

Dosages of Drugs for Asthma Exacerbations

Medication	Dosages		
	Child Dose*	Adult Dose	Comments
BETA₂-AGONISTS (SHORT-ACTING BETA₂-AGONISTS)			
Albuterol			
Nebulizer solution (0.89 mg/3 mL, 1.25 mg/3 mL, 5.0 mg/mL)	0.15 mg/kg (minimum dose 2.5 mg) every 20 minutes for 3 doses, then 0.15–0.5 mg/kg up to 10 mg every 1–4 hours as needed, or 0.5 mg/kg/hour by continuous nebulization	2.5–5 mg every 20 minutes for 3 doses, then 2.5–10 mg every 1–4 hours as needed, or 10–15 mg/h continuously	Only selective beta ₂ -agonists are recommended. For optimal delivery, dilute nebulizer to minimum of 3 mL at gas flow of 8–10 L/min. Use large-volume nebulizers for continuous administration. May mo. with ipratropium nebulizer solution.
MDI (90 mcg/puff)	4–8 puffs every 20 minutes for 3 doses, then every 1–4 hours inpatient as needed. Use VHC, add mask in children < 4 years of age.	4–8 puffs every 20 minutes up to 4 hours, then every 1–4 hours as needed.	In mild to moderate exacerbations, MDI plus VHC is as effective as nebulized therapy with appropriate administration technique and coaching by trained personnel.
Bclaterol			
Nebulizer solution (2 mg/mL)	See albuterol dose, thought to be half as potent as albuterol on mg basis	See albuterol dose	Has not been studied in severe asthma exacerbations. Do not mo. with other drugs.
MDI (97.5 mcg/puff)	See albuterol MDI dose.	See albuterol MDI dose.	Has not been studied in severe asthma exacerbations.
Levalbuterol (R-albuterol)			
Nebulizer solution (0.89 mg/3 mL, 1.25 mg/3 mL, 1.25 mg/3 mL)	0.075 mg/kg (minimum dose 1.25 mg) every 20 minutes for 3 doses, then 0.075–0.15 mg/kg up to 5 mg every 1–4 hours as needed.	1.25–2.5 mg every 20 minutes for 3 doses, then 1.25–5 mg every 1–4 hours as needed	Levalbuterol administered in one-half the mg dose of albuterol provides comparable efficacy and safety. Has not been evaluated by continuous nebulization.
MDI (45 mcg/puff)	See albuterol MDI dose.	See albuterol MDI dose.	
Formoterol			
MDI (200 mcg/puff)	See albuterol MDI dose, thought to be half as potent as albuterol on a mg basis.	See albuterol MDI dose.	Has not been studied in severe asthma exacerbations.

STEROIDS (INHALED) (SHORT-ACTING)

Budesonide (1,000 µg/mL)	0.01 mg/kg up to 0.5–0.5 mg every 20 minutes for 3 doses sq.	0.5–0.5 mg every 20 minutes for 3 doses sq.	No proven advantage of systemic therapy over steroid.
Fluticasone (1 mg/mL)	0.01 mg/kg every 20 minutes for 3 doses, then every 2–6 hours as needed sq.	0.25 mg every 20 minutes for 3 doses sq.	No proven advantage of systemic therapy over steroid.

ANTI-INFLAMMATORIES

Ipratropium bromide			
Nebulizer solution (0.25 mg/mL)	0.25–0.5 mg every 20 minutes for 3 doses, then as needed	0.5 mg every 20 minutes for 3 doses, then as needed	May mo. in some nebulizer with albuterol. Should not be used as first-line therapy, should be added to SABA therapy for severe exacerbations. The addition of ipratropium has not been shown to provide further benefit once the patient is hospitalized.
MDI (13 mcg/puff)	4–8 puffs every 20 minutes as needed up to 9 hours	8 puffs every 20 minutes as needed up to 9 hours	Should use with VHC and face mask for children < 4 years. Studies have examined ipratropium bromide MDI for up to 9 hours.
Ipratropium with albuterol			
Nebulizer solution (Each 3 mL vial contains 0.5 mg ipratropium bromide and 90 mcg of albuterol)	1.5–3 mL every 20 minutes for 3 doses, then as needed	3 mL every 20 minutes for 3 doses, then as needed	May be used for up to 9 hours in the initial management of severe exacerbations. The addition of ipratropium to albuterol has not been shown to provide further benefit once the patient is hospitalized.
MDI (Each puff contains 13 mcg ipratropium bromide and 90 mcg of albuterol)	4–8 puffs every 20 minutes as needed up to 9 hours	8 puffs every 20 minutes as needed up to 9 hours	Should use with VHC and face mask for children < 4 years.

SYSTEMIC CORTICOSTEROIDS

(Applies to all three corticosteroids)

Prednisone	1–2 mg/kg in 2 divided doses (maximum = 60 mg/day) until reaches 70% of predicted personal best	40–60 mg/day in 1 or 2 divided doses until PEF, PCF or 70% of predicted or a personal best	For outpatient "burst," use 40–60 mg in single or 2 divided doses for total of 5–10 days in adults (children, 1–2 mg/kg/day maximum 60 mg/day for 5–10 days).
Methylprednisolone			
Prednisolone			

*Children < 12 years of age

Key: ED, emergency department; MDI, metered-dose inhaler; PEF, peak expiratory flow; VHC, valved holding chamber Nebulizer

... There is no known advantage to higher doses of corticosteroids in severe asthma exacerbations, nor is there any advantage to intravenous administration over oral therapy provided gastrointestinal transit time or absorption is not impaired.

... The total course of systemic corticosteroids for an asthma exacerbation requiring an ED visit or hospitalization may last from 5 to 10 days. For corticosteroid courses of less than 1 week, there is no need to taper the dose. For slightly longer courses (eg, up to 10 days), there probably is no need to taper, especially if patients are concurrently taking ICSs.

... ICSs can be started at any point in the treatment of an asthma exacerbation.

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