

# Patient Safety Tip of the Week

February 19, 2019

## Focus on Pediatric Patient Safety

The pediatric literature this past month has had an intense focus on patient safety for children. The American Academy of Pediatrics issued a Policy Statement “Principles of Pediatric Patient Safety: Reducing Harm Due to Medical Care” ([Mueller 2019](#)). And a consortium of Children’s Hospitals compiled a prioritized list of research topics for pediatric patient safety ([Hoffman 2019](#)).

The AAP policy statement ([Mueller 2019](#)) begins with an excellent review of the literature on pediatric patient safety issues. It then goes into the safety culture, which includes human factors concepts, and discusses the concepts of human fallibility, organizational culture, reporting culture, learning culture, flexible culture, and just culture. It goes on to discuss many of the strategies and approaches to patient safety and the roles of leadership, healthcare information technology, and goals set not only by The Joint Commission but also by a variety of other professional organizations. The appendices and reference list provide excellent links to useful information and tools.

It ends with a set of recommendations:

1. Raise awareness and improve working knowledge of pediatric patient safety issues and best practices throughout the pediatric community.
  - Educate and train
  - Network
  - Create a safety culture
  - Implement and use standardized protocols of care for specific conditions, such as checklists or clinical practice guidelines, and monitor adherence
  - Expand focus (for example, to safety in ambulatory settings and other locations where children receive care, including the home and school environments)
  
2. Act and advocate to minimize preventable pediatric medical harm by using information on pediatric-specific patient-safety risks.
  - Develop pediatric-specific error reporting
  - Identify trends and areas in need of action
  - Foster leadership
  - Enhance family-centered care, actively engage patients and families in safety at all points of care, and address issues of ethnic culture, language, and health literacy.

3. Improve health care outcomes for children by adhering to proven best practices for improving pediatric patient safety.
  - Adhere to best practices
  - Target drug safety
  - Help redesign clinical systems
  - Leadership to support and expand research (locally, regionally, and nationally)

See the AAP paper for details on each of these recommendations.

The second paper comes from the Children's Hospitals Solutions for Patient Safety Network, a network of >100 children's hospitals working together to eliminate harm due to health care. They engaged key stakeholders (importantly, including parents) in an iterative process to identify and prioritize topics on pediatric patient safety ([Hoffman 2019](#)). They developed a final list of 24 topics. Top-priority research topics concerned high reliability, safety culture, open communication, and early detection of patient deterioration and sepsis. Further discussion with health system executives put the following at the top of their list as priority areas: diagnostic error, medication safety, deterioration, and ambulatory patient safety.

For years, our pediatric colleagues have been reminding us that “kids are not just little adults”. And that does ring true when it comes to patient safety. There are clearly vulnerabilities in infants and children that render them at risk for a variety of patient safety hazards. So we went back and reviewed our own patient safety columns related to children over the years, and we clearly see the impact of those vulnerabilities. We noted several key contributing factors:

- Body size, weight, surface area differences
- Communication limitations
- Cognitive skills not fully developed
- Genetic vulnerabilities (eg. rapid metabolizers)
- Someone else makes decisions for them (eg. “numeracy” of parents)
- Confusion about devices used to administer medications
- Immune systems immature
- Difficulty holding still (dental or other sedation)
- Kids play and are inquisitive (eg. may put discarded opioid patches in their mouths)
- Longer time for exposure to radiation effects
- Not included in clinical trials
- Similarities of names in neonatal units

Medication safety would have been at the top of our list and many of the vulnerabilities unique to children lead to adverse medication events. Compared to adults, where “standardized” doses are typically used, children have different body weights and surface areas that lead to the need to calculate their medication doses. Any time you have to perform a calculation, you've added an additional threat layer (see our many columns on

dosing errors and dose rounding issues). Moreover, someone else is usually making medical decisions or management and they may be prone to error (see our columns on parental “numeracy” issues). Genetically-determined vulnerabilities are often first brought to light in children (for example, the “rapid metabolizer” issue that renders children at risk from use of codeine). The fact that children are often excluded from clinical trials may preclude them from benefiting from certain drugs but may also put them in harm’s way when someone uses those drugs in a population where they have not been adequately assessed for safety and efficacy.

Because they may not be able to communicate with us, they cannot tell us “hey, you’ve got the wrong patient!”. They may not be able to communicate to us that they are having an adverse reaction to a medication we’ve given them. And inability to communicate may impede our ability to recognize early clinical deterioration in patients with sepsis or other conditions.

Infants and children can’t be expected to hold still for diagnostic studies like CT or MRI or for therapeutic interventions like dental work. Therefore, they are given sedation for such events and are put at risk for the unwanted consequences of sedation (respiratory depression, aspiration, etc.).

Kids are inquisitive and like to play. That puts them at risk for finding things like discarded opioid transdermal patches, which can lead to disaster if they put these in their mouths or attach them to their skin. They can get into medicine cabinets (or other places where medications intended for their parents or siblings are kept) and ingest medications that will harm them. We’ve also noted cases where kids had ingested magnets and underwent MRI with consequent burning of GI tissues.

Most of our columns on the effects of unnecessary radiation exposure have focused on children. The carcinogenic risks from ionizing radiation often depend upon cumulative doses and children obviously have a much longer lifespan that allows for more total radiation exposure.

While we listed “similarity of names” in neonatal units, there are actually many factors that contribute to misidentification issues in newborns. Our numerous columns on this topic are listed below.

And we’ve not even touched upon the many other safety hazards for children that are not directly related to medical care but should be addressed by healthcare professionals when they interact with infants and children and their families. These include topics like gun safety, bicycle and automobile (or other vehicles) safety, sports safety, drugs, smoking, bullying, and other topics. We pointed to some good references for those topics in our January 2019 What’s New in the Patient Safety World column “[Pediatric Health and Safety Guide](#)”.

**Some of our other columns on pediatric medication errors:**

November 2007	<a href="#">“1000-fold Overdoses by Transposing mg for micrograms”</a>
December 2007	<a href="#">“1000-fold Heparin Overdoses Back in the News Again”</a>
June 28, 2011	<a href="#">“Long-Acting and Extended-Release Opioid Dangers”</a>
September 13, 2011	<a href="#">“Do You Use Fentanyl Transdermal Patches Safely?”</a>
September 2011	<a href="#">“Dose Rounding in Pediatrics”</a>
April 17, 2012	<a href="#">“10x Dose Errors in Pediatrics”</a>
May 2012	<a href="#">“Another Fentanyl Patch Warning from FDA”</a>
June 2012	<a href="#">“Parents’ Math Ability Matters”</a>
September 2012	<a href="#">“FDA Warning on Codeine Use in Children Following Tonsillectomy”</a>
May 7, 2013	<a href="#">“Drug Errors in the Home”</a>
May 2014	<a href="#">“Pediatric Codeine Prescriptions in the ER”</a>
November 2014	<a href="#">“Out-of-Hospital Pediatric Medication Errors”</a>
January 13, 2015	<a href="#">“More on Numeracy”</a>
April 2015	<a href="#">“Pediatric Dosing Unit Recommendations”</a>
September 2015	<a href="#">“Alert: Use Only Medication Dosing Cups with mL Measurements”</a>
November 2015	<a href="#">“FDA Safety Communication on Tramadol in Children”</a>
October 2016	<a href="#">“Another Codeine Warning for Children”</a>
January 31, 2017	<a href="#">“More Issues in Pediatric Safety”</a>
May 2017	<a href="#">“FDA Finally Restricts Codeine in Kids; Tramadol, Too”</a>
August 2017	<a href="#">“Medication Errors Outside of Healthcare Facilities”</a>
August 2017	<a href="#">“More on Pediatric Dosing Errors”</a>
September 2017	<a href="#">“Weight-Based Dosing in Children”</a>

**Some of our previous columns on opioid safety issues in children:**

- September 2012 [“FDA Warning on Codeine Use in Children Following Tonsillectomy”](#)
- March 2013 [“Further Warning on Codeine in Children Following Tonsillectomy”](#)
- May 2014 [“Pediatric Codeine Prescriptions in the ER”](#)
- November 2015 [“FDA Safety Communication on Tramadol in Children”](#)
- January 2016 [“FDA Gets Even Tougher on Codeine in Kids”](#)
- October 2016 [“Another Codeine Warning for Children”](#)
- May 2017 [“FDA Finally Restricts Codeine in Kids; Tramadol, Too”](#)
- February 2018 [“FDA Warning on Cough Meds”](#)

**Some of our previous columns on sedation issues in children:**

- August 2010 [“Sedation Costs for Pediatric MRI”](#)
- January 25, 2011 [“Procedural Sedation in Children”](#)
- August 2016 [“Guideline Update for Pediatric Sedation”](#)
- January 17, 2017 [“Pediatric MRI Safety”](#)
- August 8, 2017 [“Sedation for Pediatric MRI Rising”](#)
- March 15, 2016 [“Dental Patient Safety”](#)

- March 28, 2017 “[More Issues with Dental Sedation/Anesthesia](#)”
- November 28, 2017 “[More on Dental Sedation/Anesthesia Safety](#)”

**Some of our prior columns related to identification issues in newborns:**

- November 17, 2009 “[Switched Babies](#)”
- December 20, 2011 “[Infant Abduction](#)”
- September 4, 2012 “[More Infant Abductions](#)”
- December 11, 2012 “[Breastfeeding Mixup Again](#)”
- April 8, 2014 “[FMEA to Avoid Breastmilk Mixups](#)”
- August 2015 “[Newborn Name Confusion](#)”
- January 19, 2016 “[Patient Identification in the Spotlight](#)”
- July 19, 2016 “[Infants and Wrong Site Surgery](#)”
- August 1, 2017 “[Progress on Wrong Patient Orders](#)”

**Some of our prior columns related to radiation issues in children:**

- January 2017 “[Still Too Many CT Scans for Pediatric Appendicitis](#)”
- November 2017 “[SCANSMART Program to Use CT Safely in Children](#)”
- March 2010 “[CATCH: New Clinical Decision Rule for CT in Pediatric Head Trauma](#)”
- November 23, 2010 “[Focus on Cumulative Radiation Exposure](#)”
- January 2017 “[Still Too Many CT Scans for Pediatric Appendicitis](#)”

**Miscellaneous columns on other pediatric patient safety topics:**

- August 2014 “[Delirium in Pediatrics](#)”
- August 2012 “[Newest MRI Hazard: Ingested Magnets](#)”
- January 17, 2017 “[Pediatric MRI Safety](#)”
- August 8, 2017 “[Sedation for Pediatric MRI Rising](#)”
- August 2014 “[The Weekend Effect in Pediatric Surgery](#)”
- May 2018 “[Pediatric Early Warning System Fails](#)”
- August 2018 “[Pediatric Adverse Events](#)”
- August 2011 “[CPOE Alerts Reduce Blood Transfusions in Children](#)”
- January 2019 “[Pediatric Health and Safety Guide](#)”
- September 17, 2013 “[First MEWS, Now PEWS](#)”
- May 2018 “[Pediatric Early Warning System Fails](#)”
- July 28, 2015 “[Not All Falls Are the Same](#)”

**References:**

Mueller BU, Neuspiel DR, Stucky ER, Fisher S, Council on Quality Improvement and Patient Safety. American Academy of Pediatrics. Policy Statement. Principles of Pediatric Patient Safety: Reducing Harm Due to Medical Care. Pediatrics 2019; 143(2): e20183649 February 2019  
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[http://pediatrics.aappublications.org/content/early/2019/01/21/peds.2018-0496?sso=1&sso\\_redirect\\_count=1&nfstatus=401&nftoken=00000000-0000-0000-0000-000000000000&nfstatusdescription=ERROR%3a+No+local+token](http://pediatrics.aappublications.org/content/early/2019/01/21/peds.2018-0496?sso=1&sso_redirect_count=1&nfstatus=401&nftoken=00000000-0000-0000-0000-000000000000&nfstatusdescription=ERROR%3a+No+local+token)

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