

VERSION 2.0

DIAGNOSIS

Adolescents

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ABBREVIATIONS

CFC	chlorofluorocarbon	LTRA	leukotriene receptor antagonist
COPD	chronic obstructive pulmonary disease	MBS	Medical Benefits Scheme
COX	cyclo-oxygenase	NHMRC	National Health and Medical Research Council
DXA	dual-energy X-ray absorptiometry	NIPPV	non-invasive positive pressure ventilation
ED	emergency department	NSAIDs	nonsteroidal anti-inflammatory drugs
EIB	exercise-induced bronchoconstriction	OCS	oral corticosteroids
FEV₁	forced expiratory volume over one second	OSA	obstructive sleep apnoea
FEV₆	forced expiratory volume over six seconds	PaCO	carbon dioxide partial pressure on blood gas analysis
FSANZ	Food Standards Australia and New Zealand	PaO	oxygen partial pressure on blood gas analysis
FVC	forced vital capacity	PBS	Pharmaceutical Benefits Scheme
GORD	gastro-oesophageal reflux disease	PEF	peak expiratory flow
HFA	formulated with hydrofluoroalkane propellant	pMDI	pressurised metered-dose inhaler or 'puffer'
ICS	inhaled corticosteroid	PPE	personal protective equipment
ICU	intensive care unit	SABA	short-acting beta ₂ -adrenergic receptor agonist
IgE	Immunoglobulin E	SAMA	short-acting muscarinic antagonist
IL	interleukin	SaO₂	oxygen saturation
IU	international units	SpO₂	peripheral capillary oxygen saturation measured by pulse oximetry
IV	intravenous	TGA	Therapeutic Goods Administration
LABA	long-acting beta ₂ -adrenergic receptor agonist		
LAMA	long-acting muscarinic antagonist		

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Diagnosing asthma in adolescents

Overview

This section deals with special considerations for asthma in adolescents and young adults. It should be used in conjunction with the general Diagnosis and Management sections of this handbook.

For younger adolescents, the general guidance for diagnosing and managing asthma in children will apply in most situations. By mid-adolescence (around 14–16 years), the general guidance for diagnosing and managing asthma in adults will apply in most situations.

- ▶ See: [Diagnosing asthma in children](#)
- See: [Diagnosing asthma in adults](#)
- See: [Managing asthma in children](#)
- See: [Managing asthma in adults](#)

Note: Various age ranges are used to define adolescence.¹ In this handbook 'adolescents' refers to people aged approximately 12–18 years and 'young adults' refers to people aged 19–24 years, acknowledging that hormonal changes that accompany puberty may begin before age 12 and maturation may continue beyond age 24.

In this section

General considerations

General considerations when providing health care for adolescents and young adults

<http://www.asthmahandbook.org.au/diagnosis/adolescents/general-considerations>

Investigations

Considerations when investigating new or re-emerging asthma-like symptoms in adolescents and young adults

<http://www.asthmahandbook.org.au/diagnosis/adolescents/investigations>

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1. Sawyer SM, Afifi RA, Bearinger LH, *et al.* Adolescence: a foundation for future health. *Lancet*. 2012; 379: 1630-1640. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/22538178>

General considerations when providing health care for adolescents and young adults

Recommendations

By mid-adolescence (around 14–16 years), provide medical management of asthma as for adults (e.g. medication options, doses).

Note: Whether the individual is considered to be a child or adult for the purposes of prescribing will depend on the individual's size and clinical factors, TGA-approved product information for medicines, and PBS subsidisation criteria.

How this recommendation was developed

Consensus

Based on clinical experience and expert opinion (informed by evidence, where available).

If parents or carers are present, arrange to see adolescents alone for part of the consultation so that you can confidentially discuss sensitive issues like adherence to asthma medicines and exposure to smoke from tobacco or other drugs.

How this recommendation was developed

Adapted from existing guidance

Based on reliable clinical practice guideline(s) or position statement(s):

- The Royal Australasian College of Physicians, 2008¹

Discuss confidentiality with the patient and agree on which of their personal information will not be shared with anyone else and which can be discussed with parents or passed on to other healthcare professionals.

How this recommendation was developed

Consensus

Based on clinical experience and expert opinion (informed by evidence, where available).

Assess psychosocial status so that you can identify and manage any factors that could affect their asthma management and ensure that self-management advice is appropriate to the individual's stage of psychosocial development.

How this recommendation was developed

Consensus

Based on clinical experience and expert opinion (informed by evidence, where available), with particular reference to the following source(s):

- Bender, 2006²
- Sawyer *et al.* 2012³
- The Royal Australasian College of Physicians, 2008¹
- Van de Ven *et al.* 2009⁴

Consider the person's health beliefs, cultural perspective and family circumstances that may affect asthma management.

How this recommendation was developed

Consensus

Based on clinical experience and expert opinion (informed by evidence, where available).

More information

Confidentiality issues for adolescents

Adolescents' concerns about confidentiality prevent them using health care services, especially if substance use is likely to be raised. Adolescents are more likely to disclose information about health risk behaviours, and are more likely to return for review, if they know that confidential information will not be revealed to their parents or others.⁵

When adolescents are accompanied by parents or carers, health care providers should consider seeing the adolescent alone for part of each consultation.⁵

Health professionals should discuss confidentiality and its limits with adolescents.⁵ Adolescents are more willing to communicate honestly with healthcare professionals who discuss confidentiality with them.¹

Health professionals need to clearly explain which personal health information can be confidential and which must be shared with parents, and keep parents informed.

Health care providers should advise adolescents that they can obtain their own Medicare card once they turn 15.⁵

- ▶ Go to: Royal Australasian College of Physicians' [Working with young people](#) online resource (see *Privacy and confidentiality in adolescent health care* in Topic 2: *Ethical and legal issues*)
- Go to: Australian Government Department of Human Services' [Financial and health support for young people](#) webpage

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Psychosocial factors affecting adolescent health

Adolescence is a time of rapid growth and physical, cognitive, emotional and social development. An adolescent's age is not a reliable indicator of maturity in each of these areas.¹

Mental health disorders (e.g. depression, anxiety, eating disorders) are common and clinically important among young people.¹ A significant proportion of adult mental health problems emerge during adolescence.¹

Adolescence is also a time when people can begin risky behaviours (e.g. smoking, poor eating habits, physical inactivity, and drug and alcohol use), which can continue into adulthood.^{1,3} Although smoking rates among adolescents and young people are declining,⁶ approximately 6% of adolescents aged 15–17 years smoke, and 4% smoke at least daily.⁷ Smoking rates are higher among Aboriginal and Torres Strait Islander young people, young people living in rural and remote communities, and young people of lower socioeconomic status.^{8,6}

Adolescents with chronic disease show higher rates of health risk behaviours than healthy adolescents.^{1,9} Some risk behaviours are based on incorrect health beliefs (e.g. the myth that smoking cannabis is good for asthma).

Risk-taking behaviour – as well as poor understanding of their health condition – may contribute to the higher rate of food-induced fatal anaphylaxis among adolescents and young adults, compared with other age groups.¹⁰

Depression, risk behaviours and poor adherence to medicines are interrelated.² Adolescents with asthma who adhere poorly to asthma treatment and hide their asthma are more likely to start smoking than other adolescents with asthma.⁴ Among adolescent boys, those with lower quality of life are most likely to start smoking.⁴

Adolescents often wish to discuss their health concerns with health professionals but are reluctant to discuss sensitive issues unless asked directly and confidentially.¹

Psychosocial assessment in adolescents

The Royal Australasian College of Physicians recommends that all primary care health professionals should routinely assess psychosocial health of people aged 10–24 years.¹

Routine psychosocial health assessment helps the health professional identify mental health states that may affect chronic disease management, identify and understand risk behaviours and strengths, take psychosocial circumstances into account when managing chronic disease, and promotes engagement between the health professional and patient.¹

The Royal Australasian College of General Practitioners¹¹ and Royal Australasian College of Physicians suggest that health professionals can use the HEADSS framework (Home, Education and Employment, [Eating and exercise], Activities and peers, Drugs, Sexuality, Suicide and depression, Safety, Spirituality).^{12, 13}

A list of screening and assessment tools appropriate for adolescents and young adults is included in beyondblue's *Clinical practice guidelines: Depression in adolescents and young adults* (2010).¹⁴

- ▶ Go to: [The HEADSS framework for Psychosocial Health Assessment](#), appendix to the Royal Australian College of Practitioner's [Routine adolescent psychosocial health assessment. Position statement 2008 \(PDF/535KB\)](#)
- Go to: [Beyondblue](#) information for health professionals and patients

Impact of puberty on asthma

In the past, it was thought that children typically 'outgrew' asthma due to maturation of the autonomic and central nervous systems under the effect of sex steroids during puberty.¹⁵ However, there is little evidence to support this assumption.¹⁵ Puberty does not predict remission of asthma. Almost two-thirds of children with chronic asthma have persistent symptoms throughout puberty.¹⁵

Early puberty has been reported to be an independent risk factor for the persistence of asthma into adolescence, and for the severity of asthma in adulthood.¹⁵ The mechanism for this association is unclear, and might involve the effects of hormonal changes on reactivity of airways or risk factors that are common to both asthma and early puberty.¹⁵

Increased BMI in girls has been associated with both early puberty and increased asthma risk.

Australian data show that more boys than girls experience remission of asthma during adolescence (based on 2007–2008 data):¹⁶

- the prevalence of current asthma is higher for boys than girls among children aged 0–14 years, and higher for women among people aged 15 years and over
- the prevalence of current asthma in children aged 10–14 years is approximately 12% for boys and 7% for girls
- the prevalence of current asthma in adolescents and young adults aged 15–24 years is approximately 11% in both sexes.

Asthma can worsen or improve during adolescence; close monitoring is necessary so that medicines can be adjusted to maintain good asthma control at the lowest effective doses. If attempted back-titration of an adolescent's preventer dose or step-down in the treatment regimen results in worsening of asthma symptoms, this experience can help the person understand why it is necessary to take these medicines regularly. Health professionals can make unsuccessful back-titration an opportunity to reinforce self-management education.

Asthma can occur for the first time during adolescence, more commonly in girls than boys.¹⁷ The true prevalence of asthma in adolescents is difficult to estimate because of under- and over-diagnosis.

Adherence to preventer treatment: adults and adolescents

Most patients do not take their preventer medication as often as prescribed, particularly when symptoms improve, or are mild or infrequent. Whenever asthma control is poor despite apparently adequate treatment, poor adherence, as well as poor inhaler technique, are probable reasons to consider.

Poor adherence may be intentional and/or unintentional. Intentional poor adherence may be due to the person's belief that the medicine is not necessary, or to perceived or actual adverse effects. Unintentional poor adherence may be due to forgetting or cost barriers.

Common barriers to the correct use of preventers include:

- being unable to afford the cost of medicines or consultations to adjust the regimen
- concerns about side effects
- interference of the regimen with the person's lifestyle
- forgetting to take medicines
- lack of understanding of the reason for taking the medicines
- inability to use the inhaler device correctly due to physical or cognitive factors
- health beliefs that are in conflict with the belief that the prescribed medicines are effective, necessary or safe (e.g. a belief that the prescribed preventer dose is 'too strong' or only for flare-ups, a belief that asthma can be overcome by psychological effort, a belief that complementary and alternative therapies are more effective or appropriate than prescribed medicines, mistrust of the health professional).

Adherence to preventers is significantly improved when patients are given the opportunity to negotiate the treatment regimen based on their goals and preferences.¹⁸

Assessment of adherence requires an open, non-judgemental approach.

Accredited pharmacists who undertake Home Medicines Reviews can assess adherence while conducting a review.

Table. Suggested questions to ask adults and older adolescents when assessing adherence to treatment

1. Many people don't take their medication as prescribed. In the last four weeks:
 - how many days a week would you have taken your preventer medication? None at all? One? Two? (etc).
 - how many times a day would you take it? Morning only? Evening only? Morning and evening? (or other)
 - each time, how many puffs would you take? One? Two? (etc).
2. Do you find it easier to remember your medication in the morning, or the evening?

Source: Foster JM, Smith L, Bosnic-Anticevich SZ et al. Identifying patient-specific beliefs and behaviours for conversations about adherence in asthma. *Intern Med J* 2012; 42: e136-e44. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/21627747>

Asset ID: 38

► Go to: Medicare's [Home Medicines Review \(HMR\)](#)

Resources for health professionals working with adolescents

- Go to: The Royal Australasian College of Physicians' [Working with young people online resource](#)
- Go to: [Headspace](#): Australia's National Youth Mental Health Foundation
- Go to: [Inspire Foundation](#)
- Go to: [Reachout](#)
- Go to: The Royal Children's Hospital Melbourne's [Transition – for health professionals](#)
- Go to: NSW Agency for Clinical Innovation's [Transition planning checklist](#)
- Go to: NSW Centre for Advancement of Adolescent Health, The Children's Hospital at Westmead's [Adolescent health GP resources](#)
- Go to: [ChIPS \(Chronic Illness Peer Support\)](#)
- Go to: [Relationships Australia](#)
- Go to: [Smarter than Smoking](#)
- Go to: The Children's Hospital at Westmead's [Kids Quit smoking cessation brief interventions](#)

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Investigating asthma-like symptoms in adolescents and young adults

Recommendations

Use spirometry to assess lung function objectively and to confirm the diagnosis, even if the person had asthma during childhood.

How this recommendation was developed

Consensus

Based on clinical experience and expert opinion (informed by evidence, where available), with particular reference to the following source(s):

- Towns and Asperen, 2009¹
- Weinberger and Abu-Hasan, 2007²
- Yeatts *et al.* 2003³

For adolescents with exercise-related symptoms, consider objective tests (e.g. exercise testing, bronchial provocation (challenge) tests) or referral to investigate the possibility of non-asthma causes such as dyspnoea due to poor cardiopulmonary fitness, hyperventilation or upper airway dysfunction.

How this recommendation was developed

Consensus

Based on clinical experience and expert opinion (informed by evidence, where available), with particular reference to the following source(s):

- British Thoracic Society and Scottish Intercollegiate Guidelines Network, 2008⁴
- Tilles, 2010⁵

Ask about smoking and exposure to other people's tobacco smoke.

How this recommendation was developed

Consensus

Based on clinical experience and expert opinion (informed by evidence, where available).

In adolescent girls, consider whether asthma symptoms are affected by the menstrual cycle.

How this recommendation was developed

Consensus

Based on clinical experience and expert opinion (informed by evidence, where available).

More information

Impact of puberty on asthma

In the past, it was thought that children typically 'outgrew' asthma due to maturation of the autonomic and central nervous systems under the effect of sex steroids during puberty.⁶ However, there is little evidence to support this assumption.⁶ Puberty does not predict

remission of asthma. Almost two-thirds of children with chronic asthma have persistent symptoms throughout puberty.⁶

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Asthma can occur for the first time during adolescence, more commonly in girls than boys.¹ The true prevalence of asthma in adolescents is difficult to estimate because of under- and over-diagnosis.

Assessment of asthma in adolescents

The majority of adolescents with asthma have normal lung function despite experiencing significant asthma symptoms.⁸

Lung function may not be a strong predictor of future flare-ups or correlate with current symptoms in adolescents.⁹

Assessment of asthma in adolescents is usually similar to assessment in adults, taking into account confidentiality and psychosocial factors that are especially important in this age group.

At each visit, it is useful to ask about days absent from school due to asthma.

Table. Definition of levels of recent asthma symptom control in adults and adolescents (regardless of current treatment regimen)

Good control	Partial control	Poor control
All of: <ul style="list-style-type: none">• Daytime symptoms ≤ 2 days per week• Need for SABA reliever ≤ 2 days per week[†]• No limitation of activities• No symptoms during night or on waking	One or two of: <ul style="list-style-type: none">• Daytime symptoms > 2 days per week• Need for SABA reliever > 2 days per week[†]• Any limitation of activities• Any symptoms during night or on waking	Three or more of: <ul style="list-style-type: none">• Daytime symptoms > 2 days per week• Need for SABA reliever > 2 days per week[†]• Any limitation of activities• Any symptoms during night or on waking

SABA: short-acting beta₂-agonist

[†] SABA, not including doses taken prophylactically before exercise. (Record this separately and take into account when assessing management.)

Note: Recent asthma symptom control is based on symptoms over the previous 4 weeks.

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- See: [Assessing symptom control and risk in adults](#)
- See: [Assessing symptoms and control in children 6 years and over](#)

Diagnostic difficulties when investigating asthma-like symptoms in adolescents

Asthma is commonly misdiagnosed in young people presenting with exercise-related symptoms or cough.¹ Conditions associated with dyspnoea include hyperventilation, anxiety, and poor cardiopulmonary fitness.²

Both denial and overplay of symptoms has been observed among adolescents.¹ Adolescents with new or re-emerging asthma symptoms may deny their symptoms.¹ US data suggest that risk factors for undiagnosed asthma among adolescents include female sex, smoking (current smoking and exposure to others' smoke), low socioeconomic status, family problems, low physical activity and high body mass.³

Exercise-related symptoms in adolescents

In adolescents, exercise-related wheezing and breathlessness are poor predictors of exercise-induced bronchoconstriction. Only a minority of adolescents referred for assessment of exercise-induced respiratory symptoms show objective evidence of exercise-induced bronchoconstriction.¹⁰

For adolescents with exercise-related symptoms, common conditions that should be considered in the differential diagnosis include poor cardiopulmonary fitness, exercise-induced upper airway dysfunction and exercise-induced hyperventilation.^{1, 5}

In addition to spirometry, other objective tests (e.g. cardiopulmonary fitness testing, bronchial provocation tests) may be helpful to clarify the diagnosis and inform management.

► See: [Investigation and management of exercise-induced bronchoconstriction](#)

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Psychosocial factors affecting adolescent health

Adolescence is a time of rapid growth and physical, cognitive, emotional and social development. An adolescent's age is not a reliable indicator of maturity in each of these areas.¹¹

Mental health disorders (e.g. depression, anxiety, eating disorders) are common and clinically important among young people.¹¹ A significant proportion of adult mental health problems emerge during adolescence.¹¹

Adolescence is also a time when people can begin risky behaviours (e.g. smoking, poor eating habits, physical inactivity, and drug and alcohol use), which can continue into adulthood.^{11, 12} Although smoking rates among adolescents and young people are declining,¹³ approximately 6% of adolescents aged 15–17 years smoke, and 4% smoke at least daily.¹⁴ Smoking rates are higher among Aboriginal and Torres Strait Islander young people, young people living in rural and remote communities, and young people of lower socioeconomic status.^{15, 13}

Adolescents with chronic disease show higher rates of health risk behaviours than healthy adolescents.^{11, 16} Some risk behaviours are based on incorrect health beliefs (e.g. the myth that smoking cannabis is good for asthma).

Risk-taking behaviour – as well as poor understanding of their health condition – may contribute to the higher rate of food-induced fatal anaphylaxis among adolescents and young adults, compared with other age groups.¹⁷

Depression, risk behaviours and poor adherence to medicines are interrelated.¹⁸ Adolescents with asthma who adhere poorly to asthma treatment and hide their asthma are more likely to start smoking than other adolescents with asthma.¹⁹ Among adolescent boys, those with lower quality of life are most likely to start smoking.¹⁹

Adolescents often wish to discuss their health concerns with health professionals but are reluctant to discuss sensitive issues unless asked directly and confidentially.¹¹

Physiological and psychological changes

Stress, anxiety and extreme emotions

Some patients report asthma flare-ups and asthma symptoms in response to stress and extreme emotions.^{20, 21}

Adolescents with asthma may experience breathlessness in response to stress (without changes in lung function or other asthma symptoms).²²

► See: [Investigating asthma-like symptoms in adolescents and young adults](#)

Laughter

Laughing is a common trigger for wheeze in infants. In children, the presence of respiratory symptoms that are triggered by laughter increases the probability of symptoms being due to asthma.

► See: [Diagnosing asthma in children](#)

Hormonal changes

Asthma may worsen during the premenstrual phase in up to 40% of women, possibly due to a reduced response to corticosteroids and bronchodilators.²³ However, this rarely causes severe flare-ups.²³

Perimenstrual worsening asthma may be relatively common among women with severe or poorly controlled asthma, and may share risk factors with aspirin-exacerbated respiratory disease.²⁴

Asthma control worsens during pregnancy in about one third of women with asthma.²⁵ During pregnancy, approximately 6% of women with asthma are hospitalised with a severe asthma flare-up.^{26, 27}

► See: [Managing asthma during pregnancy](#)

Sexual activity

Sexual activity may trigger asthma symptoms possibly due to physical exertion (exercise-induced bronchoconstriction), heightened emotion, or a combination of these factors. Exposure to dust mite allergens in bedding may also be a trigger for people who are sensitised.

People with asthma may experience limitation to sexual activity due to asthma or be concerned about the effect of their asthma on their sex life.^{28, 29} However, patients are unlikely to mention concerns about sexual activity to their doctor.²⁹

Practical information for patients about sex and asthma is available from Asthma Australia.

► Go to: Asthma Australia's [Triggers](#) webpage
See: [Investigation and management of exercise-induced bronchoconstriction](#)

Resources for health professionals working with adolescents

- Go to: The Royal Australasian College of Physicians' [Working with young people online resource](#)
- Go to: [Headspace](#): Australia's National Youth Mental Health Foundation
- Go to: [Inspire Foundation](#)
- Go to: [Reachout](#)
- Go to: The Royal Children's Hospital Melbourne's [Transition – for health professionals](#)
- Go to: NSW Agency for Clinical Innovation's [Transition planning checklist](#)
- Go to: NSW Centre for Advancement of Adolescent Health, The Children's Hospital at Westmead's [Adolescent health GP resources](#)
- Go to: [ChIPS \(Chronic Illness Peer Support\)](#)
- Go to: [Relationships Australia](#)
- Go to: [Smarter than Smoking](#)
- Go to: The Children's Hospital at Westmead's [Kids Quit smoking cessation brief interventions](#)

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