Use of N-acetylcysteine (Mucomyst) in Surgical Neonates

v.1-29-21

Purpose:

The purpose of this protocol is to standardize the indication, dosage and concentration of N-acetylcysteine used in neonates with suspected meconium ileus. This protocol will facilitate routine dilution of the medication regardless of route or timing (intraoperative or postoperative) decreasing the risk of medication errors and unifying the application of this medication in the neonatal intensive care unit. It will also streamline EPIC documentation and compliance.

I. Intraoperative use of N-acetylcysteine

Background:

Neonates in the intensive care unit with a suspected distal bowel obstruction will first undergo a gastrografin contrast enema. This may be repeated at 24 hours at the surgeon's discretion. If the contrast enema(s) does not lead to resolution of the obstruction, surgical plans will be initiated. If the infant is full term, >2 kg, and stable will obtain a suction rectal biopsy prior to operative intervention. If the infant is unstable or premature, will proceed to the operating room without a biopsy first. **If** the infant is found to have meconium ileus in the operating room, N-acetylcysteine will be ordered to the operating room as specified below.

Intervention:

Pharmacy to send 100 ml of 5% N-acetylcysteine to the operating room to use for enteral irrigation via the appendix, enterotomy or rectum. The total volume utilized will be at the surgeon's discretion.

II. Postoperative use of N-acetylcysteine via rectum or enterostomy

Background:

Patients diagnosed intraoperatively with meconium ileus have demonstrated improvement with postoperative use of N-acetylcysteine given via rectal irrigations or enterostomy. This will be performed by a surgeon or member of the surgical team. These irrigations will be discontinued when the patient is spontaneously stooling in between the irrigations.

Intervention:

10 ml/kg of 5% N-acetylcysteine to be given via a red rubber catheter (8 or 10 Fr at surgeon's discretion) per rectum or enterostomy daily

III. Postoperative use of N-acetylcysteine via gastric or postpyloric feeding tubes

Background:

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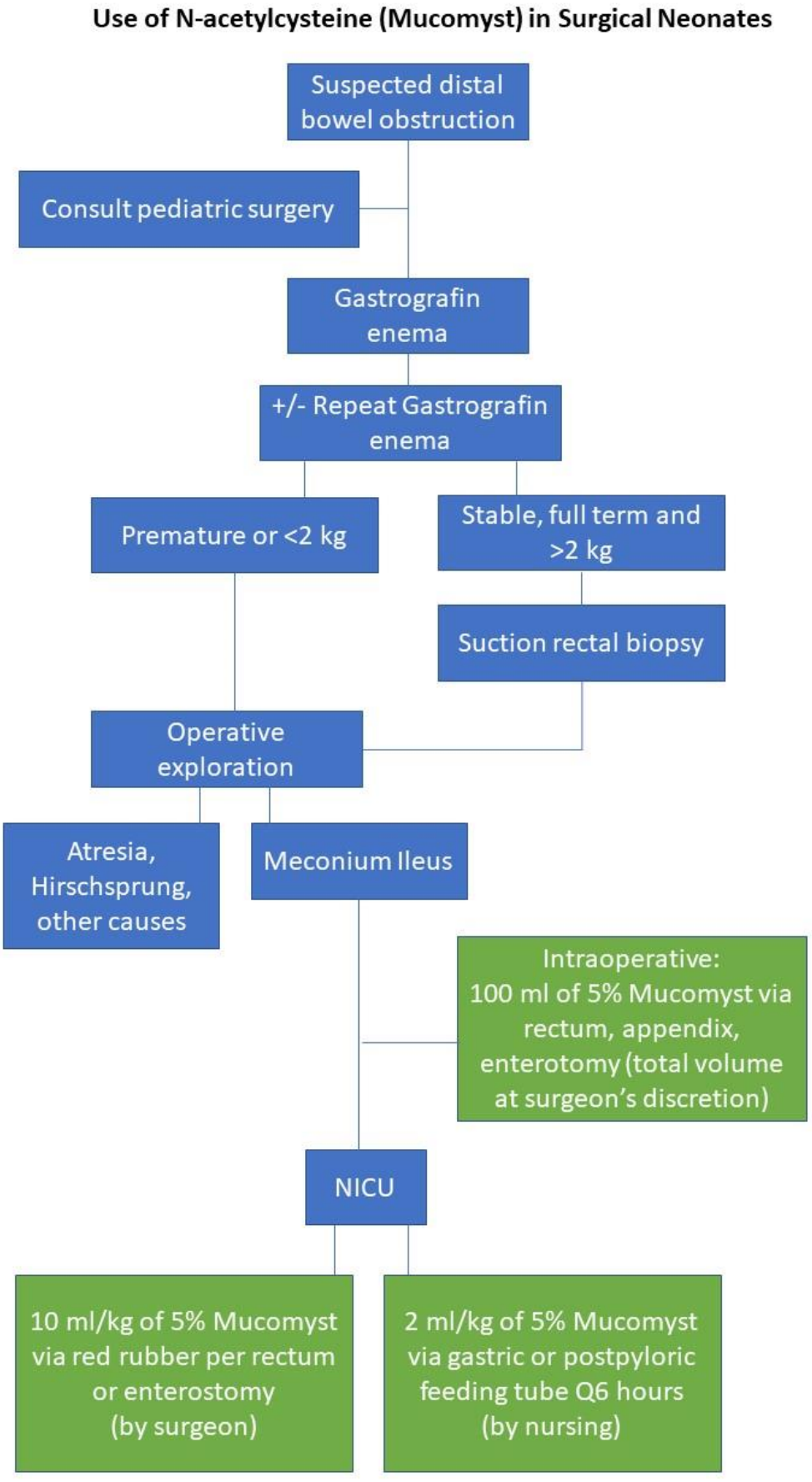
Patients diagnosed intraoperatively with meconium ileus have demonstrated improvement with postoperative use of N-acetylcysteine given via gastric and postpyloric feeding tubes. The bedside RN in the neonatal intensive care unit will deliver this medication via syringe or feeding pump. This therapy will be discontinued when the patient has reached 100 ml/kg/d of enteral feeds, stools spontaneously and no longer has significant distension. If the infant stops stooling or develops worsening distension after cessation of N-acetylcysteine, the medication will be reinitiated and continued until the patient is on goal feeds. It will then be weaned off slowly at the discretion of the neonatologist and surgeon.

Intervention:

2 ml/kg of 5% N-acetylcysteine given via gastric or postpyloric feeding tube every 6 hours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Suspected distal bowel obstruction
Consult pediatric surgery
Gastrografin enema
+/- Repeat Gastrografin enema
Premature or <2 kg
Stable, full term and >2 kg
Suction rectal biopsy
Operative exploration
Atresia, Hirschsprung, other causes
Meconium Ileus
Intraoperative: 100 ml of 5% Mucomyst via rectum, appendix, enterotomy (total volume at surgeon's discretion)
NICU
10 ml/kg of 5% Mucomyst via red rubber per rectum or enterostomy (by surgeon)
2 ml/kg of 5% Mucomyst via gastric or postpyloric feeding tube Q6 hours (by nursing)

References

The following list of supporting references is attached to the foregoing protocol for the convenience of staff. This list is not part of the foregoing protocol and may not include all resources that were used to research the subject of the protocol or prepare the content of the protocol.

Level all clinical references that use Johns Hopkins standards.	Strength	Quality
Carlyle BE, Borowitz DS, Glick PL.A review of pathophysiology and management of fetuses and neonates with meconium ileus for the pediatric surgeon. J Pediatr Surg. 2012 Apr; 47(4):772-81.	III	B
Escobar MA, Caty MG. Meconium Disease. In: Holcomb III GW, Murphy JP, St. Peter SD, editors. Holcomb and Ashcraft's Pediatric Surgery. Seventh edition. New York: Elsevier; 2020. p 517-35.	IV	B
Garcia AM, Dorsey J. Nonpulmonary Manifestations of Cystic Fibrosis. In: Wilmott RW, Deterding R, Li A, Ratjen F, Sly P, Zar HJ, Bush A, editors. Kendig's Disorders of the Respiratory Tract in Children. Ninth edition. Elsevier; 2019. p 788-99.	IV	B
Meconium Ileus [Internet]. In: Waldhausen J, Powell D, Hirschl R, editors. *Pediatric Surgery NaT*. American Pediatric Surgical Association; 2020. [cited 2020 December 04]. Available from: https://www.pedsurglibrary.com/apsa/view/Pediatric-Surgery-NaT/829040/all/Meconium_Ileus.	IV	B
Ziegler MM. Meconium Ileus. In: Coran AG, Editor in Chief. Pediatric Surgery. Seventh edition. Elsevier; 2012. p 1073-1083.	IV	B

Evidence-based references are required on all clinical policies (e.g., Patient Care, Pharmacy, Clinical Nutrition, and Infection Prevention).

List all references used to determine content, accuracy, and decisions on final content (e.g., websites, journals, books, etc.). The Medical/Science Library will assist in the gathering of current references.

Level the strength and quality of each reference according to Johns Hopkins standards. The Center for Nursing Excellence will provide the tools and training to achieve this purpose.