

ACUTE SEVERE ASTHMA IN ADULTS

RECOGNITION AND ASSESSMENT

Symptoms and signs

- Cannot complete sentences in one breath
- Respiration ≥ 25 breaths/min
- Pulse ≥ 110 beats/min
- Use of accessory muscles
- Peak expiratory flow (PEF) $< 50\%$ of predicted (Figure 1) or best (if known)

Life-threatening features

- PEF $< 33\%$ of predicted (Figure 1) or best (if known)
- Silent chest, cyanosis, or feeble respiratory effort
- Bradycardia or hypotension
- Exhaustion, confusion, or coma

Patients with severe or life-threatening attacks may not be distressed and may not have all these abnormalities. The presence of any one of these should alert the doctor

Investigations

The only investigations needed before **Immediate treatment** are:

- PEF
- Oximetry

If SaO₂ $< 92\%$ or patient has any life-threatening features or not responding to treatment, measure arterial blood gases (ABG)

ABG markers of a life-threatening attack

- Normal or high PaCO₂ (> 4.6 kPa)
- Severe hypoxia: PaO₂ < 8 kPa irrespective of treatment with O₂
- Low pH (or high H⁺)

No other investigations are needed for immediate management

IMMEDIATE TREATMENT

- O₂:
 - Give supplemental oxygen to maintain SpO₂ 94-98% if required (CO₂ retention not usually aggravated by O₂ therapy in asthma)
- Salbutamol 5 mg plus ipratropium 500 microgram [via O₂-driven](#) nebulizer
- Prednisolone tablets 40 mg (if taking maintenance prednisolone, increase daily dose by 40 mg) or hydrocortisone 100 mg slow IV bolus, or both if very ill
- No sedatives of any kind
- If patient has coincident chronic bronchitis (regularly produces sputum), consider antibiotic treatment – see **Acute exacerbation of chronic obstructive pulmonary disease** guideline
- Chest physiotherapy **not** indicated
- [Assess and treat hypovolaemia and electrolyte imbalance – Use Trust Fluid and Electrolyte management guidelines](#)

Further investigations

- Chest X-ray to exclude pneumothorax or consolidation
- U&E
- FBC

Patients with life-threatening features

Ask medical registrar, or consultant physician, ideally respiratory, to review urgently

- Give magnesium sulphate 2 g made up to 50 mL with sodium chloride 0.9% by IV infusion over 20 min if not already given earlier (e.g. in ambulance). Never give a second dose of magnesium without discussion with **consultant respiratory physician**
- **Urgently seek ITU help (ITU registrar 3995) for ITU admission if continues to deteriorate with:**
 - falling PEF, worsening or persisting hypoxia, or hypercapnia
 - exhaustion, feeble respirations, confusion, or drowsiness
 - coma or respiratory arrest

En route to ITU, ensure that patient is accompanied by a doctor (usually an anaesthetist) prepared to intubate if the patient's clinical condition requires it

SUBSEQUENT MANAGEMENT

- **Admit to a respiratory ward D19 or D20.**
- Correct disturbances in fluid and electrolyte balance, especially potassium (K⁺)

If patient requires IV fluid with potassium, always use commercially produced pre-mixed bags of sodium chloride 0.9% and potassium chloride. NEVER add potassium chloride to infusion bags

If patient is improving continue:

- 40-60% O₂
- Prednisolone daily at dose in **Immediate treatment** section, or hydrocortisone 100 mg 6 hrly as slow IV bolus over 1 min if unable to swallow
- Nebulized salbutamol 2.5 mg plus ipratropium 250 microgram 6 hrly

Ask Respiratory clinical nurse specialist in Asthma to review patient

- Change to discharge medication (check inhaler technique) 24 hr before discharge

If patient not improving after 15-30 min:

- Continue O₂ and steroids
- Give nebulized salbutamol 5 mg more frequently, up to every 15-30 min
- Give ipratropium 500 microgram 4 hrly until patient is improving
- Once patient improving, reduce nebulized salbutamol to 2.5 mg and ipratropium to 250 microgram 6 hrly

If patient still not improving:

Ask medical registrar or consultant physician (ideally respiratory) to review urgently

- Give magnesium sulphate 2 g made up to 50 mL with sodium chloride 0.9% by IV infusion over 20 min if not already given earlier (e.g. in ambulance). Never give a second dose of magnesium without discussion with **consultant respiratory physician**
- Senior clinician considers use of aminophylline or salbutamol by infusion – see **Prescribing regimens and nomograms** for doses
- **If any life-threatening features (see above) present, transfer to ITU and refer to respiratory physician**

En route to ITU, ensure that patient is accompanied by a doctor (usually an anaesthetist) prepared to intubate if the patient's clinical condition requires it

MONITORING TREATMENT

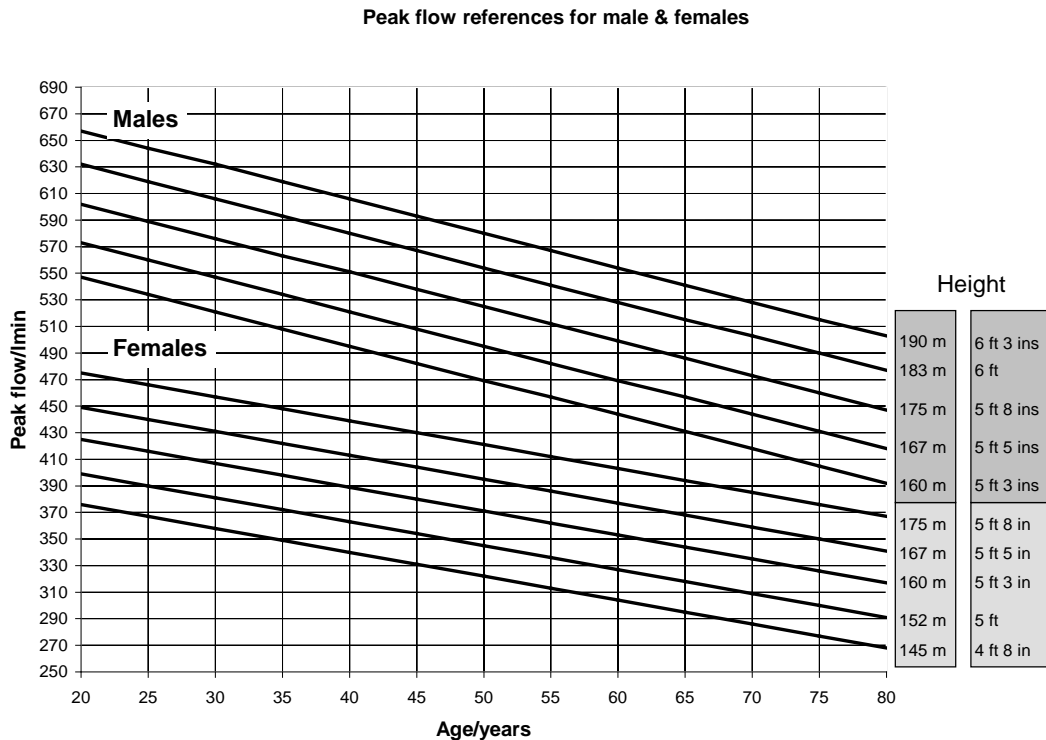
- Repeat measurement of PEF 15-30 min after starting treatment
- Oximetry: maintain SaO₂ 94-98%
- Repeat blood gas measurements within 2 hr of starting treatment if:
 - initial PaO₂ <8 kPa (60 mmHg), unless subsequent SaO₂ >92%, OR
 - initial PaCO₂ normal or raised, OR

- patient deteriorates
- Chart PEF before and 15-20 min after giving nebulized or inhaled salbutamol, and at least four times daily until stable; then change to morning and evening before salbutamol dose

DISCHARGE POLICY

- **When discharged from hospital patients should have:**
- been taking discharge medication for 24 hr and have had inhaler technique checked and recorded (**contact respiratory nurse specialist**)
- PEF >75% of predicted or best and PEF diurnal variability <25% unless discharge agreed with respiratory physician
- treatment with oral and inhaled corticosteroids in addition to bronchodilators
- own PEF meter (prescribable) and, if appropriate, a written self-management plan
- had reason for exacerbation discussed
- details of admission, discharge and potential best PEF sent to GP on discharge documentation
- GP follow-up within one week- to be written on discharge sheet please.
- Refer to **Respiratory nurse specialist** for follow-up

Figure 1: Predicted adult PEF chart for use with EU standard peak flow meters marked with yellow circle around the letters EU



To find the predicted PEF value read off from the vertical axis the value corresponding to the point where a vertical line from the patient's age intersects with the line on the graph corresponding most closely with the patient's height