

Recommendations for Choosing Wisely in Pediatric Emergency Medicine: Five Opportunities to Improve Value

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Unnecessary diagnostic tests and treatments in children cared for in emergency departments (EDs) do not benefit patients, increase costs, and may result in harm. To address this low-value care, a taskforce of pediatric emergency medicine (PEM) physicians was formed to create the first PEM Choosing Wisely recommendations. Using a systematic, iterative process, the taskforce collected suggested items from an interprofessional group of 33 ED clinicians from 6 academic pediatric EDs. An initial review of 219 suggested items yielded 72 unique items. Taskforce members independently scored each item for its extent of overuse, strength of evidence, and potential for harm. The 25 highest-rated items were sent in an electronic survey to all 89 members of the American Academy of Pediatrics PEM Committee on Quality Transformation (AAP COQT) to select their top ten recommendations. The AAP COQT survey had a 63% response rate. The five most selected items were circulated to over 100 stakeholder and specialty groups (within the AAP, CW Canada, and CW USA organizations) for review, iterative feedback, and approval. The final 5 items were simultaneously published by Choosing Wisely United States and Choosing Wisely Canada on December 1, 2022. All recommendations focused on decreasing diagnostic testing related to respiratory conditions, medical clearance for psychiatric conditions, seizures, constipation, and viral respiratory tract infections. A multinational PEM taskforce developed the first Choosing Wisely recommendation list for pediatric patients in the ED setting. Future activities will include dissemination efforts and interventions to improve the quality and value of care specific to recommendations. [Ann Emerg Med. 2024;■:1-9.]

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INTRODUCTION

Background

The United States has the highest spending on health care worldwide.¹ Approximately 20% of these costs are attributed to low-value care, defined as care that does not contribute benefit to patients.² Low-value care due to the overuse of unnecessary testing and treatment in the pediatric emergency department (ED) visits is a growing concern.^{3,4} In addition to the wasted costs of overtesting and overtreatment, these interventions can be associated with significant harm.^{4,5}

Importance

Targeted guidance and effective strategies are needed to help decrease unnecessary care for children in the ED setting. Choosing Wisely, an initiative of the American Board of Internal Medicine, aims to decrease unnecessary interventions across specialties by promoting

“conversations between clinicians and patients to assist patients in selecting care that is supported by evidence, not duplicative of other tests or procedures, free from harm, and truly necessary.”^{6,7} Since its inception in 2012, more than 100 societies and subspecialties have developed recommendations for reducing unnecessary clinical practices, and more than 30 countries have active chapters. In 2021, a group of pediatric emergency medicine (PEM) specialists within the Section of Emergency Medicine in the American Academy of Pediatrics (AAP) identified a need to create a Choosing Wisely recommendation list to highlight specific low-value practices for children in the ED.

Goals of This Investigation

A taskforce was formed to develop a Choosing Wisely list for PEM. This paper aimed to describe the systematic process for the list's creation, the specific recommendations on the list, and a summary of supporting evidence for each recommendation. These recommendations are intended to

raise awareness and guide clinicians and caregivers in their discussions to avoid unnecessary testing and treatment for children in the ED.

MATERIALS AND METHODS

In March 2021, a taskforce of 8 members (6 from the United States and 2 from Canada) of the Committee for Quality Transformation within the AAP Section of Emergency Medicine was created to build the Choosing Wisely list. All members were PEM physicians with expertise in quality improvement, patient safety, evidence appraisal, and quality measure development. The taskforce contacted the AAP, the Canadian Association of Emergency Physicians, and Choosing Wisely leadership to express interest in creating a PEM-specific list, clarify the process, and obtain endorsements to proceed with list creation. Taskforce members had no conflicts of interest, and no funding was involved in this project. The process of creating this list did not contain protected health information and was designated as not human subject research by the Human Research Protection Program of the taskforce chair's hospital (Children's Hospital of the King's Daughters).

The list creation process was based on the development of other Choosing Wisely lists and had 3 phases: collation of suggestions from a diverse group of interprofessional pediatric ED-based clinicians, a multiround ranking process, and a review process by external organizations on the wording and evidence basis for the recommendations.⁸⁻¹⁰

In phase 1, taskforce members queried a convenience sample of diverse, interprofessional, frontline clinicians at 6 of the taskforce member's institutions through email, requesting 5 to 10 recommendations from each clinician on low-value care practices in PEM that would be considered for inclusion in the PEM Choosing Wisely list. Taskforce members requested these recommendations from clinicians in each of the following defined categories: senior-level attending physician (≥ 15 years since completion of training), midcareer attending physician (5 to 14 years since completion), early-career attending physician (< 5 years since completion), a PEM subspecialty fellow, an experienced (> 5 years) pediatric ED nurse, and an experienced (> 5 years) advanced practice provider. Taskforce members excluded responses that did not relate to overuse or low-value care. Two taskforce members then met to combine duplicate or similar recommendations from this phase 1 list by a shared consensus process to produce a master list for phase 2.

In phase 2, a ranking process was completed by taskforce members and other PEM experts to determine which

Choosing Wisely recommendations would advance to phase 3. First, the taskforce members independently scored each suggested item across 3 domains on a 5-level anchored rating scale: perceived frequency of overuse, evidence for lack of utility, and potential harm associated with overuse.^{10,11} This latter category included harm to patients, overuse of staff resources, and overuse of material resources. Each taskforce member used supportive evidence based on their review of existing articles and practice guidelines.^{10,11} A 5-level, anchored rating system was determined by taskforce member consensus prior to scoring each of the items across the 3 domains (Table 1). The mean score of each of the 3 domains was calculated for every item, and an overall mean of the 3 domain means was calculated by equally weighting each domain. The 25 items with the highest overall mean scores were incorporated into an electronic questionnaire (Survey Monkey, San Mateo, CA) and emailed to all 89 active AAP Section of Emergency Medicine Committee on Quality Transformation members. The survey invitation described the survey's purpose, and recipients were asked for their consent to participate. Survey respondents were asked to select 10 of the 25 items they believed were most appropriate for the final PEM Choosing Wisely list. Respondents were asked to consider the same 3 domains (ie, frequency, evidence, and harm) when determining their selections. Prior to distribution, the survey was iteratively pilot-tested by PEM physicians who were not AAP Section of Emergency Medicine members to improve the survey's usability and clarity. Surveys were emailed in September 2021, with reminder emails sent out 7 days and 1 day prior to a 2-week deadline. The 5 items with the highest number of respondent votes that were not duplicative of existing items on Choosing Wisely recommendations from other subspecialties became the proposed PEM Choosing Wisely recommendations.

In phase 3, the ranked recommendations required external review from a number of medical organizations in order to determine the final top 5 list. To start this phase, 2 taskforce members were assigned to each of the proposed Choosing Wisely recommendation items to draft a brief evidence summary and supporting reference list (limited to 6 references per item based on standard Choosing Wisely list formatting and space limitations). The summaries and references were created based on a secondary review of the literature as conducted in phase 2. All 8 taskforce members then reviewed each of the evidence summaries and reference lists until all members had achieved full consensus before sending it to the AAP Section of Emergency Medicine Executive Committee. This executive committee, a group of 8 PEM physicians elected by their AAP peers, reviewed the proposed list, approved it, and subsequently

Table 1. Top 25 ranked items in order by number of survey votes, with taskforce ratings for each item.

Rank	Recommendation Item	AAP Section of Emergency Medicine Committee on Quality Transformation Votes (n=63)	Mean Domain Ratings by Taskforce			Overall Mean of 3 Domain Ratings
			Mean Frequency* (Min, Max)	Mean Evidence [†] (Min, Max)	Mean Harm [‡] (Min, Max)	
1	Avoid routine chest radiographs in children with uncomplicated asthma, bronchiolitis, croup, or first-time wheezing	46	1.5 (1, 3)	1 (1, 1)	2.33 (1, 4)	1.61
2	Avoid routine screening with laboratory tests in the medical clearance process of pediatric patients who require inpatient psychiatric admission unless clinically indicated	44	1.33 (1, 2)	1.67 (1, 4)	3 (2, 5)	2.00
3 [§]	Avoid testing for Group A Streptococcal pharyngitis in children less than 3 years of age	39	2.17 (2, 3)	1.17 (1, 2)	2.5 (1, 5)	1.95
4	Avoid instituting intravenous fluids before doing a trial of oral rehydration therapy in uncomplicated emergency department cases of mild to moderate dehydration in children	38	2 (1, 3)	1.5 (1, 2)	2.33 (1, 4)	1.94
5	Avoid immediate computed tomography (CT) scans of the head in children who present to the ED with a minor head injury and meet intermediate PECARN-validated criteria	37	2.5 (1, 4)	1 (1, 1)	1.5 (1, 3)	1.67
6	Avoid routine lab testing and imaging for an uncomplicated, first-time generalized atraumatic or febrile seizure	37	3 (1, 4)	1 (1, 1)	1.5 (1, 2)	1.83
7	Avoid routine abdominal radiographs for suspected constipation	36	1.83 (1, 3)	1.5 (1, 2)	2.5 (1, 5)	1.94
8	Avoid comprehensive viral panel testing for patients who have uncomplicated viral illnesses	34	1.67 (1, 3)	1.83 (1, 3)	2.5 (1, 5)	2.00
9	Avoid obtaining complete blood counts and blood cultures in well-appearing, vaccinated-for-age febrile children >60 days of age	30	2.33 (1, 3)	1 (1, 1)	2.5 (2, 4)	1.94
10	Avoid obtaining a blood culture in a patient with uncomplicated pneumonia (ie, nontoxic, immunized children without abscess, effusion, or empyema)	29	2 (1, 3)	1.67 (1, 3)	3.33 (3, 4)	2.33
11	Avoid head CT scan for the evaluation of acute, atraumatic, uncomplicated headaches	28	3 (2, 4)	1.67 (1, 4)	1.67 (1, 3)	2.11
12	Avoid delays in providing intramuscular epinephrine to treat pediatric patients with anaphylaxis	26	3 (2, 4)	2.33 (1, 3)	2.67 (1, 4)	2.67
13	Avoid routine chest radiographs in neonatal fever evaluations in the absence of concerning respiratory symptoms	24	3.17 (1, 5)	1.67 (1, 3)	2.67 (1, 4)	2.50

Table 1. Continued.

Rank	Recommendation Item	AAP Section of Emergency Medicine Committee on Quality Transformation Votes (n=63)	Mean Domain Ratings by Taskforce			Overall Mean of 3 Domain Ratings
			Mean Frequency* (Min, Max)	Mean Evidence [†] (Min, Max)	Mean Harm [‡] (Min, Max)	
14	Avoid routine use of C-spine radiographs in pediatric trauma patients with a low-risk mechanism who are alert and have a normal examination	23	1.83 (1, 2)	1.5 (1, 2)	2.5 (1, 4)	1.94
15	Avoid routine admission of infants with Brief Resolved Unexplained Events who meet low-risk criteria by history and physical examination	22	3.17 (1, 5)	1.67 (1, 3)	2 (1, 5)	2.28
16	Avoid urinary tract infection screening on low-risk infants with a fever of less than 2 days	20	3 (1, 4)	1.83 (1, 3)	2.83 (2, 5)	2.55
17	Avoid radiographs for suspected nursemaid's elbow unless there are clinical indicators of a possible fracture (swelling or point tenderness)	20	3.33 (2, 4)	1.5 (1, 2)	3.5 (2, 5)	2.78
18	Avoid giving steroids to patients with bronchiolitis	20	1.67 (1, 3)	1.33 (1, 2)	2.83 (1, 5)	1.94
19	Avoid routine use of abdominal CT scans in the immediate evaluation of pediatric blunt abdominal trauma	18	2 (1, 3)	1.5 (1, 2)	1.67 (1, 3)	1.72
20	Avoid intravenous opioids if intranasal medications are rapidly available in pediatric patients without intravenous access	16	1.8 (1, 3)	2.8 (1, 5)	3.4 (1, 5)	2.67
21	Avoid routine labs and imaging for patients who meet validated low-risk criteria for appendicitis	15	2.33 (2, 3)	1 (1, 1)	1.5 (1, 3)	1.61
22	Avoid unnecessary radiographs of extremity fractures (eg, the joint above and below fracture unless indicated by physical examination findings)	12	2.83 (2, 4)	2 (1, 3)	2.83 (1, 4)	2.55
23	Avoid routine pelvic radiographs in pediatric trauma patients unless clinically indicated	11	3.33 (1, 5)	1.5 (1, 2)	2.83 (1, 4)	2.55
24	Avoid giving steroids to patients with pharyngitis	5	3.67 (3, 5)	2 (1, 3)	2.5 (1, 4)	2.72
25	Avoid the use of antibiotics after uncomplicated paronychia incision and drainage	3	3.67 (3, 5)	1.83 (1, 3)	2.83 (2, 4)	2.78

PECARN, Pediatric Emergency Care Applied Research Network.

*Frequency of overuse in the ED. Anchor ratings: 1=High (multiple patients/shift), 3=Medium (~1 patient/shift), 5=Low (1 patient every few shifts).

[†]Lack of evidence for efficacy. Anchor ratings: 1=High grade evidence, 3=Medium grade evidence, 5=Low grade evidence.

[‡]Harm to patients or to the utilization of staffing or material resources with overuse. Anchor ratings: 1=High harm, 3=Medium harm, 5=Low harm.

[§]Excluded from the list (included on Choosing Wisely Canada Primary Care list).

^{||}Excluded from the list (included on Choosing Wisely American College of Emergency Physicians list).

sent it to 17 AAP subspecialty committees for review. Once their input was incorporated, the AAP's Executive Leadership approved the list for submission to the US and

Canadian Choosing Wisely organizations. At this point, more than 100 Choosing Wisely medical societies, including the American College of Emergency Physicians,

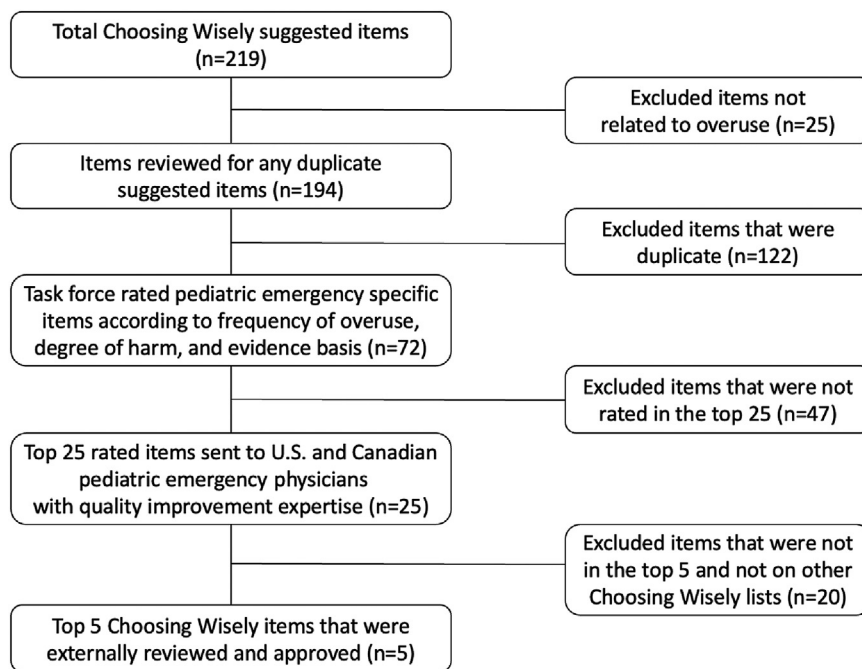


Figure. Selection process of Choosing Wisely items. US, United States.

reviewed the 5 recommendations and their explanations for clarity content to determine that none of the listed items were duplicative of items already on existing Choosing Wisely lists from other specialties. Simultaneous with the US approval process, the recommendations were submitted to the Canadian Association of Emergency Physicians and Choosing Wisely Canada for their approval.

RESULTS

In phase 1, 219 free-text responses were collected from 33 (22 women, 67%) of the 36 queried clinicians (Figure). This group included 18 attending physicians (5 early-career, 5 midcareer, and 8 senior-level), 6 PEM fellows, 5 advanced practice clinicians, and 4 nurses. After excluding 25 items not relevant to overuse, the remaining 194 items were related to diagnostics (n=143, 74%), therapeutics (n=48, 25%), ED disposition (n=2, 1%), and documentation (n=1, 1%). After combining any duplicate items, there were 72 unique items.

In phase 2, the remaining 72 items were scored by taskforce members. The 25 highest-scoring items were included in the electronic survey that was completed by 63 (71%) of the 89 Committee on Quality Transformation members (Table 1). The 25 items were related to diagnostic testing (n=18, 72%), therapeutics (n=6, 24%), and ED disposition (n=1, 4%). Of the top 25 items, 3 items were ultimately excluded due to their inclusion in other published Choosing Wisely recommendations.

In phase 3, the 5 most frequently selected recommendations, with their evidence summaries, were presented for approval and were subsequently released by the US and Canadian Choosing Wisely groups on December 1, 2022 (Table 2).¹²⁻³⁷ All 5 recommendations were related to diagnostic testing.

LIMITATIONS

Our process had some limitations. Although we solicited initial input from a diverse clinician group, this may not have been generally representative of clinicians who treat children in all ED settings. We attempted to mitigate this issue by obtaining wide stakeholder input during the approval process, including stakeholders who practiced in general and community-based EDs. Additionally, we followed a standard, stepwise process for external review that was mandated by the AAP in order to obtain approval from stakeholders in various groups within the AAP and Choosing Wisely. We also adopted similar methodological processes that had been used by other subspecialties to create their Choosing Wisely recommendations.⁸⁻¹¹ To further limit any subjective biases of taskforce members, we focused on an item reduction method with external stakeholder input to finalize the list.

DISCUSSION

A multinational PEM taskforce used a systematic process to develop the first Choosing Wisely recommendations

Table 2. Final 5 items on the Choosing Wisely Pediatric Emergency Medicine List. References and further information available on the American Academy of Pediatrics website¹² and ChoosingWiselyCanada.org.

Item	Supportive Details
#1: Do not obtain radiographs in children with bronchiolitis, croup, asthma, or first-time wheezing. ¹³⁻¹⁷	Respiratory illnesses are among the most common reasons for pediatric emergency department (ED) visits, with wheezing being a frequently encountered clinical finding. For children presenting with first-time wheezing or with typical findings of asthma, bronchiolitis, or croup, radiographs rarely yield important positive findings and expose patients to radiation, increased cost of care, and prolonged ED length of stay. National and international guidelines emphasize the value of history and physical examination in making an accurate diagnosis and excluding serious underlying pathology. Radiography performed in the absence of significant findings has been shown to be associated with overuse of antibiotics. Radiographs should not be routinely obtained in these situations unless findings such as significant hypoxia, focal abnormalities, prolonged course of illness, or severe distress are present. If wheezing is occurring without a clear atopic cause or without upper respiratory tract infection symptoms (eg, rhinorrhea, nasal congestion, and/or fever), appropriate diagnostic imaging should be considered on a case-by-case basis.
#2: Do not obtain screening laboratory tests in the medical clearance process of pediatric patients who require inpatient psychiatric admission unless clinically indicated. ¹⁸⁻²³	The incidence of mental health problems in children has increased in the last 2 decades, with suicide surpassing homicide as the second leading cause of death in teenagers. Most children with acute mental health issues do not have underlying medical causes for these symptoms. A large body of evidence, in both adults and children, has shown that routine laboratory testing without clinical indication is unnecessary and adds to health care costs. Any diagnostic testing should be based on a thorough history and physical examination. Universal requirements for routine testing should be abandoned.
#3: Do not order laboratory testing or a computed tomography (CT) scan of the head for pediatric patients with an unprovoked, generalized seizure or a simple febrile seizure who have returned to baseline mental status. ²⁴⁻²⁷	Children presenting with unprovoked, generalized seizures or simple febrile seizures who return to their baseline mental status rarely have blood tests or CT scan findings that change acute management. CT scans are associated with radiation-related risk of cancer, increased cost of care, and added risk if sedation is required to complete the scan. A head CT scan may be indicated in patients with a new focal seizure, new focal neurologic findings, or high-risk medical history (such as neoplasm, stroke, coagulopathy, sickle cell disease, and age).
#4: Do not obtain abdominal radiographs for suspected constipation. ²⁸⁻³³	Functional constipation and nonspecific, generalized abdominal pain are common presenting complaints for children in EDs. Constipation is a clinical diagnosis and does not require testing, yet many of these children receive an abdominal radiograph. However, subjectivity and lack of standardization result in poor sensitivity and specificity of abdominal radiographs to diagnose constipation. The use of abdominal radiographs to diagnose constipation has been associated with increased diagnostic error. Clinical guidelines recommend against obtaining routine abdominal radiographs in patients with a clinical diagnosis of functional constipation. The diagnosis of constipation or fecal impaction should be made primarily by history and physical examination, augmented by a digital rectal examination when indicated.
#5: Do not obtain comprehensive viral panel testing for patients who have suspected respiratory viral illness. ³⁴⁻³⁷	Viral infections occur frequently in children and are a common reason to seek medical care. The diagnosis of a viral illness is made clinically and usually does not require confirmatory testing. Additionally, there is a lack of consistent evidence to demonstrate the effect of the comprehensive viral panel (ie, panels simultaneously testing for 8-20+ viruses) results on clinical outcomes or management, especially in ED settings. Hence, most national and international clinical practice guidelines do not recommend their routine use. Additionally, some viral tests are quite expensive, and obtaining nasopharyngeal swab specimens can be uncomfortable for children. Comprehensive viral panel testing can be considered in high-risk patients (eg, immunocompromised) or in situations in which the results will directly influence treatment decisions, such as the need for antibiotics, the performance of additional tests, or hospitalization. Testing for specific viruses might be indicated if the results of the testing may alter treatment plans (eg, antivirals for influenza) or public health recommendations (eg, isolation for SARS-CoV-2). For more specific recommendations related to the diagnosis and management of SARS-CoV-2, please see www.aap.org/en/pages/2019-novel-coronavirus-covid-19-infections/ .

SARS-CoV-2, severe acute respiratory syndrome coronavirus 2.

dedicated to the care of pediatric patients in ED settings. We anticipate that these recommendations will help increase awareness of commonly overused tests and provide clinicians with support for following evidence-based practices and shared decisionmaking with caregivers. All 5 recommendations relate to diagnostics. By focusing on safe and efficient diagnostic stewardship in the ED, we can provide higher-value care that maintains or improves outcomes while reducing costs for patients and health care systems and limiting the potential for harm.

To our knowledge, ours is the first pediatric-focused set of Choosing Wisely recommendations to be jointly released by the US and Canadian organizations. Both countries have similar rates of pediatric ED visits, with 383 and 415 pediatric ED visits per 1,000 children in the US and Canadian populations, respectively.^{38,39} Reducing low-value care due to overtesting and overtreatment is a focus of both the US and Canadian Choosing Wisely organizations. The AAP Section of Emergency Medicine has members practicing in the United States and in Canada. Therefore, a cross-border collaboration was a natural result of joining the networks of participating task force members and will allow the recommendations to have a wider reach.

Although emergency physicians caring for children in the United States and Canada treat similar acute conditions, Cohen et al⁴⁰ demonstrated that overall low-value diagnostic imaging rates were lower in pediatric EDs in Ontario, Canada, than in the United States, with no differences in adverse outcomes. This may be due to differences in practice patterns, organization of care, differences in payment models, and/or medicolegal differences between the 2 countries, but it highlights an opportunity for continued learning about overtesting through international collaborative activities.⁴¹ The Choosing Wisely recommendations in PEM can affect many factors that influence overtesting by improving clinician knowledge, aiding in guiding a shared understanding of best practices among colleagues, and facilitating more effective, shared decisionmaking between clinicians and patients. Shared decisionmaking improves caregiver knowledge about their child's condition in the ED and reduces conflict related to diagnostic testing.⁴² As the majority of children are seen in nonpediatric EDs, it is important to disseminate these findings about pediatric emergency conditions broadly to caregivers as well as clinicians who have less pediatric-specific training.⁴

Future activities by taskforce members will include educational interventions to disseminate the recommendations at webinars, conference workshops, podcasts, blog posts, and online videos. We have started this dissemination process to the community of clinicians

who provide emergency care to children (<http://choosingwisely.pemblog.com/>). Taskforce members will support multicenter collaboratives aimed at implementing changes to improve clinical practice, such as the new collaborative by AAP Pediatric Acute and Critical Care Network that aims to reduce laboratory testing associated with the medical clearance process for pediatric inpatient psychiatric admissions. Quality improvement efforts will need to address key drivers of diagnostic overuse, including fear of diagnostic error, defensive medicine practices, and understanding parental beliefs and expectations.^{5,41,43-45} Ultimately, the success of the Choosing Wisely recommendations will depend on the degree to which they inspire change. We hope that this initial list of Choosing Wisely recommendations for pediatric emergency medicine will serve as a starting point for improvement activities that will enhance value, decrease harm, and improve outcomes for children receiving care in EDs.

The PEM Choosing Wisely taskforce would like to acknowledge all of the clinicians who submitted the initial set of suggested items and to the AAP Committee on Quality Transformation survey respondents for their input. The authors are grateful to all of the individuals who helped to coordinate and guide these efforts at the AAP, United States Choosing Wisely, Choosing Wisely Canada, and the Canadian Association of Emergency Physicians.

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