Quality improvement interventions to increase algorithm adherence for the evaluation and management of infants 0-60 days of age with fever of unknown source

Jennifer Honerlaw, MSN, APRN, CPNP-PC; Eileen Murtagh-Kurowski, MD; Lily Yu, MD; Rachael Bensman, MD; Victoria Wurster-O’Valle, MD; Selena Hariharan, MD

Introduction

Evaluation of infants 0-60 days of age with fever can be challenging. Providers with strong clinical acumen may still fall short of accurate diagnosis due to the vague clinical appearance infants are notorious for displaying. While viral infections remain the most common cause of fever in infants 0 to 60 days of age, a systematic approach to evaluation is paramount in identifying infants at high risk for serious and invasive bacterial infections (SBI) (Unaka et al., 2019).

The evaluation and management of febrile infants 0 to 60 days of age significantly varies across hospitals in the United States. While practice variation has not resulted in notable differences in outcomes (e.g. emergency department revisits and hospital readmission rates), evidence supports the positive impact of standardization of practice on infants appropriately identified as having an SBI, decreased hospitalization rates for infants identified as low risk for SBI, and more judicious use of antimicrobial therapy (Unaka et al., 2019).

Aim Statement

The aim of this quality improvement project is to increase algorithm adherence care from approximately 67% to 80% for the evaluation and management of infants 29-60 days of age with fever of unknown source and increase order set use from approximately 37% to 80% for all infants 0-60 days of age with fever of unknown source.

Methods

Our pediatric emergency team created an algorithm to align with our institution’s updated guidelines. Using improvement theory, we constructed a key driver diagram. Background run charts were completed to collect baseline data. Interventions aimed at key drivers were implemented. These interventions include provider education, the availability of the algorithm at point of care, integration of electronic order sets, standardized processes for specimen collection, standard severity assessment, and standardized discharge instructions. Our primary outcome will be the proportion of patient encounters for which care adhered to algorithm recommendations. Pertinent data will be extracted from patient visits for infants 0-60 days of age with presentation to the emergency department with documented or historical rectal temperature greater than 38 degrees Celsius.

Results

Post run reports have suggested improved algorithm adherent care and order set use since publication and dissemination of the guideline. Data is still being collected. Areas for improvement are being identified.

Conclusion

An evidence-based care clinical care algorithm for infants 0-60 days old allowed for our institution to standardize care through interventions aimed at key drivers to improve algorithm adherence. Our preliminary findings support the use of standardized processes for the management of febrile neonates and may be helpful to other institutions looking to establish similar structures.

Acknowledgements/References

Acknowledgements

Stephanie Wilson

References

Unaka, N; Statile, A; Bensman, R; Courter, J; Desai, S; Haslam, D; Honerlaw, J; Jerardi, K; Murtagh Kurowski, E; Rudloff, J; Schaffeld, J; Shah, S; Sosa, T; Steele, P; Wurster Ovalle, V; Vonderhaar, K,. (2019). Cincinnati Children's Hospital Medical Center: Evidence-based clinical care guideline for Evidence-Based Care Guideline for Management of Infants 0 to 60 days seen in Emergency Department for Fever of Unknown Source. http://www.cincinnatichildrens.org/service/j/anderson-center/evidence-based-care/recommendations/default/, Guideline 10, pages 1- 42, May 2019

QR Code
Abstract Title: Quality improvement interventions to increase algorithm adherence for the evaluation and management of infants 0-60 days of age with fever of unknown source.

Introduction: Evaluation of fever in infants 0-60 days of age can be challenging. There is a high prevalence of serious bacterial infections (SBI) in these infants, with estimates up to 20% making accurate diagnoses of great importance. Due to challenges identifying SBIs based on clinical appearance, implementation of standards for care of these patients can help providers adhere to evidence-based recommendations.

Objective: Increase the proportion of visits by infants 0-60 days of age with documented rectal temperature of greater than 38 C presenting to the emergency department for which algorithm adherent care is provided from October 1, 2019 to June 30, 2020.

Methods: Our pediatric emergency team created an algorithm to adhere to the above mentioned recommendations. Our pediatric emergency team constructed a key driver diagram to outline our theory for improvement. Background run charts were completed to collect baseline data. Interventions aimed at key drivers were implemented. These interventions include provider education, the availability of the algorithm at point of care, integration of electronic order sets, standardized processes for specimen collection, standard severity assessment, and standardized discharge instructions. Our primary outcome will be the proportion of patient encounters for which care adhered to algorithm recommendations. Pertinent data will be extracted from patient visits by infants 0-60 days of age with presentation to the emergency department with documented fever greater than 38 C.

Results: Our background run charts have shown an average algorithm adherence of 50.4% for infants 0-28 days of age and 55.7% for infants 29-60 days of age from January 2018 through May of 2019 prior to the Cincinnati Children’s Hospital Medical Center (CCHMC) Guideline for infants 0-60 days with fever of unknown source was published. The electronic order set was used on average 36.7% of the time prior to the CCHMC guideline. From June 2019 to August 2019, an improvement in algorithm adherence and order set use has been shown with averages of 62.7%, 80.3%, and 45.7% respectively. This work is currently in process and post-implementation data collection is not complete. However, preliminary data is promising.

Conclusion: In conclusion, an evidence-based care clinical care algorithm for infants 0-60 days old allowed for this institution to standardize care through interventions aimed at key drivers to improve algorithm adherence. Our preliminary findings support the use of standardized processes for the management of febrile neonates and may be helpful to other institutions looking to establish similar structures.
Authors
Jennifer Honerlaw, MSN, APRN, CPNP-PC
  - Pediatric Nurse Practitioner
Eileen Murtagh-Kurowski, MD
  - Associate Professor
  - Emergency Medicine Division Director of Quality Improvement
Lily Yu, MD
  - Emergency Medicine Staff Physician
Rachael Bensman, MD
  - Emergency Medicine Clinical Fellow
Victoria Wurster-O’Valle, MD
  - Emergency Medicine Staff Physician
Selena Hariharan, MD
  - Associate Professor
  - QI Project Team Lead

Department of Emergency Medicine
Cincinnati Children’s Hospital Medical Center
Cincinnati, OH