

Nutrition Guideline

Healthy Infants and Young Children

GI Function: Management of Constipation

For Professional Reference Only

Applicable to: Nurses, Physicians and Other Health Professionals

Recommendations

- Parents and caregivers should be educated about the wide variation in normal bowel movements in infants and children to avoid unnecessary anxiety and/or medical consultation.
- Evidence does not support any particular foods as being the cause of constipation. However, if high intakes of any foods create a lack of fibre or fluid intake, then constipation may result.
- Refer to the constipation decision trees on pages [7.1.7](#) (Infants 0-12 Months) and [7.1.8](#) (Children Age 1 Year and Older) for scientific evidence and the best practice for the assessment of constipation, dietary management at the onset of constipation and/or prevention of chronic constipation.
- For infants and children who do not respond to recommended management guidelines, who have chronic constipation or who present with “Red Flags” (see below), referral to a physician is recommended to rule out underlying medical problems and/or to provide other treatment.
- Non-dietary treatment (e.g. laxatives, mineral oil, lactulose) is beyond the scope of this guideline and should be discussed with a physician.

Health Benefits

This guideline provides assistance to health professionals in the assessment of constipation, and the dietary management at the onset of constipation and/or to help prevent chronic constipation in healthy term infants and children. Constipation can also be a prominent symptom in children who have underlying medical conditions such as prematurity.¹ Although this guideline was not specifically created for preterm infants, it is reasonable to apply the dietary advice in this guideline to healthy preterm infants experiencing constipation.

Healthy Stool Patterns in Infants and Children

- Parents and caregivers should be educated about the wide variation in normal bowel movements in infants and children to avoid unnecessary anxiety² and/or medical consultation.³
- It is normal for stool patterns to vary from infant to infant.³
- Stool consistency can vary according to what an infant is fed (breast milk, type of formula,^{3,4} type of solid food⁵), and stools tend to become harder as infants and children get older.^{5,6,7} In exclusively breastfed infants at one month of age, stool is typically mushy, although watery stools can occur.⁸ From birth to six months of age, runny and pasty stools occur with equal frequency, while liquid stools occur on occasion.⁸
- A picture stool diagram such as the Bristol Stool Form Scale can be helpful for standardizing stool descriptions.⁹ Refer to the *Bristol Stool Form Scale* in [Appendix 1](#).
Note: Even though runny stools (similar to types 5 – 7 in the *Bristol Stool Form Scale*) could be considered diarrhea in adults,¹⁰ this is normal for exclusively breastfed infants.⁸

Stool Frequency

1st Week after Birth

For information on stool patterns of newborn infants, refer to *Alberta Health Services (AHS), Public Health Nursing Practice, Maternal / Newborn Manual - Section 2: Newborn on Insite*.

Nutrition Guideline

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One to Four Weeks after Birth

Average bowel movements are two¹¹ to three^{3,12} per day for formula fed infants; an average of four per day for breastfed infants from one to two weeks of age.⁷ The number of bowel movements tends to decrease with age.

One to Two Months of Age

- The frequency of bowel movements tends to decrease with age in both breastfed and formula fed infants,^{3,5,7,13} for term and preterm infants, especially after one month of age.^{3,5,6}
- Breastfed infants display greater variability in stool frequency than formula fed infants.¹⁴
 - Exclusively breastfed infants typically have more frequent bowel movements than formula-fed infants^{2,3,4,6,12} in the first two¹² to eight³ weeks after birth.
 - In some healthy exclusively breastfed babies over six weeks of age with normal growth and development, bowel movements may be infrequent and soft,^{7,15,16} ranging from one every two days to two weeks,¹⁵ or even one every three or four weeks.^{7,13} These infrequent stools can be normal in infants who are effectively transferring milk and appropriately gaining weight; however, a physician should be consulted if there is no bowel movement for 2 weeks, and/or red flags are present as output coupled with weight issues or other “red flags” may be early indicators of poor feeding/illness missed by parents. (See ["Red Flags"](#), below for more information).

Two Months to Three Years of Age

Infants and children commonly whether term or preterm have approximately one^{6,12} to two^{3,5,7} bowel movements per day, but many infants have fewer than that.⁶

Three Years of Age and Older

Approximately one bowel movement per day is usual^{3,5} but it can be as few as three per week.¹

Note: For more information on Healthy Stools in infants from birth to two months of age, please refer to the AHS, *Public Health Nursing Practice, Maternal/Newborn Manual found on Insite*.

Definition of Constipation

The wide variation in normal stool patterns in infants and children makes it difficult to define constipation;¹⁷ and has resulted in a variety of definitions. Since the frequency of bowel movements varies from infant to infant,³ can vary significantly in exclusively breastfed healthy babies¹⁷ and is dependent on age,^{3,5,7,13} it has been suggested by some that constipation should not be defined by the frequency of bowel movements or by symptom duration.¹⁵ Most guidelines, however, include the frequency of bowel movements^{1,13,16,18} and the duration of symptoms^{1,13,18} in their definitions of constipation. This Nutrition Guideline considers a combination of these definitions.

For this guideline, constipation is considered to be bowel movements that are hard and dry, and may be difficult or painful to pass.¹⁵ Infrequency may also be a factor but is dependent on age and if an infant is exclusively breastfed.¹⁶ To help with establishing if constipation is present, refer to [Appendix 1](#).

Nutrition Guideline

Healthy Infants and Young Children

GI Function: Management of Constipation

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Applicable to: Nurses, Physicians and Other Health Professionals

Signs that Constipation Could Be Related To a Medical Condition (“Red Flags”)

If any of the following symptoms exist, refer to the child’s physician:

- fever;¹
- abdominal distension;¹
- anorexia;¹
- nausea;¹
- vomiting;¹
- weight loss;¹
- poor weight gain;¹
- blood in stool;¹
- diarrhea;¹(the frequent passage of loose or watery stools, usually accompanied by abdominal cramping and urgency¹⁶);
- failure to thrive;¹
- constipation in the first few weeks after birth.¹⁶

Signs and Symptoms of Chronic Constipation¹

A child exhibiting any of the following symptoms of chronic constipation should see a physician for treatment:

- extremely large bowel movements;
- fissures (small, painful tears in the skin around the anus);
- hemorrhoids;
- involuntary release of urine;
- increased urinary tract infections;
- overflow diarrhea (occurs when the stools become too hard to pass and fecal fluids flow around the blockage. The leakage consists of fluids only, is generally the color of feces, and is not accompanied by abdominal pain. Urgency in older children is often noted as difficulty in reaching the toilet before it is expelled).

Constipation in Infants 0 – 12 Months

Practical Considerations

In infants, any change in diet may result in stool inconsistency and/or a change in the frequency of bowel movements. This includes:

- changing from breast milk to formula or cow’s milk;¹⁹
- introducing new formulas;¹⁹
- introducing complementary foods.²⁰

Formula with iron does not cause constipation and is important to prevent anemia.²⁰ There is no difference in the number and consistency of stools between infants fed a low-iron or a high-iron formula.²⁰ Evidence does not support any particular foods as being the cause of constipation. However, if high intakes of any foods create a lack of fibre or fluid intake, then constipation may result.²¹

Nutrition Guideline

Healthy Infants and Young Children

GI Function: Management of Constipation

For Professional Reference Only

Applicable to: Nurses, Physicians and Other Health Professionals

Management of Constipation

In exclusively breastfed infants, hard stools are extremely rare.⁶ If an exclusively breastfed infant has dry and hard stool, hydration should be assessed and the infant referred to a physician.²²

The management of constipation in infants is supported by limited evidence and expert opinion.¹⁴ Evidence is lacking to suggest the most effective amounts, frequency of dosing, or the age at which dietary modifications can safely be introduced.¹⁴ Common recommendations include increased intake of both absorbable (digestible) and non-absorbable (non-digestible) carbohydrate, sorbitol-containing juices, water and dietary fibre to maintain soft stools.

Refer to the Constipation Decision Tree for Infants 0-12 Months, page [7.1.7](#), for the dietary assessment and management of infant constipation.

Constipation in Children Age 1 Year and Older

Practical Considerations

Constipation can make a bowel movement painful, so the child may try to prevent having one. Once a child begins to be afraid of passing bowel movements, the cycle of chronic constipation has begun and bowel movements become more and more abnormal.¹

Bowel movements in children age one and older may change in consistency and frequency when a child:

- ignores the urge to have a bowel movement, which is often done out of embarrassment to use a public bathroom, fear or lack of confidence in the absence of a parent, or not wanting to take a break from play;²⁰
- does not consume adequate fibre or fluids, or achieve appropriate physical activity.²⁰ Refer to [Appendix 2](#) for fluid guidelines. Review client handout for fibre and activity recommendations.

If constipation does occur, it is most common during toilet training, and after starting school.²⁰ Evidence does not support any particular foods as being a cause of constipation. However, if high intakes of any foods create a lack of fibre or fluid intake, then constipation may result.²¹

Management of Constipation

- The management for temporary constipation in children involves:²⁰
 - establishing open communication with the child;
 - establishing good habits and regular bathroom times;
 - diet modifications and increasing physical activity.
- Prevention of chronic constipation is important. Dietary modifications are recommended as part of maintenance therapy once chronic constipation has developed. No evidence suggests that dietary modifications alone are effective in treating chronic constipation once stool withholding has become a problem.^{14,16}
- Refer to the *Constipation Decision Tree for Children 1 Year and Older*, page [7.1.8](#), for the dietary assessment and management of childhood constipation.

Nutrition Guideline

Healthy Infants and Young Children

GI Function: Management of Constipation

For Professional Reference Only

Applicable to: Nurses, Physicians and Other Health Professionals

Key Questions

Why are prune, pear or apple juices suggested over other juices?

It is not recommended to feed juice to infants younger than six months as it could replace breast milk or formula.²³ This can result in reduced intake of protein, fat, vitamins and minerals such as iron, calcium and zinc.²⁴ Introduction of solids should occur around six months of age; however if an infant four months and older has already been started on solid foods, juice in the amount shown on the *Constipation Decision Tree for Infants 0 – 12 Months* can be provided (page [7.1.7](#)). The malabsorption of carbohydrate from juices may be beneficial for the treatment of constipation. Carbohydrate malabsorption appears to occur more frequently with juices that contain sorbitol or high fructose to glucose ratios (>1) (pear is about 3:1, apple is more than 2:1).^{19,25,26} Some research indicates that juices containing high amounts of sorbitol can cause increased frequency and water content of stools.²⁴ Prune, pear and apple juices contain higher amounts of sorbitol compared to other juices^{1,19,25,26} and therefore can have some benefit in relieving constipation. In addition, prune juice contains large amounts of phenolic compounds (184 mg/100 g), which may aid in the laxative action²⁷ and delay glucose absorption.²⁸

Can corn syrup be used to treat constipation?

The use of corn syrup is no longer a recommendation due to lack of evidence regarding the efficacy. Corn syrup was once a common home remedy for infant constipation.

Are probiotics effective in treating infant constipation?

To date, there is insufficient evidence from controlled trials to support the use of probiotics alone or in combination with prebiotics to prevent or treat constipation in children. Well designed, human trials examining the effects of specific probiotic strains and dosages on constipation in children are required.²⁹

Are herbal or natural health product preparations recommended for treatment of infant constipation?

No evidence was found relating to the use of herbal preparations in the treatment of infant constipation. The use of herbal products with infants is generally not recommended for several reasons, including the lack of standardization of strength and dosage, the multiplicity of products available and the potentially harmful side effects of some herbs.³⁰

For questions about specific herbal or natural health products, parents should consult their pharmacist or physician, or the *Medication and Herbal Advice Line* at 1-800-332-1414. Products that have been assessed by Health Canada as being safe, effective and of high quality under their recommended conditions for use will have a Natural Product Number (NPN) on the label.³¹

Nutrition Guideline
Healthy Infants and Young Children
GI Function: Management of Constipation

For Professional Reference Only

Applicable to: Nurses, Physicians and Other Health Professionals

Are milk-free diets effective in treating constipation?

In a select population of infants and young children, chronic constipation can be a manifestation of allergy to cow's milk.¹⁴ For children with constipation who do not respond to laxatives and dietary modifications, a trial of cow's milk elimination may be considered.^{1,16,32} A Registered Dietitian should be consulted regarding following a milk-free diet.

What about fibre supplements, laxatives or mineral oil?

The best way for children to get the fibre needed in their diet is from fibre-containing foods rather than supplements.³³ If parents are considering the use of fibre supplements, they should talk to their child's physician and/or dietitian first.

Are there any handouts on constipation for healthy infants and children that I can use with my clients?

For infant nutrition resources visit Nutrition Education Materials at <http://www.albertahealthservices.ca/nutrition/Page11115.aspx> and click on **Infants**.

For more information related to healthy infants and children see [Healthy Parents Healthy Children](#).

Nutrition Guideline

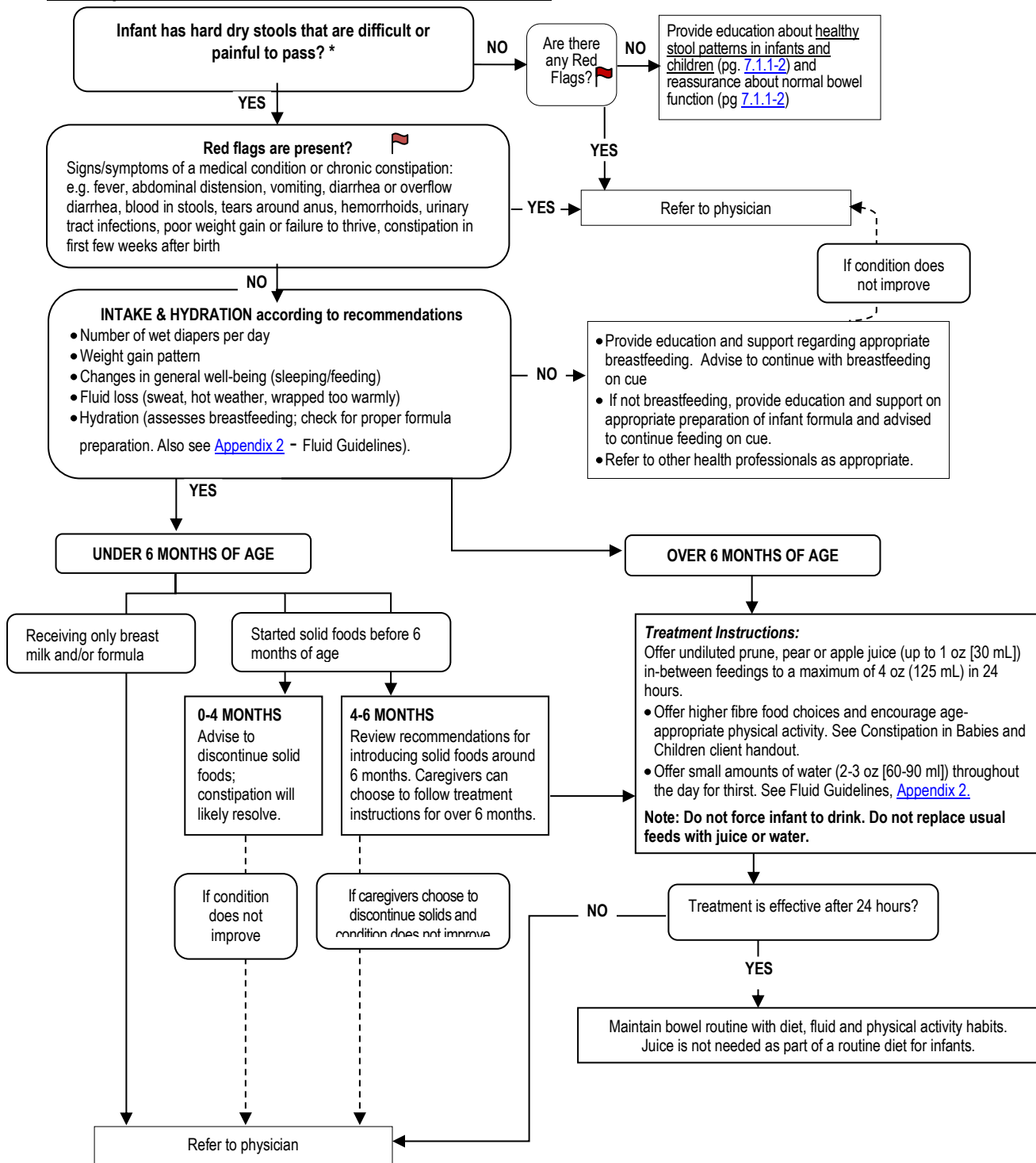
Healthy Infants and Young Children

GI Function: Management of Constipation

For Professional Reference Only

Applicable to: Nurses, Physicians and Other Health Professionals

Constipation Decision Tree for Infants 0-12 Months



* See "Healthy Stool Patterns in Infants and Children", page 7.1.1, for a description of usual stool patterns, and Appendix 1, page 7.1.9, to help establish the presence of constipation.

This decision tree is based on a combination of scientific evidence and the best practice for the assessment and management of constipation and/or prevention of chronic constipation.^{1,16,20}

Nutrition Guideline

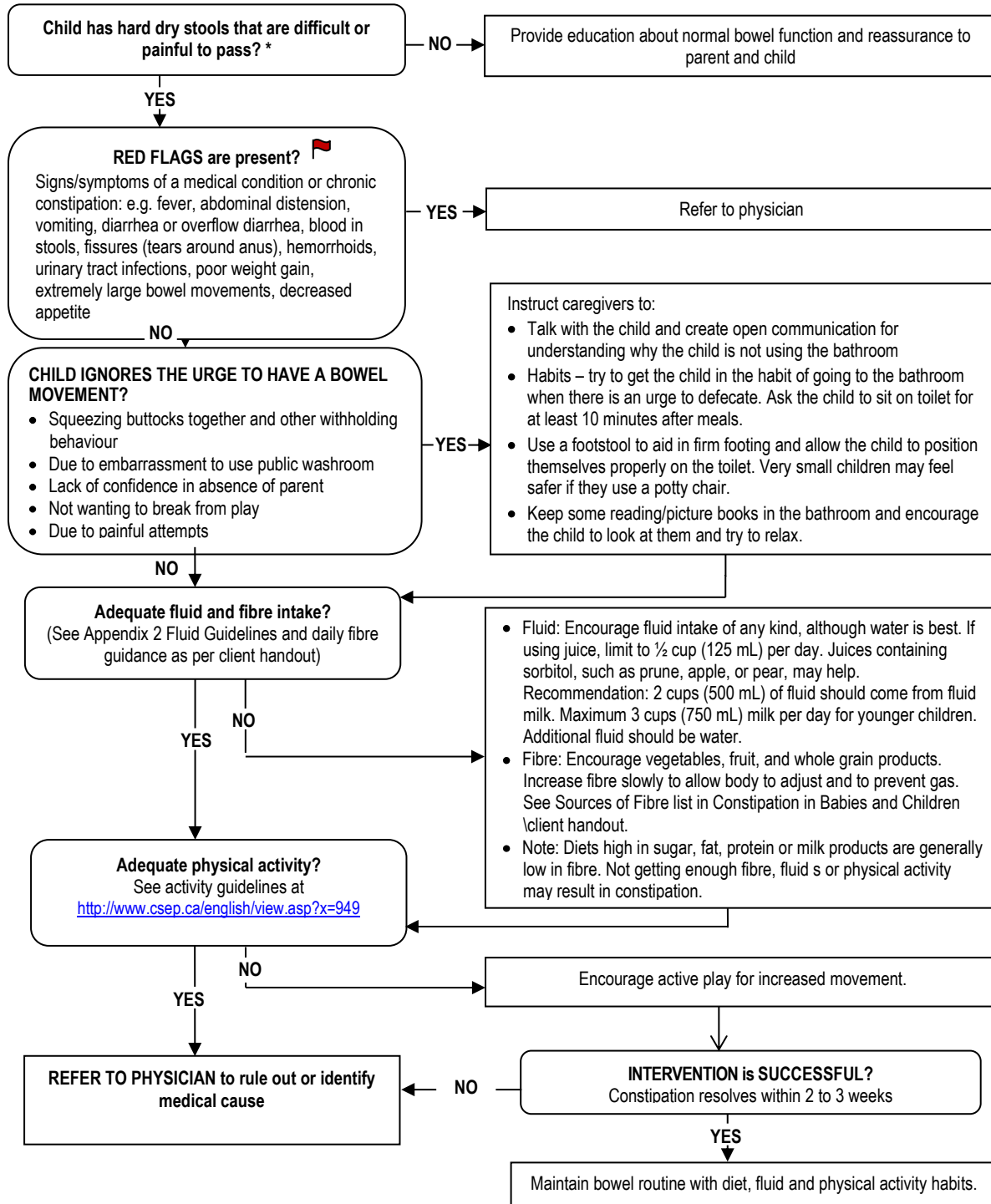
Healthy Infants and Young Children

GI Function: Management of Constipation

For Professional Reference Only

Applicable to: Nurses, Physicians and Other Health Professionals

Constipation Decision Tree for Children Age 1 Year and Older



* See "Healthy Stool Patterns in Infants and Children", page 7.1.1, for a description of usual stool patterns, and Appendix 1, page 7.1.9, to help establish the presence of constipation.

This decision tree is based on a combination of scientific evidence and the best practice for the assessment and management of constipation and/or prevention of chronic constipation.^{1,16,34}

Nutrition Guideline

Healthy Infants and Young Children

GI Function: Management of Constipation

For Professional Reference Only

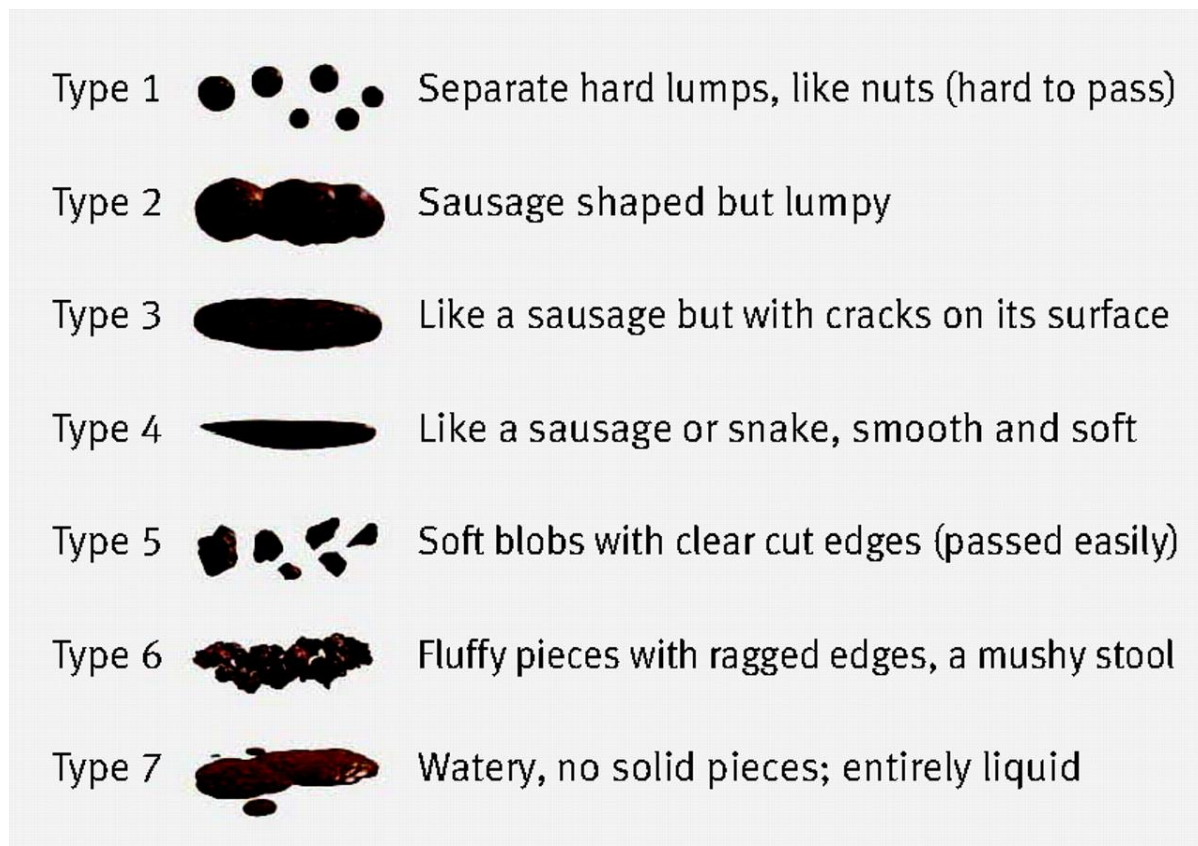
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Appendix 1

Bristol Stool Form Scale and Establishing the Presence of Constipation^{16,35}

Figure 1: Bristol Stool Form Scale

Use this scale with the information in Table 1: 'Establishing the presence of constipation', page [7.1.10](#).



*Note: Types 3 & 4 may be considered as "normal" or "ideal" stools, and types 5 to 7 as tending towards diarrhea.*¹⁰

Acknowledgements

Bristol Stool Form Scale and Stool Form Chart used with permission from: Dr. Kenneth W. Heaton (written communication – letter via e-mail (kwh@theheatons.org.uk), November 5, 2012.

Bristol Stool Form Scale originally published in: O'Donnell LJD, Virjee J, Heaton KW. Detection of pseudodiarrhoea by simple clinical assessment of intestinal transit rate. *Br Med J.* 1990;300:439-40.

Bristol Stool Chart originally published in: Heaton K. *Understanding your bowels.* Family Doctor Publications; 1999. ISBN 1-903-474310.

Nutrition Guideline

Healthy Infants and Young Children

GI Function: Management of Constipation

For Professional Reference Only

Applicable to: Nurses, Physicians and Other Health Professionals

Table 1: Establishing the Presence of Constipation

Children under 1 year of age:	
Two or more of the following indicate constipation:	
<ul style="list-style-type: none"> Fewer than three complete stools a week (type 3 or 4 from Figure 1 <i>Bristol Stool Form Scale</i>, page 7.1.9) (Note: This does not apply to exclusively breastfed infants after 6 weeks of age. Refer to <i>Healthy Stool Patterns in Infants and Children</i>, page 7.1.1, for more information). Hard large stool 	<ul style="list-style-type: none"> “Rabbit droppings” or nuts (type 1, from Figure 1 <i>Bristol Stool Form Scale</i>, page 7.1.9) Distress on having a bowel movement Bleeding associated with hard stools Straining Previous episode(s) of constipation Previous or current anal fissure
Children 1 year and older:	
Two or more of the following indicate constipation:	
<ul style="list-style-type: none"> Fewer than three complete stools per week (type 3 or 4 from Figure 1 <i>Bristol Stool Form Scale</i>, page 7.1.9) Rabbit droppings or nuts (type 1, from Figure 1 <i>Bristol Stool Form Scale</i>, page 7.1.9) Overflow soiling (commonly very loose, very smelly stool passed without sensation) Large infrequent stools that can block the toilet Poor appetite that improves with the passage of a large stool 	<ul style="list-style-type: none"> Abdominal pain that comes and goes with the passage of stool Evidence of retentive posturing (straight-legged, tiptoed, back arching posture) Straining Anal pain Previous episode(s) of constipation Previous or current anal fissure Painful bowel movements and bleeding associated with hard stools

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Text adapted with permission [via e-mail from: James Hall, Medical Editor, National Institute for Health and Clinical Excellence, Manchester, UK (James.Hall@nice.org.uk), November 5, 2012] from:

National Institute for Health and Clinical Excellence, National Collaborating Centre for Women's and Children's Health. Constipation in children and young people: diagnosis and management of idiopathic childhood constipation in primary and secondary care [Internet]. Clinical Guideline (full guideline). National Institute for Clinical Excellence. 2010 [cited 2012 Jun 27]. Available from: <http://www.nice.org.uk/nicemedia/live/12993/48721/48721.pdf>

National Institute for Health and Clinical Excellence. CG99 Constipation in children and young people: history-taking questionnaire under 1 year old [Internet]. 2010 Jul 28 [cited 2012 Jun 27]. Available from: <http://guidance.nice.org.uk/CG99/Questionnaire/Under1Year/doc/English>

National Institute for Health and Clinical Excellence. CG 99 Constipation in children and young people: history-taking questionnaire 1 year and older [Internet]. 2010 Jul 28 [cited 2012 Jun 27]. Available from: <http://guidance.nice.org.uk/CG99/Questionnaire/1YearAndOlder/doc/English>

Nutrition Guideline
Healthy Infants and Young Children
GI Function: Management of Constipation

For Professional Reference Only

Applicable to: Nurses, Physicians and Other Health Professionals

Appendix 2: Fluid Guidelines³⁶

Based on “Adequate Intake” (AI)*

Table 2: Fluid Guidelines

Age	Water Obtained from Drinks Per Day (from breast milk, formula, milk, juices and drinking water)
Infants 0 – 6 months	700 mL assumed to be from breast milk If drinking infant formula, range in 24 h: 360 – 1080 mL ³⁷
7 – 12 months	600 mL If drinking infant formula, range in 24 h: 540 – 960 mL ³⁷
1 – 3 years	900 mL
4 – 8 years	1200 mL
Boys 9 – 13 years	1800 mL
Girls 9 – 13 years	1600 mL
Boys 14 – 18 years	2600 mL
Girls 14 – 18 years	1800 mL

*The AI is the recommended average daily intake estimated to meet the needs of apparently healthy individuals and does not take into account potential additional requirements for other conditions (e.g. environmental conditions, physical activity, medical conditions).³⁶

Nutrition Guideline

Healthy Infants and Young Children

GI Function: Management of Constipation

For Professional Reference Only

Applicable to: Nurses, Physicians and Other Health Professionals

References

- 1 Tabbers MM, DiLorenzo C, Berger MY, Faure C, Langendam M, Nurko S, et al. Evaluation and treatment of functional constipation in infants and children: Evidence-Based Recommendations From ESPGHAN and NASPGHAN. *J Pediatr Gastroenterol Nutr.* 2014 Feb;58:258–74.
- 2 Kocaay P, Egritas O, Buket D. Normal defecation pattern, frequency of constipation and factors related to constipation in Turkish children 0-6 years old. *Turk J Gastroenterol.* 2011;22(4):369-75.
- 3 Fontana M, Bianchi C, Cataldo F, Nibali C, Cucchiara L, Casali G, et al. Bowel frequency in healthy children. *Acta Paediatr Scand.* 1989;78:682-4.
- 4 Hyams JS, Treem WR, Etienne NL, Weinerman H, MacGilpin D, Hine P, et al. Effect of infant formula on stool characteristics of young infants. *Pediatrics.* 1995;95:50-4.
- 5 Steer CD, Emond AM, Golding J, Sandu B. The variation in stool patterns from 1 to 42 months: a population-based observational study. *Arch Dis Child.* 2009; 94: 231-4.
- 6 Tunc VT, Camurdan AD, Ilhan MN, Sahin F, Beyazova U. Factors associated with defecation patterns in 0-24 month old children. *Eur J Pediatr.* 2008;176:1357-62.
- 7 Weaver LT, Ewing G, Taylor L. The bowel habit of milk-fed infants. *J Pediatr Gastroenterol Nutr.* 1988;7:568-71.
- 8 Dietitians of Canada. Pediatric/paediatric constipation: normal pediatric (infants, toddlers and children) stool characteristics – frequency, colour and consistency background. In: *Practice-based Evidence in Nutrition [PEN]*. 2012 Sep 12 [cited 2013 Oct 3]. Available from: <http://www.pennutrition.com> Access only by subscription.
- 9 Community Paediatrics Committee, Canadian Paediatric Society. Managing functional constipation in children - practice point *Paediatr Child Health.* 2011;16(10):661-5.
- 10 McGrath KH, Caldwell P. Diagnostic approach to constipation in children. In: *Constipation - causes, diagnosis and treatment [Internet]*. Catto-Smith A (Ed). InTech. 2012 Mar [cited 2013 Jan 14]. ISBN: 978-953-51-0237-3. DOI: 10.5772/29180. Available from: <http://www.intechopen.com/books/constipation-causes-diagnosis-and-treatment/diagnostic-approach-to-constipation-in-children>
- 11 Lemoh JN, Brooke OG. Frequency and weight of normal stools in infancy. *Arch Dis Child.* 1979 Sep;54(9):719-20.
- 12 Bekkali N, Moesker FM, Van Toledo L, Reitsma JB, Hamers SL, Valerio PG, et al. Bowel habits in the first 24 months of life: preterm- versus term-born infants. *J Pediatr Gastroenterol Nutr.* 2010 Dec;51(6):753-8.
- 13 Hyman PE, Milla PJ, Benninga MC, Davidson GP, Fleisher DF, Taminiu J. Childhood functional gastrointestinal disorders: neonate/toddler. *Gastroenterology.* 2006;130:1519-1526.
- 14 Dietitians of Canada. Pediatric/paediatric constipation evidence summary. In: *Practice-based Evidence in Nutrition [PEN]*. 2008 Feb 06 [cited 2011 Sept 16]. Available from: <http://www.pennutrition.com>. Access only by subscription.
- 15 Loening-Baucke V. Prevalence, symptoms and outcome of constipation in infants and toddlers. *J Pediatr.* 2005 Mar;146(3):359-63.
- 16 National Institute for Health and Clinical Excellence, National Collaborating Centre for Women's and Children's Health. Constipation in children and young people: diagnosis and management of idiopathic childhood constipation in primary and secondary care. Clinical Guideline (full guideline). National Institute for Clinical Excellence. 2010 [cited 2012 Jun 27]. Available from: <http://www.guideline.gov/content.aspx?id=23802>.
- 17 Afzal NA, Tighe MP, Thomson MA. Constipation in children. *Italian J Pediatr.* 2011;37:28.

Nutrition Guideline

Healthy Infants and Young Children

GI Function: Management of Constipation

For Professional Reference Only

Applicable to: Nurses, Physicians and Other Health Professionals

- ¹⁸ Rasquin-Weber A, Hyman PE, Cucchiara S, Fleisher DR, Hyams JS, Milla PJ, et al. Childhood functional gastrointestinal disorders. *Gut*. 1999;45(Suppl II):1160-8.
- ¹⁹ Cole CR, Rising R, Lifshitz F. Consequences of incomplete carbohydrate absorption from fruit juice consumption in infants. *Arch Pediatr Adolesc Med*. 1999;153(10):1098-102.
- ²⁰ Ferry GD. Patient information: constipation in infants and children [Internet]. 2012 Mar 22 [cited 2012 Jun 21]. Available from: http://www.uptodate.com/contents/patient-information-constipation-in-infants-and-children?source=search_result&selectedTitle=1%7E10#.
- ²¹ Dietitians of Canada. How to manage and prevent constipation in babies (0-12 months). In: Practice-based Evidence in Nutrition [PEN]. 2011 Oct 07 [cited 2012 April 25]. Available from: <http://www.pennutrition.com>. Access only by subscription.
- ²² Newman J, Pitman T. Dr. Jack Newman's guide to breastfeeding: updated edition. Toronto, Ontario: Harper Collins Canada; 2003; p. 227.
- ²³ Public Health Agency of Canada. Breastfeeding and infant nutrition [Internet]. 2009 Jul 15 [cited 2013 Jan 20]. Available from: http://www.phac-aspc.gc.ca/hp-ps/dca-dea/stages-etapes/childhood-enfance_0-2/nutrition/index-eng.php
- ²⁴ American Academy of Pediatrics. The use and misuse of fruit juices in pediatrics. *Pediatrics*. 2001;107(5):1210-3.
- ²⁵ Lifshitz CH. Carbohydrate absorption from fruit juices in infants. *Pediatrics*. 2000;105(1):e4.
- ²⁶ Nobigrot T, Chasalow FI, Lifshitz F. Carbohydrate absorption from one serving of fruit juice in young children: age and carbohydrate composition effects. *J Am Coll Nutr*. 1997;16(2):152-8.
- ²⁷ Dietitians of Canada. At what age is it safe and/or appropriate to use prune juice, prunes, brown sugar, white sugar, corn syrup or wheat bran to treat functional constipation? Gastrointestinal system – pediatric/paediatric constipation: key practice points. In: Practice-based Evidence in Nutrition [PEN]. 2007 July 31 [cited 2011 Sept 16]. Available from: <http://www.pennutrition.com>. Access only by subscription.
- ²⁸ Stacewicz-Sapuntzakis M, Bowen PE, Hussain EA, Damayanti-Wood BI, Farnsworth NR. Chemical composition and potential health effects of prunes: a functional food? *Crit Rev Food Sci Nutr*. 2001 May;41(4):251-86.
- ²⁹ Dietitians of Canada. Are probiotics effective in the treatment of constipation in children? Gastrointestinal system – pediatric/paediatric constipation: key practice points. In: Practice-based Evidence in Nutrition [PEN]. 2008 Feb 05 [cited 2011 Sept 16]. Available from: <http://www.pennutrition.com>. Access only by subscription.
- ³⁰ Dietitians of Canada. Can herbal tea reduce the symptoms of infant colic? Infant colic: key practice points. In: Practice-based Evidence in Nutrition [PEN]. 2009 Jan 30 [cited 2012 May 25]. Available from: <http://www.pennutrition.com/KnowledgePathway.aspx?kpid=13089&pgcatid=146&pgid=13139>. Access only by subscription.
- ³¹ Health Canada. Welcome to the licensed natural health products database (LNHPD) [homepage on the Internet]. Date modified 2011 Nov 14 [cited 2013 Mar 1]. Available from: <http://www.hc-sc.gc.ca/dhp-mps/prodnatur/applications/licen-prod/lnhpd-bdpsnh-eng.php>.
- ³² Dietitians of Canada. Pediatric/paediatric constipation practice guidance summary. In: Practice-based Evidence in Nutrition [PEN]. 2012 Sep 09 [cited 2012 Sept 19]. Available from: <http://www.pennutrition.com>. Access only by subscription.

Nutrition Guideline

Healthy Infants and Young Children

GI Function: Management of Constipation

For Professional Reference Only

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- ³³ American Dietetic Association. Position of the American Dietetic Association: health implications of dietary fiber. J Am Diet Assoc. [Internet]. 2008 Oct [cited 2013 Sep 20];108(10):1716–31. Available from: <http://linkinghub.elsevier.com/retrieve/pii/S0002822308015666>.
- ³⁴ Palmer D, Barker P. Increasing fibre: why and how. Nurs Times. 2001 Apr;97(16):54-5.
- ³⁵ Bardisa-Ezcurra L, Ullman R, Gordon J, on behalf of the Guideline Development Group. Diagnosis and management of idiopathic childhood constipation: summary of NICE guidance. Br Med J. 2010;340:C2585.
- ³⁶ Institute of Medicine. Water. In: Dietary reference intakes for water, potassium, sodium, chloride, and sulfate. Washington, DC: National Academy of Sciences; 2005. p.73-185.
- ³⁷ Government of Alberta. Feeding baby infant formula [Internet]. 2009 Jan [cited 2012 May 25]. Available from: <http://www.healthyalberta.com/BabyFormula-Jan2009.pdf>.