Marin JR, Lyons TW, Claudius I, Fallat ME, Aquino M, Ruttan T, Daugherty RJ; AMERICAN ACADEMY OF PEDIATRICS Committee on Pediatric Emergency Medicine, Section on Radiology; AMERICAN COLLEGE OF RADIOLOGY; AMERICAN COLLEGE OF EMERGENCY PHYSICIANS Pediatric Emergency Medicine Committee.
Optimizing Advanced Imaging of the Pediatric Patient in the Emergency Department: Policy Statement. Pediatrics. 2024 Jul 1;154(1):e2024066854. doi: 10.1542/peds.2024-066854. PMID: 38932710.

TABLE 1 Recommendations for Emergency Department Advanced Imaging Strategies for Common Pediatric Conditions

Clinical Problem	Risk-Stratification Tools	Recommendations	First-Line Imaging (if Available)[c]	Alternative/Additional Imaging
Seizures				
Simple febrile		Neuroimaging is not necessary for children with a simple febrile seizure[b]		
Complex febrile		Emergency neuroimaging is usually not indicated if the patient is back to baseline and without significant clinical findings.	MRI	CT
Afebrile		Do not order emergent imaging for children ≥6 mo with an unprovoked, generalized seizure who have returned to baseline mental status and have a normal neurologic examination.[b] Routine neuroimaging is not necessary after a breakthrough seizure in a patient with established epilepsy.[b]	MRI	CT
Headache (atraumatic)		Emergent neuroimaging is not necessary in patients with uncomplicated headache or those with stable headaches that meet criteria for migraine.[b]	MRI	CT
Ventricular shunt evaluation			MRI	CT
Stroke			MRI	CT
Trauma[a]		Routine whole-body CT should not be performed in pediatric trauma patients.[b] Whole-body CT is not used to screen asymptomatic children with a high-energy mechanism. When such imaging is used in children, venous-phase imaging of the chest and abdomen is often sufficient for screening.[44]		
Head	Kuppermann et al, 2009[29] Osmond et al, 2010[49] Dunning et al, 2006[50]	CT scans should not be routinely obtained for mild head injuries.[b]	CT	
Cervical spine	Leonard et al, 2019[51] Herman et al, 2019[52]	Routine advanced imaging is not warranted.[b]	XR	CT, MRI
Chest	American College of Surgery, Trauma Quality Improvement Program, 2018[44]	Chest CT is indicated if concern for blunt mediastinal vascular injury, wide mediastinum on chest XR, or for patients with penetrating thoracic trauma	CT with IV contrast	
Abdomen/pelvis	American College of Surgery, Trauma Quality Improvement Program, 2018[44]		CT (with IV contrast)	

TABLE 1 Continued

Clinical Problem	Risk-Stratification Tools	Recommendations	First-Line Imaging (if Available)[c]	Alternative/Additional Imaging
	Arbra et al, 2018[53] Holmes et al, 2013[30]			
Child abuse				
Abusive head trauma	Berger et al 2016[45]		MRI CT if acute trauma or concern for skull fracture	CT
Cervical spine injury		Immobilize cervical spine in cases of suspected abusive head trauma	MRI	
Abdominal trauma		Imaging is warranted if signs of abdominal injury or unexplained elevated transaminases (>80 u/L)[46]	CT (with IV contrast)	
Appendicitis	Pediatric Appendicitis Score[54] Alvarado score[55] Pediatric Appendicitis Risk Calculator[31]		US[b]	MRI without contrast, CT with IV contrast, repeat US,[d] observation
Neck infections			US, CT with IV contrast, MRI	
Nephrolithiasis			US	Low-dose CT (stone protocol)

IV, intravenous; US, ultrasonography; XR, radiography. All imaging is without contrast unless otherwise specified.
[a] Excludes patients with concern for child abuse.
[b] Indicates Choosing Wisely recommendation.
[c] When MRI is recommended, it should be performed only in a stable patient given the duration of obtaining and completing the examination.
[d] Patients with equivocal initial ultrasonography (eg, nonvisualized appendix) may undergo follow-up ultrasonography after a period of observation (eg, 6–12 hours).

ED imaging,[34–37] as these tools reduce variability in practice and provide a standardized approach to the evaluation for certain conditions.[38–40] Imaging typically falls into 3 categories: Imaging that determines the need for emergent intervention provided by the originating ED, imaging that may determine whether transfer is needed, and imaging in a patient who will be transferred regardless of the imaging findings (Table 2). Framing imaging decisions in this manner may help to curb unnecessary imaging.

In many cases, there may be more than one reasonable choice regarding advanced imaging, and shared decision-making is appropriate to ensure that the patient and family's needs and values are considered and incorporated into decision-making.[41] For example, a child with abdominal pain may be at moderate risk of appendicitis and need advanced imaging to evaluate the appendix; however, neither ultrasonography nor MRI are available at the referring ED. This situation presents an opportunity to weigh the options for imaging with the family including a CT at the referring ED or transfer to a pediatric facility for ultrasonography or MRI. For patients who are at low risk, an additional option to discuss with family members and document in the electronic health record is discharging home with monitoring for worsening symptoms and follow-up with the PCP.

RECOMMENDATIONS

1. EDs (including hospital and freestanding) that care for pediatric patients should ensure appropriate imaging resources are available to meet the needs of children

TABLE 2 Imaging Decision-Making Recommendations

Question to Be Answered	Recommendation	Example
Will imaging assist with determining whether emergent intervention is needed?	Perform imaging	Patient with altered mental status and possible cerebral edema
Will imaging assist with determining whether transfer is needed?	Perform imaging	Patient with head trauma who is awake and alert but with signs/symptoms concerning for clinically important traumatic brain injury and could be discharged if imaging is negative
Will patient be transferred regardless of imaging findings?	Defer imaging to the receiving institution	Patient with significant abdominal pain and/or concern for acute abdomen, presenting to an ED without pediatric surgical capabilities