

# Management of Asthma in the Emergency Department

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# Definition of Asthma

- Chronic inflammation of airways
- Asso. with airway hyperresponsiveness, leading to recurrent episodes of
  - wheezing,
  - breathlessness,
  - chest tightness, and
  - cough, particularly at night or early morning
- Asso. widespread airflow obstruction, often reversible either spontaneously or with treatment.

What is an exacerbation of asthma?

# Exacerbation of Asthma - Definition

- Progressive increase in:
  - SOB
  - Cough
  - Wheezing, or
  - Tightness of chest, OR
  - Some combination of these

# Exacerbation of Asthma

- Characterised by ↓ Exp. airflow (Spirometry - ↓FEV<sub>1</sub>, Peak Flow Meter - ↓PEFR)
- Symptoms usually precede deterioration of PEFR; progressive onset before decline in lung fn.
- A minority of patients: poor perception of aggravating symptoms - significant decline in lung fn without warning – near-fatal asthma.

# Managing Exacerbation of Asthma in ED

# Initial Assessment

- History:
  - Severity & duration of symptoms
  - Exercise limitation
  - Sleep disturbance
  - Current medications (dose prescribed, dose usu. taken, dose taken in response to deterioration)
  - Cause of present exacerbation
  - Any risk factors for asthma-related death

# Patients at High Risk of Asthma-related Death

- H/o near-fatal asthma requiring intubation and mechanical ventilation
- H/o admission for asthma in ICU
- H/o  $\geq 2$  hospitalisations in past year
- $\geq 3$  ED visits in past year
- Hospitalisation or ED visit in past month



# Patients at High Risk of Asthma-related Death (2)

- Currently on or recently stopped oral steroids
- Not currently using ICS
- Overdependent on Rescue medication (>2 canisters/mo)
- H/o psychiatric disease or psychosocial problems – use of sedatives
- Poor adherence to asthma medications


# Initial Assessment (2)

- Physical Examination:
  - Use of Accessory Respiratory muscles
  - RR
  - Auscultation
  - HR
  - SPO<sub>2</sub>
- Tests:
  - FEV<sub>1</sub> or PEF
  - ABG

# Severity of Exacerbations of Asthma

	Mild	Moderate	Severe	Life-threatening (Respiratory Arrest Imminent)
Breathless	Walking Can lie down	Talking Prefers sitting	At rest Hunched forward	Cyanosis, poor resp. effort
Talks in	Sentences	Phrases	Words	
Alertness	May be agitated	Usu. agitated	Usu. agitated	Confused, Drowsy, Coma
RR	Increased	Inreased	> 30/min (50)	
Accessory muscles & suprasternal retractions	Usu. not	Usually	Usually	Paradoxical thoraco- abdo.mvt
Wheeze	Mod., often end-expiratory	Loud	Usu. Loud	Absence of wheeze
Pulse/min	<100	100-120	>120 (130)	Bradycardia, Arrythmia
SaO <sub>2</sub> % (on air)	>95%	91-95%	<90% (<92)	< 90% (< 92)
PEF (post- bronchodilator)	>80%	≈ 60-80%	<60%	
PaO <sub>2</sub> PaCO <sub>2</sub>	Test not done	>60 mmHg <45 mmHg	<60 mmHg >45 mmHg	

# Initial Treatment

- Primary aim:
  - Relieve airflow obstruction
  - Correct hypoxaemia

as soon as possible
- Repetitive administration of rapid-acting bronchodilator
- Early introduction of systemic glucocorticosteroids
- O<sub>2</sub> supplementation

# Pharmacologic Management

DRUG	DOSE
Salbutamol	<p>2.5 – 5 mg in 2.5ml NS q15-20 mins or 5-10mg/h continuously</p> <p>Combined with Ipratropium Br 0.25 -0.5 mg; O2 driven IV if respiratory arrest imminent: Bolus 15 µg/Kg over 10 mins; continuous IV 1-2 µg/Kg/min (ECG monitoring)</p>
Steroids	<p>Oral: 50-60 mg Prednisolone stat OR</p> <p>IV: 200-400 mg HC OR 60 – 125mg Methylprednisolone</p> <p>ICS: Speed up resolution of acute bronchoconstriction</p> <p>Children 2- 5 y: 20 mg Prednisolone oral</p> <p style="padding-left: 40px;">&gt; 5 y: 30-40 mg Prednisolone PO</p> <p>If not tolerating orally: IV HC 4mg/Kg q 4h</p>

# Pharmacologic Management (2)

DRUG	DOSE
Oxygen	Through nasal cannula or mask: SPO2 >94% (95% in children, pregnancy, or coexisting cardiac dis)
Aminophylline	Adult & Children: Loading dose: 5mg/Kg over 20 mins; Maintenance: 0.5-0.7 mg/Kg/Hr
Magnesium sulphate	Adult: single dose in severe asthma, not responding to initial Tt: 1.2-2g IV over 20 mins Child 2-5Y: 150mg MgSO4 can be added to nebulised Salb-Ipratrop if SPO2 <92%
Epinephrine	Indicated in Anaphylaxis and Angioedema Refractory asthma: 0.3-0.4 ml (1:1000) sc every 20 mins x 3 doses

# Referral to ICU

- If no improvement or deteriorating condition evidenced by:
  - Persisting or worsening hypoxia
  - Exhaustion, feeble respiration
  - Drowsiness, confusion, altered conscious state
  - Deteriorating PEF
  - Hypercapnia
  - Fall in pH
  - Respiratory arrest
- For close monitoring or may require ventilation

# Resources

- British guideline on the management of asthma 2014
- Asthma control in general practice 2012
- GINA Report 2011





*Thank you*