

# ASTHMA

## Learners Guide

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### PRE-READING

Please watch or read one of the basic pathophysiology links before the session.

Also aim to listen to the PEM Playbook or EM Cases Podcasts on asthma.

Khan Academy

[Openpediatrics.org](https://openpediatrics.org), Video

Asthma Podcast

DFTB Asthma

DFTB Management of Asthma

## CASE 1 (15 MINS)

Joseph, a 10yr old boy comes into the ED. He is a known asthmatic on treatment. He appears breathless with an audible wheeze. He is able to talk in complete sentences. He has a RR of 25, sats of 94%, pulse of 100 and his PEF is 60% of normal.

**What is the severity score of this child's asthma presentation?**

**What investigations and treatment options should you consider?**

**How do you decide when it is safe to discharge home?**

**The boy is 3 years old with the same presentation – his mum asks you if her son has asthma. What is your response?**

## CASE 2 (15 MINS)

Leila, a 13yr old female, known asthmatic on treatment, presented to ED breathless and finding it hard to speak in full sentences. Her oxygen saturations are 92%, HR 130 and RR35.

**What is the severity score of this child's asthma presentation?**

**What investigations and treatment options should you consider?**

**When do you need to re-assess response to treatment to decide on discharge vs escalation?**

## ADVANCED CASE 1

Leila has not improved despite the treatment given in ED as outlined in case 2. Her sats are now 89%, she appears cyanosed and has a poor respiratory effort. On auscultation her chest is quiet. What are the next steps that need to be taken.

**How would you rate the severity score of this presentation?**

**What investigations or treatment needs to be considered?**

**Which IV medications if any should be used?**

**Which important differentials need to be considered?**

**What escalation plans need to be put in place?**

## ADVANCED CASE 2

A 15yr old male has been brought into resus with features of life threatening asthma. Pre hospital the paramedics gave continuous salbutamol nebulisers, 500mcg Ipratropium nebulisers and 0.5mg IM Adrenaline. The attending medical team in resus administered 2g IV Mg over 20 mins and a bolus of 250mcg IV Salbutamol. The patient then became unresponsive with no respiratory effort.

**What are the next steps that need to be taken?**

**What is the 'deadly triad' in asthma?**

**What are the key ALS modifications in asthma arrest?**

### Quiz Questions (10 mins)

#### Question 1.

**In an acute asthma exacerbation in children, monitoring the oxygen sats is important because:**

- A** hypoxaemia is an early sign of clinical deterioration
- B** sats <95% may suggest the need for prolonged bronchodilator therapy
- C** Hypoxaemia occurs in the presence of life threatening asthma. Children may have normal sats for some time before critical desaturation occurs.
- D** sats >96% supports the decision to safely discharge home

#### Question 2.

**What is an appropriate length of time to stretch children in the ED prior to discharge**

- A** After they reach the first 4hrs post last inhaler/nebuliser
- B** After two sets of 4hrly inhaler/nebulisers
- C** After two sets of 3hrly
- D** After 1 hour, if obs are completely normal and has had a consultant review

### Question 3.

**Under what circumstances would you choose to administer a beta agonist via nebuliser as opposed to a pMDI with a spacer?**

- A**  
When the child has become more tachycardic with worsening salbutamol induced tremor
- B**  
In severe or life threatening asthma or when under the age of 1yrs old/ learning difficulties
- C**  
If the pMDI is ineffective
- D**  
Some departments prefer nebulisers as it is cheaper than inhaled preparations

### Question 4.

**When is intubation indicated in paediatric asthma presentations?**

- A**  
When the HR > 160 OR the RR > 60
- B**  
When you have given all first line and second line treatment and trialled NIPPV and the patient has still not improved.
- C**  
The child looks exhausted with worsening hypercapnia and changes in mental status.
- D**  
When the child has a history of fast deterioration and need for intubation

### Question 5.

**You have a 4yr old, with two days of wheeze, coryzal symptoms and one day of increased work of breathing symptoms. You suspect that this may be viral induced wheeze. How do you manage this child?**

- A**  
Burst therapy with salbutamol.
- B**  
6-10 puffs of salbutamol and reassess. If severe symptoms give oral steroids
- C**  
Humidified air nebuliser and antipyretics for fever.
- D**  
6-10 puffs of salbutamol and Ipratropium bromide nebuliser. If severe symptoms give oral steroids.

## Finish-infographic of the take home tips (5 minutes)

- 1 Age (immune system development) and clinical history are key to determining the cause of wheeze in children. <1yrs old is likely bronchiolitis, 1-5 is likely viral wheeze and >5yrs may indicate asthma.
- 2 The initial assessment is key to establishing the severity of the asthma attack which guides initial management.
- 3 Always reassess response to treatment after 15 mins.
- 4 Always give oral steroids.
- 5 Know criteria for discharge and ensure safe follow up is in place.
- 6 Ensure critical care referrals are made early for children with severe asthma not responding to treatment or with any life threatening features.
- 7 Consider modifications to ALS protocol in asthma cardiorespiratory arrest.

## REFERENCES

M Balfour-Lynn (1996) Why do viruses make infants wheeze?, Archives of Disease in Childhood 74: 251-259

MO Stormon, CM Mellis, PP Van Asperen, HA Kilham (2002) Outcome evaluation of early discharge of asthmatic children from hospital: A randomized control trial, Journal of quality in clinical practise, Vol 19, issue 3, 149-154

Huay-ying Lo, Amanda Messer, Jennifer Loveless, Esther Sampayo, Robert H. Moore, Elizabeth A. Camp, Charles G. Macias and Ricardo Quinonez (2018) Discharging Asthma Patients on 3-Hour  $\beta$ -Agonist Treatments: A Quality Improvement Project, Hospital Pediatrics, 8 (12) 733-739

Basnet S, Mander G, Andoh J, Klaska H, Verhulst S, Koirala J (2012) Safety, efficacy, and tolerability of early initiation of noninvasive positive pressure ventilation in pediatric patients admitted with status asthmaticus: a pilot study. *Pediatr Crit Care Med* 13(4):393-8.

Snelson, E (2019) A simple model for understanding the causes of paediatric wheeze, *Paediatrics and Child Health*, Volume 29, Issue 8, Pages 365-368

DFTB - Managing acute asthma, Simon Craig (2017)

DFTB - Asthma for ambos (2016)

DFTB - Are nebulisers or spacers better for managing acute asthma (2013)

DFTB - The curious incident of the wheeze in the night

PEMBLOG - Heliox in the emergency department (2017)

EMCases - Management of acute paediatric exacerbations (2016)

BTS/SIGN British guideline on the management of asthma in children (2019)

PaediatricFOAMed - ventilation strategies for the critically ill asthmatic (2019)

RCEMLearning - Arrest in asthma

gppaedstips.blogspot.com - The NYCE guideline for viral induced wheeze - Let's clear a few things up (2019)