Adjusting treatment for children 6–11 years

Before adjustment

- Assess current asthma symptom control and risk factors
- If child is receiving ICS treatment, assess adherence and inhaler technique

Recommendation

Adjust ICS-based treatment to maintain good symptom control, prevent exacerbations and minimise side-effects.

Sources & rationale

Recommendation type: Adapted from GINA

Prevention of exacerbations requiring systemic corticosteroid treatment is a key goal of asthma management.

The use of multiple short courses of oral corticosteroids to manage asthma exacerbations in children is associated with a dose-dependent reduction in bone mineral accretion and increased risk for osteopenia.[Kelly 2008] Short courses of oral corticosteroids to manage asthma exacerbations are associated with increased lifetime risk of osteoporosis, pneumonia, cardiovascular or cerebrovascular diseases, cataract, sleep apnoea, renal impairment, depression/anxiety, type 2 diabetes, and weight gain.[Price 2018]

Most benefit of ICS is seen at low-to-medium doses. High doses achieve small improvements in control but greatly increase the rate of local adverse effects.[Adams 2006]

Long-term use of high doses increases the risk of systemic side-effects such as osteoporosis, cataract and glaucoma.[GINA 2025]

References

Adams NP, Jones PW. The dose-response characteristics of inhaled corticosteroids when used to treat asthma: an overview of Cochrane systematic reviews. Respir Med 2006; 100: 1297-1306.

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Kelly HW, Van Natta ML, Covar RA, et al. Effect of long-term corticosteroid use on bone mineral density in children: a prospective longitudinal assessment in the childhood Asthma Management Program (CAMP) study. Pediatrics 2008; 122: e53-e61.

Price DB, Trudo F, Voorham J, et al. Adverse outcomes from initiation of systemic corticosteroids for asthma: long-term observational study. J Asthma Allergy 2018; 11: 193-204.

Notes

Table

Low, medium and high ICS doses in children 6–11 years

Active ingredient	Total daily dose (microg)

	Low	Medium	High
Fluticasone propionate	100 (50 twice daily)	<8 years: >100–200 (e.g. 100 twice daily)	<8 years: >200
		8–11 years: >100–250 (e.g. 100 twice daily or 125 twice daily)	8–11 years: >250
Ciclesonide	80	160	>160
Budesonide	100–200	>200–400	>400
Beclometasone (extra-fine particle)	50–100	>100–200	>200

Additional information

ICS: inhaled corticosteroid;

[ ] Options recommended for first-line use in children, based on current evidence for efficacy and safety

Options not recommended as first-line treatment in children due to delivery device or concerns about systemic effects including potentially greater effects on growth

Stepping up

Recommendation

For a child treated only with salbutamol as needed, start daily maintenance treatment with low-dose ICS (plus SABA as needed) if indicated.

Start ICS if any of the following apply:

- Daytime symptoms/signs (e.g. wheeze, cough or breathlessness) occur twice per week or more.
- Night-time waking due to respiratory symptoms occurs twice per month or more.
- The child has a history of an exacerbation that necessitated an ED visit or systemic corticosteroids in the past 12 months.

Table

Indications for maintenance inhaled corticosteroid treatment in children 6–11 years

Severity of Exacerbations	**Pattern of exacerbations and symptoms**		
	Exacerbations less than once every 3 months, and no symptoms between exacerbations	Exacerbations more frequent than once every 3 months, and no symptoms or infrequent symptoms between exacerbations	Symptoms between exacerbations (any of): • Daytime symptoms more than once per week • Night-time symptoms more than twice per month • Symptoms restrict activity or sleep
Mild Exacerbations quickly resolve with salbutamol	Not indicated	Consider	Indicated
Moderate–severe ≥1 exacerbation in past year required ED or oral corticosteroids	Consider	Indicated	Indicated
Life-threatening ≥1 exacerbation required hospitalisation or PICU	Indicated	Indicated	Indicated

Additional information

ED: emergency department; PICU: paediatric intensive care unit

Table

Low, medium and high ICS doses in children 6–11 years

Active ingredient	Total daily dose (microg)		
	Low	Medium	High
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		8–11 years: >100–250 (e.g. 100 twice daily or 125 twice daily)	8–11 years: >250
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Additional information

ICS: inhaled corticosteroid;

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Options not recommended as first-line treatment in children due to delivery device or concerns about systemic effects including potentially greater effects on growth

Sources & rationale

Recommendation type: Consensus recommendation

Efficacy of ICS in children

Maintenance treatment with low doses of ICS significantly reduces the risk of asthma exacerbations in children. In a large 3-year clinical trial in children aged 5–10 years with recently diagnosed asthma, maintenance treatment with low-dose ICS (plus SABA as needed) reduced the risk of serious exacerbations by 40%, improved lung function, increased symptom-free days and decreased days lost from school years, compared with SABA only.[Chen 2006]

Most benefit of ICS is seen at low-to-medium doses. High doses achieve small improvements in control but greatly increase the rate of local adverse effects.[Adams 2006]

Safety of ICS in children

At recommended doses, ICSs are generally well tolerated in children.[Rachelefsky 2009; Kapadio 2016]

The use of a spacers with pMDIs reduces oropharyngeal drug deposition and so reduces the risk of local adverse effects (e.g. candidiasis and dysphonia) with ICS.[Lavorini 2020] Topical effects can also be reduced by mouth-rinsing and spitting after

inhaling. Immediate quick mouth-rinsing removes more residual medicine in the mouth than delayed rinsing.[Yokoyama 2007]

ICS-related systemic adverse effects in children include suppression of the hypothalamic-pituitary-adrenal (HPA) axis (rare), [Kapadio 2016] short-term linear growth suppression, clinically non-significant effects on bone mineral density, and dose-dependent effects on glucose metabolism.[Kapadio 2016]

A review of long-term clinical trials of recommended doses of inhaled corticosteroids in children found little or no effect on measures of HPA axis function over 12 to 36 months follow-up, and no clinically significant effects on bone mineral density. [Pedersen 2006]

Regular use of ICS in children before puberty is associated with an average reduction of 0.48 cm/year in linear growth rate in the first year of treatment, after which less effect is seen. Growth suppression depends on the dose.[Axelsson 2019]

Uncontrolled asthma also reduces children's growth and final adult height.[Pedersen 2001]

References

Adams NP, Jones PW. The dose-response characteristics of inhaled corticosteroids when used to treat asthma: an overview of Cochrane systematic reviews. Respir Med 2006; 100: 1297-1306.

Axelsson I, Naumburg E, Prietsch SO, Zhang L. Inhaled corticosteroids in children with persistent asthma: effects of different drugs and delivery devices on growth. Cochrane Database Syst Rev 2019; 6: CD010126.

Chen YZ, Busse WW, Pedersen S, et al. Early intervention of recent onset mild persistent asthma in children aged under 11 yrs: the Steroid Treatment As Regular Therapy in early asthma (START) trial. Pediatr Allergy Immunol 2006; 17 Suppl 17: 7-13.

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Rachelefsky G. Inhaled corticosteroids and asthma control in children: assessing impairment and risk. Pediatrics 2009; 123: 353-66.

Yokoyama H, Yamamura Y, Ozeki T, *et al*. Effects of mouth washing procedures on removal of budesonide inhaled by using Turbuhaler. Yakugaku Zasshi 2007; 127: 1245-1249.

Notes

If symptoms do not resolve, check inhaler technique and adherence, environmental triggers, and review the diagnosis.

If cough is the predominant sign, check clinical response to a treatment trial of ICS after 4 weeks. If cough has not resolved, stop ICS treatment and reconsider alternative diagnoses.

Recommendation

If signs and symptoms of asthma are not well controlled on maintenance low-dose ICS, or the child has a severe exacerbation despite treatment, review the diagnosis and assess and manage common causes before considering increasing the intensity of treatment.

Check:

- adherence to maintenance low-dose ICS treatment
- inhaler technique
- whether the symptoms and signs are likely due to asthma or an alternative or comorbid diagnosis
- exposure to irritants (e.g. smoke, pollution) or airborne allergens (if sensitised).

Sources & rationale

Recommendation type: Adapted from GINA

References

Global Initiative for Asthma. Global Strategy for Asthma Management and Prevention, 2025. Available from: www.ginasthma.org/reports.

Recommendation

If signs and symptoms of asthma are not well controlled on maintenance low-dose ICS despite good adherence and correct inhaler technique, consider maintenance treatment with low-dose ICS-LABA (plus SABA as needed).

Table

Low, medium and high ICS doses in children 6–11 years

Active ingredient	Total daily dose (microg)		
	Low	Medium	High
Fluticasone propionate	100 (50 twice daily)	<8 years: >100–200 (e.g. 100 twice daily)	<8 years: >200
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Ciclesonide	80	160	>160
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Additional information

ICS: inhaled corticosteroid;

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Options not recommended as first-line treatment in children due to delivery device or concerns about systemic effects including potentially greater effects on growth

Sources & rationale

Recommendation type: Consensus recommendation

Maintenance treatment with a combination of an ICS and a LABA in a single inhaler is approved by TGA for use in children ≥4 years.[Australian PI: fluticasone propionate/salmeterol xinafoate]

This option avoids increasing the ICS dose, while achieving at least equal efficacy.[Vaessen-Verberne 2010]

In children with asthma that is not well controlled with low-dose ICS, adding a LABA is more likely to improve asthma than increasing the ICS dose or adding montelukast to low-dose ICS.[Lemanske 2010, Chauhan 2014, Cividini 2023] However, individual responses vary; some children have a better response to other options.[Lemanske 2010]

In children aged 4–11 years, addition of LABA to ICS does not increase risk of exacerbations,[Stempel 2016] contrary to historical concerns.

References

Australian Product Information – Pavtide (fluticasone propionate/salmeterol xinafoate) Accuhaler and MDI. [Revised 7 November 2022] Therapeutic Goods Administration (www.ebs.tga.gov.au)

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Cividini S, Sinha I, Donegan S, et al. Best step-up treatments for children with uncontrolled asthma: a systematic review and network meta-analysis of individual participant data. Eur Respir J 2023; 62: 2301011.

Chauhan BF, Ducharme FM. Addition to inhaled corticosteroids of long-acting beta2-agonists versus anti-leukotrienes for chronic asthma. Cochrane Database Syst Rev 2014; 1: CD003137.

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Stempel DA, Szefler SJ, Pedersen S, et al. Safety of adding salmeterol to fluticasone propionate in children with asthma. N Engl J Med 2016; 375: 840-849.

Vaessen-Verberne AA, van den Berg NJ, van Nierop JC, et al. Combination therapy salmeterol/fluticasone versus doubling dose of fluticasone in children with asthma. Am J Respir Crit Care Med 2010; 182: 1221-1227.

Notes

Note on the 2025 recommendation: Maintenance-and-reliever therapy with ICS-formoterol is not approved by TGA for use in the treatment asthma in children younger than 12 years. Future Australian asthma handbook guidance may recommend maintenance-and-reliever therapy for children 6–11 years, depending on the findings of recent and ongoing clinical trials, and on TGA and PBS decisions.

Limited evidence in children 6–11 years suggests that the combination of very low doses of budesonide–formoterol taken as maintenance treatment, with extra doses taken as reliever whenever symptoms occur, is associated with a large reduction in exacerbation rate, compared with the same dose as maintenance treatment with SABA taken as needed for symptoms, and compared with a higher dose of maintenance ICS treatment.[Bisgaard 2006]

Recommendation

For children whose asthma is not adequately controlled by low-dose maintenance ICS-LABA (plus SABA as needed) or medium-dose ICS (plus SABA as needed), consider increasing to medium-dose ICS-LABA.

Sources & rationale

Recommendation type: Adapted from GINA

In a systematic review and network analysis of asthma treatment trials in children with asthma uncontrolled while taking ICS alone, medium-dose ICS-LABA was associated with the lowest risk of asthma exacerbations and with improved lung function, compared with medium-dose ICS, higher-dose ICS, or ICS plus LTRA.[Cividini 2023]

References

Cividini S, Sinha I, Donegan S, et al. Best step-up treatments for children with uncontrolled asthma: a systematic review and network meta-analysis of individual participant data. Eur Respir J 2023; 62: 2301011.

Global Initiative for Asthma. Global Strategy for Asthma Management and Prevention, 2025. Available from: www.ginasthma.org/reports.

Notes

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Limited evidence in children 6–11 years suggests that the combination of very low doses of budesonide–formoterol taken as maintenance treatment, with extra doses taken as reliever whenever symptoms occur, is associated with a large reduction in exacerbation rate, compared with the same dose as maintenance treatment with SABA taken as needed for symptoms, and compared with a higher dose of maintenance ICS treatment.[Bisgaard 2006]

Recommendation

If a child's asthma is not adequately controlled by medium-dose maintenance ICS-LABA (plus SABA as needed), consider specialist referral.

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Sources & rationale

Recommendation type: Consensus recommendation

Notes

Suitable specialists for referral include paediatric respiratory physicians, general paediatricians with a special interest in asthma, or allergists.

Stepping down

Recommendation

If good asthma symptom control has been maintained for at least 3 months despite exposure to triggers known to cause the child's symptoms, consider stepping down treatment.

Arrange follow-up within 3–6 weeks to reassess asthma symptom control and review the treatment plan.

Sources & rationale

Recommendation type: Adapted from GINA

References

Global Initiative for Asthma (GINA). Global Strategy for Asthma Management and Prevention, 2025. Available from: www.ginasthma.org

Notes

Do not attempt a step-down at a time when exposure to known symptoms triggers is likely (e.g. in winter when respiratory viruses are prevalent, or in springtime if the child has allergic rhinitis or known sensitisation to seasonal aeroallergens such as pollens).

Seasonal worsening of asthma symptoms is common among children (e.g. in winter months and at the start of the school term).

Consideration

Consider stepping up treatment sooner for children with a history of severe atopy, anaphylaxis, or sudden unpredictable severe exacerbations, and for those exposed to cigarette smoke.

Sources & rationale

Recommendation type: Consensus recommendation

Notes

Table

Risk factors for severe asthma exacerbations in children

High probability of respiratory viral infection (beginning of day care/preschool term, epidemics)
Confirmed food allergy or history of anaphylaxis
Poor asthma symptom control
ED visit or admission to hospital for asthma in preceding 12 months
History of sudden, unpredictable exacerbations not preceded by gradual worsening of symptoms
History of intubation/paediatric ICU admission for acute asthma
Over-use of salbutamol
Poor adherence to prescribed ICS treatment by parents/carers
Poor inhaler technique for ICS
Frequent failure to attend consultations
Parent's/carer's inability to follow asthma action plan
Significant parental psychological or socioeconomic problems
Carer unequipped to manage asthma emergency
Exposure to clinically relevant allergens
Exposure to tobacco smoke
Damp housing
Exposure to outdoor pollution
Obesity
High eosinophil count (if known)

Practice point

Update the child's asthma action plan after each change in treatment.

Practice point

Excessive use of salbutamol (e.g. 3 canisters in a year) indicates that ICS is indicated and the level of treatment should be stepped up.

Practice point

The need for repeated courses of systemic corticosteroids indicates that the level treatment should be stepped up.

Practice point

Do not delay ICS-LABA treatment until child has had several ED presentations for asthma and has received multiple courses of systemic corticosteroids. The risk-to-benefit ratio of ICS-LABA is significantly better than that of oral corticosteroids.

Alert Systemic corticosteroids should be avoided except when necessary to manage clinically significant exacerbations

Practice point

Depending on the individual's age and developmental stage, a specialist might consider prescribing a regimen based on anti-inflammatory reliever (as-needed low-dose budesonide–formoterol or maintenance-and-reliever therapy), which are currently not approved for children younger than 12 years. Older children who may benefit include those with poor adherence to maintenance ICS, and those with asthma that is poorly controlled despite management with fixed-dose ICS-LABA.