

# Respiratory Disease in Children

## Screening

### Annually:

Ask all children / carers at routine well-child check:

- Do you cough, and if so, how often? At night?
- Do you get short of breath when you run around / exercise?
- When you get a cold, do you usually have a cough that goes on for weeks afterwards?

**IF** the answer to any of these questions is yes

### AND

in all children who present with history of chronic or recurrent cough, shortness of breath and / or wheeze:

(a) Child > 7 years: perform spirometry and refer to GP

(b) Child < 7 years: usually not able to perform spirometry reliably; refer to GP.

### Spirometry

- Perform baseline spirometry, then give 2 puffs of Asmol® (salbutamol) via spacer, wait 15 minutes, and repeat the spirometry. If the FEV1 improves by >10% this is strongly suggestive of asthma / reversible airflow limitation.
- Normal values are shown on your spirometer and vary with client age and height.

## Principles of Management

Any acutely unwell child should be discussed with a GP immediately.

Pneumonia is the commonest preventable cause of death in Indigenous children under 5 years of age – always consider: could this be pneumonia? – **see below.**

Both asthma and chronic suppurative lung disease (CSLD) can lead to serious outcomes, including death - early diagnosis and treatment is known to improve both short and long term outcomes and reduces the risk of death.

## Pneumonia in Children

Always discuss with GP and / or Paediatrician.

Any child with tachypnea (fast breathing) and any of: fever > 38.5; chest in-drawing and / or CXR signs has pneumonia until proven otherwise and should be treated as follows:

### Moderate/ severe pneumonia and / or any danger signs, i.e.:

- Tachypnea (fast breathing – see box below).
- Chest in-drawing.
- Vomiting; not eating or drinking.
- O2 sats < 94%.
- Looks lethargic / sick.

### THEN

- Administer oxygen.
- Arrange transfer / evacuation to hospital.
- Give IM benzyl penicillin 30mg/kg (max 3g) six hourly while awaiting transfer to hospital.

### Mild pneumonia / no danger signs

- Under 3 months of age: admit to hospital for inpatient care
- Over 3 months: consider most appropriate site for care – inpatient vs outpatient; discuss with paediatrician if uncertain.
- Give amoxicillin 35mg/kg per dose (max 500mg) three times daily for five days **OR** if parents / carer not likely to be able to give regular oral medication at home, give procaine penicillin IM 50mg/kg (max 11.5g) for five days (note: oral antibiotics are at least as effective as IM if taken correctly).
- Review daily while on antibiotic treatment to monitor progress.
- Discuss with doctor if allergic to penicillin.

Age in years	Normal breathing rate (breaths/min)
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< 1	30 - 40
1 - 2	25 - 35
2 - 5	25 - 30
5 - 12	20 - 25
> 12	12 - 20

# Asthma

## Case Definition

Asthma is a chronic disease causing episodes of wheeze, chest tightness and shortness of breath. The underlying problem is inflammation of the air passages, with spasm and increased mucus production in the airways. Symptoms may come and go.

Consider asthma in children with:

1. Shortness of breath.
2. Wheeze.
3. Chest tightness.
4. Frequent cough, and / or cough with exercise.

Remember, cough **alone** is rarely asthma. Asthma is rarely diagnosed in children under 2 years of age.

### Confirming the diagnosis of Asthma

**Age > 7 yrs:** perform Spirometry. (See Box 1 on page 1 for *interpretation of spirometry*). Confirm diagnosis with a one-week trial of salbutamol.

**Age < 7 yrs:** the diagnosis is usually based on clinical picture alone - a history of recurrent persistent wheeze in the absence of any other cause. One-week trial of salbutamol can be helpful in confirming the diagnosis.

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## Box 1

### One week trial salbutamol

Give 2 puffs Asmol® (salbutamol) with spacer morning and night **plus** before exercise if child has exercise-induced symptoms. Significant clinical improvement confirms the diagnosis of asthma.

## Principles of Management

**Pneumonia is the commonest preventable cause of death in Indigenous children under 5 years of age – always consider: could this be pneumonia? See page 1.**

Consider other causes of asthma-like presentations, such as influenza, bronchiolitis, whooping cough or foreign body inhalation.

**And consider chronic conditions that may co-exist with asthma, such as chronic suppurative lung disease. See page 5.**

Acute episodes or “asthma attacks” can be life threatening and must be treated as an emergency.

Symptom assessment is usually the best way to monitor asthma, as PEFr is generally unreliable in children. If history is difficult to obtain, PEFr may be more useful.

## Therapeutic Protocols

### Acute Asthma

1: How bad is the child’s asthma attack?

	Mild	Moderate	Severe*
<b>Behaviour</b>	normal	normal	agitated, distressed
<b>Tiredness</b>	no	no	yes
<b>Chest recession</b>	no	mild	marked

Speech	Normal sentences	Phrases only	single words
<b>Wheeze</b>	variable	loud	soft / absent due to limited air movement
<b>O2 sats</b>	94 - 100%	90 - 94%	< 90%

\* If any one of the severe symptoms is present, treat as severe.

2. Treatment of acute asthma attack – see flow chart, page 3.

## Chronic Asthma Management

(See page 4 for detailed flow chart)

1. Assess severity.
2. Achieve best lung function.
3. Maintain good asthma control.
4. Create an individual Asthma Action Plan (see template page 6).
5. Educate and review regularly; assign client asthma plan in Ferret (or other local health database).

### Specific education and advice:

Make sure the carer +/- child understands how to use any asthma medications provided:

- Know the difference between preventer and reliever, and when to use each type of medication.
- Are able to use the asthma medication effectively – ask them to demonstrate before they leave, check technique at first review visit, and again if the child’s asthma worsens.

Advise parents/ carers that environmental smoke - including smoking around children, particularly in houses and cars, and campfire smoke - will make asthma worse.

Regular exercise is beneficial (consider need for salbutamol 20 minutes prior to exercise for children with exercise-induced symptoms).

Weight management is important for children with chronic asthma, who may benefit from dietitian referral. In particular:

- long term poor control of asthma may contribute to poor weight gain and nutritional supplementation may be indicated.
- Reducing obesity improves asthma severity and control.

### Immunisation:

- Fluvax ® is recommended for children with chronic asthma; Refer to Australian Immunisation Handbook for schedule and dosage information.
- Ensure pneumococcal immunization (Prevenar, Pneumovax) is up to date.
- See below link to the Australian immunization handbook:
- <http://www9.health.gov.au/immhandbook/home.html>

## Follow-up

- Once diagnosed, review every 2 weeks until stable.
- Once stable, review 3 monthly. Check symptom control, growth, review medications and puffer technique. Advise to attend earlier if symptom control is poor, according to written Asthma Action Plan instructions.
- Perform spirometry when symptom-free to establish baseline lung function when well.
- Include specific details in Asthma Plan regarding prevention and management of asthma triggers (e.g. URTI, exercise).
- Aim to reduce inhaled corticosteroids to the LOWEST possible dose needed to maintain good control of symptoms.
- Always consider possibility of other diagnoses when symptoms worsen (e.g. infection) or if unable to achieve good control.

## Refer Discuss

Discuss / refer to pediatrician if:

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1. suspected diagnosis of asthma in any child under 3 years.
2. following any severe asthma attack.
3. diagnosis uncertain.
4. poor response to treatment.
5. frequent hospitalisation.
6. more than 250mcg fluticasone total daily dose.
7. frequent courses of oral steroids.

## CSDL

### Case Definition

Bronchiectasis is a progressive disease characterised by dilated, thick-walled bronchi, usually with associated chronic bacterial infection and inflammation.

- The diagnosis is made with High Resolution CT (HRCT) scan.
- A plain CXR may be normal in up to 50% of children with bronchiectasis.

The term Chronic Suppurative Lung Disease (CSDL) is used to describe the **clinical picture** of bronchiectasis, regardless of whether or not the child has had a HRCT scan to confirm the underlying diagnosis of bronchiectasis.

Clinical symptoms and signs of CSDL may include:

- Chronic (> 3 months) moist or productive cough.
- Recurrent chest infections and / or wet cough.
- Poor growth.
- Short of breath, particularly with exercise / exertion.
- Coughing up blood (Haemoptysis).
- Clubbing.
- Signs of asthma, including wheeze.

CSDL is much more common in Aboriginal children than in the non-Aboriginal population.

All children with suspected CSDL / bronchiectasis should be referred to a paediatrician for consideration of HRCT to confirm the diagnosis.

### Principles of Management

Early diagnosis and intervention may prevent or delay progression.

Refer early to the regional Paediatrician, to confirm diagnosis, arrange investigations for treatable underlying causes, and to contribute to planning of ongoing care.

Physiotherapy is important in helping to improve lung function and reduce exacerbations.

Exacerbations are usually due to infection and should be treated promptly and intensively to minimise the risk of serious acute illness, as well as reducing long-term progression by minimising the amount of harm done to airways during each exacerbation.

### Therapeutic Protocols

**Baseline assessment:**

- Spirometry if over 7 years of age.
- Chest X-Ray.
- Sputum culture if possible, with specific request for mycobacterial tests, and antibiotic sensitivities of bacteria present in sputum.
- Height, weight, BMI.
- The Paediatric team may direct other investigations.

### Asthma

For children with asthma or “bronchospasm”, with wheeze and / or reversible airway obstruction documented on spirometry, treat according to asthma protocols (see previous pages of this protocol) **in addition** to standard CSDL treatment already described.

### Immunisation

- Fluvax ® is recommended for children with chronic asthma; refer to Australian Immunisation Handbook for schedule and dosage information.
- Ensure pneumococcal immunization (Prevenar, Pneumovax) is up to date.

### Care planning

All children with CSDL should have a multidisciplinary care plan developed and reviewed at least 6 monthly, involving parents/ carers, child, primary health care team, allied health and specialist services.

### Follow Up

**Following acute exacerbations**, review daily until improving, then weekly for the following 2 weeks.

At review, check sputum results (if sent) - consider changing antibiotic if sputum culture shows resistance to antibiotics selected.

**Once stable:**

Monthly review by primary health care team, including review with doctor at least every 3 months

At each review, check:

- Symptom control, including exacerbations between visits.
- Physiotherapy – frequency, technique.
- Growth and nutrition.
- Exercise / activity.

Review by the Paediatrician 6 monthly.

### Refer/ Discuss

#### TO Paediatrician:

Review 6 monthly; refer sooner if child deteriorating between visits, including failure to respond to therapy following acute exacerbations.

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## **TO Dietitian:**

All children with CSLD should be seen at earliest opportunity following diagnosis for specific nutritional advice and planning; further review depending on progress.

## **TO Physiotherapist:**

Ensure all children with CSLD are seen by a physiotherapist soon after diagnosis, then at least 6 monthly depending on access / availability.