Children's Mercy KANSAS CITY | Evidence Based Practice

Date Finalized: June 2024

Intussusception
Clinical Pathway Synopsis

Intussusception Algorithm

Inclusion criteria:
- Patient < 18 years

Exclusion criteria:
- Hemodynamically unstable
- Concern for sepsis (refer to the Sepsis Clinical Pathway)

Child presents with concerns for intussusception

- Make patient NPO
- Perform abdominal US

If abdominal US already performed at outside facility, repeat US is at the discretion of the radiologist

Was US positive for intussusception?
- No →
  - Complete further assessment for other cause/disease
  - Consider repeat US if signs and symptoms recur without alternative diagnosis
  - **Off Pathway**
- Yes → Is intussusception ileocolic or small bowel?
  - Small bowel →
    - Small bowel to small bowel intussusception is typically transient
    - Continue standard ED evaluation
    - **Off Pathway**
  - Ileocolic →
    - Consult Surgery for awareness
    - Ensure IV and monitors are in place

Is patient high risk?
- Yes →
  - Surgery for plan and disposition
  - **Off Pathway**
- No → Consult Radiology to attempt fluoroscopic (FL)/air enema reduction

Was reduction successful?
- No → Were there complications or failed to reduce after 3 attempts?
  - Yes → **Management by Surgery**
  - No →
    - Reattempt Reduction (Surgery & Radiology to discuss)
    - Wait 1 - 4 hours between reduction attempts
    - (return to Was reduction successful?)
- Yes → NPO x 3 hours then PO trial liquids (clears, breast milk, or formula) for 1 additional hour

Symptom recurrence?
- No → **Discharge to home** Instruct patient/family to return to ED if symptoms recur
- Yes → Intussusception on repeat US?
  - No → **Disposition**
    - Consider admission based on clinical status
    - Consider other etiologies of symptoms
  - Yes → Repeat air enema reduction → Reduction successful?
    - Yes → **Disposition**
    - No → **Management by Surgery**

QR code for mobile view

Signs & Symptoms of Intussusception
- Intermittent distress
- Vomiting
- Unexplained lethargy
- Fussiness
- Drawing legs up toward abdomen
- Bloody stools
- Palpable sausage like mass in right lower quadrant

High Risk Patients
- < 10 months of age
- Lethargy
- Signs of shock
- Peritonitis
- Small bowel obstruction
- Signs and symptoms have been present > 48 hrs
- US findings: ascites, intraloop fluid,
- Free air on US or X-ray
- Intra-abdominal surgery < 8 weeks

Complications
- Perforation
- Tension pneumoperitoneum
- Hemodynamic instability

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Objective of Clinical Pathway

To provide care standards for the patient diagnosed with intussusception.

Background

Intussusception is the invagination of one part of the bowel into another that may result in bowel obstruction, venous congestion, and bowel wall edema. It is a common acute abdominal emergency in infants and children between 3 months to 3 years. (Li et al., 2023). The reported incidence is between 0.33- 0.71/1000 person-years (Kelley-Quon et al., 2021). While symptoms can vary, early recognition and prompt reduction are important to prevent potential complications and morbidity. Abdominal ultrasound can be diagnostic, and sonographic signs such as the "doughnut" and "pseudo kidney" are commonly reported (Tiwari et al., 2020).

Management of intussusception can be non-operative or operative depending on hemodynamic stability. Hydrostatic reduction using saline or contrast is considered for non-operative reduction with an overall success rate from 46% to 94% (Bekdash et al., 2013). Recurrence is an important complication accounting for 10% of cases requiring repeat reductions (Kwon et al., 2017), and these repeat reductions can be attempted anywhere between 30 minutes and 4 hours (Kelley-Quon et al., 2021).

The Intussusception Clinical Pathway aims to provide an evidence-based guide on initial workup, management, and timeframe for disposition to optimize successful reductions and overall health.

Target Users

- Physicians (Emergency Department, Interventional Radiology, Surgery, Fellows, Resident Physicians)

Target Population

Inclusion Criteria

- Patients < 18 years old with concerns for intussusception

Exclusion Criteria

- Patients that are hemodynamically unstable
- Patients who have concerns for sepsis (refer to the Sepsis Clinical Pathway)

Practice Recommendations

Please refer to the systematic review on the management of intussusception in children (Kelley-Quon et al., 2021), which provided recommendations for practice, evaluation, and treatment.

Additional Questions Posed by the Clinical Pathway Committee

No additional clinical questions were posed for this review.

Measures

- Utilization of the Intussusception Clinical Pathway
- Utilization of the intussusception-associated power plans
- Rate of intussusception recurrence

Value Implications

The following improvements may increase value by reducing healthcare and non-monetary costs (e.g., missed school/work, loss of wages, stress) for patients and families and reducing costs and resource utilization for healthcare facilities.

- Decreased risk of overtreatment (i.e., treatment with surgical intervention when a non-surgical approach would be more appropriate)
- Decreased frequency of admission
- Decreased unwarranted variation in care

Organizational Barriers and Facilitators

Potential Barriers

- Variability of acceptable level of risk among providers

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Potential Facilitators

- Collaborative engagement across care continuum settings during clinical pathway development
- High rate of use of the clinical pathway
- Standardized order sets for Emergency Department, Radiology, and Surgery

Diversity/Equity/Inclusion

Our aim is to provide equitable care. These issues were discussed with the Committee, reviewed in the literature, and discussed prior to making any practice recommendations.

Power Plans

- EDP Intussusception Pathway

Associated Policies

- There are no policies associated with this pathway

Education Materials

- Intussusception available on the KidsHealth.org website
    - Available in English and Spanish
- After Intussusception: How to Care for Your Child
    - Found in Cerner depart instructions under intussusception from KidsHealth.org (non-customizable)
    - Provides instructions for the care of a child following procedure for intussusception

Clinical Pathway Preparation

This pathway was prepared by the Evidence Based Practice (EBP) Department in collaboration with the Intussusception Clinical Pathway Committee, composed of content experts at Children's Mercy Kansas City. If a conflict of interest is identified, the conflict will be disclosed next to the committee member's name.

Intussusception Clinical Pathway Committee Members and Representation

- Sonali Ramesh, MBBS, MD, FAAP | Emergency Department | Committee Co-Chair
- Leslie Hueschen, MD, FAAP, FACEP | Emergency Department | Committee Co-Chair
- Theodore Barnett, MD | Emergency Department | Committee Member
- Erin Opfer, DO | Radiology | Committee Member
- Monica Wagner, MD | Surgery | Committee Member

EBP Committee Members

- Todd Glenski, MD, MSHA, FASA | Anesthesiology, Evidence Based Practice
- Andrea Melanson, OTD, OTR/L | Evidence Based Practice

Clinical Pathway Development Funding

The development of this clinical pathway was underwritten by the following departments/divisions: Emergency Medicine, Radiology, Surgery, and Evidence Based Practice

Conflict of Interest

The contributors to the Intussusception Clinical Pathway have no conflicts of interest to disclose related to the subject matter or materials discussed.

Approval Process

- This pathway was reviewed and approved by the Intussusception Clinical Pathway Committee, Content Expert Departments/Divisions, and the EBP Department, after which they were approved by the Medical Executive Committee.
- Pathways are reviewed and updated as necessary every 3 years within the EBP Department at CMKC. Content expert teams are involved with every review and update.

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Review Requested

Department/Unit	Date Obtained
Emergency Medicine	June 2024
Radiology	June 2024
Surgery	June 2024
Evidence Based Practice	June 2024

Version History

Date	Comments
June 2024	Version one – (developed new algorithm, synopsis, and power plan for this pathway)

Date for Next Review

- June 2027

Implementation & Follow-Up

- Once approved, the pathway was presented to appropriate care teams and implemented. Care measurements will be assessed and shared with appropriate care teams to determine if changes need to occur.
- Power plans consistent with recommendations were created or updated for each care setting.
- Education was provided to all stakeholders:
  - Providers from Emergency Medicine, Radiology, and General Surgery
  - Resident physicians
- Additional institution-wide announcements were made via email, the hospital website, and relevant huddles.
- Metrics will be assessed and shared with appropriate care teams to determine if changes need to occur.

Disclaimer

When evidence is lacking or inconclusive, options in care are provided in the supporting documents and the power plan(s) that accompany the clinical pathway.

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References

Bekdash, B., Marven, S. S., & Sprigg, A. (2013). Reduction of intussusception: defining a better index of successful non-operative treatment. *Pediatric radiology*, *43*(6), 649–656. https://doi.org/10.1007/s00247-012-2552-6

Kelley-Quon, L. I., Arthur, L. G., Williams, R. F., Goldin, A. B., St Peter, S. D., Beres, A. L., Hu, Y. Y., Renaud, E. J., Ricca, R., Slidell, M. B., Taylor, A., Smith, C. A., Miniati, D., Sola, J. E., Valusek, P., Berman, L., Raval, M. V., Gosain, A., Dellinger, M. B., . . . Kawaguchi, A. (2021). Management of intussusception in children: A systematic review. *J Pediatr Surg*, *56*(3), 587-596. https://doi.org/10.1016/j.jpedsurg.2020.09.055

Kwon, H., Lee, J.H., Jeong, J.H., Yang, H.R., Kwak, Y.H., Kim, D.K., and Kim, K. (2017). A practice guideline for postreduction management of intussusception of children in the emergency department. Pediatric Emergency Care, 00(00), 1-6. https://doi.org/ 10.1097/PEC.0000000000001056.

Li, Y., Zhou, Q., Liu, C., Sun, C., Sun, H., Li, Z., and Zhang, L. (2023). Epidemiology, clinical characteristics, and treatment of children with acute intussusception: a case series. *BMC Pediatrics, 23*(143), 1–6. https://doi.org/10.1186/s12887-023-03961-y

Tiwari, C., Shah, H., Sandlas, G., & Bothra, J. (2020). Paediatric Intussusception: A Clinical Scoring System to Predict the Risk of Operative Intervention. *Journal of mother and child*, *24*(1), 19–23. https://doi.org/10.34763/jmotherandchild.2020241.1934.000002

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