This summary provides busy health professionals with key guidance for assessing and treating child and adolescent asthma.

Its source document “Asthma and Respiratory Foundation NZ Child and Adolescent Guidelines” is available for download at nzasthmaguidelines.co.nz or asthmaandrespiratory.org.nz
The diagnosis of asthma starts with the recognition of a characteristic pattern of symptoms and signs, in the absence of an alternative explanation.

The key to making the diagnosis of asthma is to take a careful clinical history, and then to undertake a clinical examination, document variable expiratory airflow limitation and assess response to inhaled bronchodilator and/or inhaled corticosteroid (ICS) treatment. There is no reliable single ‘gold standard’ diagnostic test.

Clinical features that increase or decrease the probability of asthma in adults

**Asthma more likely**
- More than one of the following:
  - Wheeze (most sensitive and specific symptom of asthma)
  - Breathlessness
  - Chest tightness
  - Cough
- Particularly if:
  - Typically worse at night or in the early morning
  - Provoked by exercise, cold air, allergen exposure, irritants, viral infections, stress and aspirin
  - Recurrent or seasonal
- Personal history of atopic disorder or family history of asthma
- Widespread wheeze heard on chest auscultation
- Otherwise unexplained expiratory airflow obstruction on spirometry
- Otherwise unexplained blood eosinophilia or raised exhaled nitric oxide
- Bronchial hyper-responsiveness on challenge testing at appropriate age
- Positive response to bronchodilator (clinical or lung function)

**Asthma less likely**
- Isolated cough in absence of wheeze or difficulty breathing
- History of wet, moist or productive cough - consider alternative diagnosis
- No wheeze or repeatedly normal physical examination when symptomatic
- Normal spirometry or peak flow (PEF) when symptomatic
- No response to trial of asthma treatment
- Features that point to an alternative diagnosis
DIAGNOSTIC PATHWAY FOR ASTHMA AND WHEEZE IN CHILDREN 1-4 YEARS

CHILD WITH RESPIRATORY SYMPTOMS.
Are the symptoms typical for asthma?

Yes
- Frequency and pattern of symptoms.

No

Frequent typical symptoms between viral illnesses or flare ups.

Frequent symptoms with viral illnesses (more than every 8 weeks) but no symptoms between flare ups.

Infrequent symptoms with viral illnesses only (up to every 8 weeks.)

Consider other diagnoses. Refer and investigate as appropriate. A trial of asthma therapy may be helpful.

Trial of asthma therapy for at least 8 weeks.

Improves with preventer?

Yes
- 'Preschool asthma'
  Trail of asthma therapy.

Evaluate response and reconsider diagnosis after 3 months.

No
- 'Infrequent or frequent preschool wheeze'.

Reliever as needed.
ICS not indicated.
STEPWISE APPROACH TO PHARMACOLOGICAL TREATMENT OF CHILDREN WITH WHEEZE 1-4 YEARS

**STEP 1**
(infrequent preschool wheeze)
SABA reliever therapy

**STEP 2**
Maintenance Low dose ICS if frequent symptoms and SABA reliever therapy (as required) or Montelukast if severe exacerbations

**STEP 3**
Maintenance Low dose ICS and SABA reliever therapy (as required) plus Montelukast if control is not achieved

**STEP 4**
Same as Step 3 plus Referral to a paediatrician

**STEP UP** to achieve control and reduce risk of exacerbations

**STEP DOWN** if stable for 3 months step down in incremental reverse fashion

If relapses, resume previous step of treatment

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**RECOMMENDED LOW AND STANDARD DAILY DOSE OF ICS IN CHILDREN WITH ASTHMA**

<table>
<thead>
<tr>
<th>LOW DOSE</th>
<th>STANDARD DOSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beclomethasone dipropionate</td>
<td>200 mcg/day</td>
</tr>
<tr>
<td>Beclomethasone dipropionate ultrafine</td>
<td>100 mcg/day</td>
</tr>
<tr>
<td>Budesonide</td>
<td>200 mcg/day</td>
</tr>
<tr>
<td>Fluticasone propionate</td>
<td>100 mcg/day</td>
</tr>
</tbody>
</table>
**DIAGNOSTIC PATHWAY FOR ASTHMA AND WHEEZE IN CHILDREN 5-15 YEARS**

**CHILD WITH RESPIRATORY SYMPTOMS.**

Are the symptoms typical for asthma?

- **Yes**
  - ‘Suspected asthma’
    - Consider lung function testing (PEF, spirometry.)
  - Trial of asthma therapy for at least 8 weeks.
  - Responds to asthma therapy?  
    - Yes
      - Diagnose and treat as asthma.
    - No
      - Check adherence/compliance and inhaler technique.
  
- **No**
  - Not typical
    - Consider other diagnoses.
    - Further investigation eg. spirometry and reversibility test. A trial of asthma therapy may be helpful.

- **Asthma reasonably likely**
  - Asthma likely
    - Evaluate response and reconsider diagnosis after 3 months.
  - Asthma not likely
    - Reconsider diagnosis. Further investigation eg. spirometry and reversibility test.

- **Asthma not likely**
  - Refer, investigate and treat as appropriate for other disorder.
STEPWISE APPROACH TO PHARMACOLOGICAL TREATMENT OF CHILDREN WITH WHEEZE 5-15 YEARS

**STEP 1**
SABA reliever therapy

**STEP 2**
Maintenance Low dose ICS and SABA reliever therapy (as required)
*Montelukast may be used as an alternative with SABA reliever therapy

**STEP 3**
Maintenance Low dose ICS/LABA and SABA reliever therapy (as required)
*Montelukast may be used as an alternative with SABA reliever therapy
**(SMART) may be used

**STEP 4**
Standard dose ICS/LABA therapy and SABA reliever therapy (as required)
In patients 12 years or older SMART therapy may be used
Consider adding Montelukast
Consider referral to a paediatrician

**STEP 5**
Standard dose ICS/LABA therapy and SABA reliever therapy or In patients 12 years or older SMART therapy may be used
Consider High dose ICS/LABA or add on treatment
Definite referral to a paediatrician

**STEP UP** to achieve control and reduce risk of exacerbation (inhaler technique and adherence must be checked before considering a step-up)

**STEP DOWN** trial reducing preventer therapy after a period of 3 months

* Not funded in this instance
**Budesonide 100mcg and Formoterol 6mcg
ALGORITHM FOR MANAGEMENT OF MODERATE AND SEVERE ASTHMA IN CHILDREN AND ADOLESCENTS

(Mild asthma is asthma symptoms not usually requiring medical attention and should be managed according to the asthma action plan.)

IMMEDIATELY

MODERATE
Able to talk
SPO2 ≥ 92%
(PEF ≥ 50% best or predicted)*
Give 6 x 100μg salbutamol via MDI and spacer,
Age ≥ 5 prednisone 1-2mg/kg (max 40mg)

SEVERE
SPO2 < 92%
Too breathless to talk
Obvious accessory muscle use
(PEF 33 – 50% best or predicted)*
Oxygen as required
Give 6 x 100μg salbutamol via MDI and spacer or salbutamol 2.5-5mg via nebulisation with oxygen;
prednisone 1-2mg/kg (max 40mg)

LIFE-THREATENING
SPO2 < 92%
Plus any of:
• Exhaustion, agitation or altered consciousness
• Cyanosis or silent chest
• (PEF < 30% best or predicted)
Oxygen as required
Give continuous salbutamol 2.5-5mg via nebulisation with oxygen;
Ipratropium bromide 0.25mg via nebulisation;
IV hydrocortisone 4mg/kg (max 100mg)

ARRANGE URGENT TRANSFER TO HOSPITAL BY AMBULANCE
All patients will require hospital admission

REFER TO RESUC/ICU/HDU
Oxygen as required
Give salbutamol 2.5-5mg via nebulisation with oxygen, frequency determined by response, up to continuously;
Ipratropium bromide 0.25mg via nebulisation up to 4 hourly;
Consider IV magnesium sulphate, aminophylline or salbutamol according to local protocol

15-60 MIN

GOOD RESPONSE
Consider oral prednisone 1-2mg/kg (max 40mg), if age ≥ 5 years and not given above, and ICS

REASSESS

REMAIN MODERATE
Give prednisone 1-2mg/kg (max 40mg) if not given above
Repeat salbutamol 6 x 100μg salbutamol via MDI and spacer

SEVERE
Oxygen as required
Give 6 x 100μg salbutamol via MDI and spacer or salbutamol 2.5-5mg via nebulisation with oxygen, up to 3 times over 1st hour;
Ipratropium bromide 4x20μg via MDI and spacer or 250 μg via nebulisation
Use life-threatening path if any life-threatening features

ARRANGE URGENT TRANSFER TO HOSPITAL BY AMBULANCE
All patients will require hospital admission

DISCHARGE
Once pre-discharge conditions are met

1-2 HR

STABLE
No signs of moderate or severe asthma

UNSTABLE
Signs of moderate or severe asthma or PEF < 70%

REFER TO HOSPITAL
Continue management and transfer by ambulance

*PEF measurement to be considered for adolescents not younger children
CHILD ASTHMA RESOURCES FOR FAMILIES

Child Asthma Action Plan and Symptom Diary

Asthma Action Plan for health professionals to complete and give to child patients and their parents/caregivers. Symptom Diaries can be used in conjunction with an Action Plan to help recognise changes in asthma symptoms.

Digital: asthmaandrespiratory.org.nz

Order brochures: http://online.printstop.co.nz/AsthmaFoundation/

Managing your child’s asthma resource

A free booklet and online resource for parents, whānau, and caregivers of children with asthma. It will help you make sure your child stays fit, healthy, and happy.

Digital: learnaboutlungs.org.nz

Order booklets: http://online.printstop.co.nz/AsthmaFoundation/

Better breathing, better living