

# Evidence for the survey

## 1. How commonly are acid blockers or motility agents used for the treatment of gastroesophageal reflux in infants (in your working environment)?

Rosen R, Vandenplas Y, Singendonk M, Cabana M, DiLorenzo C, Gottrand F, et al. Pediatric gastroesophageal reflux clinical practice guidelines: Joint recommendations of the North American Society for Pediatric Gastroenterology, Hepatology, and Nutrition (NASPGHAN) and the European Society for Pediatric Gastroenterology, Hepatology, and Nutrition (ESPGHAN). *J Pediatr Gastroenterol Nutr* 2018; 66(3): 516-554.

Tighe M, Afzal NA, Bevan A, Hayen A, Munro A, Beattie RM, et al. Pharmacological treatment of children with gastro-oesophageal reflux. *Cochrane Database Syst Rev* 2014;(11): CD008550.

De Bruyne P, Ito S. Toxicity of long-term use of proton pump inhibitors in children. *Arch Dis Child* 2018; 103(1):78-82.

Poddar U. Gastroesophageal reflux disease (GERD) in children. *Paediatr Int Child Health* 2019; 39(1):7-12.

Rybak A, Pesce M, Thapar N, Borrelli O. Gastro-esophageal reflux in children. *Int J Mol Sci* 2017; 18(8):1671.

Mousa H, Hassan M. Gastroesophageal reflux disease. *Pediatr Clin North Am* 2017; 64(3): 487-505.

Levy EI, Salvatore S, Vandenplas Y, de Winter JP. Prescription of acid inhibitors in infants: an addiction hard to break. *Eur J Pediatr* 2020;179(12):1957–1961.

## 2. How commonly are cough and cold medicines prescribed, recommended or used for respiratory illnesses in young children?

Smith SM, Schroeder K, Fahey T. Over-the-counter (OTC) medications for acute cough in children and adults in community settings. *Cochrane Database Syst Rev* 2014(11): CD001831.

Gardiner SJ, Chang AB, Marchant JM, Petsky HL. Codeine versus placebo for chronic cough in children. *Cochrane Database Syst Rev* 2016;7(7):CD011914.

Noor A, Fiorito T, Krilov LR. Cold weather viruses. *Pediatr Rev* 2019; 40(10): 497-507.

Schaeffer MK, Shehab N, Cohen AL, Budnitz DS. Adverse events from cough and cold medication in children. *Pediatrics* 2008;121(4):783–787.

## 3. How common is routine treatment of acute otitis media (OMA) with antibiotics in children (>6m of age)?

Suzuki HG, Dewez JE, Nijman RG, Yeung S. Clinical practice guidelines for acute otitis media in children: a systematic review and appraisal of European national guidelines. *BMJ Open* 2020; 10(5): e035343.

Pelton SI. Otoscopy for the diagnosis of otitis media. *Pediatr Infect Dis J* 1998;17(6):540-543; discussion 580.

PIGS Empfehlung zur Diagnose und Behandlung von Otitis media, Sinusitis, Pharyngitis und Pneumonie. 2010. [www.pigs.ch](http://www.pigs.ch) (access 09.02.2021).

Venekamp RP, Sanders SL, Glasziou PP, Del Mar CB, Rovers MM. Antibiotics for acute otitis media in children. *Cochrane Database Syst Rev* 2015(6):CD000219.  
Lieberthal AS, Carroll AE, Chonmaitree T, Ganiats TG, Hoberman A, Jackson MA, et al. The diagnosis and management of acute otitis media. *Pediatrics* 2013;131(3):e964-999.

#### **4. How common is it to routinely use steroids or bronchodilators in infants with bronchiolitis?**

Barben J, Regamey N, Hammer J. Akute Bronchiolitis - ein Update. *Swiss Med Forum* 2020;20(09-10):155-159.  
Cai Z, Lin Y, Liang J. Efficacy of salbutamol in the treatment of infants with bronchiolitis: A meta-analysis of 13 studies. *Medicine (Baltimore)* 2020;99(4):e18657.  
Gadomski AM, Scribani MB. Bronchodilators for bronchiolitis. *Cochrane Database Syst Rev* 2014(6):CD001266.  
Hartling L, Fernandes RM, Bialy L, Milne A, Johnson D, Plint A, et al. Steroids and bronchodilators for acute bronchiolitis in the first two years of life: systematic review and meta-analysis. *BMJ* 2011;342:d1714.  
Fernandes RM, Bialy LM, Vandermeer B, Tjosvold L, Plint AC, Patel H, et al. Glucocorticoids for acute viral bronchiolitis in infants and young children. *Cochrane Database Syst Rev* 2013(6):CD004878.

#### **5. How common are routine chest-X-rays (ordered/undertaken) for the diagnosis of bronchiolitis in children?**

Beigelman A, King TS, Mauger D, et al. Do oral corticosteroids reduce the severity of acute lower respiratory tract illnesses in preschool children with recurrent wheezing? *Journal of Allergy and Clinical Immunology* 2013; 131(6):1518-25.  
Bordley WC, Viswanathan M, King VJ, et al. Diagnosis and testing in bronchiolitis: a systematic review. *Archives of Pediatric Adolescent Medicine*. 2004; 158(2):119-26.  
Cao AY, Choy JP, Mohanakrishnan L, et al. Chest radiographs for acute lower respiratory tract infections. *Cochrane Database of Systematic Reviews* 2013; 12: CD009119.  
Fernandes RM, Bialy LM, Vandermeer B, et al. Glucocorticoids for acute viral bronchiolitis in infants and young children. *Cochrane Database of Systematic Reviews* 2013; 6:CD004878.  
Gadomski AM, Scribani MB. Bronchodilators for bronchiolitis. *Cochrane Database of Systematic Reviews* 2014; 6:CD001266.  
Hartling L, Fernandes RM, Bialy L, et al. Steroids and bronchodilators for acute bronchiolitis in the first two years of life: systematic review and meta-analysis. *British Medical Journal* 2011; 342:d171.  
Modaressi MR, Asadian A, Faghihinia J, et al. Comparison of epinephrine to salbutamol in acute bronchiolitis. *Iranian Journal of Pediatrics* 2012; 22(2):241-4.  
Schuh S, Lalani A, Allen U, et al. Evaluation of the utility of radiography in acute bronchiolitis. *Journal of Pediatrics* 2007; 150(4):429-33.  
Yong JH, Schuh S, Rashidi R et al. A cost effectiveness analysis of omitting radiography in diagnosis of acute bronchiolitis. *Pediatric Pulmonology* 2009; 44(2):122-7.

**6. How common is it to routinely use antibiotics in newborns (more than 36-48 hours of age) when bacterial infection is unlikely?**

Kuppala VS et al. Prolonged Initial Empirical Antibiotic Treatment is Associated with Adverse Outcome in Premature Infants. *J Pediatr* 2011; 159: 720-725.

Cotten CM et al. Prolonged Duration of Initial Empirical Antibiotic Treatment Is Associated With Increased Rates of Necrotizing Enterocolitis and Death for Extremely Low Birth Weight Infants. *Pediatrics* 2009; 123:58-66.

Cotten CM. Adverse Consequences of Neonatal Antibiotic Exposure. *urr Opin Pediatr* 2016; 28: 141-149.

rboleya S et al. Intestinal Microbiota Development in Preterm Neonates and Effect on Perinatal Antibiotics. *J Pediatr* 2015; 166: 538-44.

Esaiassen E et al. Antibiotic exposure in neonates and early adverse outcomes: a systematic review and meta-analysis. *J Antimicrob Chemother* 2017; 72: 1858-70.

**7. How commonly are blood exams prescribed/ordered in children with acute pharyngitis?**

Chiappini E et al. Management of acute pharyngitis in children: summary of the Italian National Institute of Health guidelines. *Clin Ther*. 2012;34:1442-58.

Choby BA. Diagnosis and treatment of streptococcal pharyngitis. *Am Fam Physician*. 2009;79:383-90.

**8. How commonly are urine samples taken/collected from children > 2 months of age with symptoms and signs of respiratory infection, (except when the child is septic, predisposed to urinary tract infection or has additional specific urinary tract symptoms)?**

Ralston S, Hill V, Waters A. Occult Serious Bacterial Infection in Infants Younger Than 60 to 90 Days With Bronchiolitis: A Systematic Review. *Arch Pediatr Adolesc Med*. 2011; 165(10):951-6.

Society CP. Urinary tract infection in infants and children: [Diagnosis and management Canadian Paediatric Society](#)

[Norsk Barnelegeforening. Urinveisinfeksjon. Akuttveileder i pediatri.](#)

Infants and children with an alternative site of infection should not have a urine sample tested. NICE guidelines. <https://www.nice.org.uk/donotdo/infants-and-children-with-an-alternative-site-of-infection-should-not-have-a-urine-sample-tested>

Al-Orifi F, McGillivray D, Tange S, Kramer MS. Urine culture from bag specimens in young children: Are the risks too high? *J Pediatr*. 2000; 137(2):221-6.

Tosif S, Baker A, Oakley E, et al. Contamination rates of different urine collection methods for the diagnosis of urinary tract infections in young children: An observational cohort study. *J Paediatr Child Health*. 2012; 48(8): 659-64.

**9. How commonly are IV fluids given to children with mild to moderate dehydration, before a trial of oral fluids?**

Colletti J, Brown KM, Sharieff GQ, Barata IA, Ishimine P. The management of children with gastroenteritis and dehydration in the emergency department. *J Emerg Med* 2010; 38(5): 686-698.

Lo Vecchio A, Dias JA, Berkley JA, Boey C, Cohen MB, Cruchet S, et al. Comparison of recommendations in clinical practice guidelines for acute gastroenteritis in children. *J Pediatr Gastroenterol Nutr* 2016; 63(2): 226-235.

Guarino A, Lo Vecchio A, Dias JA, Berkley JA, Boey C, Bruzzese D, et al. Universal recommendations for the management of acute diarrhea in nonmalnourished children. *J Pediatr Gastroenterol Nutr* 2018; 67(5): 586-593.

Guarino A, Ashkenazi S, Gendrel D, Lo Vecchio A, Shamir R, Szajewska H. ESPGHN/ESPID Evidence-based guidelines for the management of acute gastroenteritis in children in Europe: Update 2014. *J Pediatr Gastroenterol Nutr* 2014; 59(1): 132-152.

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.

**10. How commonly are screening panels (IgE tests) prescribed/recommended/performed for food allergies without previous consideration of the pertinent/relevant medical history?**

Bird JA, et al. Food allergen panel testing often results in misdiagnosis of food allergy. *J Pediatr*. 2015; 166: 97-100.

NIAID-Sponsored Expert Panel. Guidelines for the diagnosis and management of food allergy in the United States: report of the NIAID-sponsored expert panel. *J Allergy Clin Immunol* 2010; 126: S1-58.

Noimark, L. et al. Nutritional problems related to food allergy in childhood. *Pediatric Allergy and Immunology*, 2008; 19:188–195.

Alvares, M. et al. Misdiagnosed food allergy resulting in severe malnutrition in an infant. *Pediatrics* 2013; 132: e229–e232.

**11. How common is it to order routine chest-X-rays for the diagnosis of asthma in children?**

Hederos C-A, Janson S, Andersson H, et al. Chest x-ray investigation in newly discovered asthma. *Pediatric Allergy and Immunology* 2004; 15(2): 163–165.

Muthukrishnan L, Raman R. Analysis of clinical & radiological findings in children with acute wheeze. *Pulmonary and Respiratory Research* 2013; 1:1

Narayanan S, Magruder T, Walley SC, et al. Relevance of chest radiography in pediatric inpatients with asthma. *Journal of Asthma* 2014; 51(7):751-5.

## **12. How commonly is asthma diagnosed without performing spirometry?**

National Asthma Education and Prevention Expert Panel Report 3: Guidelines for the diagnosis and Management of Asthma. NIH Publication Number 08–5846 October 2007.

Li J, Oppenheimer J, Bernstein IL et al. Attaining asthma control. A practice parameter. *J Allergy Clin Immunol*. 2005;115:S3–11.

Global strategy for asthma management and prevention: GINA executive summary *Eur Respir J* 2008 31:143–178.

Fuhlbrigge A, Kitch B, Paltielet D et. al. FEV1 is associated with risk of asthma attacks in a pediatric population. *J Allergy Clin Immunol*. 2001;107:61–6.

Magadle R The Risk of Hospitalization and Near-Fatal and Fatal Asthma in Relation to the Perception of Dyspnea *Chest*. 2002;121:329–333.

## **13. How commonly are routine electroencephalogram or studies of neuroimaging (CT, MRI) performed in children with simple febrile convulsion?**

Subcommittee on Febrile Seizures. Febrile Seizures: Guideline for the Neurodiagnostic Evaluation of the Child With a Simple Febrile Seizure. *Pediatrics* **127**, 389–394 (2011).

Shah, S. S. *et al.* Low risk of bacteremia in children with febrile seizures. *Arch Pediatr Adolesc Med* **156**, 469–472 (2002).

Patterson, J. L., Carapetian, S. A., Hageman, J. R. & Kelley, K. R. Febrile seizures. *Pediatr Ann* **42**, 249–254 (2013).

## **14. How common is it to routinely check vitamin D level in healthy children?**

Essig et al. *BMC Health Services Research* (2020) 20:1097

<https://doi.org/10.1186/s12913-020-05956-2>

Munns CF, Shaw N, Kiely M, Specker BL, Thacher TD, et al. Global Consensus

Recommendation on Prevention and Management of Nutritional Rickets. *J Clin Endocrinol Metab*. 2016 Feb;101(2):394-415. Co-Published in *Horm Res Paediatr*. 2016;85(2):83-106.

LeBlanc E, Chou R, Zakher B, et al. Screening for Vitamin D Deficiency: Systematic Review for the U.S. Preventive Services Task Force Recommendation [Internet]. Rockville (MD): Agency for Healthcare Research and Quality (US); 2014 Nov. (Evidence Syntheses, No. 119.)

Grossmann et al. Vitamin D in European children—statement from the European Academy of Paediatrics (EAP)

*Eur J Pediatr* DOI 10.1007/s00431-017-2903-2

## **15. How commonly are IV antibiotics prescribed for a predetermined time duration for patients hospitalized with infections such as pyelonephritis, osteomyelitis, and complicated pneumonia without considering early transition to oral antibiotics?**

Keren R, et al.; Pediatric Research in Inpatient Settings Network. Comparative effectiveness of intravenous vs oral antibiotics for post-discharge treatment of acute osteomyelitis in children. *JAMA Pediatr*. 2015;169(2):120-8.

• Subcommittee on Urinary Tract Infection, Steering Committee on Quality Improvement

and Management, Roberts KB. Urinary tract infection: clinical practice guideline for the diagnosis and management of the initial UTI in febrile infants and children 2 to 24 months. *Pediatrics*. 2011;128(3):595-610.

- Shah SS, et al.; Pediatric Research in Inpatient Settings Network. Intravenous versus oral antibiotics for post-discharge treatment of complicated pneumonia. *Pediatrics*. 2016;138(6): e20161692.
- Schroeder AR, et al. Intravenous antibiotic durations for common bacterial infections in children: when is enough enough? *J Hosp Med*. 2014;9(9):604-609.

**16. How commonly is hospitalization continued in well-appearing febrile infants once the results of bacterial cultures (ie, blood, cerebrospinal, and/or urine) have been confirmed to be negative for 24–36 hours), and adequate outpatient follow-up can be ensured/provided?**

Vachani JG, et al. Current evidence on the evaluation and management of fever without a source in infants aged 0-90 days: a review. *Rev Recent Clin Trials*. 2017;12(4):240-245.

- Biondi EA, et al.; Pediatric Research in Inpatient Settings (PRIS) Network. Blood culture time to positivity in febrile infants with bacteremia. *JAMA Pediatr*. 2014;168(9):844-849.
- Fielding-Singh V, et al. Ruling out bacteremia and bacterial meningitis in infants less than one month of age: is 48 hours of hospitalization necessary? *Hosp Pediatr*. 2013;3(4):355-361.
- Greenhow TL, et al. Changing epidemiology of bacteremia in infants aged 1 week to 3 months. *Pediatrics*. 2012;129(3):e590-596.
- Mahajan P, et al.; Febrile Infant Working Group of the Pediatric Emergency Care Applied Research Network (PECARN). Risk of bacterial coinfections in febrile infants 60 days old and younger with documented viral infections. *J Pediatr*. 2018;203:86-91.e2.
- Lefebvre CE, et al. Time to positivity of blood cultures in infants 0 to 90 days old presenting to the emergency department: is 36 hours enough? *J Pediatric Infect Dis Soc*. 2017;6(1):28-32.

**17. How commonly is phototherapy initiated in term or late preterm well-appearing infants with neonatal hyperbilirubinemia if their bilirubin levels are below the level at which the AAP guidelines would recommend treatment?**

American Academy of Pediatrics Subcommittee on Hyperbilirubinemia. Management of hyperbilirubinemia in the newborn infant 35 or more weeks of gestation [published correction appears in *Pediatrics*. 2004 Oct;114(4):1138]. *Pediatrics*. 2004;114(1):297-316. doi:10.1542/peds.114.1.297

Wu YW, Kuzniewicz MW, Wickremasinghe AC, et al. Risk for cerebral palsy in infants with total serum bilirubin levels at or above the exchange transfusion threshold: a population-based study. *JAMA Pediatr*. 2015;169(3):239-46. doi: 10.1001/jamapediatrics.2014.303

Newman TB, Liljestrand P, Jeremy RJ, et al. Outcomes among Newborns with Total Serum Bilirubin Levels of 25 mg per Deciliter or More. *NEJM*. 2006;354(18):1889-1900.

Newman TB, Kuzniewicz MW, Liljestrand P, et al. Numbers Needed to Treat With Phototherapy According to American Academy of Pediatrics Guidelines. *Pediatrics* 2009;123:1352–1359

Kuzniewicz MW, Wickremasinghe AC, Wu YW, et al. Incidence, Etiology, and Outcomes of

Hazardous Hyperbilirubinemia in Newborns. *Pediatrics* 2014;134:504.

Kuzniewicz MW, Escobar G, Newman TB. Impact of Universal Bilirubin Screening on Severe Hyperbilirubinemia and Phototherapy Use. *Pediatrics* 2009;124:1031–1039. DOI: <https://doi.org/10.1542/peds.2008-2980>

Wickremasinghe AC, Kuzniewicz MW, Grimes BA, McCulloch CE, Newman TB. Neonatal Phototherapy and Infantile Cancer. *Pediatrics*. 2016;137(6):e20151353. doi:10.1542/peds.2015-1353

**18. How commonly are broad-spectrum antibiotics, such as ceftriaxone, used for children hospitalized with uncomplicated community acquired pneumonia (CAP) instead of using narrow-spectrum antibiotics, such as penicillin, ampicillin, or amoxicillin?**

Bradley JS, et al.; Pediatric Infectious Diseases Society and the Infectious Diseases Society of America. The management of community-acquired pneumonia in infants and children older than 3 months of age: clinical practice guidelines by the Pediatric Infectious Diseases Society and the Infectious Diseases Society of America. *Clin Infect Dis*. 2011;53(7):e25-76.

- Williams DJ, et al. Narrow vs broad-spectrum antimicrobial therapy for children hospitalized with pneumonia. *Pediatrics*. 2013;132(5):e1141-1148.
- Queen MA, et al. Comparative effectiveness of empiric antibiotics for community-acquired pneumonia. *Pediatrics*. 2014;133(1):e23-29.
- Thomson J, et al. Hospital outcomes associated with guideline-recommended antibiotic therapy for pediatric pneumonia. *J Hosp Med*. 2015;10(1):13-18.

**19. How common is it to start IV antibiotic therapy on well-appearing newborn infants with isolated risk factors for sepsis (such as maternal chorioamnionitis, prolonged rupture of membranes, or untreated group B streptococcal colonization) instead of using clinical tools (such as an evidence-based sepsis-risk calculator) to guide management?**

Puopolo KM, et al.; Committee on Fetus and Newborn; Committee on Infectious Diseases. Management of neonates born at  $\geq 35$  0/7 weeks' gestation with suspected or proven early-onset bacterial sepsis. *Pediatrics*. 2018;142(6):e20182894.

- Leonardi BM, et al. Utilization of a neonatal early-onset sepsis calculator to guide initial newborn management. *Pediatr Qual Saf*. 2019;4(5):e214.
- Goel N, et al. Screening for early onset neonatal sepsis: NICE guidance-based practice versus projected application of the Kaiser Permanente sepsis risk calculator in the UK population. *Arch Dis Child Fetal Neonatal Ed*. 2020;105(2):118-122.
- Kaiser Permanente Research. Neonatal Early-Onset Sepsis Calculator. <https://neonatalespsiscalculator.kaiserpermanente.org/>