

Aktualne wytyczne leczenia choroby refluksowej przełyku u dzieci

Jarosław Kwiecień

Katedra i Klinika Pediatrii w Zabrze

Śląski Uniwersytet Medyczny w Katowicach

Aktualne wytyczne ESPGHAN - 2018

SOCIETY PAPER

Pediatric Gastroesophageal Reflux Clinical Practice Guidelines: Joint Recommendations of the North American Society for Pediatric Gastroenterology, Hepatology, and Nutrition and the European Society for Pediatric Gastroenterology, Hepatology, and Nutrition

**^aRachel Rosen, ^{†a}Yvan Vandenplas, [‡]Maartje Singendonk, [§]Michael Cabana,
^{||}Carlo DiLorenzo, [¶]Frederic Gottrand, [#]Sandeep Gupta, ^{**}Miranda Langendam,
^{††}Annamaria Staiano, ^{‡‡}Nikhil Thapar, ^{§§}Neelesh Tipnis, and [‡]Merit Tabbers*

(JPGN 2018;66: 516–554)

GERD u dzieci – brytyjskie wytyczne NICE (2015)

GUIDELINES

Gastro-oesophageal reflux disease in children: NICE guidance

leuan Davies *consultant paediatric gastroenterologist*¹, Shona Burman-Roy *senior research fellow and guideline lead*², M Stephen Murphy *clinical director, children's health*², on behalf of the Guideline Development Group

¹Department of Paediatric Gastroenterology, University Hospital of Wales, Cardiff CF14 4XW, UK; ²National Collaborating Centre for Women's and Children's Health, Royal College of Obstetricians and Gynaecologists, London NW1 4RG, UK

BMJ 2014;350:g7703 doi: 10.1136/bmj.g7703 (Published 14 January 2015)

Leczenie farmakologiczne GERD – przegląd Cochrane: 2023



Cochrane
Library

Cochrane Database of Systematic Reviews

Pharmacological treatment of gastro-oesophageal reflux in children (Review)

Tighe MP, Andrews E, Liddicoat I, Afzal NA, Hayen A, Beattie RM

Tighe MP, Andrews E, Liddicoat I, Afzal NA, Hayen A, Beattie RM.
Pharmacological treatment of gastro-oesophageal reflux in children.
Cochrane Database of Systematic Reviews 2023, Issue 8. Art. No.: CD008550.
DOI: [10.1002/14651858.CD008550.pub3](https://doi.org/10.1002/14651858.CD008550.pub3).

GERD związany z alergią pokarmową u dzieci – stanowisko EAACI 2022







Received: 11 July 2022 | Revised: 26 August 2022 | Accepted: 6 September 2022

DOI: 10.1111/pai.13856

POSITION PAPER

WILEY

Diagnosis and management of food allergy-associated gastroesophageal reflux disease in young children—EAACI position paper

Rosan Meyer^{1,2,3}  | Yvan Vandenplas⁴  | Adriana Chebar Lozinsky⁵ | Mario C. Vieira⁶ | Roberto Berni Canani⁷ | Christophe Dupont⁸  | Pinar Uysal⁹  | Ozlem Cavkaytar¹⁰  | Rebecca Knibb¹¹ | David M. Fleischer¹² | Anna Nowak-Wegrzyn^{13,14} | Carina Venter¹⁵ 

Pediatr Allergy Immunol. 2022;33:e13856.
<https://doi.org/10.1111/pai.13856>

GERD u dzieci z otyłością – wytyczne ESPEN 2023

Clinical Nutrition 42 (2023) 987–1024

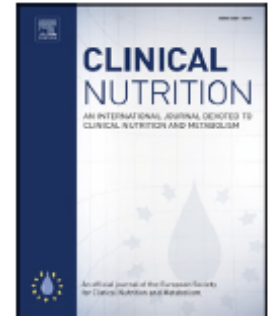


ELSEVIER

Contents lists available at [ScienceDirect](#)

Clinical Nutrition

journal homepage: <http://www.elsevier.com/locate/clnu>



ESPEN Guideline

Practical guideline on obesity care in patients with gastrointestinal and liver diseases – Joint ESPEN/UEG guideline



Stephan C. Bischoff ^{a, *}, Johann Ockenga ^b, Ahad Eshraghian ^c, Rocco Barazzoni ^d, Luca Busetto ^e, Marjo Campmans-Kuijpers ^f, Vincenzo Cardinale ^g, Irit Chermesh ^h, Haluk Tarik Kani ⁱ, Wafaa Khannoussi ^j, Laurence Lacaze ^k, Miguel León-Sanz ^l, Juan M. Mendive ^m, Michael W. Müller ⁿ, Frank Tacke ^o, Anders Thorell ^p, Darija Vranesic Bender ^q, Arved Weimann ^r, Cristina Cuerda ^s

GERD – wytyczne leczenia chirurgicznego (2021)

Surgical Endoscopy (2021) 35:4903–4917
<https://doi.org/10.1007/s00464-021-08625-5>



SAGES GUIDELINES



SAGES guidelines for the surgical treatment of gastroesophageal reflux (GERD)

Bethany J. Slater¹ · Rebecca C. Dirks² · Sophia K. McKinley³ · Mohammed T. Ansari⁴ · Geoffrey P. Kohn^{5,6} · Nirav Thosani⁷ · Bashar Qumseya⁸ · Sarah Billmeier⁹ · Shaun Daly¹⁰ · Catherine Crawford¹¹ · Anne P. Ehlers¹² · Celeste Hollands¹³ · Francesco Palazzo¹⁴ · Noe Rodriguez¹⁵ · Arianne Train¹⁶ · Eelco Wassenaar¹⁷ · Danielle Walsh¹⁸ · Aurora D. Pryor¹⁹ · Dimitrios Stefanidis²

Received: 17 May 2021 / Accepted: 28 June 2021 / Published online: 19 July 2021

© The Author(s), under exclusive licence to Springer Science+Business Media, LLC, part of Springer Nature 2021

GERD a kaszel u dzieci – wytyczne CHEST (2019)

[Evidence-Based Medicine]



Chronic Cough and Gastroesophageal Reflux in Children

CHEST Guideline and Expert Panel Report



*Anne B. Chang, MBBS, PhD, MPH; John J. Oppenheimer, MD; Peter J. Kahrilas, MD; Ahmad Kantar, MD; Bruce K. Rubin, MD; Miles Weinberger, MD, FCCP; and Richard S. Irwin, MD, Master FCCP; on behalf of the CHEST Expert Cough Panel**

CHEST 2019; 156(1):131-140

GERD – powikłania związane ze stosowaniem PPI (2023)

JAMA Pediatrics | [Original Investigation](#)

Proton Pump Inhibitor Use and Risk of Serious Infections in Young Children

Marion Lassalle, PharmD, PhD; Mahmoud Zureik, MD, PhD; Rosemary Dray-Spira, MD, PhD

JAMA Pediatr. 2023;177(10):1028-1038. doi:[10.1001/jamapediatrics.2023.2900](https://doi.org/10.1001/jamapediatrics.2023.2900)
Published online August 14, 2023.

Aktualne wytyczne ESPGHAN (2018)

- **Definicje:**

- GER (refluks żołądkowo-przełykowy): cofanie się treści żołądkowej do przełyku z regurgitacjami lub bez regurgitacji i/lub wymiotów

- GERD (choroba refluksowa przełyku): gdy GER powoduje kłopotliwe („troublesome”) objawy i/lub powikłania

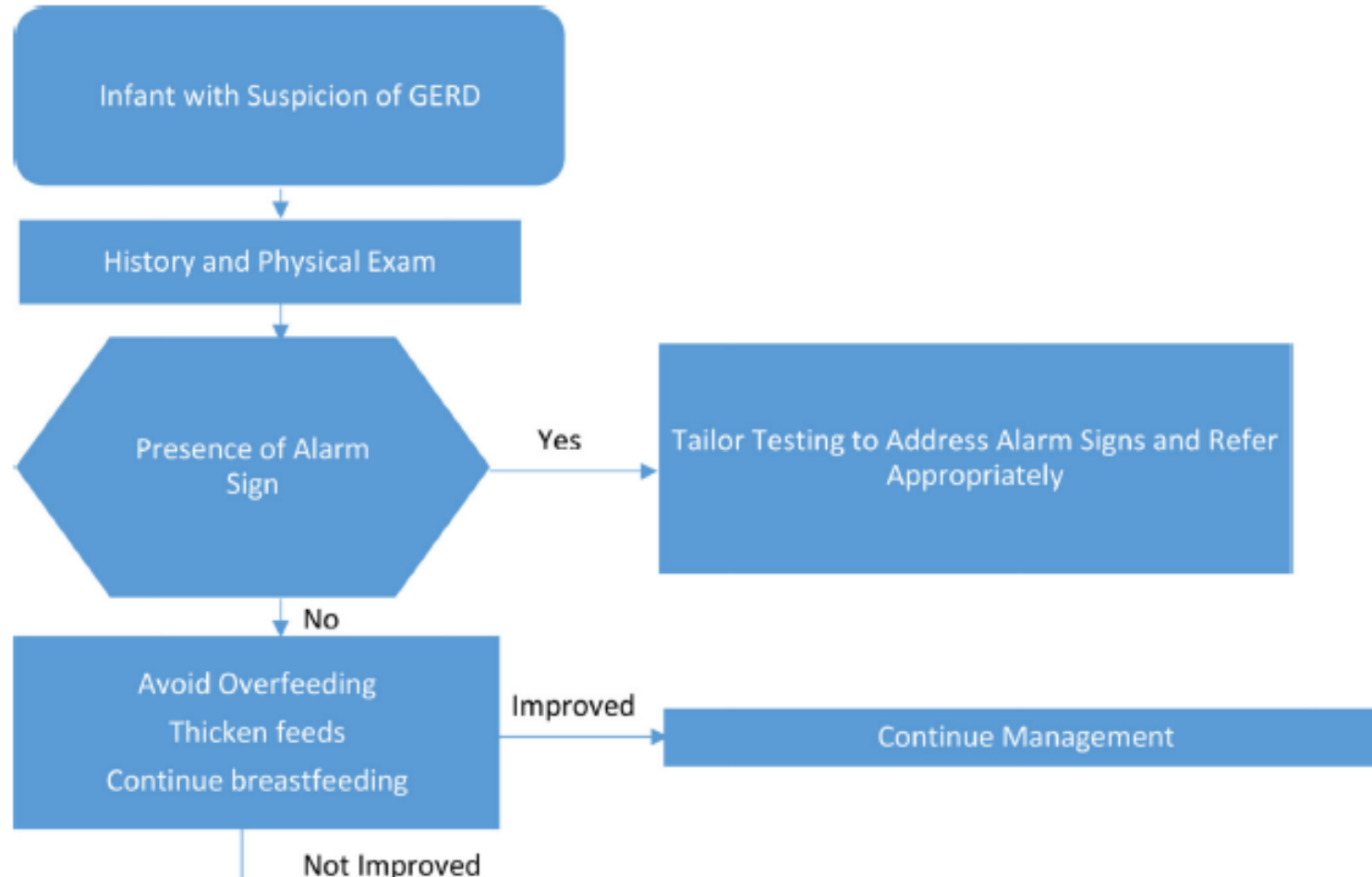
- **Patogeneza:** zależna od wieku, u młodszych dzieci przede wszystkim okres fizjologicznej niedojrzałości przewodu pokarmowego, u starszych objawy związane z TLESR (większość) lub dysfunkcją anatomiczną (mniejszość); możliwy wpływ diety (alergia pokarmowa) i czynników psychosomatycznych

- **Diagnostyka:** system czerwonych flag, ograniczanie inwazyjnych badań

Aktualne wytyczne ESPGHAN (2018) – podstawowe algorytmy postępowania - niemowlę

Rosen et al.

Page 77



(JPGN 2018;66: 516–554)

Aktualne wytyczne ESPGHAN (2018) – podstawowe algorytmy postępowania - niemowlę

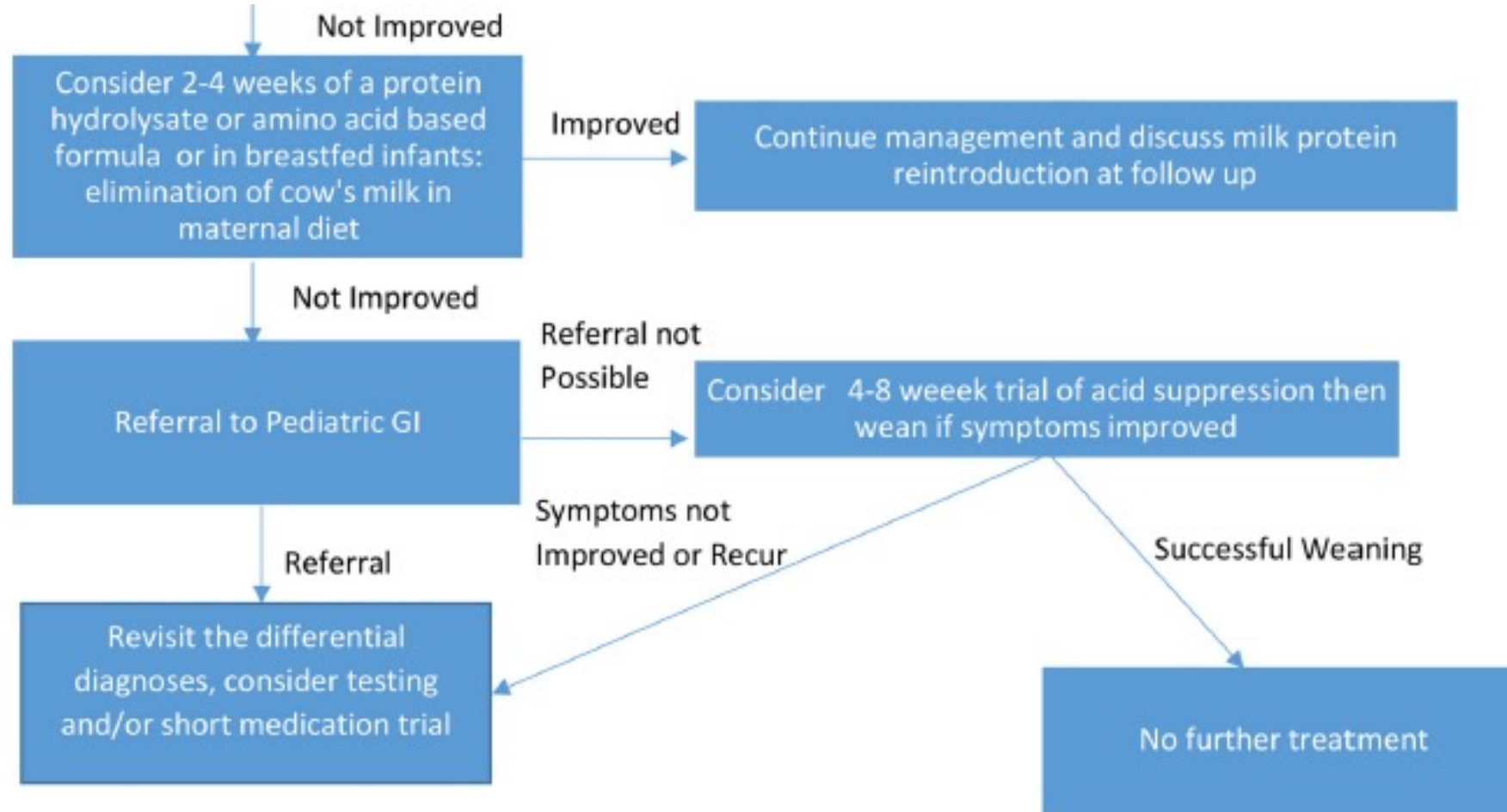
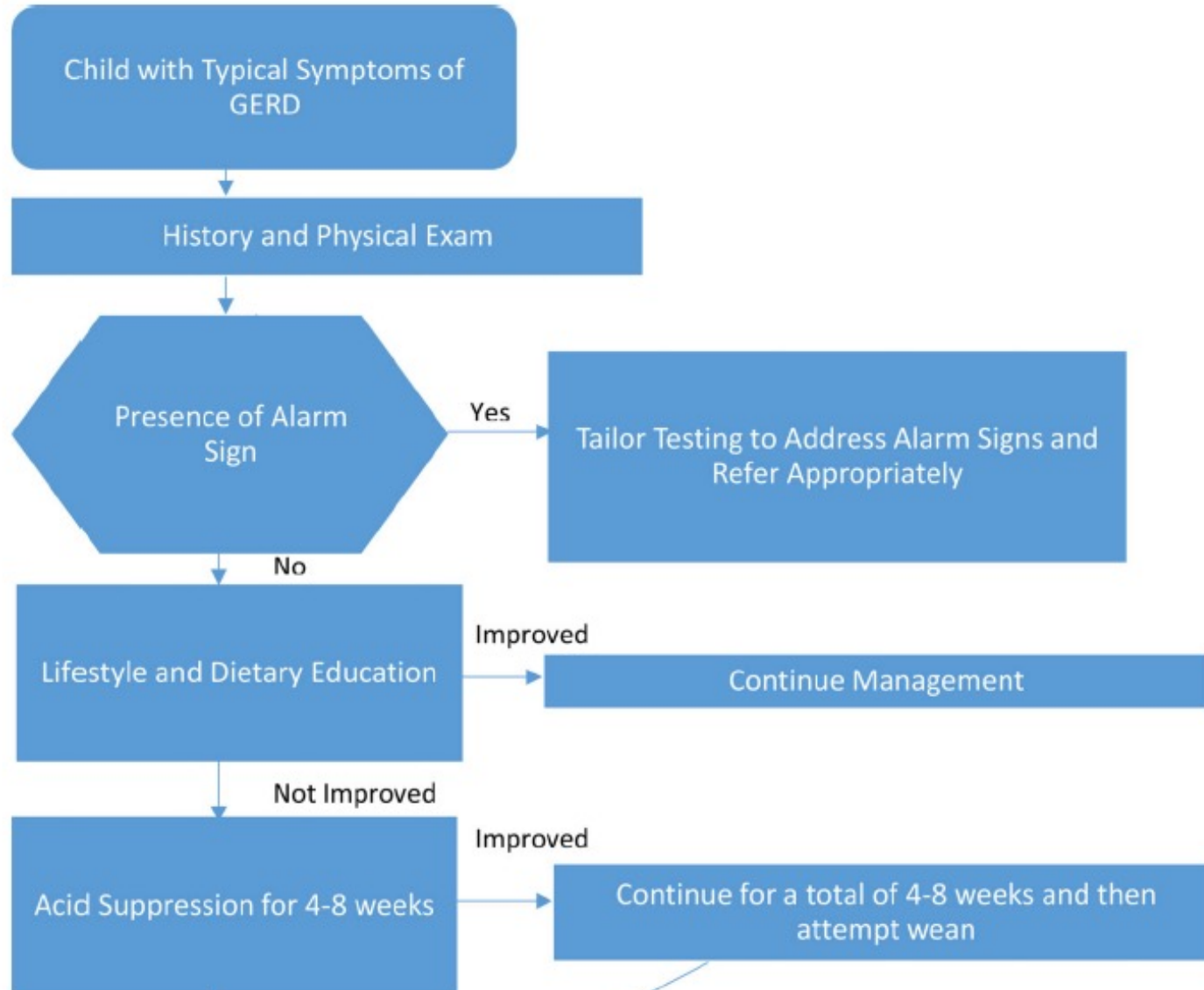
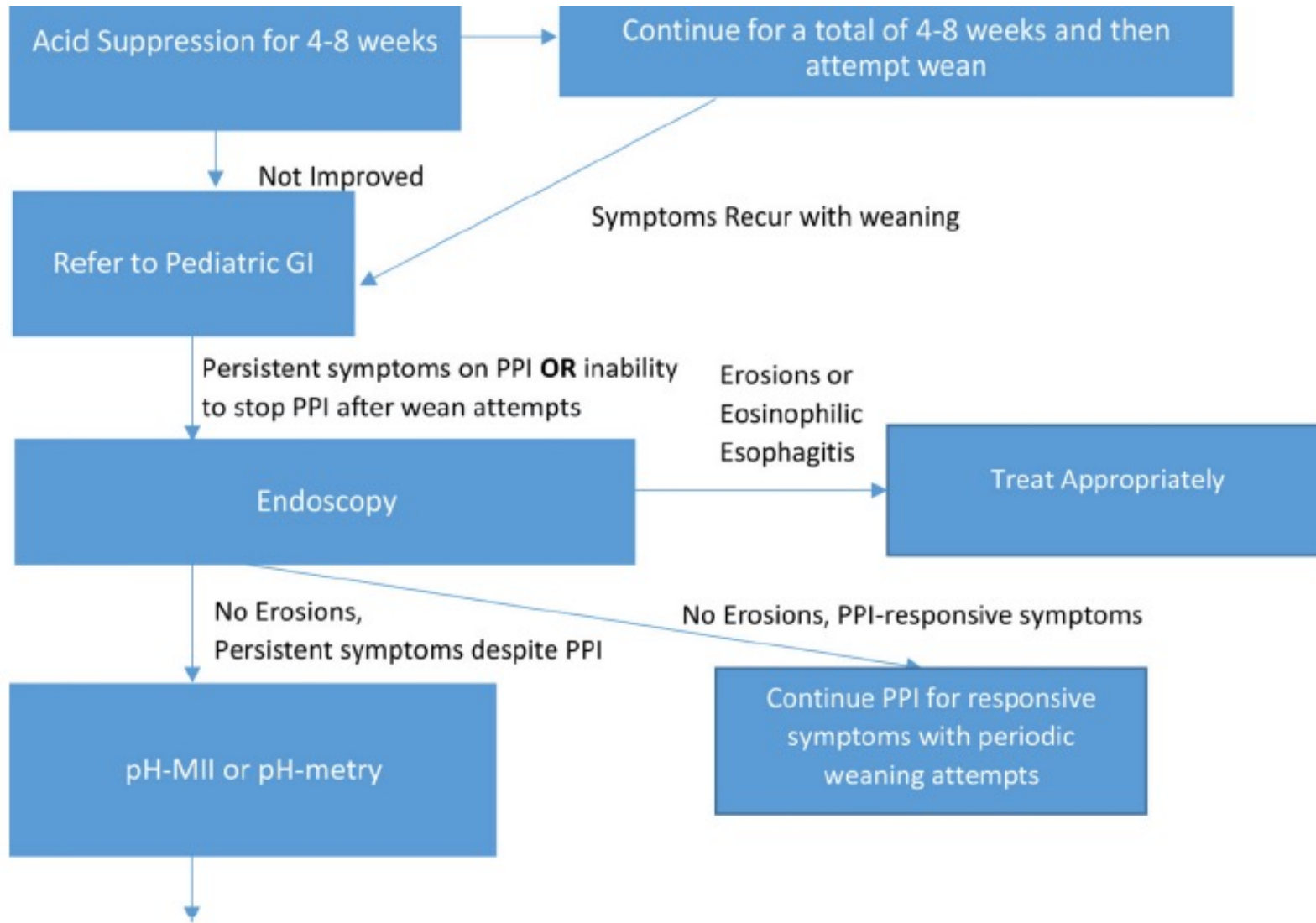


Figure 6.

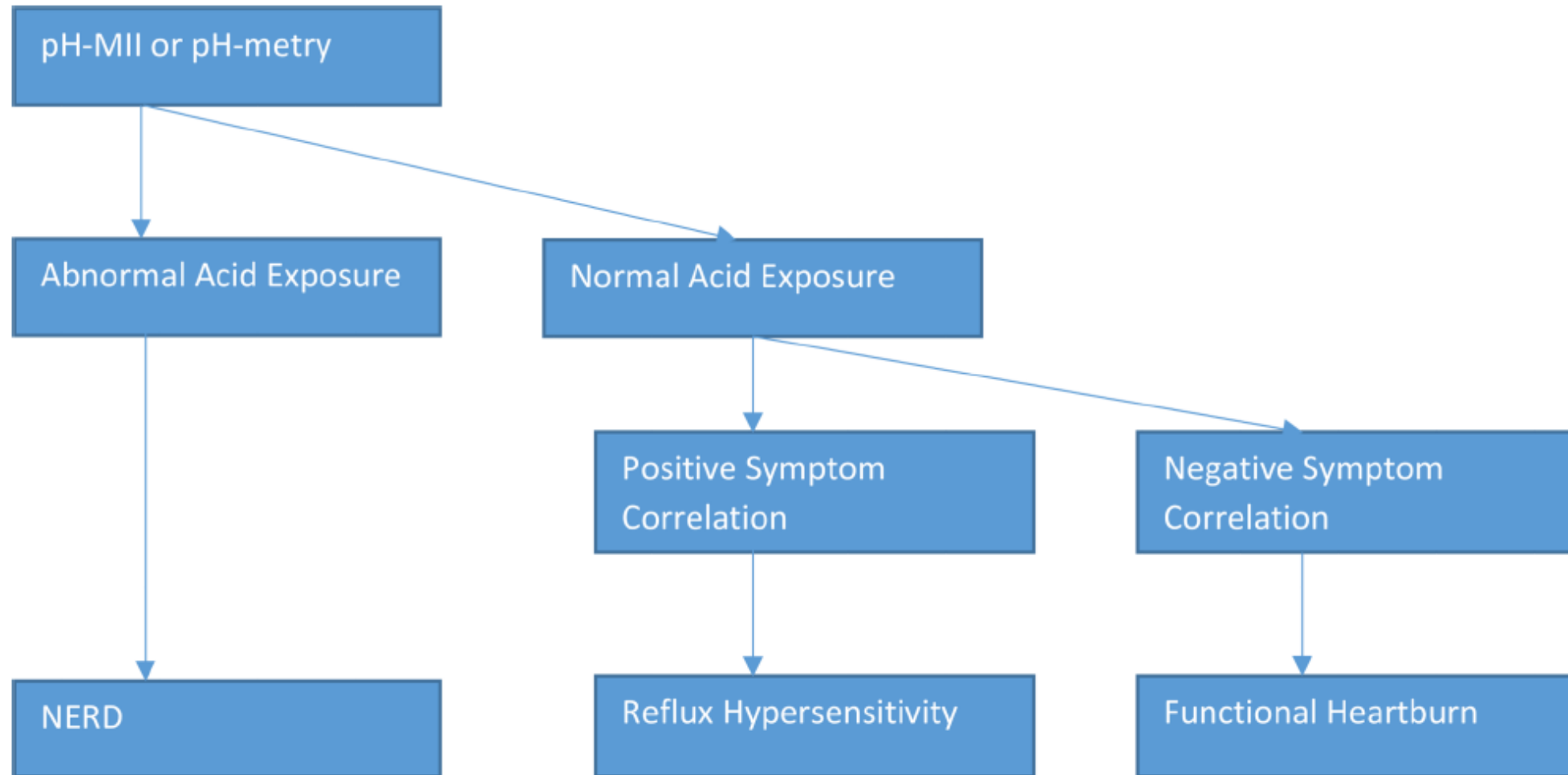
Aktualne wytyczne ESPGHAN (2018) – podstawowe algorytmy postępowania – dzieci starsze



Aktualne wytyczne ESPGHAN (2018) – podstawowe algorytmy postępowania – dzieci starsze



Aktualne wytyczne ESPGHAN (2018) – podstawowe algorytmy postępowania – dzieci starsze



Aktualne wytyczne ESPGHAN (2018) – podstawowe algorytmy postępowania – diagnostyka

- RTG górnego odcinka przewodu pokarmowego – **NIE**, za wyjątkiem...
- USG połączenia żołądkowo-przełykowego – **NIE**
- Scyntygrafia przełyku i żołądka – **NIE**
- Manometria przełyku – **NIE**, za wyjątkiem...
- Pepsyna w ślinie, „Lipid-ladden macrophages index” (BAL), Bilitec – **NIE**
- PPI test – **NIE rutynowo u niemowląt i małych dzieci, TAK - u starszych**
- pH-metria, pH-impedancja – **TAK, ale w określonych wskazaniach**
- Gastroskopia – **TAK, ale w określonych wskazaniach**

Aktualne wytyczne ESPGHAN (2018) – podstawowe algorytmy postępowania – diagnostyka pH-metria

3.17 Recommendations:

Based on expert opinion, the working group suggests to consider to use pH-MII testing only to:

1. Correlate persistent troublesome symptoms with acid and non-acid gastroesophageal reflux events
Voting: 6, 7, 7, 7, 8, 8, 8, 9, 9. (strong recommendation)
2. Clarify the role of acid and non-acid reflux in the etiology of esophagitis and other signs and symptoms suggestive for GERD.
Voting: 6, 7, 7, 7, 8, 8, 8, 9, 9. (weak recommendation)
3. Determine the efficacy of acid suppression therapy.
Voting: 6, 6, 7, 7, 7, 9, 8, 8, 9. (weak recommendation)
4. Differentiate NERD, hypersensitive esophagus and functional heartburn in patients with normal endoscopy.
Voting: 6, 6, 6, 7, 7, 7, 8, 9, 9, 9, 9. (weak recommendation)

Aktualne wytyczne ESPGHAN (2018) – podstawowe algorytmy postępowania – diagnostyka pH-metria

Recommendations:

3.16 Based on expert opinion, when pH-MII is not available, the working group suggests to consider to use pH-metry only to

1. Correlate persistent troublesome symptoms with acid gastroesophageal reflux events (See also under pH-MII)

Voting: 6, 7, 7, 7, 7, 8, 8, 9, 9. (strong recommendation)

2. Clarify the role of acid reflux in the etiology of esophagitis and other signs and symptoms suggestive for GERD.

Voting: 6, 7, 7, 7, 7, 8, 8, 9, 9. (strong recommendation)

3. Determine the efficacy of acid suppression therapy.

Voting: 6, 7, 7, 7, 7, 9, 8, 8, 9. (strong recommendation)

Aktualne wytyczne ESPGHAN (2018) – podstawowe algorytmy postępowania – diagnostyka endoskopia

Recommendations:

3.5 The working group suggests not to use esophago-gastro-duodenoscopy to diagnose GERD in infants and children.

Voting: 7, 8, 8, 8, 9, 9, 9, 9, 9, 9. (weak recommendation)

3.6 Based on expert opinion, the working group suggests to use esophago-gastro-duodenoscopy with biopsies to assess complications of GERD, in case an underlying mucosal disease is suspected, or prior to escalation of therapy.

Voting: 6, 8, 8, 9, 9, 9, 9, 9, 9, 9. (strong recommendation)

Aktualne wytyczne ESPGHAN (2018) – podstawowe algorytmy postępowania – diagnostyka PPI test

Recommendations:

3.13 Based on expert opinion, the working group suggests that a trial of PPIs should not be used as a diagnostic test for GERD in infants.

Voting: 5, 6, 7, 7, 7, 8, 8, 9, 9, 9. (weak recommendation)

3.14 Based on expert opinion, the working group suggests a 4 to 8 week trial of PPIs for typical symptoms (heartburn, retrosternal or epigastric pain) in children as a diagnostic test for GERD.

Voting: 3, 7, 7, 7, 8, 8, 8, 9, 9, 9. (weak recommendation)

3.15 Based on expert opinion, the working group suggests that trial of PPIs should not be used as a diagnostic test for GERD in patients presenting with extraesophageal symptoms.

Voting: 7, 8, 8, 8, 8, 8, 8, 9, 9, 9. (weak recommendation)

Aktualne wytyczne ESPGHAN (2018) – podstawowe algorytmy postępowania – leczenie niemowląt

Recommendations:

4.1 The working group suggests to use thickened feed for treating visible regurgitation/vomiting in infants with GERD (Algorithm 1).

Voting: 6, 7, 7, 8, 8, 8, 9, 9, 9. (weak recommendation)

4.2 Based on expert opinion, the working group suggests to modify feeding volumes and frequency according to age and weight to avoid overfeeding in infants with GERD (Algorithm 1).

Voting: 7, 7, 8, 8, 8, 8, 8, 9, 9, 9. (weak recommendation)

4.3 Based on expert opinion, the working group suggests a 2 to 4 week trial of formula with extensively hydrolyzed protein (or amino-acid based formula) in formula fed infants suspected of GERD after optimal non-pharmacological treatment has failed (Algorithm 1, or see ESPGHAN 2012 CMPA guidelines).

Voting: 4, 6, 7, 8, 8, 8, 8, 9, 9, 9. (weak recommendation)

Aktualne wytyczne ESPGHAN (2018) – podstawowe algorytmy postępowania – leczenie niemowląt

Recommendations:

4.4 The working group recommends not to use positional therapy (ie, head elevation, lateral and prone positioning) to treat symptoms of GERD in sleeping infants.

Voting: 6, 6, 7, 8, 8, 8, 9, 9, 9, 9. (strong recommendation)

4.5 Based on expert opinion, the working group suggests to consider the use of head elevation or left lateral positioning to treat symptoms of GERD in children.

Voting: 7, 8, 8, 8, 9, 9, 9, 9, 9, 9. (weak recommendation)

Aktualne wytyczne ESPGHAN (2018) – podstawowe algorytmy postępowania – leczenie niemowląt

Recommendations:

4.6 The working group suggests not to use massage therapy to treat infant GERD.

Voting: 7, 7, 7, 8, 8, 8, 9, 9, 9, 9. (weak recommendation)

4.7 Based on expert opinion, the working group suggests not to use currently available lifestyle interventions or complementary treatments such as prebiotics, probiotics, or herbal medications to treat GERD.

Voting: 5, 6, 7, 7, 8, 9, 9, 9, 9, 9. (weak recommendation)

4.8 Based on expert opinion, the working group suggests informing caregivers and children that excessive body weight is associated with an increased prevalence of GERD.

Voting: 6, 7, 7, 7, 7, 8, 8, 9, 9, 9. (weak recommendation)

Aktualne wytyczne ESPGHAN (2018) – podstawowe algorytmy postępowania – leczenie farmakologiczne

TABLE 4. Dosages of most frequently used drugs for the treatment of gastroesophageal reflux disease

Drugs	Recommended pediatric dosages	Max:
Histamine-2 Receptor Antagonists (H2RAs)		
Ranitidine	5–10 mg/kg/day	
Cimetidine	30–40 mg/kg/day	
Nizatidine	10–20 mg/kg/day	
Famotidine	1 mg/kg/day	
Proton Pump Inhibitors (PPIs)		
Omeprazole	1–4 mg/kg/day	
Lansoprazole	2 mg/kg/day for infants	
Esomeprazole	10 mg/day (weight <20kg) or 20 mg/day (weight >20kg)	
Pantoprazole	1–2 mg/kg/day	
Prokinetics		
Metoclopramide	0.4-0.9 mg/kg/day	
Domperidone	0.8–0.9 mg/kg/day	
Baclofen	0.5 mg/kg/day	
Antacids		
Mg alginate plus simethicone	2.5 ml 3×/day (weight < 5kg) or 5 ml 3×/day (weight >5 kg)	
Sodium alginate	225 mg sodium alginate and magnesium alginate 87.5 mg) in a total 0.65 g One sachet/day (weight <4.54 kg) or Two sachet/day (weight >4.54 kg)	

Aktualne wytyczne ESPGHAN (2018) – podstawowe algorytmy postępowania – leczenie

Recommendations:

5.4 The working group recommends not to use H2RA or PPI for the treatment of crying/distress in otherwise healthy infants.

Voting: 5, 7, 7, 8, 9, 9, 9, 9, 9, 9. (strong recommendation)

5.5 The working group recommends that H2RA or PPI should not be used for the treatment of visible regurgitation in otherwise healthy infants.

Voting: 7, 8, 8, 8, 9, 9, 9, 9, 9, 9. (strong recommendation)

Aktualne wytyczne ESPGHAN (2018) – podstawowe algorytmy postępowania – leczenie

Recommendation:

5.13 Based on expert opinion, the working group suggests not to use any other prokinetics (ie, erythromycin, betanechol) as first-line treatment in infants and children with GERD.

Voting: 8, 8, 8, 8, 9, 9, 9, 9, 9, 9 (weak recommendation)

Aktualne wytyczne ESPGHAN (2018) – podstawowe algorytmy postępowania – leczenie

Recommendation:

5.1 The working group suggests not to use antacids/alginate for chronic treatment of infants and children with GERD.

Voting: 6, 7, 8, 8, 8, 8, 9, 9, 9, 9. (weak recommendation)

To jest jedyna zasadnicza różnica w wytycznych ESPGHAN i brytyjskich wytycznych NICE, które dopuszczają opcję / próbę alginianów.

Alginiany dostępne w Polsce: Gaviscon (>12 r.ż.), Gastrotuss Baby (dopuszczony od 1 m.ż.), Dicogel Gastro (dopuszczony od 1 m.ż.), Ranigast S-O-S, Alugastrin 3 Forte.

Aktualne wytyczne ESPGHAN (2018) – podstawowe algorytmy postępowania – leczenie

Recommendations:

6.1 Based on expert opinion, the working group suggests antireflux surgery, including fundoplication, can be considered in infants and children with GERD and:

- life threatening complications (eg, cardiorespiratory failure) of GERD after failure of optimal medical treatment
- symptoms refractory to optimal therapy (question 4, 5, 6), after appropriate evaluation to exclude other underlying diseases
- chronic conditions (ie, neurologically impaired, cystic fibrosis) with a significant risk of GERD-related complications
- the need for chronic pharmacotherapy for control of signs and/or symptoms of GERD.

Voting: 5, 7, 7, 7, 8, 9, 9, 9, 9, 9. (weak recommendation)

GERD u dzieci – brytyjskie wytyczne NICE (2015)

GUIDELINES

Gastro-oesophageal reflux disease in children: NICE guidance

leuan Davies *consultant paediatric gastroenterologist*¹, Shona Burman-Roy *senior research fellow and guideline lead*², M Stephen Murphy *clinical director, children's health*², on behalf of the Guideline Development Group

¹Department of Paediatric Gastroenterology, University Hospital of Wales, Cardiff CF14 4XW, UK; ²National Collaborating Centre for Women's and Children's Health, Royal College of Obstetricians and Gynaecologists, London NW1 4RG, UK

BMJ 2014;350:g7703 doi: 10.1136/bmj.g7703 (Published 14 January 2015)

GERD u dzieci – brytyjskie wytyczne NICE (2015)

- Give advice about gastro-oesophageal reflux, and reassure parents and carers that in well infants effortless regurgitation of feeds:
 - Is common (affects at least 40% of infants)
 - Usually begins before the infant is 8 weeks old
 - May be frequent (5% of those affected have six or more episodes a day)
 - Usually becomes less frequent with time (it resolves in 90% of affected infants before age 1 year)
 - Does not usually need further investigation or treatment.

GERD u dzieci – brytyjskie wytyczne NICE (2015)

- Do not routinely investigate or treat for gastro-oesophageal reflux disease if an infant or child without overt regurgitation presents with only one of the following:
 - Unexplained feeding difficulties (such as refusing to feed, gagging, or choking)
 - Distressed behaviour
 - Faltering growth
 - Chronic cough
 - Hoarseness
 - A single episode of pneumonia.

[Based on high, moderate, and low quality evidence from observational studies.]

GERD u dzieci – brytyjskie wytyczne NICE (2015)

- In breastfed infants with frequent regurgitation associated with marked distress:
 - Ensure that a person with appropriate expertise and training carries out a breastfeeding assessment
 - If marked distress continues despite breastfeeding assessment and advice, consider treatment with alginate for a trial period of one to two weeks. If successful continue

Leczenie farmakologiczne GERD – przegląd Cochrane: 2023



Cochrane
Library

Cochrane Database of Systematic Reviews

Pharmacological treatment of gastro-oesophageal reflux in children (Review)

Tighe MP, Andrews E, Liddicoat I, Afzal NA, Hayen A, Beattie RM

Tighe MP, Andrews E, Liddicoat I, Afzal NA, Hayen A, Beattie RM.
Pharmacological treatment of gastro-oesophageal reflux in children.
Cochrane Database of Systematic Reviews 2023, Issue 8. Art. No.: CD008550.
DOI: [10.1002/14651858.CD008550.pub3](https://doi.org/10.1002/14651858.CD008550.pub3).

Leczenie farmakologiczne GERD – przegląd Cochrane: 2023

Objectives

To assess the effects of pharmacological treatments for GOR in infants and children.

Main results

We included 36 RCTs involving 2251 children and infants. We were able to extract summary data from 14 RCTs; the remaining trials had insufficient data for extraction. We were unable to pool results in a meta-analysis due to methodological differences in the included studies (including heterogeneous outcomes, study populations, and study design).

We present the results in two groups by age: infants up to 12 months old, and children aged 12 months to 16 years old.

Tighe MP, Andrews E, Liddicoat I, Afzal NA, Hayen A, Beattie RM.
Pharmacological treatment of gastro-oesophageal reflux in children.
Cochrane Database of Systematic Reviews 2023, Issue 8. Art. No.: CD008550.
DOI: [10.1002/14651858.CD008550.pub3](https://doi.org/10.1002/14651858.CD008550.pub3).

Leczenie farmakologiczne GERD – przegląd Cochrane: 2023

Niemowlęta: żadnego korzystnego wpływu omeprazolu i/lub esomeprazolu na objawy u dzieci do 12. m.ż.

Omeprazole versus placebo: there is no clear effect on symptoms from omeprazole. One study (30 infants; very low-certainty evidence) showed cry/fuss time in infants aged three to 12 months had altered from 246 ± 105 minutes/day at baseline (mean \pm standard deviation (SD)) to 191 ± 120 minutes/day in the omeprazole group and from 287 ± 132 minutes/day to 201 ± 100 minutes/day in the placebo group (mean difference (MD) 10 minutes/day lower (95% confidence interval (CI) -89.1 to 69.1)). The reflux index changed in the omeprazole group from $9.9 \pm 5.8\%$ in 24 hours to $1.0 \pm 1.3\%$ and in the placebo group from $7.2 \pm 6.0\%$ to $5.3 \pm 4.9\%$ in 24 hours (MD 7% lower, 95% CI -4.7 to -9.3).

Esomeprazole versus placebo: esomeprazole appeared to show no additional reduction in the number of GORD symptoms compared to placebo (1 study, 52 neonates; very low-certainty evidence): both the esomeprazole group (184.7 ± 78.5 to 156.7 ± 75.1) and placebo group (183.1 ± 77.5 to 158.3 ± 75.9) improved: MD -3.2 (95% CI -4.6 to -1.8).

Tighe MP, Andrews E, Liddicoat I, Afzal NA, Hayen A, Beattie RM.
Pharmacological treatment of gastro-oesophageal reflux in children.
Cochrane Database of Systematic Reviews 2023, Issue 8. Art. No.: CD008550.
DOI: [10.1002/14651858.CD008550.pub3](https://doi.org/10.1002/14651858.CD008550.pub3).

Leczenie farmakologiczne GERD – przegląd Cochrane: 2023

Dzieci starsze: efekt kliniczny i endoskopowy w najlepszym razie niewielki

Proton pump inhibitors (PPIs) at different doses may provide little to no symptomatic and endoscopic benefit.

Rabeprazole given at different doses (0.5 mg/kg and 1 mg/kg) may provide similar symptom improvement (127 children in total; very low-certainty evidence). In the lower-dose group (0.5 mg/kg), symptom scores improved in both a low-weight group of children (< 15 kg) (mean $-10.6 \pm \text{SD } 11.13$) and a high-weight group of children (> 15 kg) (mean -13.6 ± 13.1). In the higher-dose groups (1 mg/kg), scores improved in the low-weight (-9 ± 11.2) and higher-weight groups (-8.3 ± 9.2). For the higher-weight group, symptom score mean difference between the two different dosing regimens was 2.3 (95% CI -2 to 6.6), and for the lower-weight group, symptom score MD was 4.6 (95% CI -2.9 to 12).

Pantoprazole: pantoprazole may or may not improve symptom scores at 0.3 mg/kg, 0.6 mg/kg, and 1.2 mg/kg pantoprazole in children aged one to five years by week eight, with no difference between 0.3 mg/kg and 1.2 mg/kg dosing (0.3 mg/kg mean -2.4 ± 1.7 ; 1.2 mg/kg -1.7 ± 1.2 ; MD 0.7 (95% CI -0.4 to 1.8)) (one study, 60 children; very low-certainty evidence).

There were insufficient summary data to assess other medications.

Tighe MP, Andrews E, Liddicoat I, Afzal NA, Hayen A, Beattie RM.
Pharmacological treatment of gastro-oesophageal reflux in children.
Cochrane Database of Systematic Reviews 2023, Issue 8. Art. No.: CD008550.
DOI: [10.1002/14651858.CD008550.pub3](https://doi.org/10.1002/14651858.CD008550.pub3).

Leczenie farmakologiczne GERD – przegląd Cochrane: 2023

Authors' conclusions

There is very low-certainty evidence about symptom improvements and changes in pH indices for infants. There are no summary data for endoscopic changes. Medications may or may not provide a benefit (based on very low-certainty evidence) for infants whose symptoms remain bothersome, despite nonmedical interventions or parental reassurance. If a medication is required, there is no clear evidence based on summary data for omeprazole, esomeprazole (in neonates), H₂ antagonists, and alginates for symptom improvements (very low-certainty evidence). Further studies with longer follow-up are needed.

In older children with GORD, in studies with summary data extracted, there is very low-certainty evidence that PPIs (rabeprazole and pantoprazole) may or may not improve GORD outcomes. No robust data exist for other medications.

Further RCT evidence is required in all areas, including subgroups (preterm babies and children with neurodisabilities).

Tighe MP, Andrews E, Liddicoat I, Afzal NA, Hayen A, Beattie RM.
Pharmacological treatment of gastro-oesophageal reflux in children.
Cochrane Database of Systematic Reviews 2023, Issue 8. Art. No.: CD008550.
DOI: [10.1002/14651858.CD008550.pub3](https://doi.org/10.1002/14651858.CD008550.pub3).

GERD związany z alergią pokarmową u dzieci – stanowisko EAACI 2022







Received: 11 July 2022 | Revised: 26 August 2022 | Accepted: 6 September 2022

DOI: 10.1111/pai.13856

POSITION PAPER

WILEY

Diagnosis and management of food allergy-associated gastroesophageal reflux disease in young children—EAACI position paper

Rosan Meyer^{1,2,3}  | Yvan Vandenplas⁴  | Adriana Chebar Lozinsky⁵ | Mario C. Vieira⁶ | Roberto Berni Canani⁷ | Christophe Dupont⁸  | Pinar Uysal⁹  | Ozlem Cavkaytar¹⁰  | Rebecca Knibb¹¹ | David M. Fleischer¹² | Anna Nowak-Wegrzyn^{13,14} | Carina Venter¹⁵ 

Pediatr Allergy Immunol. 2022;33:e13856.
<https://doi.org/10.1111/pai.13856>

GERD związany z alergią pokarmową u dzieci – stanowisko EAACI 2022

- zarówno alergia pokarmowa jak i refluks żołądkowo-przełykowy (GER) występują szczególnie często u dzieci do 12. miesiąca życia.
- dzieci z ABMK niewątpliwie częściej mają objawowy nasilony GER
- aktualne wytyczne ESPGHAN / NASPGHAN sugerują **rozważanie alergii pokarmowej, a zwłaszcza ABMK jako przyczyny nasilonych objawów GER u niemowląt i sugerują opcję próbnej diety eliminacyjnej jeszcze przed ewentualną farmakoterapią antyrefluksową**
- mechanizm ABMK powodującej objawowy GER jest zwykle **NIE IgE-zależny**

GERD związany z alergią pokarmową u dzieci – stanowisko EAACI 2022

TABLE 1 Clinical questions related to FA-associated GORD in early childhood

1. What is the pathophysiology of FA-associated GORD?
2. What are the symptoms related to FA-associated GORD?
3. How should FA-associated GORD be diagnosed?
4. What is the dietary management of FA-associated GORD?
5. What is the medical management of FA-associated GORD?
6. What is the prevalence and management of FA-associated in GORD?
7. What is the impact on the quality of life of FA-associated GORD?

GERD związany z alergią pokarmową u dzieci – stanowisko EAACI 2022

- **patomechanizm wiążący ABMK z GER/GERD** jest dwukierunkowy i nadal nie w pełni poznany, ale niewątpliwe wydają się:
 - wpływ na TLESR, neurony trzewne i komórki zapalne (mastocyty, eozynofile)
 - wpływ na integralność i bioimpedancję śluzówki przełyku (przepuszczalność dla antygenów i reakcja podśluzówkowa?)
 - zaburzenia motoryki przełyku, zaburzenia w EGG (dysrytmie), próby poszukiwania specyficznego obrazu pH-metrycznego

Omar T, Tobin JM, McCall L, Savage K, Ferris L, Hammond P, Kritas S, Quinn P, Abu-Assi R, Moore D, Davidson G, Gold M, Heine RG
Characterization of upper gastrointestinal motility in infants with persistent distress and non-IgE-mediated Cow's milk protein allergy. *J Pediatr Gastroenterol Nutr* Apr 2020;70(4):489–496.

Pediatr Allergy Immunol. 2022;33:e13856.
<https://doi.org/10.1111/pai.13856>

GERD związany z alergią pokarmową u dzieci – stanowisko EAACI 2022

- **patomechanizm wiążący ABMK z GER/GERD**

**Czy GERD związany z ABMK i alergią na inne pokarmy
to rzeczywiście tylko GERD czy może patogenetycznie
wczesna faza EoE ?**

GERD związany z alergią pokarmową u dzieci – stanowisko EAACI 2022

Practice points

- FA-associated GORD symptoms are difficult to distinguish from non-FA-associated GORD and a clinical and allergy-focused history (i.e. dietary intake in relation to symptoms, atopic comorbidities) forms the cornerstone for an accurate diagnosis. (100% agreement)
- The presence of other GI symptoms typically associated with non-IgE mediated and/or eczema may increase the likelihood of the GORD being FA associated. (100% agreement)

GERD związany z alergią pokarmową u dzieci – stanowisko EAACI 2022

- For infants unresponsive to currently recommended standard GOR treatment including thickening of feeds and avoidance of overfeeding, FA needs to be considered. (100% agreement)
- A 2–6 week targeted diagnostic elimination of cow's milk (and/or other culprit food implicated through the food allergy history) needs to be followed by the reintroduction of the offending allergen, to confirm the diagnosis. (80% agreement)

GERD związany z alergią pokarmową u dzieci – stanowisko EAACI 2022

Jakie testy i badania dodatkowe?

- Specific IgE or skin prick test are not indicated unless symptoms of an IgE-mediated allergy are presented and/or atopic eczema. (100% agreement)
- MII-pH metry is desirable in cases with alarm signs, not responding to either GORD or FA-associated GORD management and if MII-pH is not available, then pH-metry alone can still be useful. (90% agreement)
- Endoscopy should be performed if EoE is suspected, in cases that have not responded or insufficiently responded to GORD treatment (elimination diet and/or medications), as infants with EoE often present with similar symptoms as infants with GORD. (90% agreement)

GERD związany z alergią pokarmową u dzieci – stanowisko EAACI 2022

Jaka mieszanka eliminacyjna?

- If breastmilk is not available or insufficient an EHF is recommended as first-line treatment, unless faltering growth, multi-system involvement and multiple FAs are suspected, in which case an AAF needs to be considered. *(100% agreement)*
- Thickened EHF or AAF, where available, may give an additional benefit in infants with ongoing GI symptoms. *(100% agreement)*

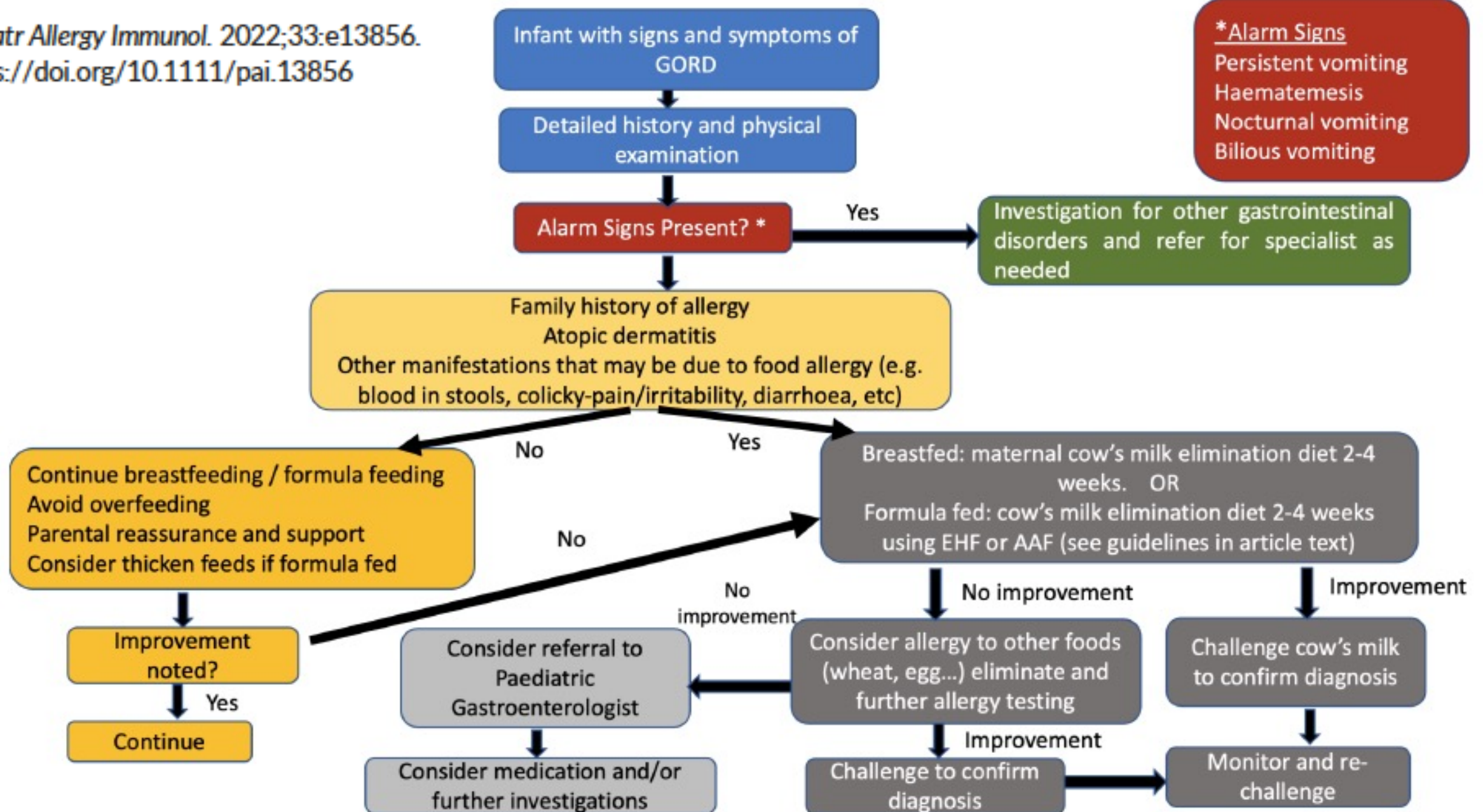


FIGURE 1 Proposed pathway in the assessment and diagnosis of FA-associated GORD

GERD związany z alergią pokarmową u dzieci – stanowisko EAACI 2022

PPI u niemowląt z GERD i podejrzeniem alergii pokarmowej – brak wskazań!

- There is insufficient evidence to recommend routine use of PPI for infants (<1 year of age) with FA-associated GORD. (100% agreement)
- PPIs have been shown to have a significant impact on selected micronutrient availability, the microbiome, the risk of developing food allergy and protein breakdown and require special attention to counteract these effects. (100% agreement)

GERD u dzieci z otyłością – wytyczne ESPEN 2023

Clinical Nutrition 42 (2023) 987–1024

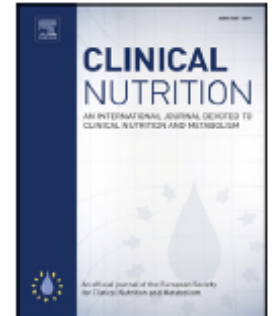


ELSEVIER

Contents lists available at [ScienceDirect](#)

Clinical Nutrition

journal homepage: <http://www.elsevier.com/locate/clnu>



ESPEN Guideline

Practical guideline on obesity care in patients with gastrointestinal and liver diseases – Joint ESPEN/UEG guideline



Stephan C. Bischoff ^{a, *}, Johann Ockenga ^b, Ahad Eshraghian ^c, Rocco Barazzoni ^d, Luca Busetto ^e, Marjo Campmans-Kuijpers ^f, Vincenzo Cardinale ^g, Irit Chermesh ^h, Haluk Tarik Kani ⁱ, Wafaa Khannoussi ^j, Laurence Lacaze ^k, Miguel León-Sanz ^l, Juan M. Mendive ^m, Michael W. Müller ⁿ, Frank Tacke ^o, Anders Thorell ^p, Darija Vranesic Bender ^q, Arved Weimann ^r, Cristina Cuerda ^s

GERD u dzieci z otyłością – wytyczne ESPEN 2023

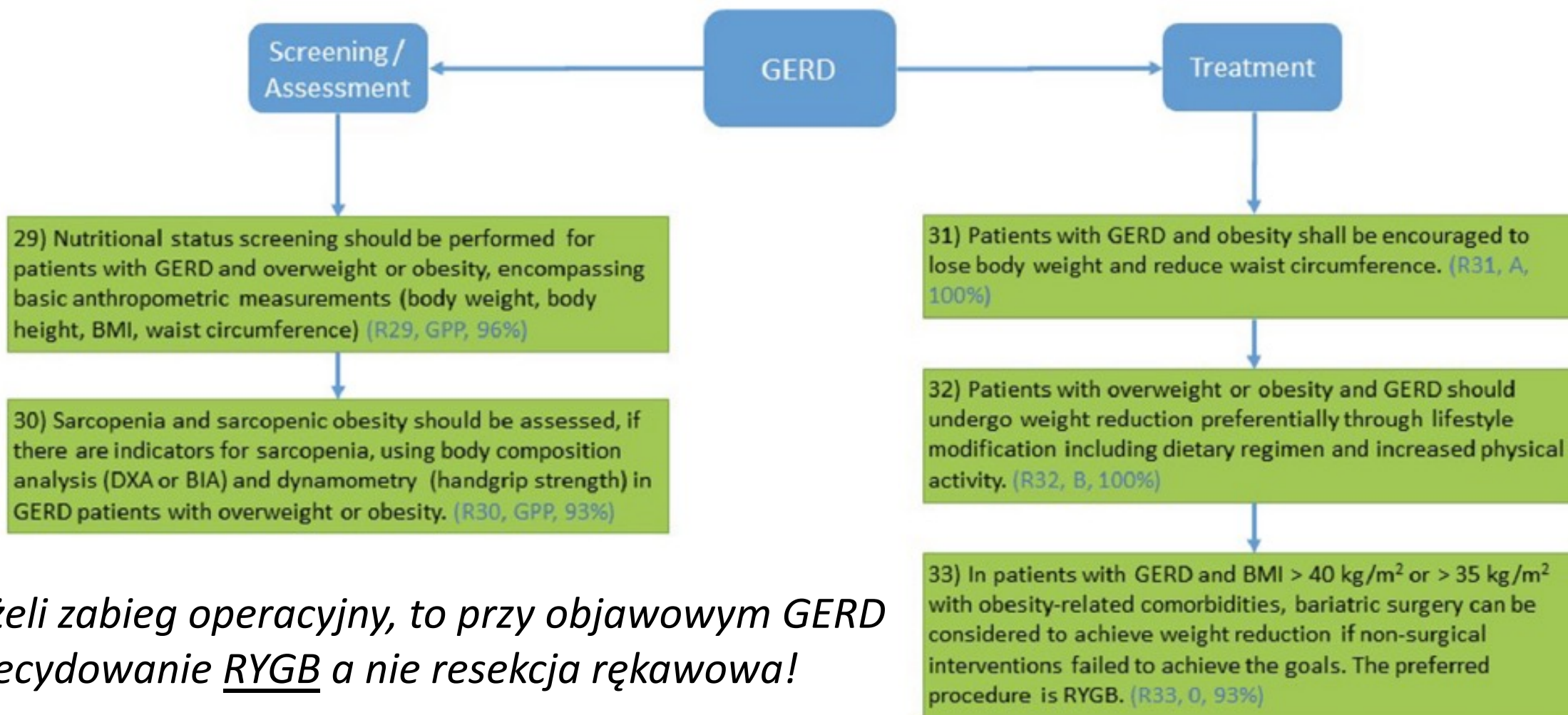
- 30) Sarcopenia and sarcopenic obesity should be assessed, if there are indicators for sarcopenia, using body composition analysis (DXA or BIA) and dynamometry (handgrip strength) in GERD patients with overweight or obesity.
(R30, grade GPP, strong consensus 93%)

Commentary

Sarcopenia is associated with GERD, and sarcopenic obesity may be a predictive factor for erosive reflux disease [152]. There-

Therapy of patients with GERD and obesity implies higher dosages and longer courses of antisecretory drugs, and concomitant use of ursodeoxycholic acid (UCDA) [150] (Fig. 6).

GERD u dzieci z otyłością – wytyczne ESPEN 2023



Jeżeli zabieg operacyjny, to przy objawowym GERD zdecydowanie RYGB a nie resekcja rękawowa!

Fig. 6. Nutritional screening/assessment and obesity treatment in patients with GERD and obesity. Abbreviations: see Fig. 1.

GERD – wytyczne leczenia chirurgicznego (2021)

Surgical Endoscopy (2021) 35:4903–4917
<https://doi.org/10.1007/s00464-021-08625-5>



SAGES GUIDELINES



SAGES guidelines for the surgical treatment of gastroesophageal reflux (GERD)

Bethany J. Slater¹ · Rebecca C. Dirks² · Sophia K. McKinley³ · Mohammed T. Ansari⁴ · Geoffrey P. Kohn^{5,6} · Nirav Thosani⁷ · Bashar Qumseya⁸ · Sarah Billmeier⁹ · Shaun Daly¹⁰ · Catherine Crawford¹¹ · Anne P. Ehlers¹² · Celeste Hollands¹³ · Francesco Palazzo¹⁴ · Noe Rodriguez¹⁵ · Arianne Train¹⁶ · Eelco Wassenaar¹⁷ · Danielle Walsh¹⁸ · Aurora D. Pryor¹⁹ · Dimitrios Stefanidis²

Received: 17 May 2021 / Accepted: 28 June 2021 / Published online: 19 July 2021

© The Author(s), under exclusive licence to Springer Science+Business Media, LLC, part of Springer Nature 2021

GERD – wytyczne leczenia chirurgicznego (2021)

Results The panel provided seven recommendations for adults and children with GERD. All recommendations were conditional due to very low, low, or moderate certainty of evidence. The panel conditionally recommended surgical treatment over medical management for adults with chronic or chronic refractory GERD. There was insufficient evidence for the panel to make a recommendation regarding surgical versus medical treatment in children. The panel suggested that once the decision to pursue surgical therapy is made, adults and children with GERD may be treated with either a robotic or a laparoscopic approach, and either partial or complete fundoplication based on surgeon–patient shared decision-making and patient values. In adults, the panel suggested either division or non-division of the short gastric vessels is appropriate, and that children should undergo minimal dissection during fundoplication.

GERD a kaszel u dzieci – wytyczne CHEST (2019)

[Evidence-Based Medicine]



Chronic Cough and Gastroesophageal Reflux in Children

CHEST Guideline and Expert Panel Report



*Anne B. Chang, MBBS, PhD, MPH; John J. Oppenheimer, MD; Peter J. Kahrilas, MD; Ahmad Kantar, MD; Bruce K. Rubin, MD; Miles Weinberger, MD, FCCP; and Richard S. Irwin, MD, Master FCCP; on behalf of the CHEST Expert Cough Panel**

CHEST 2019; 156(1):131-140

GERD a kaszel u dzieci – wytyczne CHEST (2019)

TABLE 1] Summary of Data of the Included Publications Relevant to Key Question 1: For Children With Chronic Cough (> 4 Weeks Duration) Who Do Not Have Gastrointestinal GER Symptoms or an Underlying Chronic Lung Disease, Should Empirical Treatment for GERD Be Used?

Paper and Year	Evidence Level	Key Relevant Recommendation	Comment
CHEST guidelines 2017 ³	Cohort studies and one RCT	For children aged ≤ 14 -years with chronic cough, we recommend basing the management on the etiology of the cough. An empirical approach aimed at treating upper airway cough syndrome due to a rhinosinus condition, GERD and/or asthma should not be used unless other features consistent with these conditions are present. Strong recommendation	Systematic review focused on children with chronic cough and was not specific for GER
de Benedictis and Bush, 2018 ⁸	Not stated	"In otherwise well children with non-specific cough, empirical GER therapy is unlikely to be beneficial and is generally not recommended" ⁸	PRISMA data not shown
NASPGHAN and ESPGHAN guideline, 2018 ¹	Expert opinion	"Based on expert opinion, the working group suggests not to use H ₂ receptor antagonists or PPIs in patients with extraesophageal symptoms (ie, cough, wheezing, asthma), except in the presence of typical GERD symptoms and/or diagnostic testing suggestive of GERD." Weak recommendation	GER-specific systematic review and guideline
NICE guideline, 2015 ²	"Based on high, moderate, and low quality evidence from observational studies" ²⁵	"Do not routinely investigate or treat for GER if an infant or child without overt regurgitation presents with chronic cough" ²	GRADE profile of the studies shown in Table 18 of the paper

GERD a kaszel u dzieci – wytyczne CHEST (2019)

BACKGROUND: Whether gastroesophageal reflux (GER) or GER disease (GERD) causes chronic cough in children is controversial. Using the Population, Intervention, Comparison, Outcome (PICO) format, we undertook four systematic reviews. For children with chronic cough (> 4-weeks duration) and without underlying lung disease: (1) who do not have gastrointestinal GER symptoms, should empirical treatment for GERD be used? (2) with gastrointestinal GER symptoms, does treatment for GERD resolve the cough? (3) with or without gastrointestinal GER symptoms, what GER-based therapies should be used and for how long? (4) if GERD is suspected as the cause, what investigations and diagnostic criteria best determine GERD as the cause of the cough?

GERD a kaszel u dzieci – wytyczne CHEST (2019)

RESULTS: Few randomized controlled trials addressed the first two questions and none addressed the other two. The single meta-analysis (two randomized controlled trials) showed no significant difference between the groups (any intervention for GERD vs placebo for cough resolution; OR, 1.14; 95% CI, 0.45-2.93; $P = .78$). Proton pump inhibitors (vs placebo) caused increased serious adverse events. Qualitative data from existing CHEST cough systematic reviews were consistent with two international GERD guidelines.

CONCLUSIONS: The panelists endorsed that: (1) treatment(s) for GERD should not be used when there are no clinical features of GERD; and (2) pediatric GERD guidelines should be used to guide treatment and investigations.

CHEST 2019; 156(1):131-140

GERD a kaszel u dzieci – wytyczne CHEST (2019)

Summary of Recommendations/Suggestions

- 1. For children aged \leq 14-years with chronic cough ($>$ 4 weeks duration) without an underlying lung disease, we recommend that treatment(s) for GERD should NOT be used when there are no clinical features of gastroesophageal reflux such as recurrent regurgitation, dystonic neck posturing in infants, or heartburn/epigastric pain in older children. (Grade 1B)**

GERD a kaszel u dzieci – wytyczne CHEST (2019)

- 3. For children aged ≤ 14 -years with chronic cough (> 4 weeks duration) without an underlying lung disease but who have symptoms and signs or tests consistent with gastroesophageal pathological reflux, we recommend that acid suppressive therapy should not be used solely for their chronic cough. (Grade 1C)**
- 4. For children with chronic cough (> 4 weeks duration) who do not have an underlying lung disease but with gastrointestinal GER symptoms, we suggest that they be treated for GERD in accordance to evidence-based GERD-specific guidelines^{1,2} for 4-8 weeks and their response reevaluated. (Ungraded Consensus-based Statement)**

GERD – powikłania związane ze stosowaniem PPI (2023)

JAMA Pediatrics | [Original Investigation](#)

Proton Pump Inhibitor Use and Risk of Serious Infections in Young Children

Marion Lassalle, PharmD, PhD; Mahmoud Zureik, MD, PhD; Rosemary Dray-Spira, MD, PhD

JAMA Pediatr. 2023;177(10):1028-1038. doi:[10.1001/jamapediatrics.2023.2900](https://doi.org/10.1001/jamapediatrics.2023.2900)
Published online August 14, 2023.

GERD – powikłania związane ze stosowaniem PPI (2023)

- Znaczny wzrost preskrypcji PPI u niemowląt i małych dzieci pomimo **braku wyraźnych wskazań i braku związku objawów u najmłodszych dzieci z nadmiernym narażeniem przełyku na kwas**
- **Francja: u dzieci poniżej 2. roku życia PPI stosowało 3,6% dzieci w roku 2010 i 6,1% dzieci w roku 2019**
- Nowa Zelandia: u dzieci w pierwszym roku życia PPI przepisywano u 2,4% dzieci w roku 2005 ze wzrostem do 5,2% w roku 2021
- Szwecja: 1,9% niemowląt
- Norwegia: 2,3% niemowląt
- Dania: 4,6% niemowląt
- w każdym z tych trzech krajów wzrost 3-5x na przestrzeni lat 2000-2020

GERD – powikłania związane ze stosowaniem PPI (2023)

- **Wcześniej wykazano związek stosowania PPI ze wzrostem ryzyka:**
 - osteoporozy i złamań kości
 - alergii i astmy
 - zespołu SIBO
 - niekorzystnych zmian mikrobioty jelit
 - IBD u dzieci
- **Cytowane badanie to praca z Francji, analizująca kompletną bazę danych urodzeń dzieci we Francji po roku 2010 i oceniająca związek preskrypcji PPI z poważnymi infekcjami wieku dziecięcego.**

GERD – powikłania związane ze stosowaniem PPI (2023)

Table 2. Overall Risk of Serious Infections Associated With PPI Exposure in Children

Exposure	No. of events/No. of person-years	Incidence rate (95% CI) ^a	Crude HR (95% CI)	aHR (95% CI) ^b
PPI exposure over time				
Unexposed	126 864/4 810 746	2.64 (2.62-2.65)	1 [Reference]	1 [Reference]
Exposed	25 191/271 874	9.27 (9.15-9.38)	1.42 (1.40-1.44)	1.34 (1.32-1.36)
History of PPI exposure over time				
None	82 545/2 853 971	2.89 (2.87-2.91)	1 [Reference]	1 [Reference]
Past	44 319/1 956 775	2.26 (2.24-2.29)	1.10 (1.08-1.11)	1.07 (1.06-1.09)
Ongoing	25 191/271 874	9.27 (9.15-9.38)	1.45 (1.43-1.47)	1.36 (1.34-1.38)
Duration of ongoing PPI exposure over time				
Unexposed	126 864/4 810 746	2.64 (2.62-2.65)	1 [Reference]	1 [Reference]
≤6 mo	20 718/209 875	9.87 (9.74-10.01)	1.41 (1.39-1.43)	1.34 (1.32-1.36)
7-12 mo	3491/43 000	8.12 (7.85-8.39)	1.41 (1.37-1.46)	1.33 (1.29-1.38)
>12 mo	982/18 998	5.17 (4.86-5.50)	1.65 (1.55-1.76)	1.38 (1.30-1.47)

JAMA Pediatr. 2023;177(10):1028-1038. doi:10.1001/jamapediatrics.2023.2900
Published online August 14, 2023.

GERD – powikłania związane ze stosowaniem PPI (2023)

RESULTS The study population comprised 1 262 424 children (median [IQR] follow-up, 3.8 [1.8-6.2] years), including 606 645 who received PPI (323 852 male [53.4%]; median [IQR] age at index date, 88 [44-282] days) and 655 779 who did not receive PPI (342 454 male [52.2%]; median [IQR] age, 82 [44-172] days). PPI exposure was associated with an increased risk of serious infections overall (aHR, 1.34; 95% CI, 1.32-1.36). Increased risks were also observed for infections in the digestive tract (aHR, 1.52; 95% CI, 1.48-1.55); ear, nose, and throat sphere (aHR, 1.47; 95% CI, 1.41-1.52); lower respiratory tract (aHR, 1.22; 95% CI, 1.19-1.25); kidneys or urinary tract (aHR, 1.20; 95% CI, 1.15-1.25); and nervous system (aHR, 1.31; 95% CI, 1.11-1.54) and for both bacterial (aHR, 1.56; 95% CI, 1.50-1.63) and viral infections (aHR, 1.30; 95% CI, 1.28-1.33).

CONCLUSIONS AND RELEVANCE In this study, PPI use was associated with increased risks of serious infections in young children. Proton pump inhibitors should not be used without a clear indication in this population.

JAMA Pediatr. 2023;177(10):1028-1038. doi:10.1001/jamapediatrics.2023.2900
Published online August 14, 2023.

GERD u dzieci – przegląd z roku 2023, varia

Ultrasound

Ultrasound has high sensitivity and positive predictive value for GERD as it can assess both the anatomy of the esophagus and real-time reflux. It is a non-invasive tool with some evidence-based studies supporting its fair sensitivity (76%-100%) and specificity (50%-100%) compared to pH studies [40-43]. A study noted the presence of a shorter abdominal esophageal length, increased cervical and abdominal esophageal wall thickness, diameter and angle of His in Thai children diagnosed with GERD ($n = 22$, median age of 1.6 years) compared with healthy children ($n = 23$), however, these differences failed to reach statistical significance[44] (Figure 3). Moreover, the reliability of the test depends on the individual experience of the radiologist[45].

Oropharyngeal pH monitoring

UES dysfunction is thought to represent a major factor underlying the pathogenesis of the extraesophageal symptoms of GERD. Oropharyngeal pH monitoring should, in theory, detect abnormal acid reflux in this area and thus the cause of such symptoms. However, studies to date report conflicting results regarding the correlation of oropharyngeal pH monitoring and full-column reflux episodes detected by pH-impedance monitoring[50-56]. These studies were limited by small numbers of participants as well as equipment available to measure the pH above the LES and at the UES in children.

Dziękuję za uwagę!