Oral corticosteroid use in asthma: what's safe and appropriate?

National Asthma Council | Australian Asthma Handbook

For patients with a clinically significant asthma exacerbation, prompt treatment with systemic corticosteroids is indicated to avoid escalation to emergency department attendance, hospitalisation, or life-threatening acute asthma – but we must not encourage people to regard these as a harmless alternative to prevention.

Growing evidence highlights the risks associated with repeated short courses, even at relatively low cumulative doses. Many Australians accumulate a harmful lifetime dose.[1]

Systemic corticosteroid exposure can be minimised by:

- optimising asthma treatment to prevent exacerbations
- writing scripts that specify only the required quantity of oral corticosteroids (OCS), with no repeats
- dispensing only the specified quantity of OCS in pharmacies
- educating patients and parents to help reduce inappropriate OCS use in the community.

OCS use indicates the need for a full asthma review to optimise preventive treatment.

What is the problem with short courses of OCS in asthma care?

Short courses of OCS in asthma care are associated with increased lifetime risk of several serious adverse effects (see below).[2,3] A cumulative dose of only 500 mg to <1000 mg (equivalent to ≥2 typical 5-day courses) increases risk, compared with lower use.[2,3]

One-quarter (27.9%) of Australians aged 12 years or more who were treated for asthma with an ICS-containing inhaler during 2014–2018 were dispensed potentially toxic cumulative oral corticosteroid doses in an analysis of PBS dispensing data (Figure 1).[4]

In children, the use of multiple short courses of OCS to manage asthma exacerbations is associated with a dose-dependent reduction in bone mineral accretion and increased risk of osteopenia.[5] Anecdotal evidence suggests widespread overuse of OCS in children, administered by parents in the mistaken belief that oral medicines (especially liquid formulations), are 'safe'.

Adverse effects associated with short courses of OCS[2,3]

Osteoporosis

Pneumonia

Cardiovascular/cerebrovascular disease

Cataract

Sleep apnoea

Kidney disease

Depression/anxiety

Type 2 diabetes

Weight gain

When should OCS be used in asthma?

A short course of OCS (Table 1) is indicated in patients aged 6 years and over when asthma symptoms persist despite reliever use, recur within 4 hours, or worsen over a day. In children 1–5 years, OCS are generally reserved for asthma exacerbations severe enough to require hospital admission.

How can OCS requirement be reduced for people with asthma?

For all age groups, minimise exacerbations through optimised use of inhaled corticosteroids (ICS). The Australian Asthma Handbook now recommends ICS-containing treatment for all patients 12 years and over. For patients with severe asthma, maintenance OCS can almost always be avoided with specialist treatments such as monoclonal antibody therapy.

Strategies for safer OCS use

Manage asthma to prevent exacerbations.

Prescribe only the quantity needed for one course, with no repeats.

In pharmacies, dispense only the specified quantity.

Educate patients and parents/carers to use the medicine wisely.

Do not include parent-initiated OCS courses in asthma action plans for children.

For adults and adolescents, give clear written instructions on when to take OCS, and ask them to notify you every time.

If a patient has recently needed OCS or visited an emergency department due to asthma, conduct a full asthma review and consider specialist referral.

Figure 1. Oral corticosteroid exposure in people with asthma[4]

1 in 4 Australians (≥12 years) with asthma are exceeding 1000 mg of OCS lifetime exposure

Australians prescribed asthma preventer treatment across 5 years

50% will be prescribed an OCS

50% of these will be dispensed >1000 mg cumulative dose

4 short courses of 50 mg/day is equivalent to ≥1000 mg

Potentially toxic cumulative dose

Table 1. Limited roles for oral corticosteroid use in asthma

	Age group (years)			
	1–5	**6–11**	**12–17**	**18+**
Self- or parental administration*	Not recommended†	Only if advised by a health professional during an exacerbation‡	**12–14:** Only if advised by a GP or virtual emergency consultation during an exacerbation	Provide script for short course and include clear written instructions in personal asthma action plan§
Worsening asthma managed in primary care	Not recommended	For moderate–severe exacerbations	**15+:** Provide script for short course and include clear written instructions in personal asthma action plan§	For moderate–severe exacerbations
Acute asthma in primary or acute care	If poor response to bronchodilators within 30 mins or presentation or if hospitalisation required	Within 1 hour of presentation	For moderate–severe exacerbations	Within 1 hour of presentation
Dose (prednisone or prednisolone)	1 mg/kg (maximum 50 mg) each morning for up to 3 days			37.5–50 mg each morning for 5–10 days

** Advise patients and parents/carers about common side-effects, including sleep disturbance, increased appetite, reflux, and mood changes.*

† In regions where there are significant delays to acute care, consider providing a short course of OCS to be taken when indicated, with clear written instructions in the patient's asthma action plan.

‡ Instruct parents to contact a health professional before starting a course of OCS for their child. If the child's GP or other usual asthma clinician is unavailable, parents should contact the online or phone urgent care service in their state or territory.

§ Instruct patient or parent/carer to notify healthcare provider whenever OCS are used.

How can prescribers prevent unnecessary use of OCS by patients and carers?

Avoid prescribing more prednisone/prednisolone than needed to manage an asthma exacerbation: write PBS scripts for the required quantity, with no repeats.

Educate patients and parents/carers about risks and benefits. If a child has been prescribed prednisone/prednisolone tablets or liquid during a severe asthma exacerbation, explain that this medicine should not be used after the course is completed, unless instructed by a doctor or nurse. It must not be used for day-to-day symptoms, or given to another child.

Key messages for patients

When needed to control severe asthma attacks, these medicines can be lifesaving but, like all medicines, they have side effects. These problems were not well known until recently.

Only take the medicine if your asthma action plan tells you to. Don't give it to other family members.

Don't give your child extra doses or start a new course without first speaking to your doctor or asthma nurse.

Take your everyday asthma inhaler as prescribed, to help prevent asthma attacks.

REFERENCES: 1. Blakey J, et al. Respirology 2021; 26: 1112-1130. **2.** Price DB, et al. J Asthma Allergy 2018; 11: 193-204. **3.** Skov IR, et al. Eur Respir J 2022; 60: 2103054. **4.** Hew M, et al. Med J Aust 2020; 213: 316-320. **5.** Kelly HW, et al. Pediatrics 2008; 122: e53-61.

For more information, refer to the National Asthma Council's Australian Asthma Handbook: asthmahandbook.org.au

Reducing the environmental impact of asthma treatment information sheet: nationalasthma.org.au/living-with-asthma/resources/health-professionals/information-paper/reducing-the-environmental-impact-of-asthma-treatment

Asthma action plans: nationalasthma.org.au/living-with-asthma/resources/health-professionals/asthma-action-plans

Asthma and COPD medications chart: nationalasthma.org.au/living-with-asthma/resources/health-professionals/charts/asthma-copd-medications-chart

Monoclonal therapy for severe asthma: nationalasthma.org.au/living-with-asthma/resources/health-professionals/information-paper/monoclonal-antibody-therapy-for-severe-asthma

Developed by the National Asthma Council Australia in collaboration with

Clinical Associate Professor Debbie Rigby
Advanced practice pharmacist

Dr Amanda Lucci
General practitioner

Dr Tom Skinner
Respiratory physician

Dr Kim Watkins
Pharmacist

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