



# The Wheezing Child

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# Wheeze

- Definition – continuous, high-pitched sound, with whistling or musical quality emitting from chest during expiration
- Airway obstruction distal to the intr–thoracic trachea
- Causes can be divided into acute causes and causes of a persistent wheezer



## Wheeze according to pattern or duration

- Episodic wheeze : discrete period, clinical evidence of viral cold, wheezing between episodes
- Multitrigger wheeze : wheezing that presents with an acute viral episode and also without



# Wheeze according to pattern or duration

## **Never or infrequent**

- These children never wheeze or presented with wheeze once in their lifetime

## **Transient early wheeze**

- Type that starts early in first year of life
- Continues through second year
- Subsides in third year
- Not associated with asthma and atopy

## **Intermediate Wheeze**

- Onset between 18 and 42 months of age
- Persists into later childhood
- Strong association with atopy, allergic sensitization, and hyperresponsiveness



# Wheeze according to pattern or duration

## **Late-onset wheeze**

- Infrequent wheezing at 6 to 42 months
- Persists till age 6 years of age
- Skin allergy test usually produces strong results in this group

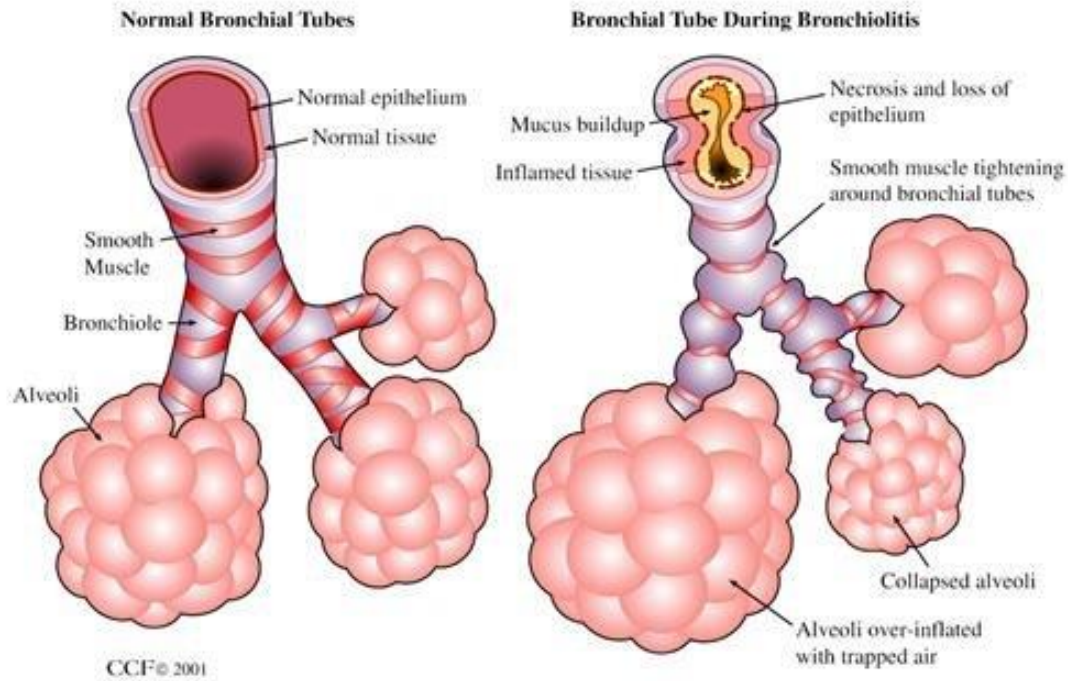
## **Persistent wheeze**

- Usually presents at 6 months of age or later
- Divided into Nonatopic persistent wheezing phenotype
- IgE-associated atopic and persistent wheezing phenotype

# Bronchiolitis

- Viral induced lower respiratory tract infection
- Predominantly in children < 2 years of age
- RSV most common pathogen
- Parainfluenza, Rhinovirus, Influenza , Human Metapneumovirus

## Bronchiolitis Pathophysiology



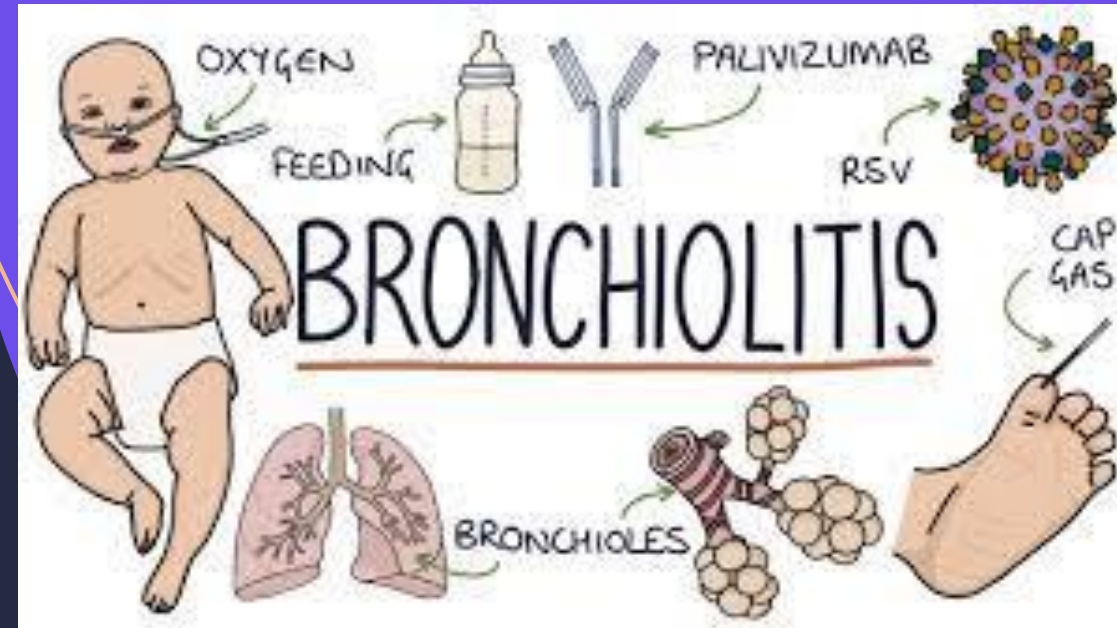
# Bronchiolitis

## Symptoms

- Runny nose
- Congested nose
- Cough
- Fever (not always present)

## Signs

- Tachypnoea
- Wheezing
- Grunting
- Subcostal recessions
- Low sats on Room Air



# Bronchiolitis

## X-ray

- Doesn't need to be done
- Clinical examination sufficient
- > 8 posterior ribs
- Mucuous plugging

## NPA Virusses

## Treatment

- NPO2
- Nasal drops
- Trial of AB Nebs





# ASTHMA

- Chronic/recurrent wheeze with or without cough
- Triggered by multiple factors
  - ❑ Viral infections
  - ❑ Allergens
  - ❑ Irritants (pollution)
  - ❑ Exercise,
  - ❑ Emotions
- Responds to an inhaled bronchodilator.
- Clinical improvement during 2-3 months of controller treatment

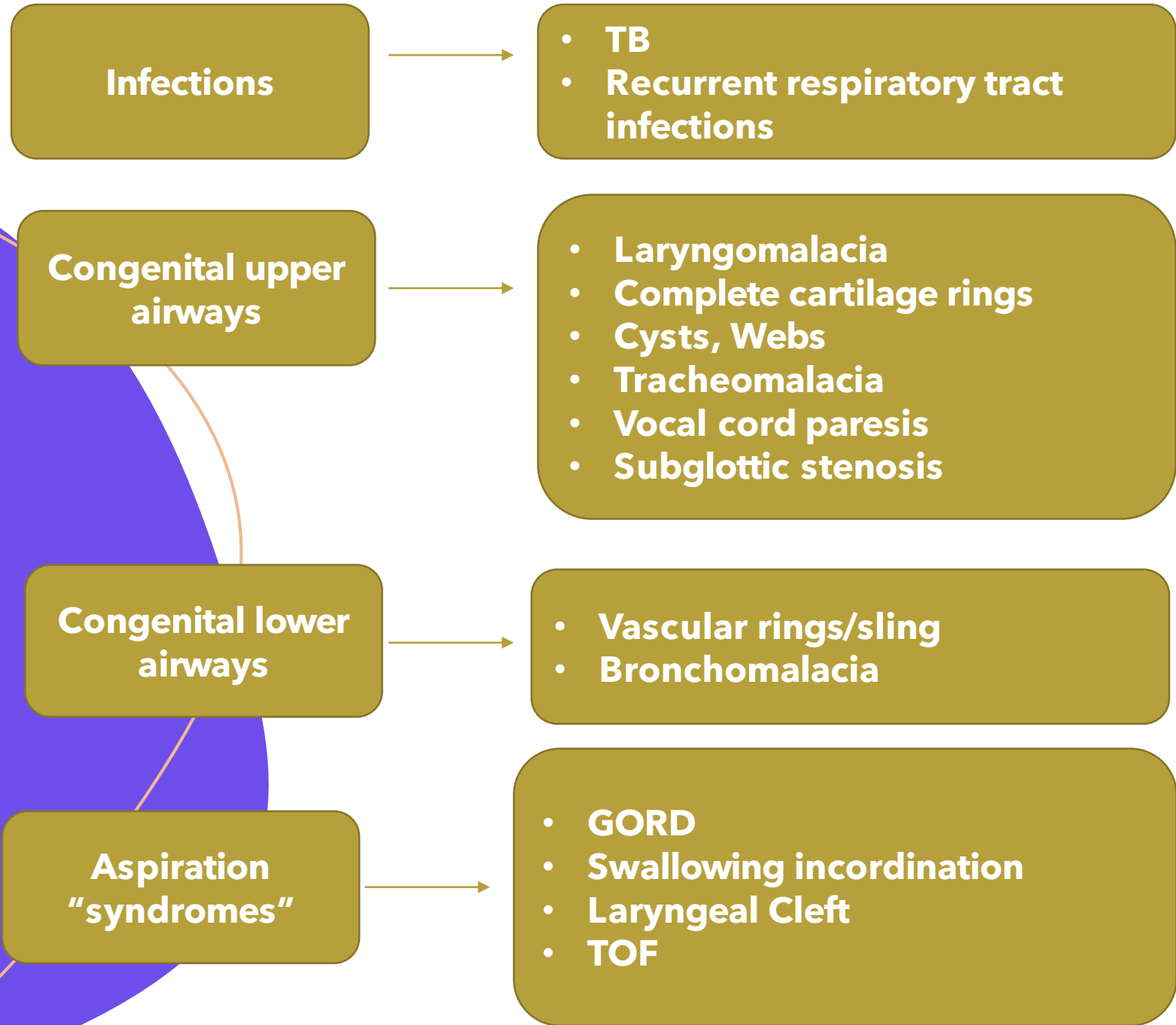




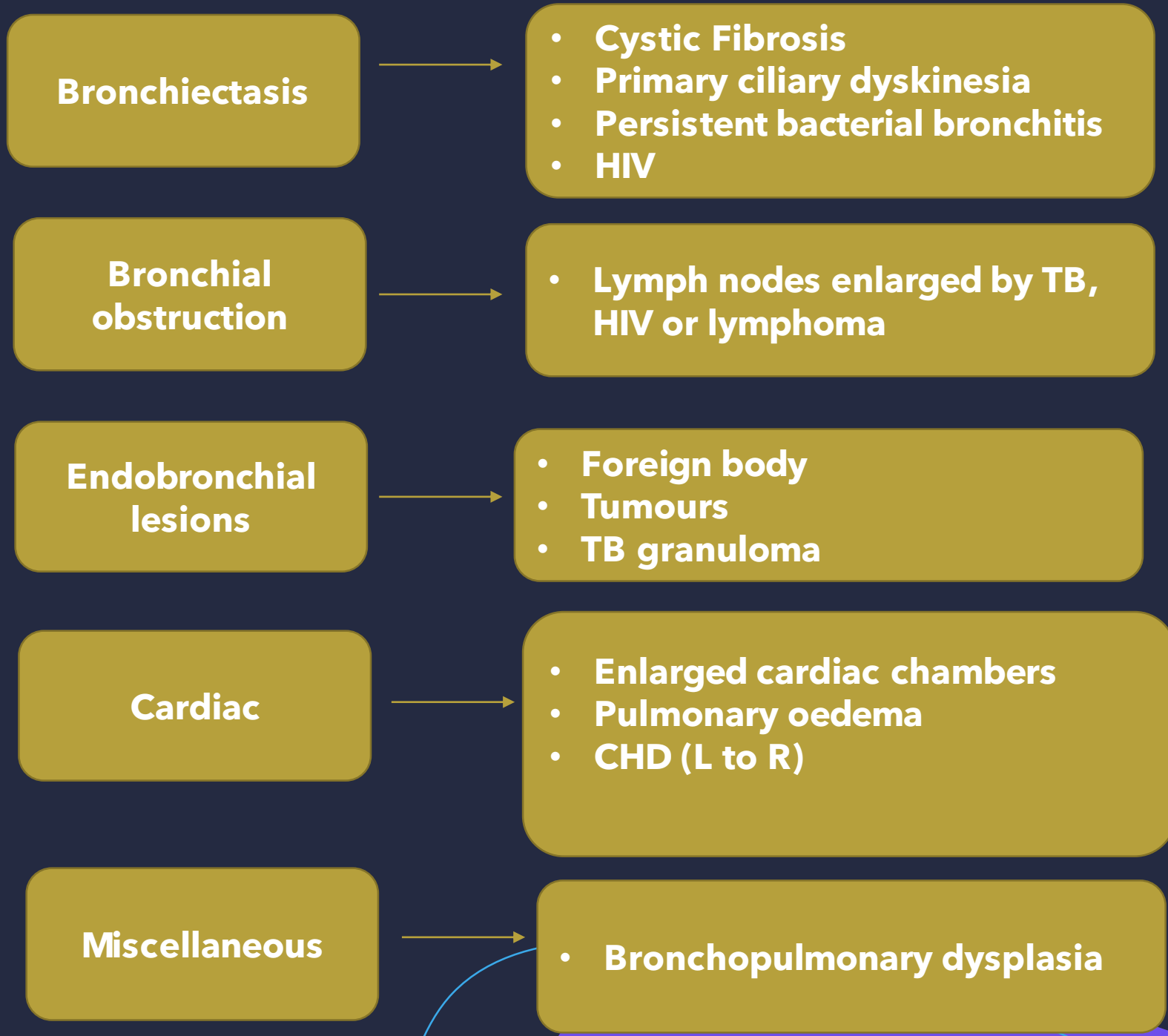
# ASTHMA

- Worsening of Sx after cessation
- Hx of other allergic disease
- Asthma in 1st-degree relatives .
- Airway inflammation and airway obstruction are features of the disease

# Differential Diagnosis of Recurrent Wheeze in Child < 5 years



# Differential Diagnosis of Recurrent Wheeze in Child < 5 years



# History is the most NB!



Question	
• How old was the patient when the wheezing initially presented ?	Distinguish congenital from non-congenital causes
• Did the wheezing start suddenly ?	Foreign body aspiration
• Is there a pattern to the wheezing ?	Episodic : Asthma Persistent : Congenital or genetic cause
• Is the wheezing associated with a cough ?	GORD Sleep apnoea Asthma Allergies
• Is the wheezing associated with feeding ?	GORD
• Is the wheezing associated with multiple respiratory illnesses ?	Cystic Fibrosis Immunodeficiency

# History is the most NB!

Question	
<ul style="list-style-type: none"><li>• Is the wheezing associated with a specific season ?</li></ul>	Allergies Croup RSV Influenza
<ul style="list-style-type: none"><li>• Does the wheezing get better or worse when the patient changes position ?</li></ul>	Tracheomalacia Anomalies of great vessels
<ul style="list-style-type: none"><li>• Is there a family history of wheezing ?</li></ul>	Infections Allergic triad Persistent : Congenital or genetic cause

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## The prevalence of atopic triad in children with physician-confirmed atopic dermatitis

Roger Kapoor, MD, MBA • Chandrakala Menon, PhD • Ole Hoffstad, MA • Warren Bilker, PhD •  
Patricia Leclerc, MA • David J. Margolis, MD, PhD  

Published: August 10, 2007 • DOI: <https://doi.org/10.1016/j.jaad.2007.06.041>

# Investigations

- Usually history is sufficient
- Based on clinical judgement, investigations can be done

Circumstances :

Recovery  
slow/incomplete

Symptoms  
present from  
birth

Airway  
obstruction  
abnormally  
severe

Episodes persist  
in absence of  
viral infection

Failure to thrive

Parental anxiety



# Investigations

- Modified bronchodilator-response test
- Lung-function tests
- Exhaled nitric oxide
- Skin prick test
- Total serum IgE
- CXR
- Rule out GORD
- NPA for viruses
- Flexible fibre-optic bronchoscopy

# Treatment

## Non-pharmacological Treatment

- Environmental manipulation
- Parent and patient education



# Pharmacological Treatment

- Short-acting bronchodilator
  - Inhaled
  - Oral bronchodilator therapy
- Long-acting inhaled B<sub>2</sub>-agonists
- Inhaled corticosteroids

Cardinal principle

**Box 2-2. GINA assessment of asthma control in adults, adolescents and children 6–11 years**

A. Asthma symptom control		Level of asthma symptom control		
In the past 4 weeks, has the patient had:		Well controlled	Partly controlled	Uncontrolled
		<ul style="list-style-type: none"> <li>Daytime asthma symptoms more than twice/week? Yes <input type="checkbox"/> No <input type="checkbox"/></li> <li>Any night waking due to asthma? Yes <input type="checkbox"/> No <input type="checkbox"/></li> <li>SABA reliever for symptoms more than twice/week? Yes <input type="checkbox"/> No <input type="checkbox"/></li> <li>Any activity limitation due to asthma? Yes <input type="checkbox"/> No <input type="checkbox"/></li> </ul>	None of these	1–2 of these

**B. Risk factors for poor asthma outcomes**

Assess risk factors at diagnosis and periodically, particularly for patients experiencing exacerbations.

Measure FEV<sub>1</sub> at start of treatment, after 3–6 months of controller treatment to record the patient's personal best lung function, then periodically for ongoing risk assessment.

**Having uncontrolled asthma symptoms is an important risk factor for exacerbations.**<sup>95</sup>

Additional **potentially modifiable risk factors for flare-ups (exacerbations)**, even in patients with few symptoms<sup>†</sup> include:

- Medications:** high SABA use (≥3 x 200-dose canisters/year associated with increased risk of exacerbations;<sup>123,96</sup> increased mortality particularly if ≥1 canister per month<sup>71,97</sup>); inadequate ICS: not prescribed ICS; poor adherence;<sup>98</sup> incorrect inhaler technique<sup>99</sup>
- Other medical conditions:** obesity;<sup>100,101</sup> chronic rhinosinusitis;<sup>101</sup> GERD;<sup>101</sup> confirmed food allergy;<sup>102</sup> pregnancy<sup>103</sup>
- Exposures:** smoking;<sup>104</sup> e-cigarettes;<sup>105</sup> allergen exposure if sensitized;<sup>104</sup> air pollution<sup>106-108</sup>
- Context:** major psychological or socioeconomic problems<sup>109</sup>
- Lung function:** low FEV<sub>1</sub>, especially <60% predicted;<sup>104,110</sup> high BD responsiveness<sup>101,111,112</sup>
- Type 2 inflammatory markers:** higher blood eosinophils;<sup>101,113,114</sup> elevated FeNO (in adults with allergic asthma taking ICS)<sup>115</sup>

Other major independent risk factors for flare-ups (exacerbations)

- Ever intubated or in intensive care unit for asthma<sup>116</sup>
- ≥1 severe exacerbation in last 12 months<sup>117,118</sup>

**Having any of these risk factors increases the patient's risk of exacerbations even if they have few asthma symptoms**

In a world  
where you can  
be anything,  
be kind.



Be Kind

Be  
Generous

Be  
grateful