

# Management of acute severe asthma in adults in hospital

## Features of acute severe asthma

- Peak expiratory flow (PEF) 33-50% of best (use % predicted if recent best unknown)
- Cannot complete sentences in one breath
- Respirations  $\geq 25$  breaths/min
- Pulse  $\geq 110$  beats/min

## Life threatening features

- PEF  $< 33\%$  of best or predicted
- $\text{SpO}_2 < 92\%$
- Silent chest, cyanosis or feeble respiratory effort
- Bradycardia, dysrhythmia or hypotension
- Exhaustion, confusion or coma

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:

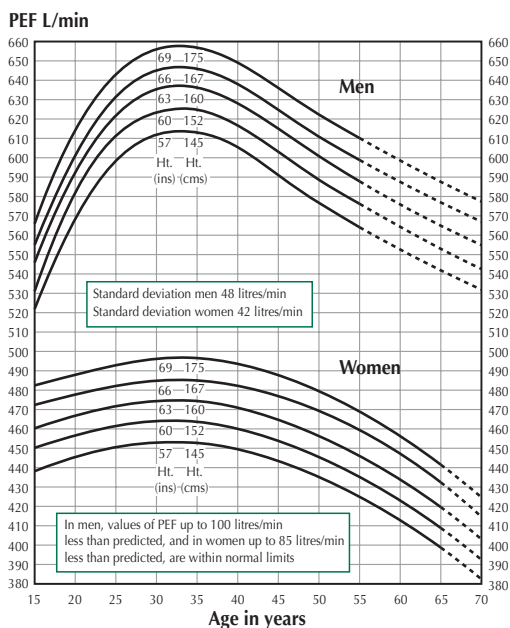
- Normal (4.6-6 kPa, 35-45mm Hg)  $\text{PaCO}_2$
- Severe hypoxia:  $\text{PaO}_2 < 8$  kPa (60mm Hg) irrespective of treatment with oxygen
- A low pH (or high  $\text{H}^+$ )

**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  $\text{PaCO}_2$
- Requiring IPPV with raised inflation pressures

## Peak expiratory flow in normal adults



Nunn A.J., Gregg I. New regression equations for predicting peak expiratory flow in adults. BMJ 1989; 298: 1068-70

## IMMEDIATE TREATMENT

- **Oxygen 40-60%** ( $\text{CO}_2$  retention is not usually aggravated by oxygen therapy in asthma)
- Salbutamol 5mg or terbutaline 10mg via an oxygen-driven nebuliser
- Ipratropium bromide 0.5mg via an oxygen-driven nebuliser
- Prednisolone tablets 40-50mg or IV hydrocortisone 100mg or both if very ill
- No sedatives of any kind
- Chest radiograph only if pneumothorax or consolidation are suspected or patient requires IPPV

## IF LIFE THREATENING FEATURES ARE PRESENT:

- Discuss with senior clinician and ICU team
- Add IV magnesium sulphate 1.2-2g infusion over 20 minutes (unless already given)
- Give nebulised  $\beta_2$  agonist more frequently e.g. salbutamol 5mg up to every 15-30 minutes or 10mg continuously hourly

## SUBSEQUENT MANAGEMENT

### IF PATIENT IS IMPROVING continue:

- 40-60% oxygen
- Prednisolone 40-50mg daily or IV hydrocortisone 100mg 6 hourly
- Nebulised  $\beta_2$  agonist and ipratropium 4-6 hourly

### IF PATIENT NOT IMPROVING AFTER 15-30 MINUTES:

- Continue oxygen and steroids
- Give nebulised  $\beta_2$  agonist more frequently e.g. salbutamol 5mg up to every 15-30 minutes or 10mg continuously hourly
- Continue ipratropium 0.5mg 4-6 hourly until patient is improving

### IF PATIENT IS STILL NOT IMPROVING:

- Discuss patient with senior clinician and ICU team
- IV magnesium sulphate 1.2-2g over 20 minutes (unless already given)
- Senior clinician may consider use of IV  $\beta_2$  agonist or IV aminophylline or progression to IPPV

## MONITORING

- Repeat measurement of PEF 15-30 minutes after starting treatment
- Oximetry: maintain  $\text{SpO}_2 > 92\%$
- Repeat blood gas measurements within 2 hours of starting treatment if:
  - initial  $\text{PaO}_2 < 8$  kPa (60mm Hg) unless subsequent  $\text{SpO}_2 > 92\%$
  - $\text{PaCO}_2$  normal or raised
  - patient deteriorates
- Chart PEF before and after giving  $\beta_2$  agonists 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 hypercapnea
- Exhaustion, feeble respirations, confusion or drowsiness
- Coma or respiratory arrest

## DISCHARGE

### When discharged from hospital, patients should have:

- Been on discharge medication for 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 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