



Five Things Physicians and Patients Should Question

1 **Avoid the routine use of whole-body computed tomography (CT) scanning (pan-scanning) in pediatric trauma patients.**

While CT scans can be a helpful adjunct to diagnosing traumatic injuries, their usage should be tailored to the mechanism of injury and clinical findings. Radiation from CT scans places children at a low, but real risk of developing potentially fatal malignancies later in life. Decision rules have been developed to guide the judicious use of CT scans for evaluating traumatic head, cervical spine, chest, and abdominal/pelvic injuries. Chest CTs, in particular, have limited value in the evaluation of pediatric blunt trauma patients as few findings require specific treatments that change management. Adherence to published guidelines helps reduce unnecessary scans and reduce costs while minimizing significant missed injuries.

2 **Avoid using computed tomography (CT scan) as the first-line imaging modality in the evaluation of suspected appendicitis in children. Ultrasound should be done first with a CT scan or magnetic resonance imaging (MRI) considered in equivocal cases.**

Although CT is the most accurate radiologic modality for the evaluation of appendicitis, ultrasound should be the preferred initial evaluation in children. This modality is cost effective, avoids radiation exposure, and has excellent accuracy, with a reported sensitivity and specificity of 94 percent in experienced hands. When the ultrasound is equivocal, decision guidelines based on clinical findings as well as radiologic findings may assist in determining the need for cross-sectional imaging. Other options to consider prior to CT scan may include an evaluation by a surgeon, observation with serial exams, repeat ultrasound after a period of observation, and MRI, which has been shown to have similar diagnostic accuracy as CT.

3 **Avoid performing antireflux operations (funduplications) during gastrostomy insertion in most children who are otherwise growing and thriving with gastric feedings.**

There is significant hospital-related variation in rates of concurrent fundoplication at time of gastrostomy placement.[1] Despite recommendations that anti-reflux surgery should be considered only for children who have persistent symptoms despite medical management or are unable to be weaned from medical therapy, many patients undergo surgery without a trial of medical therapy.[2]

This is especially true in children with cardiac, pulmonary and neurologic comorbidities, for whom some surgeons may recommend prophylactic fundoplication. There are insufficient data to support the concept of fundoplication in the absence of reflux, regardless of patient comorbidities. In fact, neurologically impaired patients are at higher risk for post-operative complications and/or fundoplication failure,[3–5] and fundoplication does not lead to reduction in reflux-related admissions compared to gastrostomy alone.[6] Definitive evidence supporting the effectiveness of fundoplication in children is lacking.[7] Expert opinion-based guidelines[2] state that fundoplication can be considered in infants and children with GERD who also meet any of the following criteria: 1) life threatening complications (e.g., cardiorespiratory failure) of GERD after failure of optimal medical treatment, 2) symptoms refractory to optimal therapy, 3) chronic conditions (i.e. neurologically impaired, cystic fibrosis) with a significant risk of GERD-related complications, 4) the need for chronic pharmacotherapy for control of signs and/or symptoms of GERD.

4

Avoid referring most children with umbilical hernias to a pediatric surgeon until around age 4–5 years.

Patients with umbilical hernias may safely be observed until at least age 4 years; at that point pediatric surgical consultation is recommended to discuss surgical repair option. Special consideration for earlier consultation can be given in cases of parental concern.

Umbilical hernias, resulting from failure of complete closure of the umbilical ring after birth, affect up to 25% of newborns. Unlike inguinal hernias, or umbilical hernias in adults, a majority of newborn umbilical hernias will close spontaneously – about 85% closure rate by age 5 years. Larger umbilical hernias – vaguely defined as those over 1.5 cm in diameter – have a lower likelihood of spontaneous closure. Complications of umbilical hernia, such as incarceration (where omentum or bowel is “stuck” in the hernia sac, estimated at 0.2–4.5%) or strangulation (where omentum or bowel is incarcerated and proceeds to suffer ischemic damage, estimated at less than 0.8%) are very rare; thus the risk/benefit ratio in surgical closure of umbilical hernias strongly favors observation. Even markedly large or protuberant umbilical hernias (such as a proboscis, or elephant-trunk, type hernia) may undergo spontaneous closure and are not clearly associated with an increased risk of complications when not surgically closed. Non-operative closure techniques such as umbilical strapping are generally ineffective, can lead to skin breakdown, and should be avoided.

Complications following umbilical hernia repair in children are rare and may include infection (estimated at less than 1%) and recurrence (estimates ranging from 0.27%–2.44%). Recurrence rates appear to be higher in children repaired at an early age (less than 4 years).

5

Reduce post-operative opioid requirements in pediatric patients by administering acetaminophen and/or non-steroidal anti-inflammatory medications in the perioperative period.

Multi-modal analgesia is recommended in the management of children for their perioperative pain. Significant decreases in opioid consumption can be achieved with the concurrent use of non-steroidal anti-inflammatory drugs (NSAID) and/or acetaminophen in infants and children undergoing surgery of moderate or major severity, especially within the first twenty-four hours following surgery. The use of NSAIDs during the first 24-hours of post-operative care also reduced the incidence of nausea and vomiting.

In addition to decreasing the possibility of narcotic dependence, avoidance of opioids confers added benefits of reducing the incidence of post-operative nausea and constipation and aiding in early ambulation.

How This List Was Created

Members of the American Academy of Pediatrics Section on Surgery Subcommittee on Education and Delivery of Surgical Care submitted the top 5 topics for *Choosing Wisely* items based on a review of the literature and expert opinion. The items were refined, ranked and approved by the Section on Surgery leadership. The list was then reviewed and approved by more than a dozen relevant AAP Committees, Councils and Sections. The AAP Executive Committee granted final approval of the list.

The guidance in this list does not indicate an exclusive course of treatment or serve as a standard of medical care. Variations, taking into account individual circumstances, may be appropriate.

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