Over the counter medications- What can I give my child?

Sweeney Irizarry, BS
Doctor of Pharmacy Candidate 2021
USF Health Taneja College of Pharmacy
sweeneyirizarry@usf.edu

1

Objectives

- Identify common illnesses that affect children which are manageable with OTC products
- Assess the child presentation and recommend an appropriate OTC product for treatment
- Recommend non-pharmacological appropriate therapies

2

Common Cold

- Characteristics[1]
  - rhinorrhea
  - cough
  - sore throat
  - fever
  - malaise
  - headache
  - loss of appetite

Gwaltney JM. The common cold. In:Mandell GL et al., eds. Principles and practice of infectious diseases. 3rd ed. New York, Churchill Livingstone, 1990: 491-493

3

Common Cold

- No benefit from antibiotics[2]
- Rule out bacterial infections
  - pneumonia, AOM, bacterial sinusitis and streptococcal pharyngitis
- Bronchiolitis, measles and pertussis start like a common cold

Lexomboon U, Duangmani C, Kusalasai V, Sunakorn P, Olson LC, Noyes HE (1971) Evaluation of orally administered antibiotics for treatment of upper respira infections in Thai children. J Pediatr. **78**:772–778

4

Common Cold

- Non effective therapies
  - Echinacea purpurea[3]
  - Vitamin C[4,5]
  - Homeopathic products
- Elderberry may be effective in adults[6]
- Zinc reduced duration and severity in adults[7]

5

Bacterial Sinusitis vs URI

- Diagnosis:[8,9]
  - Nasal discharge or daytime cough lasting more than 10 days without improvement
  - Worsening course after initial improvement
  - Severe onset
    - Fever > 39 C or 102.2 F
    - Purulent discharge for at least 3 days

Wald R. Ellen et. Al. Clinical Practice Guideline for the Diagnosis and Management of Acute Bacterial Sinusitis in Children Aged 1 to 18. Pediatrics. 2013; 132(1): 262-280

6

Bacterial Sinusitis vs URI

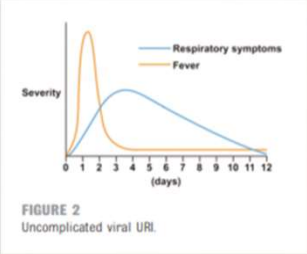


FIGURE 2
Uncomplicated viral URI.

Wald R, Ellen et. Al. Clinical Practice Guideline for the Diagnosis and Management of Acute Bacterial Sinusitis in Children Aged 1 to 18. Pediatrics. 2013; 132(1): 262-260

7

Allergic Rhinitis

- Clinical feature:[10]
  - Rhinorrhea
  - Nasal itching
  - Sneezing
  - Postnasal drip
- Reversible spontaneously or with treatment

Bousquet J, Khaltaev N, Cruz AA, et al. Allergic Rhinitis and its Impact on Asthma (ARIA) 2008 update (in collaboration with the World Health Organization, GA(2)LEN, and AllerGen). J Allergy Clin Immunol. 2008;63 Suppl 86:8-160. doi:10.1111/j.1398-9995.2007.01620.x

8

Allergic Rhinitis

- Second generation antihistamines are first line for mild cases[11]
  - Loratadine
  - Cetirizine
  - Fexofenadine
- Intranasal corticosteroids are most effective for moderate to severe cases[12]
  - Fluticasone propionate
  - Triamcinolone
  - Budesonide

Weiner JM, Abramson MJ, Puy RM. Intranasal corticosteroids versus oral H1 receptor antagonists in allergic rhinitis: systematic review of randomised controlled trials. BMJ. 1998;317(7173):1624-1629. doi:10.1136/bmj.317.7173.1624

9

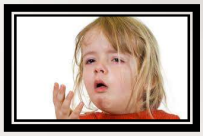
Allergic Rhinitis

- Nasal irrigation is effective for treatment of sinusitis symptoms[13]
- Addition of nasal irrigation to fluticasone may improve[14] symptoms

10

Cough Treatments

- Expectorants- mixed data available in adults[15,16]
  - Guaifenesin
- Antihistamines - not effective[17]
  - Loratadine, Cetirizine, Fexofenadine
  - Chlorpheniramine, Diphenhydramine
- Antitussive- possibly effective[18]
  - Dextromethorphan



11

Non-pharmacological therapies

- Honey might reduce mucus secretion and cough in children[19,20]
  - Avoid children <12 months
- Vapor rub[21]
  - Improves nasal congestion and sleep
  - Reduces severity of cough

Paul IM, Beiler J, McMonagle A, Shaffer ML, Duda L, Berlin CM., Jr Effect of honey, dextromethorphan, and no treatment on nocturnal cough and sleep quality for coughing children and their parents. Arch Pediatr Adolesc Med. 2007;161(12):1140-6

12

Antipyretics/Analgesics[22]

- Ibuprofen[23] - 10mg/kg Q6-8H
  - max 40mg/kg/day
- Acetaminophen 15mg/kg Q4-6H
  - max 90mg-kg/day
- Combination therapy may be superior but not routinely recommended[24,25]

Sullivan, J. Farrar, H. (2011). Fever and antipyretic use in children. Pediatrics, 127(3), 580

13

Atopic Dermatitis

- Major clinical features:[26]
  - Itching/pruritus
  - Chronic or relapsing history
  - Family history of atopy
  - Typical distribution/age specific pattern
- Oozing, drainage, pus bumps, and yellow crusts might indicate infection

Elias PM, Steinhoff M. "Outside-to-inside" (and now back to "outside") pathogenic mechanisms in atopic dermatitis. J Invest Dermatol. 2008;128(5):1067–1070;quiz 1140.PMID: 18408746

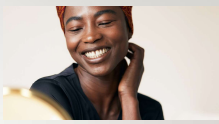
14

Skin-directed approach

- 1) Maintenance of skin care
- 2) Topical anti-inflammatory medications
- 3) Itch control
- 4) Managing infectious triggers

15

Moisturizers[27]

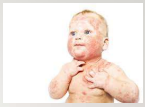


- Occlusive emollient- petrolatum, coal tar ointment
- Emollient creams- colloidal oatmeal, dimethicone
- Humectants- urea and glycerin draw water from environment into application site
- Ointments>creams>lotions

Gan YC, Hebert AA, Dizon MV, et al. A review on the role of moisturizers for atopic dermatitis. *Asia Pac Allergy*. 2016;6(2):120-128. doi:10.5415/apallergy.2016.6.2.120

16

Atopic Dermatitis



- Hydrocortisone for flares and emollients for maintenance[28,29]
- Avoid in children younger than 2years old
- Avoid in face or skin folds
- Use until flare is gone or up to 2 weeks at a time

Cullen J, Chamlin S, Eichenfield LF, et al. A systematic review of the safety of topical therapies for atopic dermatitis. Br J Dermatol. 2007;156(2):203–21[epub 17221859

17

Itching

- AD may be referred to as the itch that rashes[30]
- First generation vs second generation antihistamines[31,32]
  - Caution with infants
- Use only as needed
- Lack evidence of efficacy

Herman SM, Vender RB. Antihistamines in the treatment of dermatitis. *J Cutan Med Surg*. 2003;7(6):467-473. doi:10.1007/s10227-003-0164-3

18

Non-pharmacological tips

- Avoid triggers- scents, soaps, laundry detergents, allergens, sun exposure
- Minimize scratching
- Warm showers → apply emollient after patting dry while skin is still moist
- During flare add topical corticosteroid and more liberal use of emollients
- Bandages over treatment to prevent scratching[33]

19

Diaper Rash

Primary cause:

- Prolonged/increased exposure to wetness/moisture and irritants
- Cutaneous immaturity and higher susceptibility to skin barrier disruption and absorption
- Increased friction

20

Diaper Rash

Severity of presentation

21

Diaper Rash Treatments

- Zinc oxide
- Lanolin/petrolatum
- Dimethicone
- Colloidal Oatmeal
- Coconut oil

22

Diaper Rash Non-pharm tips

- Keep diaper area clean and dry[34]
- Minimize exposure to irritants and moisture
- Use protectants[35]
- Bathe the baby as opposed to washing with a cloth
- Use emollients after bathing[36]

23

Defining Constipation[37]

Rome IV criteria

- ❑Straining
- ❑Lumpy or hard stools
- ❑Sensation of incomplete evacuation
- ❑Sensation of anorectal obstruction/blockage
- ❑Manual maneuvers to facilitate defecation
- ❑<3 BMs per week

Tabbers MM, DiLorenzo C, Berger MY, et al. Evaluation and treatment of functional constipation in infants and children: evidence-based recommendations from ESPGHAN and NASPGHAN. J Pediatr Gastroenterol Nutr. 2014; 58(2):258-274.

24

Constipation Treatment

- Polyethylene Glycol (PEG) 3350
  - 1-1.5g/kg PO once daily for 3-6 days for fecal disimpaction
  - 0.4-0.8g/kg PO once daily for treatment of functional constipation
- Milk of Magnesia (1.2g/15mL)
  - 2-5 years 1.2g/day
  - 6-11 years 1.2-2.4g/day
  - 12-18 years 2.4-4.8g/day

Tabbers MM, DiLorenzo C, Berger MY, et al. Evaluation and treatment of functional constipation in infants and children: evidence-based recommendations from ESPGHAN and NASPGHAN. J Pediatr Gastroenterol Nutr 2014; 58(2):258-274.

25

Constipation Treatment

- Mineral oil
  - 1-3mL/kg/day, max 90mL
  - Risk of aspiration and lipid pneumonitis, especially in children with neurologic impairment
  - Avoid in children less than 12 or with difficulty swallowing
- Enemas
- Bisacodyl
- Senna

Tabbers MM, DiLorenzo C, Berger MY, et al. Evaluation and treatment of functional constipation in infants and children: evidence-based recommendations from ESPGHAN and NASPGHAN. J Pediatr Gastroenterol Nutr 2014; 58(2):258-274.

26

Constipation Non-Pharmacological Treatment

- Fiber supplements[38]
- Fluid intake
- Pre/Pro biotics
- Behavioral therapy

Tabbers MM, DiLorenzo C, Berger MY, et al. Evaluation and treatment of functional constipation in infants and children: evidence-based recommendations from ESPGHAN and NASPGHAN. J Pediatr Gastroenterol Nutr 2014; 58(2):258-274.

27

Constipation Non-Pharmacological Treatment

- Prunes/Prune Juice- High Sorbitol Content[39]
- Exercise[40]
- OTC supplements
  - Cascara sagrada
  - Rhubarb
  - Aloe vera juice

Heyman MB, Abrams SA; SECTION ON GASTROENTEROLOGY, HEPATOLOGY, AND NUTRITION; COMMITTEE ON NUTRITION. *Fruit Juice in Infants, Children, and Adolescents: Current Recommendations. Pediatrics*. 2017;139(6):e20170967. doi: 10.1542/peds.2017-0967

28

Diarrhea

- Acute gastroenteritis is the most common cause[41]
- Severity is dependent on etiology
- Dehydration is the main clinical feature and correlates with severity

Harman S, Brown E, Loomis E, and Russell HA. Gastroenteritis in Children. Am Fam Physician. 2019 Feb 1;99(3):159-165

29

Diarrhea Considerations

- High fat foods are difficult to absorb
- Food intolerance
  - i.e. lactose, gluten
- High sugar or sorbitol
- Unnecessary restriction of diet can prolong diarrhea
- Small frequent feeds

Guarino A, Ashkenazi S, Gendrel D, et al. European Society for Pediatric Gastroenterology, Hepatology, and Nutrition/European Society for Pediatric Infectious Diseases evidence-based guidelines for the management of acute gastroenteritis in children in Europe: update 2014. *J Pediatr Gastroenterol Nutr*. 2014;59(1):132-152. doi:10.1097/MPG.0000000000000378

30

Diarrhea Treatments

- Oral rehydration solution 50mL/kg over 4 hours
  - Start slow and increase as tolerated
- Consider diluted apple juice as an alternative to ORS[42]
- Resume normal feeds 4-6 hours after rehydration
  - No dietary restriction necessary

Guarino A, Ashkenazi S, Gendrel D, et al. European Society for Pediatric Gastroenterology, Hepatology, and Nutrition/European Society for Pediatric Infectious Diseases evidence-based guidelines for the management of acute gastroenteritis in children in Europe: update 2014. *J Pediatr Gastroenterol Nutr*. 2014;59(1):132-152. doi:10.1097/MPG.0000000000000378

31

Diarrhea Treatments

- Loperamide[43]
  - Not recommended for management of acute gastroenteritis
  - Not recommended in young children (<6 years)
- Bismuth Subsalicylate[44]
  - Darkening of tongue and stool
  - Risk of Reye's syndrome

Su-Ting T, Grossman, D., & Cummings P. (2007) Loperamide therapy for acute diarrhea in children. Systematic Review and Meta-Analysis. PLoS Med. 4(3), E98.

32

Diarrhea Treatments

- Lactobacillus rhamnosus GG, Saccharomyces boulardi[45,46,47]
  - May reduce symptoms
- Zinc may be useful in the presence of a deficiency[47]
  - Most useful in limited income countries

33

Nausea and Vomiting Non-Pharmacological Treatment

- Acupressure wristbands[49]
- Phosphorated carbohydrate solution
- Sodium citrate dihydrate
- Ginger, chamomile, peppermint[50]
- Aromatherapy[51]
- Rice water[52,53,54]

34

Nausea and Vomiting in Motion Sickness

- Meclizine
  - Not for children < 12years
- Diphenhydramine, Dimenhydrinate[55]
  - Use limited by drowsiness
- Second generation antihistamines are not effective[56]

35

Takeaway Points

- Medications can't be simply dose adjusted for children
- Some medications are either not appropriate for children or not effective
- Most common illnesses are self limited and only require supportive care
- Always behave as a patient advocate

36

Thank you!

37

References

1) Gwaltney JM. The common cold. InMandell GL et al., eds. Principles and practice of infectious diseases, 3rd ed. New Yok, Churchill Livingstone, 190: 489-493

2) Lexomboon U, Duangmani C, Kasalasai V, Sunakorn P, Olson LC, Noyes HE (1971) Evaluation of orally administered antibiotics for treatment of upper respiratory infections in Thai children. J Pediatr. **78**:772–778

3)Yale SH, Liu K, Arch. ECHINACEA PURPUREA THERAPY FOR THE TREATMENT OF THE COMMON COLD: A RANDOMIZED, DOUBLE-BLIND, PLACEBOCONTROLLED CLINICAL TRIAL Intern Med. 2004;164:1237–1241

4)Gómez E, Quidel S, Bravo-Soto G, Ortigoza Á. Does vitamin C prevent the common cold? ¿Previene la vitamina C el resfrío común?. *Medwave*. 2018;18(4):e7235. Published 2018 Aug 6. doi:10.5867/medwave.2018.04.7236

5)Quidel S, Gómez E, Bravo-Soto G, Ortigoza Á. What are the effects of vitamin C on the duration and severity of the common cold?. ¿Cuál es el efecto del tratamiento con vitamina C en la duración y severidad del resfrío común?. *Medwave*. 2018;18(6):e7261. Published 2018 Oct 3. doi:10.5867/medwave.2018.06.7260

6) Hawkins J, Baker C, Cherry L, Dunne E. Black elderberry (Sambucus nigra) supplementation effectively treats upper respiratory symptoms: A meta-analysis of randomized, controlled clinical trials. *Complement Ther Med*. 2019;42:361-365. doi:10.1016/j.ctim.2018.12.004

7)Science M, Johnstone J, Roth DE, Guyatt G, Loeb M. Zinc for the treatment of the common cold: a systematic review and meta-analysis of randomized controlled trials. *CMAJ*. 2012;184(10):E551-E561. doi:10.1503/cmaj.111990

8) Wald R. Ellen et. Al. Clinical Practice Guideline for the Diagnosis and Management of Acute Bacterial Sinusitis in Children Aged 1 to 18. Pediatrics. 2013; 132(1): 262-280

9)Wald ER, Chiponis D, Ledesma-Medina J. Comparative effectiveness of amoxicillin and amoxicillin-clavulanate potassium in acute paranasal sinus infections in children: a double-blind, placebo-controlled trial. Pediatrics. 1986;77(6):795–800

10) Bousquet J, Khaltaev N, Cruz AA, et al. Allergic Rhinitis and its Impact on Asthma (ARIA) 2008 update (in collaboration with the World Health Organization, GA(2)LEN and AllerGen). *Allergy*. 2008;63 Suppl 86:8-160. doi:10.1111/j.1398-9995.2007.01620.x

38

References continued

11) Simons FE. H1-antihistamines in children. *Clin Allergy Immunol*. 2002;17:437-464.

12) Weiner JM, Abramson MJ, Puy RM. Intranasal corticosteroids versus oral H1 receptor antagonists in allergic rhinitis: systematic review of randomised controlled trials. *BMJ*. 1998;317(7173):1624-1629. doi:10.1136/bmj.317.7173.1624

13) Wang YH, Yang CP, Ku MS, Sun HL, Lue KH. Efficacy of nasal irrigation in the treatment of acute sinusitis in children. *Int J Pediatr Otorhinolaryngol*. 2009;73(12):1696-1701. doi:10.1016/j.ijporl.2009.09.001

14) Tugral S, Dogan R, Eren SB, Meric A, Ozturan O. The use of large volume low pressure nasal saline with fluticasone propionate for the treatment of pediatric acute rhinosinusitis. *Int J Pediatr Otorhinolaryngol*. 2014;78(8):1393-1399. doi:10.1016/j.ijporl.2014.06.006

15) Weippl G. Therapeutic approaches to the common cold in children. Clinical Therapeutics 1984, 6 (4): 475-482

16) Zimeri I. What to expect from expectorants. JAMA 1976, 236 193-194.

17) Chang CC, Cheng AC, Chang AB. Over-the-counter (OTC) medications to reduce cough as an adjunct to antibiotics for acute pneumonia in children and adults. *Cochrane Database of Systematic Reviews* 2010, Issue 1.

18) Smith SM, Schroeder K, Fahey T. Over-the-counter (OTC) medications for acute cough in children and adults in ambulatory settings. *Cochrane Database of Systematic Reviews* 2010, Issue 9.

19_Paul IM, Beiler J, McMonagle A, Shaffer ML, Duda L, Berlin CM., Jr Effect of honey, dextromethorphan, and no treatment on nocturnal cough and sleep quality for coughing children and their parents. Arch Pediatr Adolesc Med. 2007;161(12):1140–6

20) Küplülü O, Gönciloglu M, Özdemir H, Koluman A. Incidence of Clostridium botulinum spores in honey in Turkey. *Food Control* 2006;17(3):222-4.

39

References continued

21) Paul, I., Beiler J. King, T. et al. (2010). Vapor rub, petrolatum, and no treatment for children with nocturnal cough and cold symptoms. Pediatrics, 126(6), 1092.

22) Sullivan, J. Farrar, H. (2011). Fever and antipyretic use in children. Pediatrics, 127(3), 580

23) Ulinski T, Guigonis V, Dunan O, Bensman A. Acute renal failure after treatment with non-steroidal anti-inflammatory drugs. *Eur J Pediatr*. 2004;163(3):148-150. doi:10.1007/s00431-003-1392-7

24) Hay AD, Redmond NM, Costelloe C, et al. Paracetamol and ibuprofen for the treatment of fever in children: the PITCH randomised controlled trial. *Health Technol Assess*. 2009;13(27):iii-163. doi:10.3310/hta13270

25) Luo S, Ren M, Luo Q, et al. Alternating Acetaminophen and Ibuprofen versus Monotherapies in Improvements of Distress and Reducing Refractory Fever in Febrile Children: A Randomized Controlled Trial. *Paediatr Drugs*. 2017;19(5):479-486. doi:10.1007/s40272-017-0237-1

26) Elias PM, Steinhoff M. "Outside-to-inside" (and now back to "outside") pathogenic mechanisms in atopic dermatitis. J Invest Dermatol. 2008;**128**(5):1067–1070pmid:18408746

27) Giam YC, Hebert AA, Dizon MV, et al. A review on the role of moisturizers for atopic dermatitis. *Asia Pac Allergy*. 2016;6(2):120-128. doi:10.5415/apallergy.2016.6.2.120

28) Callen J, Chamlin S, Eichenfield LF, et al. A systematic review of the safety of topical therapies for atopic dermatitis. Br J Dermatol. 2007;**156**(2):203–221pmid:17223859

29) Grimalt R, Mengeaud V, Cambazard F; Study Investigators' Group. The steroid-sparing effect of an emollient therapy in infants with atopic dermatitis: a randomized controlled study. *Dermatology*. 2007;214(1):61-67. doi:10.1159/000096915

30) Silverberg JI, Gang NK, Paller AS, Fishbein AB, Zee PC. Sleep disturbances in adults with eczema are associated with impaired overall health: a US population-based study. *J Invest Dermatol*. 2015;135(1):56-66. doi:10.1038/jid.2014.325

40

References continued

31) Herman SM, Vender RB. Antihistamines in the treatment of dermatitis. *J Cutan Med Surg*. 2003;7(6):467-473. doi:10.1007/s10227-003-0164-3

32) Klein PA, Clark RA. An evidence-based review of the efficacy of antihistamines in relieving pruritus in atopic dermatitis. *Arch Dermatol*. 1999;135(12):1522-1525. doi:10.1001/archderm.135.12.1522

33) Dahabe TS, Davis DM, Wetter DA, et al. Wet dressing therapy in conjunction with topical corticosteroids is effective for rapid control of severe pediatric atopic dermatitis: experience with 218 patients over 30 years at Mayo Clinic. *J Am Acad Dermatol*. 2012;67(1):100-106. doi:10.1016/j.jaad.2011.06.025

34) Blume-Peytavi U, Kanti V. Prevention and treatment of diaper dermatitis. *Pediatr Dermatol*. 2018;35 Suppl 1:s19-s23. doi:10.1111/pde.13495

35) Blume-Peytavi U, Lavender T, Jeszeowicz D, et al. Recommendations from a European roundtable meeting on best practice healthy infant skin care. *Pediatr Dermatol*. 2016;**33**:311-321.

36) Stamatas GN, Tierney NK. Diaper dermatitis: etiology, manifestations, prevention, and management. *Pediatr Dermatol*. 2014;**31**:1-7.

37) Tabbers MM, DiLorenzo C, Berger MY, et al: Evaluation and treatment of functional constipation in infants and children: evidence-based recommendations from ESPGHAN and NASPGHAN. J Pediatr Gastroenterol Nutr 2014; 58(2):258-274.

38) Tabbers MM, Benninga MA. Constipation in children: fibre and probiotics. *BMJ Clin Evid*. 2015;2015:0303. Published 2015 Mar 10.

39) Heyman MB, Abrams SA; SECTION ON GASTROENTEROLOGY, HEPATOLOGY, AND NUTRITION; COMMITTEE ON NUTRITION. Fruit Juice in Infants, Children, and Adolescents: Current Recommendations. *Pediatrics*. 2017;139(6):e20170967. doi:10.1542/peds.2017-0967

40) Gao R, Tao Y, Zhou C, et al. Exercise therapy in patients with constipation: a systematic review and meta-analysis of randomized controlled trials. *Scand J Gastroenterol*. 2019;54(2):169-177. doi:10.1080/00365521.2019.1568544

41

References continued

41) Hartman S, Brown E, Loomis E, and Russell HA. Gastroenteritis in Children. Am Fam Physician. 2019 Feb 1;99(3):159-165

42) Freedman SB, Willan AR, Boutis K, Schuh S. Effect of Dilute Apple Juice and Preferred Fluids vs Electrolyte Maintenance Solution on Treatment Failure Among Children With Mild Gastroenteritis: A Randomized Clinical Trial. *JAMA*. 2016;315(18):1966-1974. doi:10.1001/jama.2016.5352

43) Su-Ting T. Grossman, D., & Cummings P. (2007) Loperamide therapy for acute diarrhea in children. Systematic Review and Meta-Aanalysis. PLoS Med 4(3). E98.

44) Goldman RD. Bismuth salicylate for diarrhea in children. *Can Fam Physician*. 2013;59(8):843-844

45) Canani RB, Cirillo P, Terrin G, et al. Probiotics for treatment of acute diarrhoea in children: randomised clinical trial of five different preparations. *BMJ*. 2007;335(7615):340. doi:10.1136/bmj.39272.581736.55

46) Schnadower D, Tarr PI, Casper TC, et al. Lactobacillus rhamnosus GG versus Placebo for Acute Gastroenteritis in Children. *N Engl J Med*. 2018;379(21):2002-2014. doi:10.1056/NEJMoa1802598

47) Freedman SB, Williamson-Urquhart S, Farion KJ, et al. Multicenter Trial of a Combination Probiotic for Children with Gastroenteritis. *N Engl J Med*. 2018;379(21):2015-2026. doi:10.1056/NEJMoa1802597

48) Florez ID, Veroniki AA, Al Khalifah R, et al. Comparative effectiveness and safety of interventions for acute diarrhea and gastroenteritis in children: A systematic review and network meta-analysis. *PLoS One*. 2018;13(12):e0207701. Published 2018 Dec 5. doi:10.1371/journal.pone.0207701

49) Miller KE, Muth ER. Efficacy of acupressure and acustimulation bands for the prevention of motion sickness. *Aviat Space Environ Med*. 2004;75(3):227-234.

50) Dupuis LL, Nathan PC. Options for the prevention and management of acute chemotherapy-induced nausea and vomiting in children. *Paediatr Drugs*. 2003;5(9):597-613. doi:10.2165/00148581-200305090-00003

42

References continued

51) Kiberd MB, Clarke SK, Chorney J, d'Eon B, Wright S. Aromatherapy for the treatment of PONV in children: a pilot RCT. *BMC Complement Altern Med*. 2016;16(1):450. Published 2016 Nov 9. doi:10.1186/s12906-016-1441-1

52) Gore SM, Fontaine O, Pierce NF. Impact of rice based oral rehydration solution on stool output and duration of diarrhoea: meta-analysis of 13 clinical trials. *BMJ*. 1992;304(6822):287-291. doi:10.1136/bmj.304.6822.287

53) Greenough WB 3rd. Rice based oral rehydration solutions. *BMJ*. 1992;304(6832):982. doi:10.1136/bmj.304.6832.982-a

54) Islam A, Molla AM, Ahmed MA, et al. Is rice based oral rehydration therapy effective in young infants?. *Arch Dis Child*. 1994;71(1):19-23. doi:10.1136/adc.71.1.19

55) McCall JE, Stubbs K, Saylors S, et al. The search for cost-effective prevention of postoperative nausea and vomiting in the child undergoing reconstructive burn surgery: ondansetron versus dimenhydrinate. *J Burn Care Rehabil*. 1999;20(4):309-315. doi:10.1097/00004630-199907000-00007

56) Cheung BS, Heskin R, Hofer KD. Failure of cetirizine and fexofenadine to prevent motion sickness. *Ann Pharmacother*. 2003;37(2):173–177.

43