

Adjunctive Medications for Use in Pediatric Home Cleanout among Children with Chronic Constipation

Jianne De Raya, PharmD Candidate ¹; Amy Kruger Howard, PharmD ¹; Samra Blanchard, MD²; Jill A. Morgan, PharmD, BCPS, BCPPS ¹

1. University of Maryland School of Pharmacy, Baltimore, MD, USA 2. University of Maryland Medical Center, Baltimore, MD, USA



BACKGROUND

- Functional constipation is a common problem in approximately one in ten children ¹
- Approximately 50% of children with functional constipation will require fecal disimpaction prior to initiation of maintenance treatment ²
- North American Society for Pediatric Gastroenterology, Hepatology, and Nutrition (NASPGHAN) 2014 guidelines for the management of functional constipation recommends the use of polyethylene glycol (PEG) over enemas for fecal disimpaction ³
- Both medications are considered equally efficacious, however PEG is preferred over enemas because of its route of administration ³
- Despite being preferred monotherapy, it is common to see PEG prescribed with additional agents (i.e. senna, mineral oil, magnesium hydroxide, or enema) for disimpaction ³

OBJECTIVES

- Primary**
- Describe the adjunctive therapies used in combination with PEG for home cleanouts in an outpatient pediatric gastrointestinal (GI) clinic
- Secondary**
- Determine the percentage of patients who received doses in accordance with NASPGHAN guidelines or pediatric reference dosing recommendations

METHODS

Study Design

- Retrospective, convenience sample, multi-site review of pediatric patients who visited the University of Maryland Pediatric GI Clinic with a diagnosis of functional constipation and were prescribed a cleanout from September 2017 through October 2018

Statistical Analysis

- Descriptive statistics to assess patient demographics and medication use and reported means (SD) or medians (IQR) as appropriate
- Appropriateness of therapy was defined as dosing within the reference ranges (see Table 1)

Inclusion Criteria	Exclusion Criteria
• Age 13 months to 18 years	• Missing documented weight on retrospective chart review
• Diagnosis of functional constipation AND	• Diagnosis of Hirschsprung's, diabetes, cystic fibrosis, hypothyroidism, lead poisoning OR
• Prescribed at-home disimpaction (cleanout) with PEG	• Concomitant use of bismuth or opiates

Table 1. Recommended Daily Doses for Treatment of Functional Constipation According to NASPGHAN and Lexicomp

Medication	NASPGHAN	Lexicomp
Bisacodyl		
3 to 9 years	5 mg	5 mg
10 to 11 years	5 – 10 mg	5 – 10 mg
≥12 years	5 – 10 mg	5 – 15 mg
Magnesium Citrate		
2 to 5 years	N/A	60 – 90 mL
6 to 11 years	N/A	100 – 150 mL
≥12 years	N/A	150 – 300 mL
Magnesium Hydroxide		
2 to 5 years	400 – 1,200 mg	400 – 1,200 mg
6 to 11 years	1,200 – 2,400 mg	1,200 – 2,400 mg
≥12 years	2,400 – 4,800 mg	2,400 – 4,800 mg
Senna		
2 to 5 years	2.5 – 5 mg	4.3 – 17.2 mg
6 to 11 years	7.5 – 10 mg	8.6 – 34.4 mg
≥12 years	15 – 20 mg	17.2 – 68.8 mg
Enema		
2 to 4 years	2.5 mL/kg *	33 mL
5 to 11 years	2.5 mL/kg *	66 mL
≥12 years	2.5 mL/kg *	133 mL

*max 133 mL

RESULTS

- A total of 54 participants included in the final study analysis, the majority were female and white (see Table 2)

Table 2. Demographic Summary

Participant Demographics	Total (n=54)
Median Age (years, IQR)	9 (6.3, 12)
Female (n, %)	28 (51.9)
Median Weight (kg, IQR)	30.1 (23, 39.9)
Race/ethnicity (n, %)	
White	22 (40.7)
Black	14 (25.9)
Other/Non-specific	16 (29.6)
Latino	2 (3.7)
Previous Dx of Chronic Constipation (n, %)	39 (72.2)
Median Age of Onset (years, IQR)	5 (2.6, 8.5)
On Medications Prior to Presentation (n, %)	27 (50)

- Dosing was appropriate in 53% of all adjunctive therapies (100% magnesium hydroxide, 71.88% senna, 52.63% magnesium citrate, 33.33% bisacodyl, 30.76% sodium phosphate enema)
- Doses exceeded either NASPGHAN or Lexicomp recommendations in 100% of inappropriately dosed adjunctive therapy

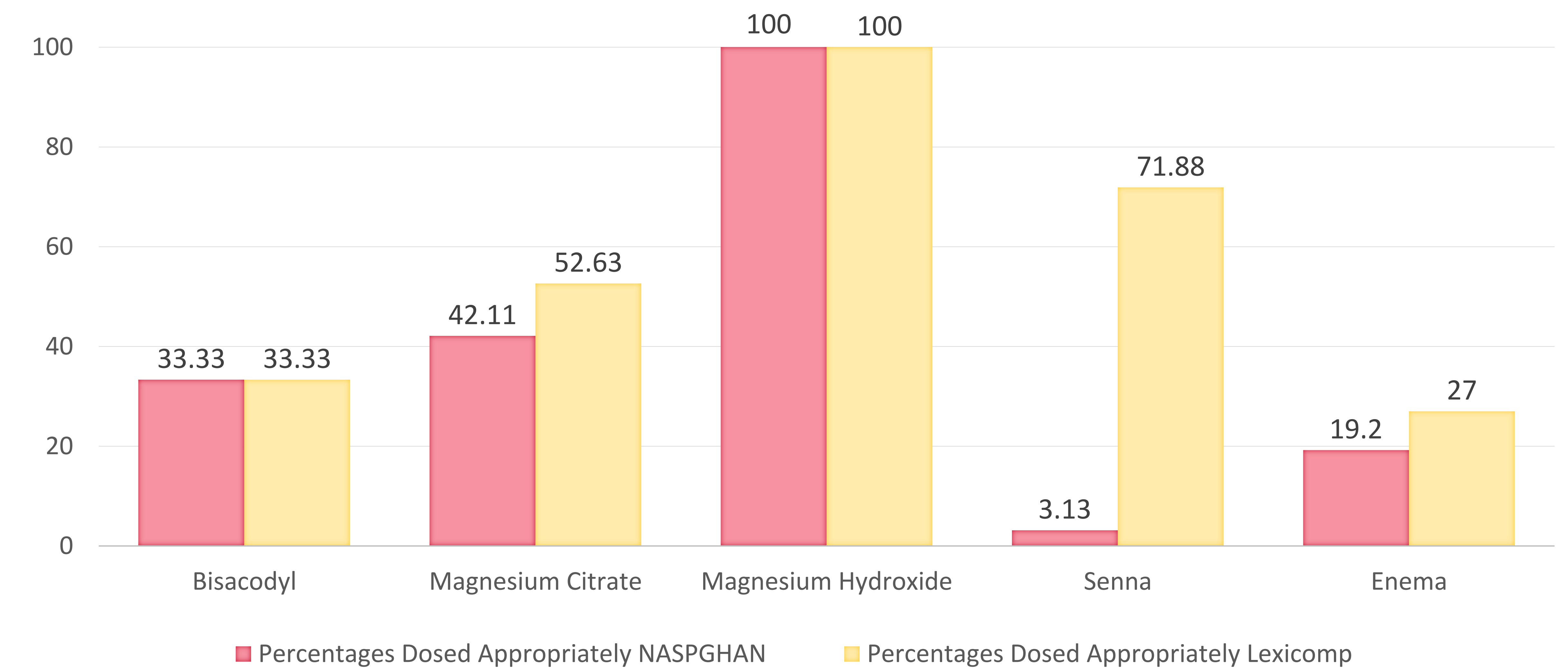
Table 3. Summary of Medications Prior to Presentation

Medications Prior to Presentation	n (%)
Single Med, n=19	
PEG 3350	18 (66.7)
Magnesium hydroxide	1 (3.7)
Dual Med, n=7	
PEG 3350 + Senna	2 (7.4)
PEG 3350 + Mineral Oil	2 (7.4)
PEG 3350 + Lactulose	1 (3.7)
PEG 3350 + Magnesium Hydroxide	1 (3.7)
Lactulose + Enema	1 (3.7)
Triple Med, n=1	
Bisacodyl + Magnesium Hydroxide + Senna	1 (3.7)

Table 4. Summary of Medication Regimen for Cleanouts

Medication Regimen	n (%)
Single Med, n=1	
PEG 3350	1 (1.9)
Dual Med, n=25	
PEG 3350 + Magnesium Citrate	13 (24.1)
PEG 3350 + Senna	10 (18.5)
PEG 3350 + Bisacodyl	1 (1.9)
PEG 3350 + Magnesium Hydroxide	1 (1.9)
Triple Med, n=28	
PEG 3350 + Senna + Enema	22 (40.7)
PEG 3350 + Magnesium Citrate + Enema	4 (7.4)
PEG 3350 + Magnesium Citrate + Bisacodyl	2 (3.7)

Figure 1. Percentages Dosed Appropriately Based on NASPGHAN and Lexicomp



REFERENCES & CONTACT INFORMATION

1. Koppen IJN, Vriesman MH, Saps M, Rajindrajith S, Shi X, van Etten-Jamaludin FS, DiLorenzo C, Benninga MA, Tabbers MM. Prevalence of Functional Defecation Disorders in Children: A Systematic Review and Meta-Analysis. *The Journal of Pediatrics*. 2018;198:121–130. doi:10.1016/j.jpeds.2018.02.029
2. Koppen IJN, Lammers LA, Benninga MA, Tabbers MM. Management of Functional Constipation in Children: Therapy in Practice. *Paediatr Drugs*. 2015;17(5):349–360. doi:10.1007/s40272-015-0142-4
3. Tabbers MM, DiLorenzo C, Berger MY, Faure C, Langendam MW, Nurko S, Staiano A, Vandenplas Y, Benninga MA. Evaluation and Treatment of Functional Constipation in Infants and Children: Evidence-Based Recommendations from ESPGHAN and NASPGHAN. *Journal of Pediatric Gastroenterology and Nutrition*. 2014;58:258–274. doi:10.1097/MPG.0000000000000266

Jianne De Raya, PharmD Candidate jcderaya@umaryland.edu

DISCUSSION

- Only one of the 54 patients were treated with a regimen aligning with NASPGHAN guidelines
- Future studies are necessary to determine if cleanout success is dependent on these additional medications or higher doses and which patients require adjunctive medications.