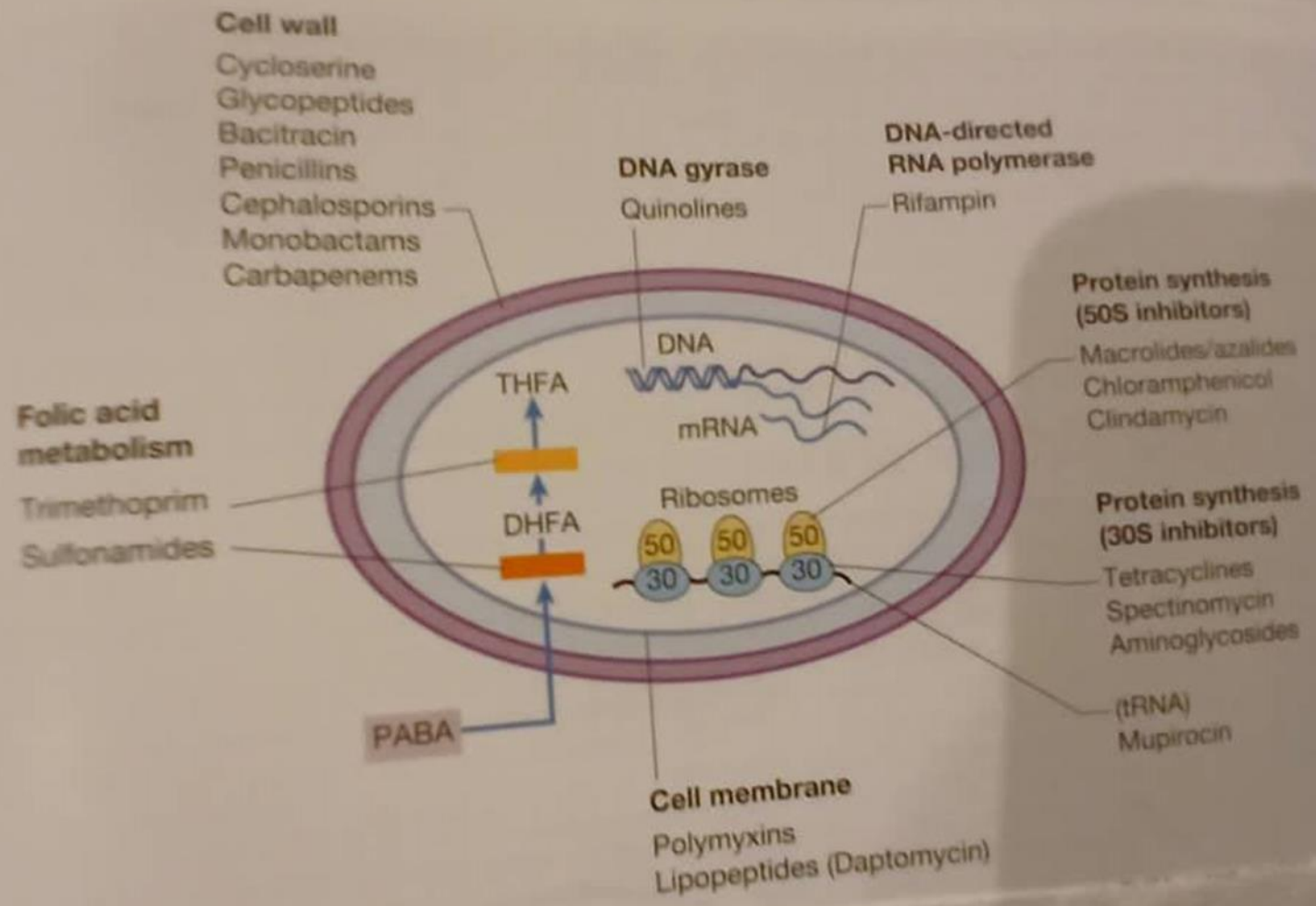


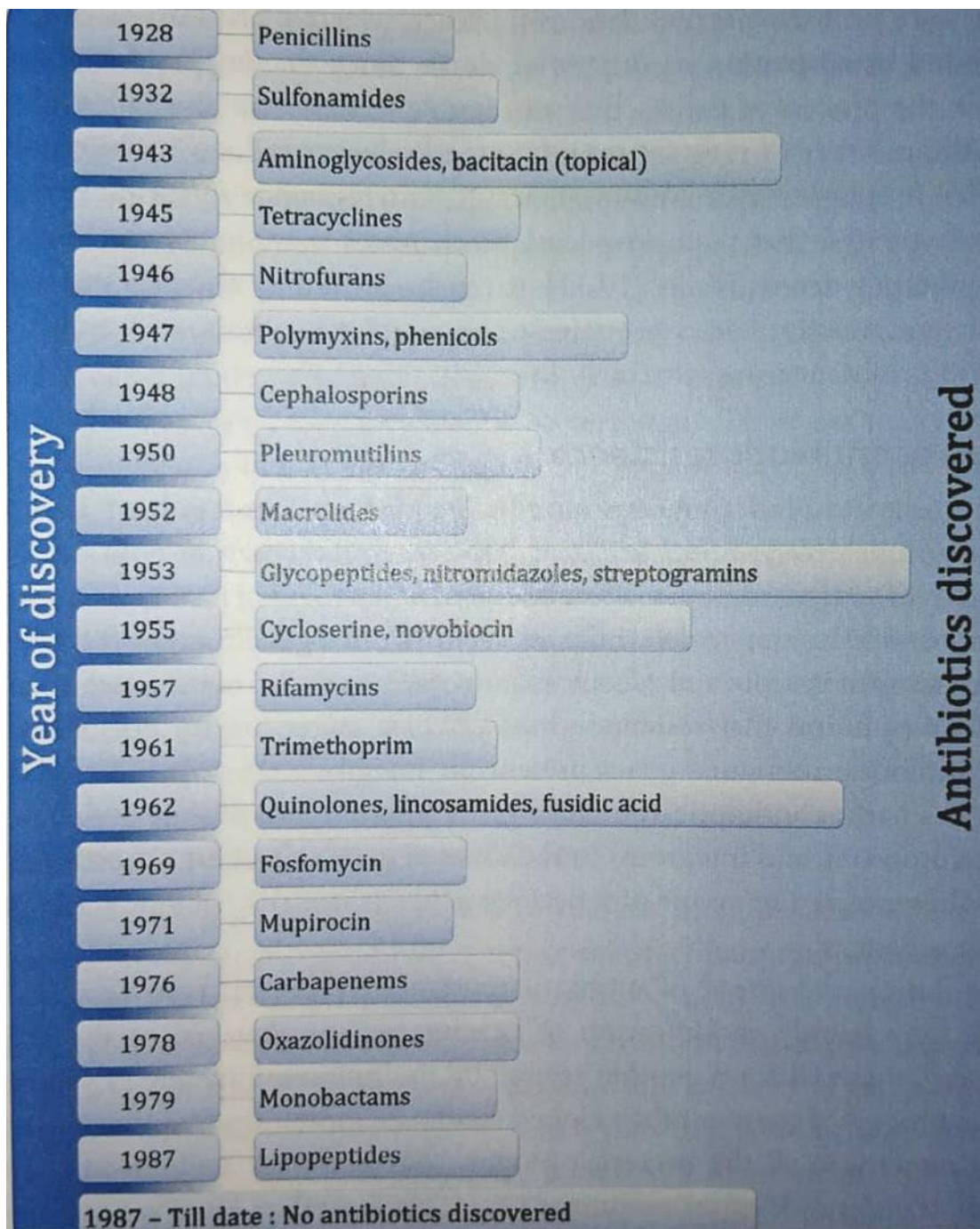
Pediatric Cough: Classification, Diagnosis & Management

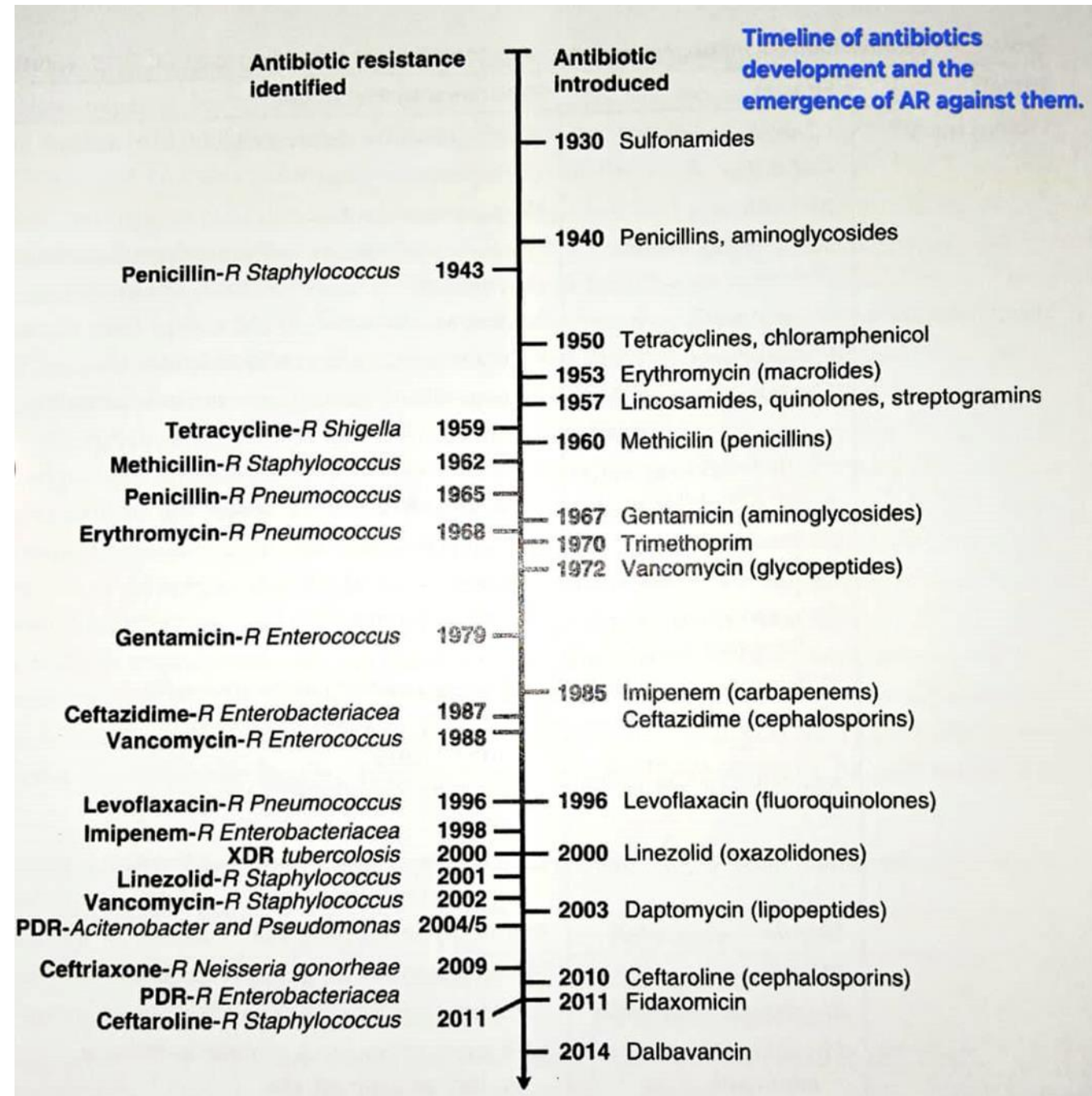
Dr. AliAkbar Rahbarimanesh

Iranian Society of Pediatrics Infectious Diseases
Tehran University of Medical Sciences (TUMS)

Sep 2026







درمان های تکمیلی

زینک (روی)

*الف- روی آنتی اکسیدان و ضد التهاب است و موجب تقویت سیستم ایمنی می شود.

*ب- مصرف روی موجب کاهش موارد عفونت های تنفسی و گوارشی می گردد

*ج- در کودکان زیر ۶ ماه روزانه ۱۰ میلی گرم و کودکان سن بالاتر روزانه ۲۰ میلی گرم به مدت ۱۰ الی ۱۴ روز توصیه می شود.

*د- مصرف روی سبب کاهش موریدیتی و مورتالیتی می شود

*ه- توجه به نقش ویتامین A و آهن در عفونت ها

پروبیوتیک ها

- * میکروارگانیزم های غیر بیماری زا هستند که برای پیشگیری و درمان خیلی از بیماری ها از جمله اسهال، IBS و IBD به کار می روند.
- * بیشتر آنها سوش های لاکتیت باکتریا مثل لاکتوباسیل و بیسیدوباکتریوم و قارچ های غیر بیماری زا مثل ساکرومایسس بولاردی هستند.
- * مکانیزم اثر پروبیوتیک ها: تغییر میکروفلور روده و مقابله با میکروب های پاتوژن.
- * به نظر می رسد پروبیوتیک ها در درمان اسهال ناشی از روتاویروس و اسهال های persistent و همچنین در پیشگیری از بروز اسهال ناشی از مصرف آنتی بیوتیک موثرند.

Neurophysiology & Clinical Context

Vagal Afferent Reflex Arc

Triggers via mechanical and chemical receptors in respiratory epithelium.

Cortical Modulation

Higher cortical centers allow voluntary suppression or behavioral augmentation.

Parental & Quality-of-Life Impact

Significant sleep disruption, school absence, and high health utilization.



Duration-Based Classification

Key distinction: Pediatric chronic cough threshold is **4 weeks** (unlike 8 weeks in adults).

< 4 WEEKS

Acute Cough

Predominantly self-limiting post-viral respiratory infection.

TRANSITIONAL

Subacute Phase

Resolving post-infectious airway hyperresponsiveness.

> 4 WEEKS

Chronic Cough

Requires structured algorithm for underlying pulmonary pathology.

Diagnostic Auditory Clues



Barking / Brassy

Subglottic edema in croup or tracheomalacia.



Dry, Staccato

Infantile *Chlamydia trachomatis* or Mycoplasma.



Paroxysmal / Whoop

Pertussis toxin-mediated spasmodic coughing.



Wet / Productive

Suppurative lung disease, PBB, or bronchiectasis.

Specific Cough Pointers ("Red Flags")

⚠ Systemic Red Flags

Failure to thrive: Cystic fibrosis, immunodeficiency.

Neonatal onset: Congenital airway anomaly, PCD.

Sudden choking onset: Foreign body aspiration.

Physical Exam Pointers

Digital clubbing: Chronic suppurative lung disease.

Hypoxia / Chest deformity: Structural lung parenchymal defect.

Focal auscultatory defect: Monophonic wheeze or consolidation.

Age-Stratified Etiologies

Age Cohort	Common Acute Etiologies	Common Chronic Etiologies
Infants (< 1 Year)	RSV, Bronchiolitis, Viral URTI	Tracheomalacia, GERD, Congenital anomaly
Toddlers (1–5 Years)	Croup, Viral infection, Foreign body	Protracted Bacterial Bronchitis, Asthma
School Age (> 5 Years)	Mycoplasma, Post-viral syndrome	Asthma, Upper Airway Cough Syndrome

Chronic Wet Cough Spectrum

PBB

PROTRACTED BACTERIAL BRONCHITIS

Endobronchial bacterial infection (*H. influenzae*, *S. pneumoniae*). Responds to 2-week antibiotics.

Bronchiectasis

IRREVERSIBLE AIRWAY DAMAGE

Permanent bronchial dilation resulting from untreated suppurative inflammation.

Cystic Fibrosis

GENETIC / CLEARANCE DEFECT

Thick mucus impairment requiring sweat chloride and genetic testing.

CHEST Diagnostic Algorithm

01

Red Flag Screen

Rule out foreign body, hypoxia, and congenital defects.

02

Baseline Workup

Order Chest X-ray & Spirometry (if age $\geq$ 6 yrs).

03

Symptom Branch

Separate into Wet Cough vs. Dry Cough pathway.

04

Targeted Trial

2–4 week etiology-specific trial with mandatory review.

Objective Testing Modalities

Chest Radiography (CXR)

Universal baseline test for all non-specific chronic cough cases.

Spirometry & Reversibility

Evaluates airflow obstruction and asthma bronchodilator response.

HRCT & Flexible Bronchoscopy

Reserved for persistent suppurative cough or structural concerns.



Evidence-Based Treatment Pathways

CHRONIC WET COUGH

Targeted Antibiotic Course

High evidence for 2-week High-Dose Amoxicillin-Clavulanate (NNTB = 3).

DRY ASTHMATIC COUGH

Inhaled Corticosteroids

Trial ICS via spacer with mask when cough is accompanied by wheeze or atopy.

ENVIRONMENTAL

Irritant Elimination

Remove environmental tobacco smoke and indoor air pollution triggers.



Evidence-Based Treatment Pathways

CHRONIC WET COUGH

Targeted Antibiotic Course

High evidence for 2-week High-Dose Amoxicillin-Clavulanate (NNTB = 3).

DRY ASTHMATIC COUGH

Inhaled Corticosteroids

Trial ICS only when dry cough is accompanied by wheeze or atopy.

ENVIRONMENTAL

Irritant Elimination

Remove environmental tobacco smoke and indoor air pollution.

Antitussive Classes & Clinical Efficacy

OPIOID AGONISTS

Codeine & Hydrocodone

Suppresses medullary cough center.
High risk of fatal respiratory depression in pediatric ultra-rapid metabolizers.

NON-OPIOID CENTRALLY-ACTING

Dextromethorphan

NMDA antagonist / sigma-1 agonist. No superior efficacy over placebo in pediatric randomized controlled trials.

ANTIHISTAMINES / COMBOS

Diphenhydramine & Decongestants

Anticholinergic sedating agents. Lack clinical benefit and carry risks of CNS excitation and dysrhythmias.

FDA Black Box Warnings & Safe Care

Black Box Contraindications (< 12 Yrs)

FDA & AAP prohibit codeine and tramadol in children under 12 due to severe mortality risks.

Demulcent Honey Therapy (> 1 Yr)

1 tsp single dose before bedtime reduces nocturnal cough frequency (contraindicated < 1 yr for botulism).

Supportive Non-Pharmacologic Care

Isotonic saline nasal rinses, cool-mist humidification, adequate hydration, and treating underlying etiology.

Kids & Cough Syrup

- Over-the-counter syrups may cause drowsiness or breathing problems.
- Avoid adult-strength medicines for infants and toddlers always.
- Excess dosage risks heart rhythm issues or serious side effects.
- Use doctor-prescribed pediatric formulations for safe symptom relief.
- Try honey or humidifier for mild natural cough management.

Over-the-Counter Cough Suppressants

0%

Proven Clinical Efficacy in Pediatrics

OTC cough medicines carry significant risk of toxicity without proven symptomatic benefit. Treatment must always target the specific underlying etiology.

Probiotics in Active Treatment & Symptom Management

Role During Active Respiratory Infection & Cough:

- **Primary Focus:** Probiotics are **adjunctive therapy**, not a standalone replacement for standard pediatric care or viral clearance.
- **Cough & Congestion Mitigation:** Reduces overall symptom severity scores and shortens the resolution time of post-viral coughs.
- **Gastrointestinal Support:** Offsets antibiotic-associated diarrhea (AAD) if secondary bacterial complications require antibiotic therapy.

Probiotics in Active Treatment & Symptom Management

Clinical Considerations & Safety:

- **Optimal Timing:** Best initiated at the onset of symptoms or concurrently with antibiotic therapy (spaced 2 hours apart).
- **Target Populations:** Most effective in toddler and school-age cohorts with recurrent acute respiratory infections.

Safety Profile:

Well-tolerated in immunocompetent pediatric patients.

Contraindicated/Use Caution: Immunocompromised children, central venous catheters, or severely ill infants (risk of bacteremia/fungemia).

SUMMARY & CLINICAL POINTS

- ✓ **4-Week Cutoff:** Define chronic cough at 4 weeks in children (not 8 weeks).
- ✓ **Acoustic Phenotyping:** Differentiate wet (PBB, suppurative) vs. dry (asthma, post-viral) cough pathways early.
- ⚠ **Avoid OTC Suppressants:** Never prescribe codeine or OTC antitussives; rely on etiology-specific treatment and demulcent honey (>1 yr).
- ✓ While **probiotics** do not immediately cure acute viral coughs, using them as adjunctive care speeds up overall recovery and protects the gut microbiome during treatment.

Questions & Discussion

REFERENCES

Key Guidelines

CHEST / ACCP GUIDELINES

Chang AB, et al. CHEST Guideline and Expert Panel Report on Cough in Children.

Chest, 2020; 158(1): 303–329. Establishes the 4-week chronic cough definition and pediatric diagnostic algorithm.

FDA & AAP REGULATORY

FDA Safety Announcement: Codeine & Tramadol Restrictions in Children.

US FDA & AAP Clinical Reports, 2017/2018. Black box warnings and prohibition of opioid antitussives under age 12.

BTS / ERS GUIDELINES

Shields MD, et al. BTS Guidelines for Management of Cough in Children.

Thorax, 2008; 63(Suppl 3): iii1–iii15. Criteria for wet vs. dry cough, red flag signs, and pediatric asthma evaluation.

COCHRANE SYSTEMATIC REVIEWS

Smith SM, et al. Over-the-Counter Medications for Acute Cough in Children.

Cochrane Database Syst Rev, 2014; (11): CD001831. Systematic review demonstrating lack of efficacy for OTC cough medicines.

Image Sources



https://www.childrencolorado.org/globalassets/parenting-advice/articles/cold-vs-flu-article-image_1280x720.jpeg?v=4a556a

Source: www.childrencolorado.org



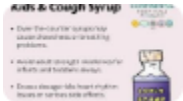
<https://pedimedicine.com/wp-content/uploads/2023/01/Chest-Xray-lobar-pneumonia.jpg>

Source: pedimedicine.com



https://medicaldialogues.in/h-upload/2021/08/25/1500x900_159436-child-using-asthma-inhaler-spacer.webp

Source: medicaldialogues.in



https://continentalhospitals.com/uploads/mceu_11076635711760105048528.jpg

Source: continentalhospitals.com

- CHEST & ACCP Guidelines