

INHALED CORTICOSTEROIDS (ICS)

ICS are the preferred treatment for all levels of persistent asthma. ICS work by binding to receptor sites on target cells in the epithelium. ICS decrease the amount of inflammation and mucus in the airway. ICS are very unlikely to cause the systemic side effects that are associated with frequent use of oral corticosteroids, such as weight gain, risk of infection, and stunting. ICS are very different from the illegal anabolic steroids taken by some athletes. This is a highly effective class of medications that are capable of changing the underlying airway pathology of asthma leading to dramatically reduced morbidity and greatly improved quality of life. Relieving inflammation and swelling helps prevent the chain reaction that causes asthma symptoms. **These Drugs should not be stopped without consulting a health care provider.**

Generic Name	Brand Name	Dosage Form	Shaking and Priming Instructions	Cleaning Instructions	Sprays/ Inhalations per inhaler
Beclomethasone HFA	QVAR®	MDI: 40 or 80 mcg/ spray	Do not shake. Spray 2 times before first use or after 10 days of non-use.	Once a week wipe mouthpiece with dry cloth, do not use water.	100 sprays
Budesonide DPI	Pulmicort Flexhaler®	DPI: 90 or 180 mcg/ spray	Do not shake. Twist and click 2 times before first use.	Once a week, wipe mouthpiece with dry cloth. Do not use water.	60 or 120 inhalations
Budesonide HFN	Pulmicort Respules®	0.25 mg; 0.50 mg; or 1.0 mg in 2ml			
Ciclesonide HFA	Alvesco®	MDI: 80 or 160 mcg/spray	Do not shake. Spray 3 times before first use or after 10 days of non-use.	Once a week, wipe mouthpiece with dry cloth; do not use water.	60 sprays
Flunisolide CFC	AeroBid® and AeroBid-M®	MDI: 250 mcg/ spray	Shake before each use.	Every few days, remove canister and rinse plastic actuator with warm water, dry thoroughly.	100 sprays
Fluticasone HFA	Flovent®	MDI: 44, 110, or 220 mcg/spray	Shake 5 seconds and spray 4 times before first use-shake and spray once after dropping or after 7 days non-use.	Once a week, clean exit port with damp cotton swab; wipe mouthpiece with damp tissue, air dry overnight.	120 sprays
Fluticasone DPI	Flovent®	DPI: 50, 100, or 250 mcg/inhalation	Do not shake or prime.	Do not wash or take apart, keep dry.	60 inhalations
Mometasone	Asmanex®	110 or 220 mcg/ inhalation	Do not shake or prime.	After each use, wipe mouthpiece with dry cloth.	30, 60, or 90 inhalations
Triamcinolone	Azmacort®	75 mcg/spray	Shake and spray 2 times before first use or after 3 days of non-use.	Once a day, remove canister and rinse plastic actuator with warm water. Dry thoroughly.	240 sprays

ICS dosages are different between the various brands. To determine low, medium, or high daily dose for each medicine, refer to chart “Estimated Comparative Daily Dosages for Inhaled Corticosteroids”.

Side effects for all inhaled corticosteroids include oral candidiasis (thrush), cough, and dysphonia. Rinse mouth after each use. Be sure to wash the face if a mask is used to deliver this medicine. Use of a spacer is recommended for MDI forms of ICS.

Estimated Comparative Daily Dosages for Inhaled Corticosteroids

Drug	Low daily dose			Medium daily dose			High daily dose		
	Child 0-4 years of age	Child 5-11 years of age	≥12 years of age and adult	Child 0-4 years of age	Child 5-11 years of age	≥12 years of age and adult	Child 0-4 years of age	Child 5-11 years of age	≥12 years of age and adult
Beclomethasone HFA 40 or 80 mcg/puff	NA	80-160 mcg	80-240 mcg	NA	>160-320 mcg	>240-480 mcg	NA	>320 mcg	>480 mcg
Budesonide DPI 90, 180, or 200 mcg/ inhalation	NA	180-400 mcg	180-600 mcg	NA	>400-800 mcg	>600-1200 mcg	NA	>800 mcg	>1200 mcg
Budesonide inhaled inhalation suspension for nebulizer	0.25-0.5 mg	0.5 mg	NA	>0.5-1.0 mg	1.0 mg	NA	>1.0 mg	2.0 mg	NA
Flunisolide 250 mcg/puff	NA	500-750 mcg	500-1000 mcg	NA	1000-1250 mcg	>1000-2000 mcg	NA	>1250 mcg	>2000 mcg
Flunisolide HFA 80 mcg/puff	NA	160 mcg	320 mcg	NA	320 mcg	>320-640 mcg	NA	≥640 mcg	>640 mcg
Fluticasone HFA/MDI: 44, 110, or 220 mcg/puff DPI: 50, 100, or 250 mcg/inhalation	176 mcg NA	88-176 mcg 100-200 mcg	88-264 mcg 100-300 mcg	>176-352 mcg NA	>176-352 mcg >200-400 mcg	>264-440 mcg >300-500 mcg	>352 mcg NA	>352 mcg >400 mcg	>440 mcg >500 mcg
Mometasone DPI 200 mcg/inhalation	NA	NA	200 mg	NA	NA	400 mg	NA	NA	>400 mcg
Triamcinolone acetonide 75 mcg/puff	NA	300-600 mcg	300-750 mcg	NA	>600-900 mcg	>750-1500 mcg	NA	>900 mcg	>1500 mcg

DPI, Dry power inhaler; HFA, hydroflouroalkane; NA, not available (not approved, no date available, or safety and efficacy not established for this age group).

Reference: Used with permission. Expert Panel Report 3 (EPR-3): Guidelines for the Diagnosis and Management of Asthma. Bethesda, MD: US Department of Health and Human Services; National Institutes of Health; National Heart, Lung and Blood Institute; National Asthma Education and Prevention Program; 2007