

Features of acute severe asthma

- Peak expiratory flow (PEF) 33-50% of best (use % predicted if recent best unknown)
- Can't complete sentences in one breath
- Respiration ≥ 25 breaths/min
- Pulse ≥ 110 beats/min

Life-threatening features

- PEF <33% of best or predicted
- SpO₂ <92%
- Silent chest, cyanosis, or poor respiratory effort
- Arrhythmia or hypotension
- Exhaustion, altered consciousness

If a patient has any life-threatening feature, measure arterial blood gases. No other investigations are needed for immediate management.

Blood gas markers of a life-threatening attack:

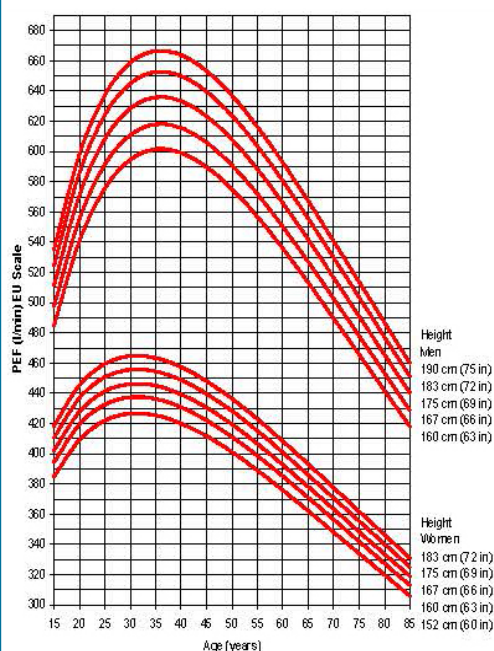
- 'Normal' (4.6-6 kPa, 35-45 mmHg) PaCO₂
- Severe hypoxia: PaO₂ <8 kPa (60 mmHg) irrespective of treatment with oxygen
- A low pH (or high H+)

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

Near-fatal asthma

- Raised PaCO₂
- Requiring mechanical ventilation with raised inflation pressures

Peak Expiratory Flow Rate - Normal Values



Immediate treatment

- Oxygen to maintain SpO₂ 94-98%
- β_2 Bronchodilator (Salbutamol 5 mg) via an oxygen-driven nebuliser
- Ipratropium Bromide 0.5 mg via an oxygen-driven nebuliser
- Prednisolone tablets 40-50 mg or IV Hydrocortisone 100 mg
- No sedatives of any kind
- Chest X-ray if pneumothorax or consolidation are suspected or patient requires mechanical ventilation

If life-threatening features are present:

- Discuss with senior clinician and ICU team
- Consider IV magnesium sulphate 1.2-2 g infusion over 20 minutes (unless already given)
- Give nebulised β_2 bronchodilator more frequently eg. Salbutamol 5 mg up to every 15-30 minutes or 10 mg per hour via continuous nebulisation (requires special nebuliser)

Subsequent management

if patient is improving continue:

- Oxygen to maintain SpO₂ 94-98%
- Prednisolone 40-50mg daily or IV hydrocortisone 100 mg 6 hourly
- Nebulised β_2 bronchodilator with ipratropium 4-6 hourly

If patient not improving after 15-30 minutes:

- Continue oxygen and steroids
- Use continuous nebulisation of salbutamol at 5-10 mg/hour if an appropriate nebuliser is available. Otherwise give nebulised salbutamol 5 mg every 15-30 minutes
- Continue ipratropium 0.5 mg 4-6 hourly until patient is improving

If patient is still not improving:

- Discuss patient with senior clinician and ICU team
- Consider IV magnesium sulphate 1.2-2 g over 20 minutes (unless already given)
- Senior clinician may consider use of IV β_2 bronchodilator or IV aminophylline or progression to mechanical ventilation

Monitoring

- Repeat measurement of PEF 15-30 minutes after starting treatment
- Oximetry: maintain SpO₂ 94-98%
- Repeat blood gas measurements within 1 hour of starting treatment if:
 - initial PaO₂ <8 kPa (60 mmHg) unless subsequent SpO₂ >92% or
 - PaCO₂ normal or raised or
 - patient deteriorates
- Chart PEF before and after giving β_2 bronchodilator and at least 4 times daily throughout hospital stay

Transfer to ICU accompanied by a doctor prepared to intubate if:

- Deteriorating PEF, worsening or persisting hypoxia, or hypercapnia
- Exhaustion, altered consciousness
- Poor respiratory effort or respiratory arrest

Discharge

When discharged from hospital, patients should have:

- Been on discharge medication for 12-24 hours and have had inhaler technique checked and recorded
- PEF >75% of best or predicted and PEF diurnal variability <25% unless discharge is agreed with respiratory physician
- Treatment with oral steroids (prednisolone 40-50 mg until recovery - minimum 5 days) and inhaled steroids in addition to bronchodilators
- Own PEF meter and written asthma action plan
- GP follow up arranged within 2 working days
- Follow-up appointment in respiratory clinic within 4 weeks

Patients with severe asthma (indicated by need for admission) and adverse behavioural or psychosocial features are at risk of further severe or fatal attacks.

- Determine reason(s) for exacerbation and admission
- Send details of admission, discharge and potential best PEF to GP