INTRANASAL CORTICOSTEROIDS (INCS) [1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18]

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Generic/ TRADE	Pregnancy Category [19]	Side Effects (Common & Rare)	Contraindications CI Precautions	Systemic Bioavailability [2]	Dose: For Perennial & seasonal allergic rhinitis USUAL & MAX	$ per bottle (~30-50cents/day) Scented vs Non	Comments
Beclomethasone dipropionate generic only 50ug aqueous spray [i] (previously available as **BECONASE AQ**)	C	**Common:** Transient nasal irritation (burning/stinging [<10%]), epistaxis [<10%], pharyngitis [<5%], sneezing [<3%] in hyperactive nose, rhinitis [<3%], headache [<3%], & taste/smell/voice changes. **Rare:** Ulceration of mucous membranes, Pharyngeal candidiasis, ↓ wound healing esp. in nasal area, & skin rash. **Very rare:** Nasal septal perforation, ? atrophic rhinitis, face/tongue edema & ↑ intraocular pressure. Systemic effects may be more of a concern if on other corticosteroids (e.g. for asthma) †	**Contraindications** Hypersensitivity reaction to any component of the medication; in pts. With untreated fungal, bacterial, tuberculosis & viral infections **Precautions:** Excess Nasal Secretions: may ↓ effectiveness (blowing first +/- decongestants important) Steroid Withdrawal: can occur if pt. **stops systemic steroid** therapy too quickly, after starting INCS (pain, depression & adrenal suppression can occur; also can **unmask** existing asthma or eczema) ↓ Thyroid & Cirrhosis: ↑ corticosteroid effects Nasal Structure: so far, biopsies normal [30] **Growth retardation**: Minimal effect, but a beclomethasone trial [1yr] found a small effect. [20] Not seen in products that have **low** systemic bioavailability.	High: 44% 400ug/day did not affect HPA; however 800ug/day did ↓ urinary cortisol Growth retardation: small but sig. effect in 6-9yr olds over 1yr [20]	1-2 spray in EACH nostril BID Max 3 spray EN BID (Kids <6yr not rec.) Also indicated for: ↓ nasal polyps if >5yr	**$22** / 200 doses (metered pump & nasal applicator in amber glass bottle) ◆ Scented	**i** ◆ **Storage**: protect from light, discard after 3 months use; shake well ◆ effectiveness / safety established with >20yrs of experience
Budesonide **RHINOCORT AQUA** generic 64ug [ii], 100ug aqueous suspension nasal spray **RHINOCORT** Turbuhaler (100ug dry powder [iii])	B			Moderate: 31% (Turbuhaler 22% [29]) HPA: none [21,22,23,24; ? some effect 25] Growth retardation: none at 2yr [26; some in asthma 27,28]	1-2 spray in EACH nostril OD Max 1 spray EN BID (Kids <6yr not rec.) Also indicated for: ↓ nasal polyps if >5yr	**$18** / 10ml / ~120 doses [64ug] **$23** / 10ml / ~165 doses [100ug] {1 spray EN OD→ lowest price @ ~30¢/day} (metered dose, nasal adapter in amber glass bottle) **$34** Turbuhaler / 200 doses	**ii** (Rhinocort Aqua), **iii** (Turbuhaler) ◆ **Turbuhaler** has no additives, & less bioavailability vs spray [29]; may be favored if post nasal drip is bothersome ◆ effectiveness / safety established with >20yrs of experience ◆ **DI**: itraconazole ↑ Cushing's risk [30]
Flunisolide **RHINALAR**, generic ~25ug (0.025%) nasal spray [iv]	C			High: 40-50% Growth retardation: none at 1yr [31] in asthma	1-2 spray in EACH nostril BID Max 3 spray EN BID Kids 6-14yr 1spray EN TID (Kids <6yr not rec.)	**$24** / 25ml / ~225 doses (metered pump & nasal applicator in a plastic bottle)	**iv** (Rhinalar) ◆ Contains polyethylene glycol which may keep nose moist
Fluticasone propionate **FLONASE** 50ug aqueous nasal spray [v]	C			**Very Low:** ~0.5% HPA: none [2, some effect 32] Growth retardation: none at 1yr [33, 34 (in asthma)]	1-2 spray in EACH nostril OD Max 2 spray EN BID (Kids <4yr not rec.) Also: sinusitis acute if ≥12yr	**$35** / ~120 doses (metered pump & nasal applicator in amber glass bottle) ◆ Scented	**v** (Flonase) ◆ **Storage**: shake gently before use ◆ **DI:** ritonavir ↑ risk of Cushing's [35]
Mometasone furoate monohydrate **NASONEX** ~50ug (0.05%) aqueous nasal spray [vi]	C			**Very Low:** ~0.5% HPA: no effect Growth retardation: none at 1yr [36]	1-2 spray in EACH nostril OD Max 4 spray EN BID (Kids <3yr not rec.) Also: sinusitis acute if ≥12yr	**$36** / ~140 sprays (metered pump & nasal applicator in a plastic bottle) ◆ Scented	**vi** (Nasonex) ◆ **Storage**: protect from light, shake before use
Triamcinolone acetonide **NASACORT AQ** ~55ug aqueous nasal spray [vii]	C			High: 46% HPA: no effect	1-2 spray in EACH nostril OD (Kids <4yr not rec.)	**$33** ~120 sprays (metered pump & nasal applicator in a plastic bottle)	**vii** (Nasacort Aq) ◆ **Storage**: shake before use
Non Steroidal Nasal Anti-inflammatory: B Cromoglycate sodium **CROMOLYN**			2% nasal solution OTC	Adults & ≥2yr : 1 spray TID-QID [14,15] -effective prophylaxis if before isolated allergy exposure [18] (eg. cats/cutting lawn); low potency but very safe (even for **pregnancy & kids ≥2 yrs)**, but benefits for seasonal allergic rhinitis in ~1-2weeks. {Expert Opinion: **Opthalmic formulation** often useful for eye symptoms whereas **Intranasal formulation** often not very helpful.}		

☎=Exception Drug Status ✘ =non-form Sask. **BP**=blood pressure **EN**=each nostril **HPA**=hypothalamic pituitary adrenal axis **OTC**=Over the Counter **Pts**=patients **rec**=recommended C=Pregnancy: possible fetal risk (evident in animals)

Efficacy: potent & effective for nasal symptoms (blockage, rhinorrhoea, sneezing, itching) in mod-severe allergic rhinitis. Also for **nasal polyps** & **chronic sinusitis**. No evidence of one INCS more efficacious than another.[13]

Therapeutic Tips: ◆**Ensure adequate dose & duration!** ◆Optimal effects of INCS seen within ~3-14days (whereas decongestants work quickly) ◆Best given regularly & ~1week before allergen exposure ◆ Seasons of heavy allergen challenge may necessitate additional therapy especially for eye symptoms ◆Topical route: requires lower doses than with oral steroids & lowers side effect potential ◆BID dosing of agents may ↑ efficacy (even if the same daily dose is used). ◆With chronic dosing a dose reduction is often possible & desirable ◆**Initial Priming**: a few actuations to create a uniform spray (re-prime if spray used infrequently).

Administration: Blow nose, then insert nozzle into the nostril; avoid placing nozzle tip in too far; compress the opposite nostril & actuate the spray while inspiring through the nose, with closed mouth. Avoid blowing nose for ~15mins. **Medication is aimed away from the septum** towards the turbinates (outer part of the nose) to lessen nasal bleeding. Vaseline may be used to lubricate the anterior nasal septal area. {The **Contralateral Hand Nostril technique** has been recommended. It uses the alternate hand method – the right hand to spray in the left nostril; and vice versa.[37]}

† **Systemic Steroid Cautions**: **(unlikely with low→normal dose INCS)**: ↑ BP, diabetes, infections, thin skin, ↑ weight, cause cataracts & osteoporosis (treat: Calcium 1500mg/d, Vit. D 800iu/d, +/- bisphosphonates).

Drug Induced Rhinitis: α blockers (eg. prazosin), **ASA/NSAIDs** in susceptible individuals, cocaine abuse, eye drops, methyldopa, & **topical decongestants** (rebound congestion with overuse).

Other Therapy: **Antihistamines**: for itching, sneezing & rhinorrhoea; combination with INCS may lack ↑ efficacy vs INCS alone [6,38] **Decongestants**: for congestion **Ophthalmics**: for eye symptoms **Atrovent nasal**: for rhinorrhoea

Not avail. in : Azelastine ASTELIN nasal & ocular antihistamine: 2 sprays each nostril BID (5-11yr: 1 spray each nostril BID [15]) –has rapid onset, but sometimes leaves a bitter taste & rarely sedation; useful for patients with mucosal irritation/nose bleeds.

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