# Algorithm for the Inpatient management of acute exacerbation of asthma in children

Initial assessment:
Asthma Clinical Score (PRAM)

Any signs of IMPENDING RESPIRATORY FAILURE? ( Score of 12 + lethargy, cyanosis, decreasing respiratory effort)

MILD
(Score 0-4)

MODERATE
(Score 5-8)

SEVERE
(Score 9-12)

**High flow oxygen as needed to maintain Sp02 at ≥94%**

**Salbutamol inhaler**
(100mcg/puff) via **spacer**
- < 6 y/o : 2 to 6 puffs
- > 6 y/o : 6 to 12 puffs

*If spacer unavailable, give salbutamol nebuliser*:
- *< 6 y/o : 2.5mg*
- *> 6 y/o : 5mg*

*Systemic steroids not usually required*

**Reassess after 30 mins**

**3 doses of nebulised mixture of Salbutamol and Ipratropium*** in the first hour
- Salbutamol
- < 6 y/o : 2.5mg
- > 6 y/o : 5mg
- Ipratropium : 250mcg

**AND**
**PO Prednisolone** 1mg/kg (max 40mg) for 3-5 days

**Reassess after 1 hour**

**Continuous nebulised Salbutamol** (add **Ipratropium*** if not already given, max 3 doses of Ipratropium)

**AND**

**PO Prednisolone** 1mg/kg (max 40mg)
OR **IV Hydrocortisone** 4mg/kg (max 100mg)

*Consider IV access, bloods, CXR and fluids*

**Reassess after 20 mins**

## IMPENDING RESPIRATORY FAILURE

- Transfer to PICU
- Put on continuous monitoring
- **Continuous nebulised Salbutamol and Ipratropium** (if not already given, max 3 doses of ipratropium)
- IV access and IV fluids
- Start **IV Magnesium Sulphate** 40mg/kg (max 2g) over 30mins (dilute in 100ml of normal saline)
- **IV Hydrocortisone** (if not already given)
- Obtain ABG and make arrangements for transfer to PICU

**If no improvement after 20mins –** inform Paeds Consultant on call
- IV Salbutamol** (bolus followed by infusion)
- **Bolus: 15mcg/kg over 10 mins
- Infusion 1mcg/kg/min

If still no improvement, consider intubation

**If score ≤3** and SpO2 ≥94%
- Discharge with asthma action plan
- Consider follow up in area clinic in 3-7 days

**If score >3**:
- Treat as MODERATE severity

Response ?

No → Treat as SEVERE

Yes → Give nebs or inhaler 1-4hourly

Response?

Yes → Give nebs or inhaler 1-4hourly

No → IMPENDING RESPIRATORY FAILURE

:*(add NS to make up a total of 4mLs)

| ASTHMA CLINICAL SCORE (PRAM) | | | | |
|---|---|---|---|---|
| Signs | 0 | 1 | 2 | 3 |
| Suprasternal Indrawing (tracheal tug) | Absent | | Present | |
| Scalene retractions (Use of accessory Muscles) | Absent | | Present | |
| Wheezing | Absent | Expiratory only | Inspiratory and expiratory | Audible without stethoscope/silent chest with minimal air entry |
| Air entry | Normal | Decreased at bases | Widespread decrease | Absent/minimal |
| SpO2 in room air | ≥94% | 90 – 93% | ≤89% | |

| Severity | Asthma Clinical Score |
|---|---|
| Mild | 0 - 4 |
| Moderate | 5 – 8 |
| Severe | 9 - 12 |
| Impending respiratory failure | 12 + presence of lethargy, cyanosis, decreasing respiratory effort, and/or rising pCO2 |

**References:** *Chalut D, Ducharme F, Davis G - J Pediatrics 2000;137:762-768; Ducharme F, Chalut D, Plotnick L Journal of Pediatrics 2008;152;476-480 The rest of this algorithm is adapted from Alberta Health Services Acute Childhood Asthma Pathway 2012; British Thoracic Society guideline on the management of asthma 2014; Calgary Health Region Pediatric Acute Asthma Pathway 2008; Global Initiative for Asthma (GINA) 2015; RIPAS Hospital (MOH) Brunei, Guidance on*