Management of acute asthma or wheezing in children 5 years and younger

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Early symptoms of an exacerbation

- Onset of symptoms of respiratory tract infection
- An acute or sub-acute increase in wheeze and shortness of breath
- An increase in coughing, especially while the child is asleep
- Lethargy or reduced exercise tolerance
- Impairment of daily activities, including feeding
- A poor response to reliever medication.

Need for urgent medical attention

Parents/caregivers should be advised to seek medical attention immediately if:

- The child is acutely distressed
- The child's symptoms are not relieved promptly by inhaled bronchodilator
- The period of relief after doses of SABA becomes progressively shorter
- A child younger than 1 year requires repeated inhaled SABA over several hours.

Initial treatment at home

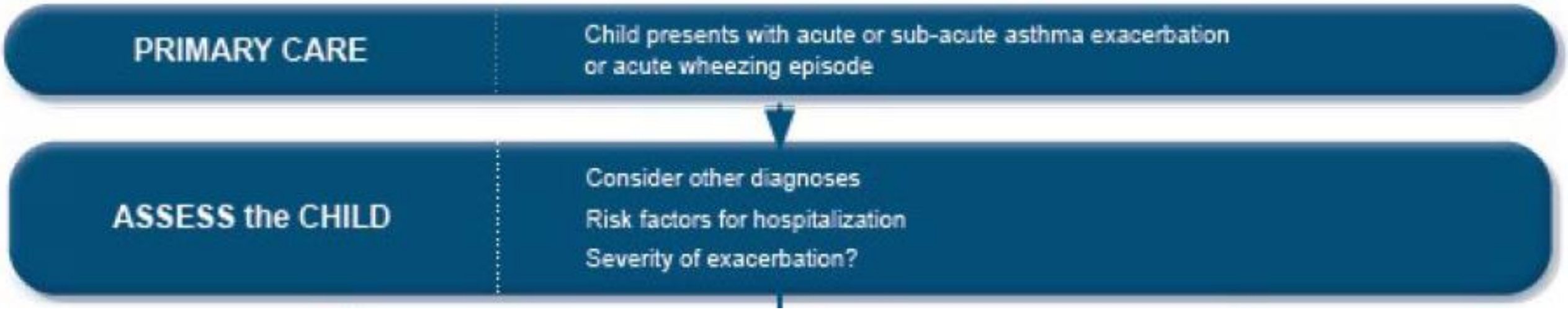
Inhaled SABA via a mask or spacer, and review response

Family/carer-initiated corticosteroids

Leukotriene receptor antagonists

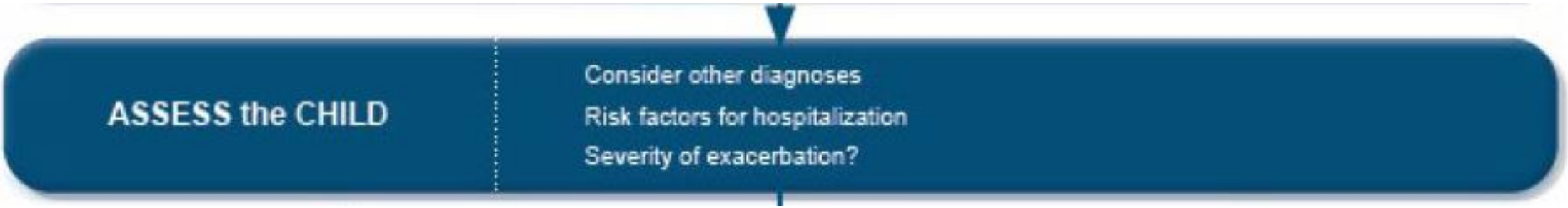
PRIMARY CARE

Child presents with acute or sub-acute asthma exacerbation or acute wheezing episode


PRIMARY CARE
Child presents with acute or sub-acute asthma exacerbation
or acute wheezing episode
ASSESS the CHILD
Consider other diagnoses
Risk factors for hospitalization
Severity of exacerbation?

Box 12-2. Initial assessment of acute asthma exacerbations in children 5 years and younger

Symptoms	Mild	Severe*
Altered consciousness	No	Agitated, confused or drowsy
Oximetry on presentation (SaO_2)**	>95%	<92%
Speech†	Sentences	Words
Pulse rate	<100 beats/minute	>180 beats/minute (0–3 years) >150 beats/minute (4–5 years)
Respiratory rate	≤40/minute	>40/minute
Central cyanosis	Absent	Likely to be present
Wheeze intensity	Variable	Chest may be quiet


ASSESS the CHILD
Consider other diagnoses
Risk factors for hospitalization
Severity of exacerbation?

Box 12-3. Indications for immediate transfer to hospital for children 5 years and younger

Immediate transfer to hospital is indicated if a child ≤5 years with asthma has ANY of the following:

- **At initial or subsequent assessment:**
  - Child is unable to speak or drink
  - Cyanosis
  - Respiratory rate >40 per minute
  - Oxygen saturation <92% when breathing room air (note potential for overestimation of oxygen saturation with pulse oximetry in people with dark skin color.
  - Silent chest on auscultation

- **Lack of response to initial bronchodilator treatment:**
  - Lack of response to 6 puffs of inhaled salbutamol [albuterol] (2 separate puffs, repeated 3 times) over 1–2 hours
  - Persisting tachypnea* despite three administrations of inhaled SABA, even if the child shows other clinical signs of improvement

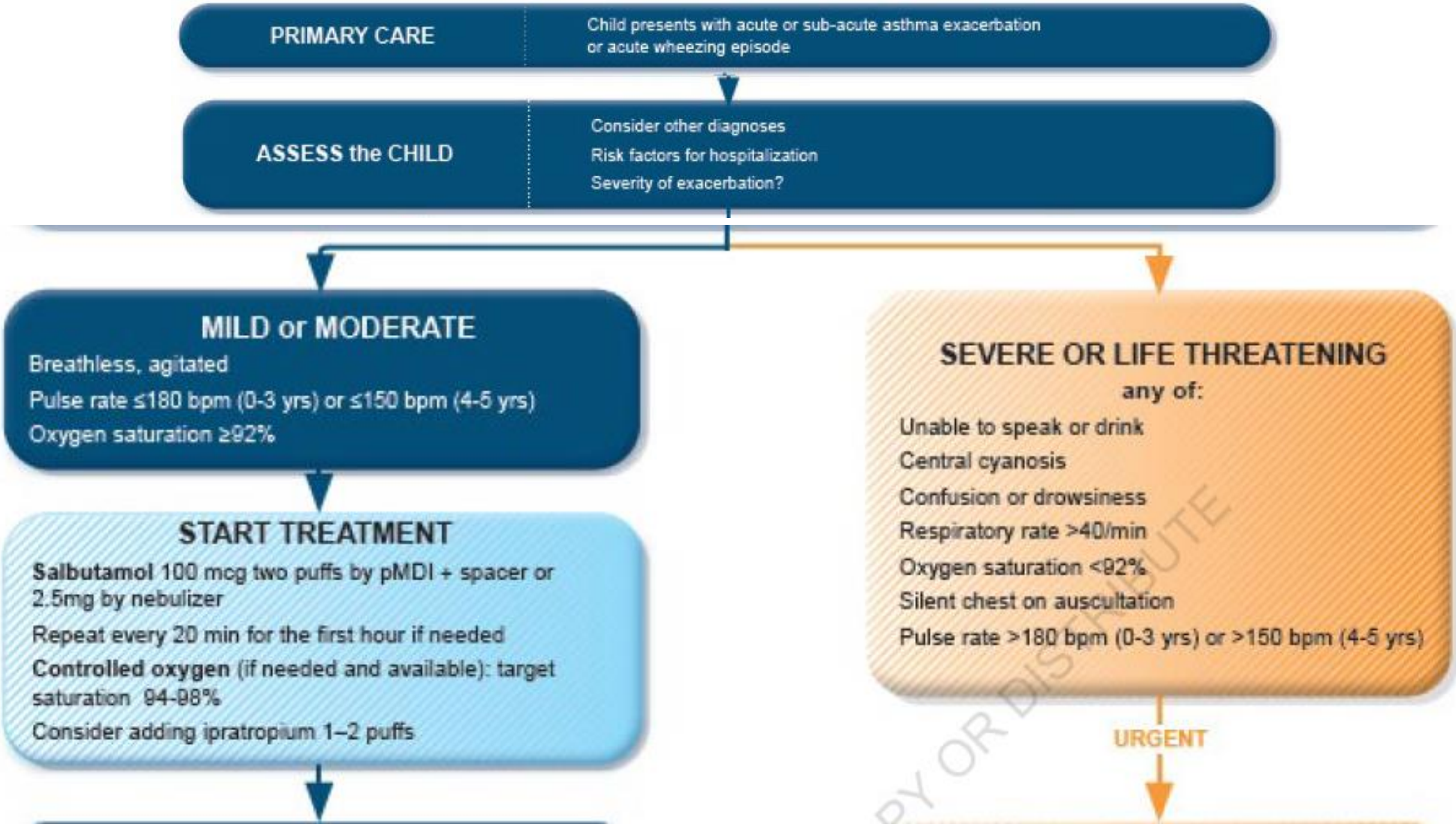
- **Social environment that limits delivery of acute treatment, or parent/caregiver unable to manage acute asthma at home.**

During transfer to hospital, continue to give inhaled SABA, oxygen (if available) to maintain saturation 94–98%, and give systemic corticosteroids (see Box 12-1, p.199)

See list of abbreviations (p.11). *Normal respiratory rates: <60 breaths/minute in children 0–2 months; <50 breaths/minute in children 2–12 months; <40 breaths/minute in children 1–5 years.

Box 12-4. Initial emergency department management of asthma exacerbations in children 5 years and younger

Therapy	Dose and administration
Supplemental oxygen	Delivered by face nasal prongs or mask, as indicated to maintain oxygen saturation at ≥94%
Short-acting beta$_2$-agonist (SABA)	4 or more puffs of salbutamol (albuterol) by spacer, or 2.5 mg by nebulizer. For moderate or severe exacerbation, consider giving SABA every 20 minutes for 3 doses, then reassess severity. If symptoms persist or deteriorate, give an additional 4 puffs or more per hour.
Systemic corticosteroids	For moderate or severe exacerbation, give initial dose of oral prednisolone (1–2 mg/kg up to a maximum 20 mg for children <2 years old; 30 mg for children 2–5 years) OR oral dexamethasone 0.3–0.6 mg/kg (max 12 mg) OR intravenous methylprednisolone 1 mg/kg 6-hourly on day 1
Additional options within or after the first hour of treatment	
Ipratropium bromide	For moderately severe or severe exacerbation, give 4 puffs of 20 mcg ipratropium bromide by pMDI and spacer or 250 mcg by nebulization every 20 minutes with SABA for 3 doses. For mild exacerbation, if poor response to SABA in the initial hour, consider adding ipratropium as described above (if not already given).
Magnesium sulfate	Consider intravenous isotonic magnesium sulfate (40–50 mg/kg, maximum 2 g over 10–20 minutes for children aged ≥2 years with severe exacerbation (Box 12-2, p.205)


PRIMARY CARE
Child presents with acute or sub-acute asthma exacerbation or acute wheezing episode
ASSESS the CHILD
Consider other diagnoses
Risk factors for hospitalization
Severity of exacerbation?
MILD or MODERATE
Breathless, agitated
Pulse rate ≤180 bpm (0-3 yrs) or ≤150 bpm (4-5 yrs)
Oxygen saturation ≥92%
START TREATMENT
Salbutamol 100 mcg two puffs by pMDI + spacer or 2.5mg by nebulizer
Repeat every 20 min for the first hour if needed
Controlled oxygen (if needed and available): target saturation 94-98%
Consider adding ipratropium 1–2 puffs
SEVERE OR LIFE THREATENING
any of:
Unable to speak or drink
Central cyanosis
Confusion or drowsiness
Respiratory rate >40/min
Oxygen saturation <92%
Silent chest on auscultation
Pulse rate >180 bpm (0-3 yrs) or >150 bpm (4-5 yrs)
URGENT

MONITOR CLOSELY for 1-2 hours

Transfer to high level care if any of:

- Lack of response to salbutamol over 1–2 hrs
- Any signs of severe exacerbation
- Increasing respiratory rate
- Decreasing oxygen saturation

IMPROVING

CONTINUE TREATMENT IF NEEDED

Monitor closely as above

If symptoms persist or worsen after initial improvement

- Give extra salbutamol 4+ puffs per hour
- Add OCS and inhaled ipratropium bromide if not already given

IMPROVING

WORSENING, or lack of improvement

WORSENING, or failure to respond to therapy

TRANSFER TO HIGH LEVEL CARE (e.g. ICU)

While waiting give:

- Salbutamol 100 mcg 6 puffs by pMDI+spacer (or 2.5 mg by nebulizer). Repeat every 20 min as needed.
- Oxygen (if available) to keep saturation ≥94%
- Add OCS and inhaled/nebulized ipratropium bromide if not already given
- Consider IV magnesium sulfate

IMPROVING

DISCHARGE/FOLLOW-UP PLANNING

Ensure that resources at home are adequate.

Reliever: continue as needed

Controller: consider need for, or adjustment of, regular controller

Check inhaler technique and adherence

Follow up: within 1-2 working days; prednisone for ≥3-5 days

Provide and explain action plan

FOLLOW UP VISITS

Review symptoms and signs: Is the exacerbation resolving? Should prednisone be continued?

Reliever: Reduce to as-needed

Controller: Continue or adjust depending on cause of exacerbation, and duration of need for extra salbutamol

Risk factors: Check and correct modifiable risk factors that may have contributed to exacerbation, including inhaler technique and adherence

Action plan: Is it understood? Was it used appropriately? Does it need modification?

Schedule next follow up visit

No benefit for:

- Nebulized MgS
- Mocrolids
- Montelukast