importance, 1=Not at all important.

- ‡Strength Score= The sum of weighted frequencies, (total points) resulting from multiplying the number of participants selecting a rating (frequency of occurrence) by the Value of the rating from the Likert-type scale.[21]
- §Pct. Endorsed= The percentage of panelists out of 13 from Round 2 and 12 from Round 3 who endorsed the item by selecting the highest rating: "Very important" from Round 2, and "Must Teach" from Round 3.
- ||Rank= The rank assigned to items based on the rank order of their strength score and percentage of panelists endorsing that item with the highest rating.
- ¶Status= Recommendations from the panel: Must= Highly recommended experiences; Optional= May be offered.