

MEDICAL INSIGHTS

An insight into evidence based medicine

November 2025



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MESSAGE FROM THE EDITOR



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Dear friends,

We are glad to bring another edition of the Medical Insights magazine on Children's Day this year. The main purpose of our magazine is to highlight the clinical evidence for common pediatric conditions for the benefit of practising paediatricians and postgraduate students.

On the occasion of World Premature Day (November 17th 2025), Dr. Srinivas Murki, Consultant Neonatologist, Ankura Hospitals, LB Nagar, has written a beautiful article on the journey of a preterm baby. This article highlights the challenges faced by the preterm baby, the parents and the NICU team right from birth until discharge from the NICU unit.

The second article compares the advantages and disadvantages of syrups versus tablets in children. The third article looks at the clinical evidence for cough medications, which are one of the most commonly prescribed drugs. The final article deals with a very important topic of foreign body aspiration in children. We sincerely hope that the readers find these articles useful in their day-to-day practice.

PEDIATRIC QUIZ

- An 18-month-old girl presented with H/O of cold, cough and breathlessness for 2 days.
- An initial CXR was done
- The child was started on antibiotics and bronchodilators for 1 week



As there was no improvement after 1 week, a CXR was repeated.

What do you see in the CXR, and how will you proceed?

(Answer to the above question in page 7)



THE JOURNEY OF A PRETERM BABY

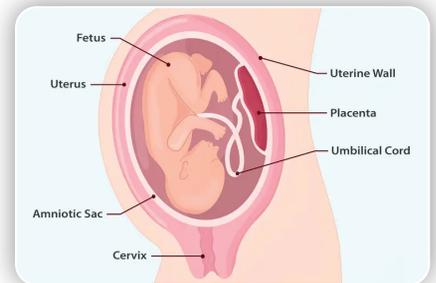
Dr. Srinivas Murki, Consultant Neonatologist, Ankura Hospitals, LB Nagar

1. Before Birth – The Seeds of Prematurity

Pregnancy doesn't always follow the calendar.

Mrs. Arathi, a second-time mother, conceived through IVF and developed pregnancy-induced hypertension and gestational diabetes. Despite regular check-ups and good antenatal care, these complications—common in high-risk pregnancies—made an early delivery likely. She received **two doses of antenatal steroids**, a quiet but powerful step that matured her baby's lungs before birth.

At **32 weeks**, the obstetric team performed an **elective LSCS** for oligohydramnios. The baby cried at birth, then slipped into brief secondary apnea—one of the many tightropes a premature infant walks.



2. The First Hours – Fragile Beginnings

Transferred to the NICU, the 1.46 kg infant faced **respiratory distress**.

Early **CPAP** stabilized the lungs; careful monitoring prevented barotrauma. Still, the immature drive to breathe led to **recurrent apneas**—a hallmark of prematurity—managed with **non-invasive ventilation (NIV)** and **caffeine therapy**.

This stage often tests both teams and parents: balancing support without over-handling, sustaining trust through alarms and tubes.

3. The Storms – Infection and Fragility

On day 7, the baby developed **late-onset sepsis** due to *Klebsiella pneumoniae*, leading to **shock, thrombocytopenia and a liver abscess**. Each complication echoed a preterm infant's vulnerability—fragile immunity, thin vascular walls, and limited reserves.

Through **timely blood cultures**, antibiotic tailoring, and vigilant hemodynamic care, the infection resolved. The baby endured **ventilation, ionotropes** and **platelet transfusions**, yet recovered steadily.

A **PDA aneurysm with thrombosis** required **low-molecular-weight heparin**, an unusual twist handled with precision.

4. Rebuilding Strength – Nutrition and Growth

Preterm nutrition is its own science. Early **minimal enteral feeds**, though briefly interrupted for intolerance, set the gut in motion.

With patient advancement, the baby reached **full feeds by day 15** and transitioned to **breastfeeding and spoon-feeds**—each drop of mother's milk offering antibodies and calories in equal measure.

Metabolic bone profile, supplements, and **vitamin D** supported catch-up growth.

5. Steadying the Breath – The Power of Gentle Support

Every intervention leaned toward gentleness: **early CPAP, avoidance of prolonged ventilation**, and **careful weaning** to room air by day 19.

These choices—rooted in evidence—reduce bronchopulmonary dysplasia, a chronic lung disease once common in such babies.

6. Human Warmth – Kangaroo Mother Care

Once stable, the baby was nestled skin-to-skin in **Kangaroo Mother Care (KMC)**.

KMC offered what machines couldn't: thermal stability, bonding, and synchronized breathing. For the mother, it restored agency after weeks of anxious watching; for the baby, it bridged the gap between NICU and home.

7. Preparing for Home – Healing with Vigilance

By **36 weeks corrected age**, the infant weighed **1.52 kg**, on room air and feeding well.

Before discharge, screenings ensured nothing was missed:

- **Pulse oximetry** – passed
- **Thyroid profile** – normal
- **ROP screening** – zone 2, stage 1 (for follow-up)
- **Neurosonogram** – grade I IVH, mild PVL
- **Hearing (BERA)** – scheduled at term
- **DDH screening** – negative

Parents were taught to recognize danger signs—poor feeding, fast breathing, lethargy, fever—and were equipped with a **clear follow-up plan**, including **neurodevelopmental assessments** at 3, 6, 9, 12, 24, and 48 months.

8. Beyond Discharge – The Quiet Work of Follow-Up

Preterm survival is only the first milestone.

Growth, vision, hearing, and developmental milestones unfold over months. Regular follow-up detects issues early—retinopathy, hearing loss, anemia, or delayed milestones—turning potential disabilities into manageable challenges.

10. The Takeaway

Preterm birth begins as a crisis but can end as resilience.

When science, patience, and compassion meet, even a 32-week, 1.46-kg baby can leave the NICU in a mother's arms—breathing on his own, feeding by mouth, ready for the long, luminous road of growth ahead.

9. The Broader Lesson – What Made the Difference

This baby's story threads through the key pillars of modern neonatal care:

Intervention	Impact
Antenatal steroids	Enhanced lung maturity, reduced RDS and IVH
Gentle ventilation and early CPAP	Fewer chronic lung problems
Early, graded enteral feeding	Better gut adaptation, less NEC
Non-invasive ventilation and caffeine	Reduced apnea, earlier extubation
KMC	Improved thermoregulation, bonding, growth
Rigorous infection control	Controlled sepsis, prevented multi-organ damage
Comprehensive screening and follow-up	Ensured early detection of complications



SYRUPS VS TABLETS IN CHILDREN

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Sometimes, parents and paediatricians get confused as to whether they should be using the prescribed medications in syrup or tablet form. Both have their advantages and disadvantages for children. The advantages and disadvantages are compared in the table below:

COMPARISON OF TABLETS AND LIQUIDS IN CHILDREN

Feature	Syrups (Liquid)	Tablets (Solid)
Ease of Swallowing	Generally easier for infants and very young children, especially if flavoured well	It can be a challenge for young children who haven't learned to swallow pills. Mini-tablets (2-4 mm) show high acceptability across young age groups.
Taste/Palatability	Often highly flavoured and sweetened to mask bitter active ingredients, which can be a major factor in acceptance or refusal	Taste is less of an issue, leading to higher palatability ratings in some studies.
Dosing Accuracy	Offers flexible dosing according to age. However, requires careful measurement with an oral syringe to ensure accuracy. Highly concentrated liquids pose a risk of dosing errors.	Lacks flexibility as the dosage is fixed. However, offers precise, standardised doses in each unit Splitting or crushing tablets can lead to dose variation and should only be done if specified.
Speed of Action	Generally absorbed faster as the drug is already in liquid form and bypasses the initial breakdown process in the stomach.	Takes longer to take effect as the body needs time to dissolve the solid form.
Portability, cost & Storage	Bulky, heavier and may require refrigeration and have a shorter shelf life once opened or mixed.	Compact, lightweight, easy to store and transport, with a longer shelf life and typically lower cost.
Side Effects/ Excipients	May contain potentially inappropriate excipients (e.g., alcohol, certain preservatives, excess sugar) that need careful consideration for pediatric use.	Generally, have fewer excipients, which may be safer from a toxicity perspective.

From what age can children start taking tablets

Clinical evidence: an observational cohort study on 113 children (6-11 years) showed that 91% of children are able to swallow a small oral tablet [1]. The majority of children who said that they could not swallow a pill at the start of the study later learned how to swallow a pill with some training.

In clinical practice, most children under 6 years old have trouble swallowing tablets. Most children can be taught to swallow pills from the age of 6 years and older, with many mastering the skill by 8-10 years of age.

Techniques for taking tablets

Some children have difficulty taking tablets, either due to an aversion to swallowing pills or physical difficulty in swallowing them. The following techniques can help these children:

Have the child sit up straight with their head level or tilted back slightly (for tablets). For capsules, a slight chin-down tilt may help them float to the back of the throat.

Place the tablet on the middle or back of the tongue. Follow immediately with a large sip of water, juice, or milk. Drinking through a straw can help the child focus on swallowing the liquid rather than the pill.

The pop-bottle method is one technique designed for swallowing tablets. Fill a bottle with water. Put the tablet on your tongue and close your lips tightly around the bottle opening. Take a drink, keeping the bottle against your lips and using a sucking motion to swallow the water and pill. Don't let air get into the bottle (Fig. 1)

The Lean-forward method to swallow pills. Put a capsule on your tongue. Take a sip of water, but don't swallow. Tilt your chin toward your chest. Swallow the capsule and water while your head is bent (Fig. 2)

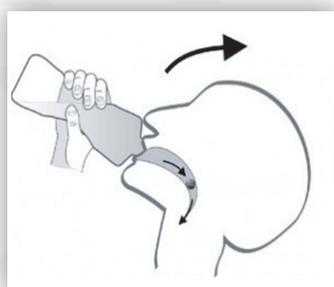


Fig 1- pop bottle method

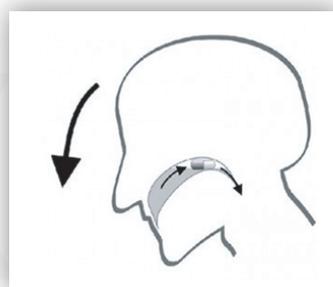


Fig 2- lean forward method

Tips for taking liquid formulations

Always check with a doctor or pharmacist before crushing, breaking, opening, or mixing a tablet or capsule with food or drink.

For liquids or dissolved medicine, an oral syringe allows for controlled, small amounts to be squirted into the side of the child's cheek, reducing the risk of choking.

For infants, slowly squirt liquid medicine into the cheek pouch (not the back of the throat) in small amounts, allowing them to swallow each time.

Always use an oral syringe or medicine cup for measuring liquid medicine, not household spoons.

If mixing a crushed pill with food or liquid, use a very small amount to ensure the child consumes the entire dose.

Do not mix medicine with a child's essential foods (like formula or daily milk) as they may develop an aversion to those foods.

Keep all medicines out of the reach and sight of children in a secure location. Accidental overdose can cause potential health risks.

Reference

1. At what age can a child swallow a pill? Ostrom, N.K. et al.
Journal of Allergy and Clinical Immunology, Volume 115, Issue 2, S42
2. <https://www.health.harvard.edu/blog/two-tricks-make-easier-swallow-pills>

EVIDENCE FOR COUGH MEDICATIONS

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Cough is a very common presenting symptom in the paediatric OPD. The common causes include infections (viral, bacterial) and allergies. Treating a cough can be challenging as well as confusing in view of several options available in the market. This article aims to look at the mechanism of action and the clinical evidence for the commonly used medications in cough formulations.

Mechanism of action of various cough medications

Mechanism of action	Example
Antitussives (centrally acting)	Codeine, Dextromethorphan
Antitussives (peripherally acting)	Levodropropizine
Expectorants and mucolytics	Guaiphenesin, Ambroxol
Antihistamines (1st generation)	Chlorpheniramine, Diphenhydramine
Antihistamines (2nd generation)	Cetirizine, Loratidine
Decongestants	Phenylephrine, Pseudoephedrine
Others	Honey

Scientific evidence for various medications

Scientific evidence	Summary for practitioners
<p>Honey Oduwole O, Udoh EE, Oyo-Ita A, Meremikwu MM. Honey for acute cough in children. Cochrane Database Syst Rev. 2018 Apr 10;4(4):CD007094. doi: 10.1002/14651858.CD007094. pub5. PMID: 29633783; PMCID: PMC6513626.</p>	<p>A Cochrane review found that honey is more effective in reducing cough frequency, cough severity, and the impact of cough on sleep compared to no treatment, salbutamol or diphenhydramine and as effective as dextromethorphan..</p> <p>It can be given to children above one year of age.</p>
<p>Dextromethorphan Smith SM, Schroeder K, Fahey T. Over-the-counter (OTC) medications for acute cough in children and adults in community settings. Cochrane Database of Systematic Reviews 2014, Issue 11. Art. No.: CD001831. DOI: 10.1002/14651858. CD001831.pub5.</p>	<p>A Cochrane review concluded there is no good evidence for or against the effectiveness of dextromethorphan (DM) in children, but noted limited and varied studies. The review highlighted that while some trials showed DM reduced cough frequency and severity, others found it was no better than a placebo.</p> <p>It can be given to children above 4 years of age.</p>
<p>Codeine Smith SM, Schroeder K, Fahey T. Over-the-counter (OTC) medications for acute cough in children and adults in community settings. Cochrane Database of Systematic Reviews 2014, Issue 11. Art. No.: CD001831. DOI: 10.1002/14651858. CD001831.pub5.</p>	<p>A Cochrane review on codeine for chronic cough in children found no randomized controlled trials were available, and recommends against its use due to a lack of evidence and known risks like respiratory suppression</p> <p>Not recommended for children</p>

Scientific evidence	Summary for practitioners
<p>Levodropropizine</p> <p>Zanasi A, Lanata L, Fontana G, Saibene F, Dicipinigitis P, De Blasio F.</p> <p>Levodropropizine for treating cough in adult and children: a meta-analysis of published studies. <i>Multidiscip Respir Med.</i> 2015 May 31;10(1):19. doi: 10.1186/s40248-015-0014-3. PMID: 26097707; PMCID: PMC4472410.</p>	<p>No Cochrane review available.</p> <p>A meta-analysis indicates that Levodropropizine is an effective antitussive drug in children and adults, with statistically significant outcomes compared to central antitussive drugs and a more favourable benefit/risk profile. While meta-analyses support its use, some limitations exist due to a small number of studies and different efficacy variables assessed across the studies</p> <p>Recommended for children above 2 years of age.</p>
<p>Guaiphenesin</p> <p>Smith SM, Schroeder K, Fahey T.</p> <p>Over-the-counter (OTC) medications for acute cough in children and adults in community settings. <i>Cochrane Database of Systematic Reviews</i> 2014, Issue 11. Art. No.: CD001831. DOI: 10.1002/14651858.CD001831.pub5.</p>	<p>Studies on guaiphenesin have shown mixed results. In one trial, a majority of participants taking guaifenesin found it helpful, but a second trial showed no statistically significant difference compared to a placebo.</p> <p>It can be given to children above 4 years of age.</p>
<p>Antihistamines</p> <p>Chang AB, Peake J, McElrea MS.</p> <p>Anti-histamines for prolonged non-specific cough in children. <i>Cochrane Database of Systematic Reviews</i> 2008, Issue 2. Art. No.: CD005604. DOI: 10.1002/14651858.CD005604.pub3.</p>	<p>A Cochrane review found that the effectiveness of antihistamines for acute and prolonged non-specific cough in children is uncertain.</p> <p>If antihistamines are to be tried, it's important to balance the potential benefits against the risk of side effects, especially in very young children and with first-generation antihistamines.</p> <p>The licensed age depends on the drug used</p>
<p>Ambroxol</p> <p>Kantar A, Klimek L, Cazan D, Sperl A, Sent U, Mesquita M.</p> <p>An overview of efficacy and safety of ambroxol for the treatment of acute and chronic respiratory diseases with a special regard to children. <i>Multidiscip Respir Med.</i> 2020 Mar 3;15(1):511. doi: 10.4081/mrm.2020.511. PMID: 32269775; PMCID: PMC7137760.</p>	<p>This review indicates that ambroxol treatment offers benefits to pediatric patients as a secretolytic therapy, with a favourable benefit/risk profile.</p> <p>It can be given to all ages, including infants.</p>
<p>Decongestants</p> <p>Smith SM, Schroeder K, Fahey T.</p> <p>Over-the-counter (OTC) medications for acute cough in children and adults in community settings. <i>Cochrane Database of Systematic Reviews</i> 2014, Issue 11. Art. No.: CD001831. DOI: 10.1002/14651858.CD001831.pub5.</p>	<p>A Cochrane review on decongestants found insufficient evidence for effectiveness in children. Based on the lack of evidence and potential for harm, decongestants are not recommended for children under 6 years old.</p>

Practical tips for Paediatricians

1. Firstly, treat the underlying cause of the cough rationally. For example, using salbutamol inhalation only if there is wheeze or antibiotics only if bacterial infection is suspected.
2. Avoid drugs whose side effects outweigh the benefits, like codeine, first-generation antihistamines, etc.
3. Where needed, we can probably try drugs with some clinical evidence if the cough is affecting the sleep or lifestyle of the child. The recommended age for the medications is mentioned in the table above.
4. Global health bodies, including the Indian Academy of Paediatrics (IAP) and the World Health Organisation (WHO), recommend against the routine use of over-the-counter (OTC) cough syrups for children, especially those under six years of age.

FOREIGN BODY ASPIRATION IN CHILDREN

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Foreign body aspiration is quite common in children. Unfortunately, in many cases, there is hesitation to diagnose and investigate these children appropriately, leading to missed diagnoses and complications. Let us see how these children present with some examples.

CASE REPORT 1

An 18-month-old girl presented with H/O of cough for 2 days. Treated with antibiotics and bronchodilators for 1 week. As there was no improvement after 1 week, a CXR was repeated after 1 week. Examination shows decreased air entry on the left side.

It shows hyperinflation on the left side with mediastinal shift. Bronchoscopy revealed a peanut cotyledon in the left main bronchus.

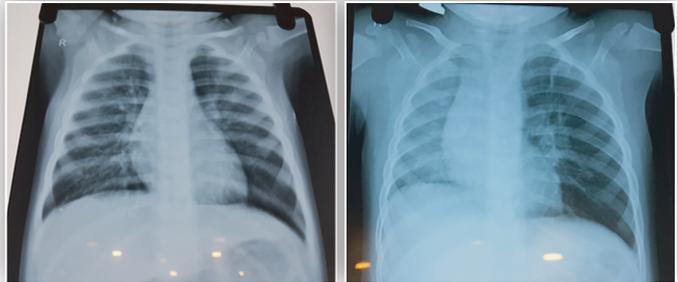


Fig 1: CXR at the onset and one week after treatment.

CASE REPORT 2

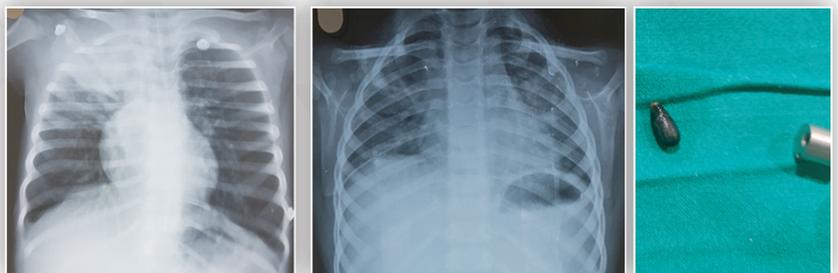
A 15-month-old male presented with fever and cough for 1 week. There was no response after treatment with antibiotics for 1 week. Examination shows decreased air entry on the right side. A CXR followed by a CT scan was done.



An intercostal drain was inserted for the pneumothorax. Bronchoscopy was done, and 3 peanut cotyledons were removed.

Case report 3

A 2-year-old male child presented with a sudden onset of respiratory distress to the referring hospital. The respiratory distress gradually worsened, and on arriving at our hospital, the child was noted to be gasping with saturations of 70% in air. In the ER, the baby developed generalised seizure.



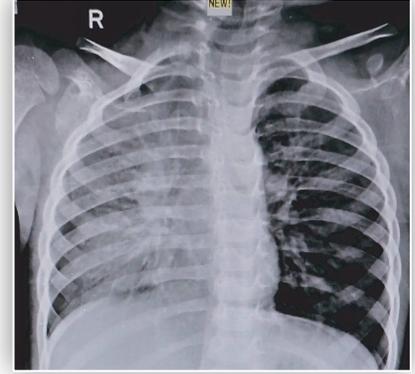
He was intubated and ventilated. After stabilisation, bronchoscopy was performed and a Custard apple (Sitaphal) seed was removed from the right bronchus. CXRs before and after the procedure are shown above.

Case report 4

A 16-month-old male child presented with a history of fever and respiratory distress for 1 week. On examination, he was noted to have- RR 60/min; saturations 70% in air; tachycardia, cold peripheries. Auscultation revealed decreased air entry on the right side. He was treated for suspected pneumonia of the right lung 3 months ago.

After stabilisation with fluids, HHFNC and inotropes, a chest X-ray showed homogenous opacity in the right lung. A chest CT scan suggested a suspected foreign body in the right lung.

Bronchoscopy revealed multiple pieces of chana dal in the right main bronchus. There was inflammation and purulent discharge in the right main bronchus. The lung expanded, and the child recovered after the procedure. The family gave a history of choking 3 months ago. This is a delayed foreign body presenting as pneumonia and sepsis.



Practical tips for Paediatricians

Foreign body aspiration should be suspected when:

- Sudden onset of symptoms (choking, cough, breathlessness, wheeze)
- Lack of prodromal symptoms (cold, cough, fever)
- H/O choking during feeds
- Asymmetric findings on auscultation
- Asymmetric findings on radiology (collapse, hyperinflation)

Foreign body cannot be excluded by:

- Absence of choking history
- Normal radiology (CXR, CT scan)

Delayed diagnosis can result in difficulty in retrieval and complications

Hence, a low index of suspicion is needed to diagnose, treat and prevent complications.

The gold standard for diagnosis is flexible bronchoscopy.



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