

## **EDITORIAL ARTICLE**

# **CHILDHOOD ASTHMA: ONE SIZE MANAGEMENT DOES NOT FIT ALL!**

**By**

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### **INTRODUCTION**

Asthma is the most common chronic childhood disease in nearly all industrialized countries.

Nevertheless, there are few national and international guidelines that focus exclusively on pediatric asthma.

The information available on specific aspects of pediatric asthma, in particular in children under 5 years of age, is limited and does not include the opinion and contributions of the pediatric allergy and respiratory community.

In contrast to adults, the evidence base for pharmacotherapy and randomized controlled trials in children less than 5 years of age is very sparse. The most accessible source of information for treatment of pediatric asthma - with recommendations of the available literature - is lacking the evidence based on expert opinion.

In view of the limited data from randomized controlled trials in children and the difficulties in applying systematic review criteria to diagnosis, prognosis and non pharmacological management, the European Academy of Allergy and Clinical Immunology and the American Academy of Allergy, Asthma and Immunology nominated expert teams to find a consensus to serve as pediatric expertise guidelines for clinical practice of childhood asthma. This consensus report is a part of the PRACTALL initiative, which is endorsed by both academies and was published at (Allergy Journal. 2008;

63:5-34).

### **What is PRACTALL?**

#### ***"PRACTicing ALLergy program on childhood asthma"***

The PRACTALL Pediatric Asthma Group consists of approximately 40 international experts in pediatric allergy and asthma. The paper includes the natural history & patho-physiology of childhood asthma phenotypes and recommendations for diagnosis, management, and monitoring. The major breakthrough of PRACTALL is that it simplifies all the existing asthma management guidelines for children. This is a short navigation through Practall consensus report for Pediatric Asthma.

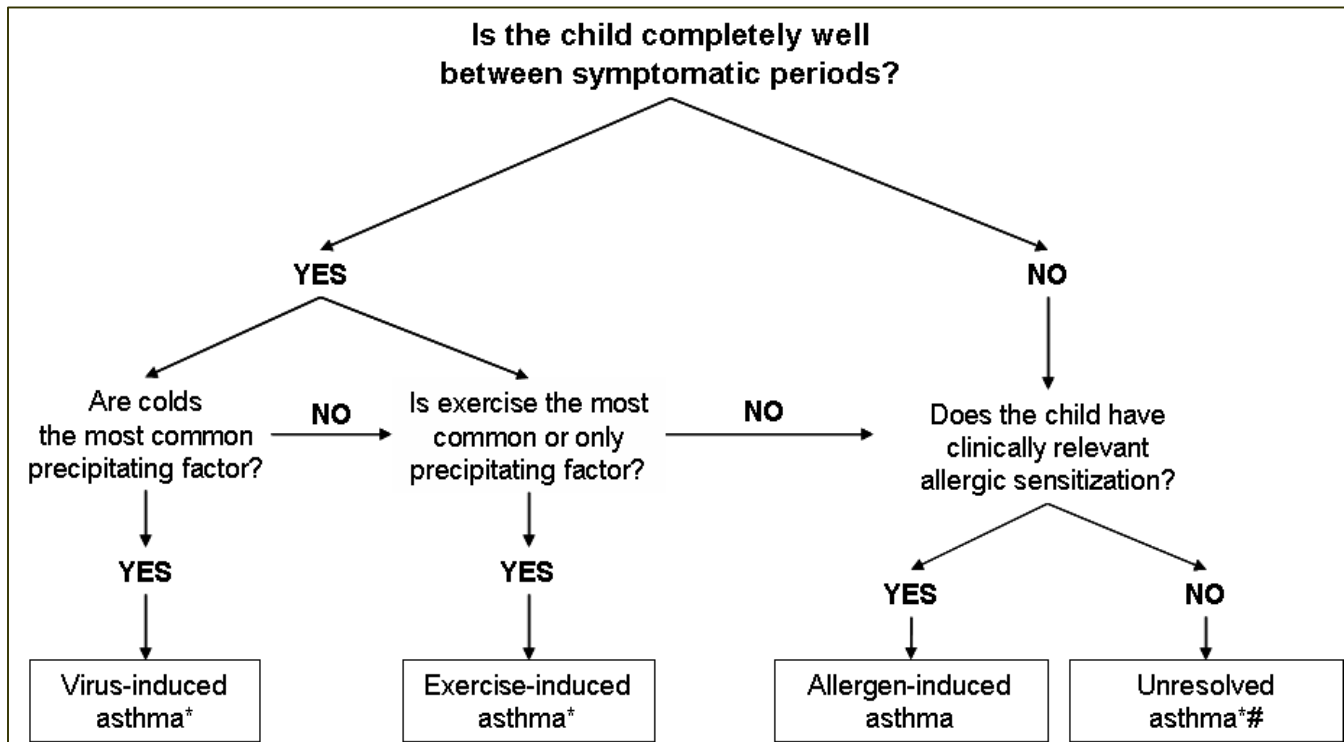
### **First: Thinking "Phenotype"**

#### **What is a phenotype?**

A phenotype is defined at (Oxford English Dictionary, 2005) as: "A type of organism distinguishable from others by observable features." i.e. it is a cluster of different characteristics that defines a subgroup within a disease, and is apparent at the time of consultation.

In asthma, age and triggers can be used to define different phenotypes of disease. These phenotypes are likely to be useful because they recognize the heterogeneity of childhood asthma. They do not represent separate diseases, but are part of the asthma syndrome. Guidelines that recognize different phenotypes should provide better direction for prognosis and therapeutic strategies.

**What are PRACTALL Phenotypes?**



Severity should be assessed for each phenotype.

Overlap between phenotypes is frequently present.

\*Children may also be atopic.

# Different etiologies, including irritant exposure, multi-triggered asthma and as-yet not evident allergies may be included here.

**Phenotypes differ in pathophysiology**

Bronchial inflammation is a central characteristic of most patients who have asthma symptoms, and involves changes at the epithelial level, recruitment of inflammatory cells, and production of multiple mediators.

Cellularity and other characteristics of inflammation depend upon trigger and age and differ between asthma phenotypes. Accordingly, evidence is supporting differential effectiveness of treatments depending on pediatric asthma phenotypes.

**Second: How to assess for Pediatric Asthma?**

- **History and physical examination** (symptoms, triggers, personal-family history of atopy, smoking)
- **Investigations :**
  - Microbiological
  - Sensitisation tests (IgE, skin prick test, immunoCAP)
  - Radiological test
  - Lung function tests
  - FeNO and other tests of airway inflammation
  - Airway wall biopsy, BAL

**How to use Asthma Control Test (ACT) for children with asthma?**

It is a simple test to evaluate Asthma control of asthmatic children. It is supplied for free with multiple languages on the following web site: ([www.asthma.controltest.com](http://www.asthma.controltest.com)).

ACT is completed by the child and parents/caregivers

(subjective). It is clinically validated by specialist assessment and spirometry (objective). ACT is recognized by the National Institutes of Health and huge literature sources started to recommend its important practical impact.

ACT is available in 2 forms, first for children between 4-11 years and children more than 12 years.

<p><b>Childhood Asthma Control Test for children 4 to 11 years old.</b>  <b>Know the score.</b>          This test will provide a score that may help your doctor determine if your child's asthma treatment plan is working as it might be time for a change. Please see your doctor for the Childhood Asthma Control Test.          Step 1 Let your child respond to the first four questions (1 to 4). If your child needs help reading or understanding the questions, you may help. But let your child select the responses. Complete the remaining three questions (5 to 7) on your own and without letting your child's responses influence your answers. There are no right or wrong answers.          Step 2 Write the number of each answer in the score box provided.          Step 3 Add up each score box for the total.          Step 4 Take the test to the doctor to talk about your child's total score.</p> <p><b>19</b> If your child's score is 19 or less, it may be a sign that your child's asthma is not controlled as well as it could be. We would like to see you bring the test to your doctor to talk about your child's results.</p> <p>Please have your child complete these questions.</p> <p>1. How is your asthma today?          Very bad (1), Bad (2), Okay (3), Very good (4)</p> <p>2. How much of a problem is your asthma when you're outside or play time?          It's a big problem. I can't do most of my usual activities. It's a problem, but I don't mind it. (2) It's a little problem, but I like it. (3) It's not a problem. (4)</p> <p>3. Do you cough because of your asthma?          Yes, all of the time. (1) Yes, most of the time. (2) Yes, some of the time. (3) No, most of the time. (4)</p> <p>4. How many up-dos during the night because of your asthma?          Yes, all of the time. (1) Yes, most of the time. (2) Yes, some of the time. (3) No, most of the time. (4)</p> <p>Please complete the following questions on your own.</p> <p>5. During the last 4 weeks, on average, how many times per month did your child have any daytime asthma symptoms?          Not at all (1), 1-3 days (2), 4-10 days (3), 11-20 days (4), 21-28 days (5), Sometimes (6)</p> <p>6. During the last 4 weeks, on average, how many times per month did your child awaken during the night because of asthma?          Not at all (1), 1-3 days (2), 4-10 days (3), 11-20 days (4), 21-28 days (5), Sometimes (6)</p> <p>7. During the last 4 weeks, on average, how many times per month did your child wake up during the night because of asthma?          Not at all (1), 1-3 days (2), 4-10 days (3), 11-20 days (4), 21-28 days (5), Sometimes (6)</p> <p>Please have this page over to see what your child's total score means.</p>	<p>Enter Name _____ Today's Date _____          Enter Address _____ Parent's Name _____          Enter City/State/Zip _____</p> <p><b>FOR PATIENTS:</b>  <b>Take the Asthma Control Test™ (ACT) for people 12 yrs and older.</b>  <b>Know your score. Share your results with your doctor.</b></p> <p>Step 1 Write the number of each answer in the score box provided.          Step 2 Add the score boxes for your total.          Step 3 Take the test to the doctor to talk about your score.</p> <div style="border: 1px solid gray; padding: 5px;"> <p>1. In the past 4 weeks, how much of the time did your asthma keep you from getting as much done at work, school or at home?          Not at all (1) Not at all (1) Some of the time (2) Most of the time (3) Most of the time (3) <b>SCORE</b></p> <p>2. During the past 4 weeks, how often have you had shortness of breath?          None that week or less (1) Once a day (2) Two or three times (3) More than three times (4) Not at all (5)</p> <p>3. During the past 4 weeks, how often did your asthma symptoms (coughing, wheezing, shortness of breath, chest tightness or pain) wake you up at night or earlier than usual in the morning?          Not more often than usual (1) Two or three times (2) Once a week (3) More than once a week (4) Not at all (5)</p> <p>4. During the past 4 weeks, how often have you used your rescue inhaler or medication (such as albuterol)?          One or more times per day (1) One or two times per day (2) One or two times per week (3) Once a week or less (4) Not at all (5)</p> <p>5. How would you rate your asthma control during the past 4 weeks?          Not controlled at all (1) Partly controlled (2) Somewhat controlled (3) Well controlled (4) Completely controlled (5) <b>TOTAL</b></p> <p><small>Copyright © 2004 American Lung Association. All rights reserved. All other trademarks are the property of their respective owners.</small></p> </div> <p><b>If your score is 19 or less, your asthma may not be controlled as well as it could be.</b></p>
<b>Asthma Control Test (ages 4-11)</b>	<b>Asthma Control Test (ages 12 and older)</b>

**A score of  $\leq 19$  means your patient's asthma may be uncontrolled.**

### How to take childhood ACT (ages 4-11)?

- **Step 1:** Let your child respond to the first four questions (1 to 4). If your child needs help in reading or understanding the question, you may help, but let your child select the response.
- **Step 2:** Complete the remaining three questions (5 to 7) on your own and without letting your child's responses influence your answers.
- **Step 3:** When all seven questions have been answered, press the "SEE YOUR SCORE" button to view your score.
- **Step 4:** Take a printout of the test results to the doctor to talk about your child's total score.

### How to take childhood ACT (ages 12 and older)?

Simple 5 questions are going to be answered by the child and assess for the score.

### **Third: What are the elements of Pediatric Asthma management?**

1. Avoidance of triggers
2. Education
3. Pharmacotherapy:
  - i. Acute
  - ii. Prevention
4. Monitoring

### 1. Steps to avoid specific allergens in sensitized individuals.

<b>Pets</b>	<b>Remove pet and clean home, especially carpets and upholstered surfaces Encourage schools to ban pets</b>
<b>Dust mites</b>	<b>Wash bedding and clothing in hot water every 1–2 weeks Freeze stuffed toys once per week Encase mattress, pillows and quilts in impermeable covers Use dehumidifying device</b>
<b>Cockroach</b>	<b>Clean home Use professional pest control Encase mattress and pillows in impermeable covers</b>
<b>Mold</b>	<b>Wash moldy surfaces with weak bleach solution Use dehumidifying equipment Fix leaks Remove carpets Use High Efficiency Particle Arrestor filtration</b>

### 2. Parent and Patient Education (the choice of the method depends on social and economic factors):

- Home booklet, visual aids (videos, DVDs, electronic games) followed by practitioner review
- Group teaching by nurses
- School education
- Asthma camps, patient organisations/support groups
- Professional societies

### 3. Pharmacotherapy:

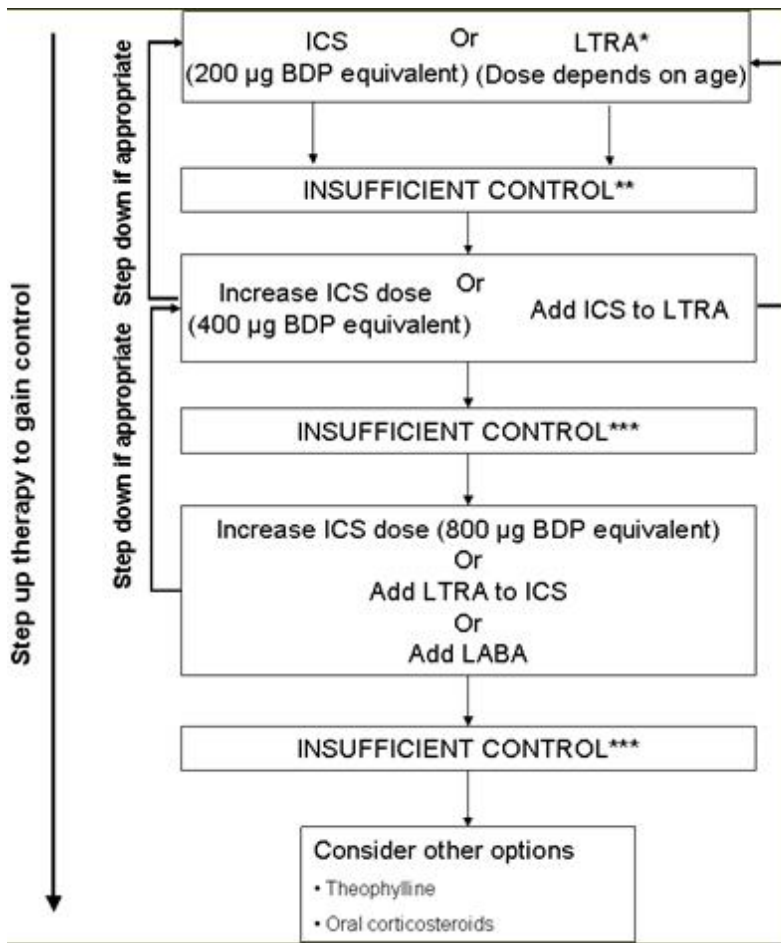
#### A. Asthma treatment 0-2 years

- Asthma  $\geq 3$  episodes in the previous 6 months
- Start with  $\beta_2$  agonists are first choice
- LTRA daily controller therapy for virus induced asthma symptoms
- Inhaled steroids for persistent asthma, especially if severe or requiring frequent oral corticosteroid therapy
- Oral steroids (e.g. 1–2 mg/kg prednisone) for 3–5 days during acute and frequently recurrent obstructive episodes
- Evidence of atopy / allergy lowers the threshold for use of ICS and they may be used as first-line treatment in such cases

#### B. Pharmacotherapy in children > 2 years (Practall Algorithm)

It simplifies the management in 3 step therapy (according to severity and response to treatment) with phenotypic considerations.

**Practall Algorithm**



\* LTRA may be particularly useful if the patient has concomitant rhinitis

\*\* Check compliance, allergen avoidance and re-evaluate diagnosis

\*\*\* Check compliance and consider referring to specialist

**Use of the "phenotype" to fine-tune pediatric asthma treatment**

	Virus	Exercise	Allergen
Avoidance	In severe/persistent cases	NO	Intense measure with perennial allergens
Education	Hand washing	Pre-warming	
Pharmacotherapy	Montelukast Inh.steroids	Salbutamol PRN Montelukast Inh.steroids	Inhaled steroids Anti-IgE
Immunotherapy	NO	NO	<b>YES</b>
Monitoring	Especially after summer vacation	Follow activity	Look into allergen seasonality

#### 4. **Regular Monitoring:**

Includes:

- Questionnaire(may use ACT)
  - Symptom frequency
  - Exacerbations
  - Avoidance of triggers
  - Use of medications
  - Side effects
  - Quality of life
- Use of devices
- Measure lung function (basic spirometry, provocation tests and recently IOS system for preschool children)
- Assess airway inflammation (including FeNO assessment)

#### **In summary:**

##### **What does the PRACTALL consensus add?**

- Complete focus on children
- A discussion of asthma phenotypes in childhood and the heterogeneity of childhood asthma
- Emphasis on allergy testing of children with suspected asthma
- Definition of asthma control for children and sample questions for asthma monitoring
- Exhaled nitric oxide and IOS tools proposed as useful adjunct to routine clinical assessment in asthma management
- A greater role, as compared with GINA, for leukotriene receptor antagonists (LTRAs)
- Research recommendations

#### **List of abbreviations used in the article:**

**ACT:** Asthma Control Test

**FeNO:** Fraction of exhaled Nitric Oxide

**GINA:** The Global Initiative for Asthma Management

**ICS:** Inhaled corticosteroids

**LTRAs:** Leukotriene receptor antagonists

**PRACTALL:** PRACTicing ALLergology program on childhood asthma

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## REFERENCES

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