Evaluation of a Nurse-Initiated Acute Gastroenteritis Pathway in the Pediatric Emergency Department

Authors: Rebecca A. Carson, DNP, CRNP, Shawna S. Mudd, DNP, CRNP, and P. Jamil Madati, MD, Washington, DC, and Baltimore, MD

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Contribution to Emergency Nursing Practice

- Educational interventions provided at regular intervals and with various methods increased the use of nurse-initiated treatment when implementing a new gastroenteritis pathway.
- This project demonstrated that nurse-initiated treatment was more efficient and patients had less resource utilization than when the same treatment was initiated by providers (physician or advanced practice provider).
- Nurses effectively initiated a gastroenteritis pathway on acutely ill patients with vomiting, which despite increasing length of stay, promoted family-centered care by providing early initiation of treatment.

Abstract

Problem: Acute gastroenteritis (AGE) is a common illness treated in the emergency department. Delays in initiating rehydration for children with mild or moderate dehydration from AGE can lead to prolonged ED visits and increased resource utilization that do not provide prognostic value or support family-centered care. The purpose of this quality improvement project was to promote early oral rehydration therapy (ORT) for persons with AGE in an attempt to reduce unnecessary resource utilization and length of stay (LOS).

Methods: This prospective quality improvement project used a nurse-initiated waiting room ORT pathway for patients 6 months to 21 years of age who presented to the emergency department with diarrhea with or without vomiting. Outcomes related to nurse-initiated ORT, intravenous fluid use, laboratory studies or diagnostic imaging, and LOS were measured before and after implementation.

Results: Of 643 patients for whom the pathway was initiated, 392 received nurse-initiated care. The proportion of intravenous fluid use was 10.2% lower (odds ratio [OR], 0.43; 95% confidence interval [CI], 0.27-0.68) and laboratory test ordering was 7.4% lower (OR, 0.64; 95% CI, 0.43-0.94) in patients receiving nurse-initiated care. Time to discharge after provider examination was 46 minutes faster in the nurse-initiated care group ($P < .001$), resulting in an overall LOS reduction by 40 minutes ($P < .001$).

Implications for Practice: Nurse autonomy in using an AGE pathway facilitates evidence-based practice, improves ED efficiency, and decreases resource utilization and LOS. Future research should focus on family satisfaction and ED revisits within 72 hours of discharge.

Key words: Acute gastroenteritis; Nurse-initiated pathway
Oral rehydration

Acute gastroenteritis (AGE) is a common childhood illness, accounting for 1.7 million outpatient visits annually in the United States.[1] Treatment principles from clinical guidelines suggest use of oral rehydration therapy (ORT) as the primary treatment while avoiding laboratory tests, diagnostic imaging, and medications that detract from ORT and have no prognostic value in treating this self-limited illness.[2] An estimated 31% of American hospitals do not adhere to these recommendations; instead, practitioners order diagnostic tests or intravenous

Rebecca A. Carson is Pediatric Nurse Practitioner, Children's National Medical Center, Washington, DC, and?, Johns Hopkins University School of Nursing, Baltimore, MD.

Shawna S. Mudd is Assistant Professor, Acute and Chronic Care, Johns Hopkins University School of Nursing, Baltimore, MD.

P. Jamil Madati is Assistant Professor, Pediatrics and Emergency Medicine, Children's National Medical Center, Washington, DC.

For correspondence, write: Rebecca A. Carson, DNP, CRNP, 111 Michigan Ave, NW, Washington, DC 20009; E-mail: beckyanncarson@gmail.com.

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fluids (IVF), which increases the burden on emergency medical resources through ED overcrowding, delays in treatment, prolonged lengths of stay (LOS), decreased patient satisfaction, and higher rates of ED revisits.[3,4]

Barriers to implementation of evidence-based practice for the treatment of AGE are complicated and multifaceted, but interventions that facilitate early recognition and initiation of ORT may eliminate some barriers and reduce overtreatment.[5] Recent literature on the safety and efficacy of ondansetron supports its use as an adjunct to ORT in the acute care setting to help patients with persistent vomiting.[6] ORT can be combined with ondansetron and a family education care plan to facilitate early initiation of treatment using clinical pathways that encourage nurses to follow algorithmic treatment plans prior to provider (physician or advanced practice provider) examination.[7] This approach standardizes treatment by providing objective assessment, treatment steps, and quantifiable criteria for progression along the pathway.[7,8] The Centers for Medicare and Medicaid Services supports pathways as effective methods to promote high-quality, evidence-based patient care that is safe and efficient.[4] Authors of previous quality improvement (QI) projects found that an implementation plan is essential to the sustainability of a pathway over time, and thus this project utilized Pathman's Pipeline as a translation framework, using its cognitive, stepwise approach to behavior change.[9,10]

The purpose of this QI project was to promote early initiation of treatment of children who present to the emergency department with AGE using an evidence-based approach. The aims of the project were to (1) increase the use of nurse-initiated ORT in the waiting room to treat dehydration, (2) decrease the incidence of IVF use and laboratory testing or imaging once a patient is seen by a provider, and (3) improve ED throughput by decreasing the duration of time before a patient is discharged after he/she is examined by a provider. This article used the SQUIRE 2.0 guidelines on reporting quality, value, and safety in health care.[11]

Methods

STUDY DESIGN

This QI project had a prospective design with one historical comparison group and a natural comparison group. It took place at the 2 campuses of a children's hospital at (1) a freestanding, urban, academic level I trauma center pediatric emergency department and (2) its community satellite campus. The AGE advanced nursing directive from DeForest and Thompson was adapted with permission into a pathway that fit the safety standards of the department using stakeholder buy-in and multidisciplinary collaboration.[7] An educational project was developed to disseminate the practice changes to nursing and provider staff.

INTERVENTION

A multidisciplinary team composed of nurses, nurse educators, advanced practice providers, and physicians adapted the AGE pathway. The primary modification was the requirement that patients have diarrhea as a presenting symptom to minimize the risk of missing alternate and potentially severe diagnoses that present as vomiting alone, but are not AGE. The pathway consisted of risk criteria for initiation of the pathway (Figure 1), an algorithm of care progression based on a clinical dehydration scale (Figure 1), an optional ondansetron algorithm for patients with active vomiting, a parent education worksheet to document ORT progress, and recommendations for admission or discharge based on the patient's clinical status and progress.

Patients 6 months to 21 years of age who presented to the emergency department with symptoms of AGE and low-risk profiles (age greater than 6 months, diarrhea, with or without vomiting, and no signs of an acute abdominal process) were eligible for the AGE pathway. Patients with a high-risk profile were triaged as usual based on triage guidelines. Although the AGE pathway was designed to be initiated by a nurse in triage, any provider or nurse could initiate the pathway at any time during the visit if the patient met eligibility criteria. Staff reviewed a narrated slideshow and pamphlets specific to their role 2 weeks prior to implementation of the pathway. Additional education interventions took place over the course of the intervention in the form of monthly tip e-mail messages, a one-on-one 5-minute teaching tool, and restroom visual aids (Figure 2).

An order form was created in the electronic medical record (EMR) for the initial dehydration assessment, activation of initial nursing orders once eligibility criteria were met, and continuation orders for providers. The AGE pathway was available in 4 versions based on a patient's weight and need for ondansetron: diarrhea without vomiting, diarrhea with vomiting (8-15 kg), diarrhea with vomiting (15-30 kg), and diarrhea with vomiting (>30 kg). Once eligibility was verified, nurses could initiate nursing orders through the EMR while providers could initiate nursing orders and continuation orders of fluids, laboratory studies, and imaging within the order form if needed.

PROCEDURES

Data collection took place July 27, 2015, through December 27, 2015. The study population was a convenience sample of eligible patients who met low-risk criteria and for whom an