

**FIGURE 19. USUAL DOSAGES FOR QUICK-RELIEF MEDICATIONS\***

Medication	<5 Years of Age	5–11 Years of Age	≥12 Years of Age and Adults	Potential Adverse Effects	Comments (not all inclusive)
<b>Inhaled Short-Acting Beta<sub>2</sub>-Agonists</b>					
	<i>Dose applies to Albuterol.</i>	<i>Dose applies to Albuterol/and Levalbuterol.</i>	<i>Dose applies to all four SABAs</i>		<i>Apply to all four (SABAs)</i>
<b>MDI</b>					
Albuterol CFC 90 mcg/puff, 200 puffs/canister	1–2 puffs 5 minutes before exercise	2 puffs 5 minutes before exercise	2 puffs 5 minutes before exercise	<ul style="list-style-type: none"> <li>■ Tachycardia, skeletal muscle tremor, hypokalemia, increased lactic acid, headache, hyperglycemia. Inhaled route, in general, causes few systemic adverse effects. Patients with preexisting cardiovascular disease, especially the elderly, may have adverse cardiovascular reactions with inhaled therapy.</li> </ul>	<ul style="list-style-type: none"> <li>■ Drugs of choice for acute bronchospasm.</li> <li>■ Differences in potencies exist, but all products are essentially comparable on a puff per puff basis.</li> <li>■ An increasing use or lack of expected effect indicates diminished control of asthma.</li> <li>■ Not recommended for long-term daily treatment. Regular use exceeding 2 days/week for symptom control (not prevention of EIB) indicates the need for additional long-term control therapy.</li> <li>■ May double usual dose for mild exacerbations.</li> <li>■ For levalbuterol, prime the inhaler by releasing 4 actuations prior to use.</li> <li>■ For HFA: periodically clean HFA actuator, as drug may plug orifice.</li> <li>■ For autohaler: children &lt;4 years of age may not generate sufficient inspiratory flow to activate an auto-inhaler.</li> <li>■ Nonselective agents (i.e., epinephrine, isoproterenol, metaproterenol) are not recommended due to their potential for excessive cardiac stimulation, especially in high doses.</li> <li>■ May mix with cromolyn solution, budesonide inhalant suspension, or ipratropium solution for nebulization. May double dose for severe exacerbations.</li> <li>■ Does not have FDA-approved labeling for children &lt;6 years of age.</li> <li>■ Compatible with budesonide inhalant suspension. The product is a sterile-filled preservative-free unit dose vial.</li> </ul>
Albuterol HFA 90 mcg/puff, 200 puffs/canister	2 puffs every 4–6 hours, as needed for symptoms	2 puffs every 4–6 hours, as needed for symptoms	2 puffs every 4–6 hours, as needed for symptoms		
Levalbuterol HFA 45 mcg/puff, 200 puffs/canister	NA <4 years of age				
Pirbuterol CFC Autohaler 200 mcg/puff, 400 puffs/canister	NA	NA			
<b>Nebulizer solution</b>					
Albuterol 0.63 mg/3 mL 1.25 mg/3 mL 2.5 mg/3 mL 5 mg/mL (0.5%)	0.63–2.5 mg in 3 cc of saline q 4–6 hours, as needed	1.25–5 mg in 3 cc of saline q 4–8 hours, as needed	1.25–5 mg in 3 cc of saline q 4–8 hours, as needed	(Same as with MDI)	
Levalbuterol (R-albuterol) 0.31 mg/3 mL 0.63 mg/3 mL 1.25 mg/0.5 mL 1.25 mg/3 mL	0.31–1.25 mg in 3 cc q 4–6 hours, as needed for symp- toms	0.31–0.63 mg, q 8 hours, as needed for symptoms	0.63 mg– 1.25 mg q 8 hours, as needed for symptoms	(Same as with MDI)	

Key: CFC, chlorofluorocarbon; ED, emergency department; EIB, exercise-induced bronchospasm; HFA, hydrofluoroalkane; IM, intramuscular; MDI, metered-dose inhaler; NA, not available (either not approved, no data available, or safety and efficacy not established for this age group); PEF, peak expiratory flow; SABA, short-acting beta<sub>2</sub>-agonist

\*Dosages are provided for those products that have been approved by the U.S. Food and Drug Administration (FDA) or have sufficient clinical trial safety and efficacy data in the appropriate age ranges to support their use.

**FIGURE 19. USUAL DOSAGES FOR QUICK-RELIEF MEDICATIONS\* (continued)**

Medication	<5 Years of Age	5–11 Years of Age	≥12 Years of Age and Adults	Potential Adverse Effects	Comments (not all inclusive)
<b>Anticholinergics</b>					
Ipratropium HFA					
<b>MDI</b>					
17 mcg/puff, 200 puffs/canister	NA	NA	2–3 puffs q 6 hours	<ul style="list-style-type: none"> <li>■ Drying of mouth and respiratory secretions, increased wheezing in some individuals, blurred vision if sprayed in eyes. If used in the ED, produces less cardiac stimulation than SABAs.</li> </ul>	<ul style="list-style-type: none"> <li>■ Multiple doses in the emergency department (not hospital) setting provide additive benefit to SABA.</li> <li>■ Treatment of choice for bronchospasm due to beta-blocker medication.</li> <li>■ Does not block EIB.</li> <li>■ Reverses only cholinergically mediated bronchospasm; does not modify reaction to antigen.</li> <li>■ May be an alternative for patients who do not tolerate SABA.</li> <li>■ Has not proven to be efficacious as long-term control therapy for asthma.</li> </ul>
<b>Nebulizer solution</b>					
0.25 mg/mL (0.025%)	NA	NA	0.25 mg q 6 hours		
Ipratropium with albuterol					
<b>MDI</b>					
18 mcg/puff of ipratropium bromide and 90 mcg/puff of albuterol	NA	NA	2–3 puffs q 6 hours		
200 puffs/canister					
<b>Nebulizer solution</b>					
0.5 mg/3 mL ipratropium bromide and 2.5 mg/3 mL albuterol	NA	NA	3 mL q 4–6 hours		<ul style="list-style-type: none"> <li>■ Contains EDTA to prevent discoloration of the solution. This additive does not induce bronchospasm.</li> </ul>
<b>Systemic Corticosteroids</b>					
Methylprednisolone	<b>Dosages apply to first three corticosteroids.</b>				<b>(Applies to the first three corticosteroids.)</b>
2, 4, 6, 8, 16, 32 mg tablets	Short course “burst”: 1–2 mg/kg/day, maximum 60 mg/day, for 3–10 days	Short course “burst”: 40–60 mg/day as single or 2 divided doses for 3–10 days	Short course “burst”: 40–60 mg/day as single or 2 divided doses for 3–10 days	<ul style="list-style-type: none"> <li>■ Short-term use: reversible abnormalities in glucose metabolism, increased appetite, fluid retention, weight gain, facial flushing, mood alteration, hypertension, peptic ulcer, and rarely aseptic necrosis.</li> <li>■ Consideration should be given to coexisting conditions that could be worsened by systemic corticosteroids, such as herpes virus infections, varicella, tuberculosis, hypertension, peptic ulcer, diabetes mellitus, osteoporosis, and <i>Strongyloides</i>.</li> </ul>	<ul style="list-style-type: none"> <li>■ Short courses or “bursts” are effective for establishing control when initiating therapy or during a period of gradual deterioration. Action may begin within an hour.</li> <li>■ The burst should be continued until patient achieves 80 percent PEF personal best or symptoms resolve. This usually requires 3–10 days but may require longer. There is no evidence that tapering the dose following improvement prevents relapse in asthma exacerbations.</li> <li>■ Other systemic corticosteroids such as hydrocortisone and dexamethasone given in equipotent daily doses are likely to be as effective as prednisolone.</li> </ul>
Prednisolone					
5 mg tablets, 5 mg/5 cc, 15 mg/5 cc					
Prednisone					
1, 2.5, 5, 10, 20, 50 mg tablets; 5 mg/cc, 5 mg/5 cc					

**FIGURE 19. USUAL DOSAGES FOR QUICK-RELIEF MEDICATIONS\*** (continued)

Medication	<5 Years of Age	5–11 Years of Age	≥12 Years of Age and Adults	Potential Adverse Effects	Comments (not all inclusive)
<b>Systemic Corticosteroids (continued)</b>					
<b><i>Repository injection</i></b> (Methylprednisolone acetate) 40 mg/mL 80 mg/mL	7.5 mg/kg IM once	240 mg IM once	240 mg IM once		<ul style="list-style-type: none"> <li>■ May be used in place of a short burst of oral steroids in patients who are vomiting or if adherence is a problem.</li> </ul>