INTRANASAL CORTICOSTEROIDS

a Supplement to the OTC Products Chart

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Intranasal corticosteroids (**INCS**) are potent and effective drugs. **Uses may include chronic sinusitis, nasal polyps and rhinitis**. In allergic rhinitis, a stepwise treatment approach is usually recommended which may include antihistamines for mild or intermittent symptoms. [1,2,3,4]. Administration of INCS should be reserved for more severe or persistent conditions particularly when nasal obstruction is a factor. Appropriate drug therapy will depend on diagnosis and individual considerations (See Tables 1 & 2).

Six INCS agents are currently available (See Table 3). Agents share similar efficacy and side effect potential. Differences that may factor into the product selection process include: scented versus non-scented [23,34], spray versus powder, "with additives" versus "without additives", systemic bioavailability, and cost.

Table 1: Rhinitis: Symptoms & Associated Factors [1,3]

ALLERGIC	NON-ALLERGIC
Symptoms: • watery rhinorrhoea • **sneezing**, paroxysmal • nasal obstruction • nasal pruritis • +/- conjunctivitis: itchy, watery, red (NOT photophobia, burning, dry) • bilateral symptoms	**Symptoms:** • nasal obstruction without other symptoms • post-nasal drip -with thick mucous (e.g. common cold, sinusitis) &/or no anterior rhinorrhea • pain (ear or sinus) • recurrent epistaxis • anosmia: ↓ sense of smell
Associated Factors: • animals e.g. cats,dogs, horses • trees, weeds, grass, hay • mites (in warm & humid areas) • seasonal (spring & fall) • family history • **asthma** (~40% of rhinitis patients have asthma) [5], dermatitis • drug causes: ASA/NSAIDs	**Associated Factors:** • **respiratory irritants** -e.g. perfumes, smoke, paint, hair, spray, dust (irritants also an issue for allergic rhinitis) • **drug causes** e.g. nasal decongestant [overuse], cocaine abuse, eyedrops, α-adrenergic antagonists

Do INCS affect growth in children?

Systemic bioavailability ranges from <1% to <50% with various agents although the total dose delivered is low. A small effect on growth over 1 year has been reported for beclomethasone [6]; however, intranasal mometasone [45] NASONEX and fluticasone FLONASE did not affect growth.[7] The only 3 approved in preschoolers are: mometasone for ≥3yrs, and both fluticasone & triamcinolone NASACORT for ≥4yrs. Although less effective [28], cromoglycate CROMOLYN is a safe non-steroidal option in children ≥2 yrs of age.

Table 2: Treatment of Allergic Rhinitis [1 (ARIA) ,2,3,8,9,10]

Mild Intermittent	Moderate-Severe Intermittent	Mild Persistent	Moderate-Severe Persistent
	Step-up options: ↑ dosage or add-on therapy as required; following improvement, consider **step-down** treatment after 3 months		
	nasal corticosteroid – regular dosing most effective - best to begin ~1 week before allergy season - double dose if severe/nasal obstruction. (leukotriene receptor antagonists orally less effective option[11,12])		
	cromoglycate – (QID) seasonal & prophylactic use		
oral antihistamine - especially for itching, sneezing, rhinorrhea			
decongestant: oral; or short-term nasal (≤3-7 days) – for congestion			
environmental controls: allergen & irritant avoidance (pollen mask; shower after dusting/vacuuming/mowing; air conditioning, etc.)			

Specific Considerations
Rhinorrhoea - skier-jogger's nose, non-allergic perennial rhinitis: ⇨ ipratropium ATROVENT nasal spray: rapid onset & most effective
Severe Acute Symptoms – desire rapid effect / nasal blockage ⇨ oral prednisone: Adult 30-50mg/day **x3**-7 days + concomitant INCS; may also consider other therapies such as antihistamines or LTRA.
Conjunctival Symptoms ⇨ antihistamines [po or topical]; ophthalmics (e.g. **H_1 blockers:** LIVOSTIN✗, EMADINE✗; **H_1 & Mast Cell:** ZADITOR✗, PATANOL✗; **Mast Cell only:** ALOCRIL✗)
Poor Response / Intolerance to Drugs ⇨consider immunotherapy eg. venom allergies; pollen/cat allergies unresponsive to other therapy
Children ⇨antihistamines (or LTRAs): oral route easier to administer ⇨cromoglycate: very safe, but slow onset & less effective ⇨INCS most effective; mometasone & fluticasone least systemic effect; however some prefer unscented (see Table 3)
Pregnancy - congestion common; minimal data regarding drug use; historical data supports safety for beclomethasone nasal, cromoglycate & chlorpheniramine

Intermittent (versus persistent) = occurring ≤4 days per week or for ≤4 weeks
Mild= causing minimal interference with daily living (normal sleep; no impairment of daily activities, leisure and/or sport, school or work; & no troublesome symptoms)
LTRA= leukotriene receptor antagonist (e.g. montelukast SINGULAIR: age ≥2yrs)
See Table 3 & RxFiles OTC Products Chart [13] for additional considerations

How can we reduce nasal bleeding with INCS?

Aiming the spray toward the outer part of the nose rather than the septum may lessen nasal bleeding, irritation & septum perforation[(rare)]. [14] Lubrication of the anterior nasal septum with vaseline may help. See Table 3 - Administration.

What is the treatment for drug-induced rhinitis?

Initiate INCS and stop the offending drug (if caused by nasal decongestant may stop after 3 days of INCS or taper over 1 week to minimize discomfort). [15] Oral decongestants may be used if necessary. In resistant cases, an oral corticosteroid may be required, tapering the dose over 7-10 days. INCS may be continued for up to 1 month or longer.

For list of contributors and reviewers see reference page3.

Table 3: INTRANASAL CORTICOSTEROIDS (INCS) [3,4,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31]

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Generic/ TRADE — Pregnancy Category [32]	Side Effects (Common & Rare)	Contraindications CI Precautions	Systemic Bioavailability [16]	Dose: For Perennial & seasonal allergic rhinitis USUAL & MAX	$ per bottle (~30-50cents/day) Scented vs Non	Comments
Beclomethasone dipropionate C generic only ▼ 50ug aqueous spray [i] (previously available as **BECONASE AQ**)	**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. [33] 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 [33]	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 C 64ug [ii], 100ug aqueous suspension nasal spray **RHINOCORT** Turbuhaler ▼ (100ug dry powder [iii])			Moderate: 31% (Turbuhaler 22% [29]) HPA:none [34,35,36; ? some effect 37] Growth retardation: none at 2yr [38; some in asthma 39,40]	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) **$33** Turbuhaler / 200 doses	**ii** (Rhinocort Aqua), **iii** (Turbuhaler) ◆ **Turbuhaler** has no additives, & less bioavailability vs spray [41]; may be favored if post nasal drip is bothersome ◆ effectiveness / safety established with >20yrs of experience
Flunisolide **RHINALAR** ▼, generic C ~25ug (0.025%) nasal spray [iv]			High: 40-50% Growth retardation: none at 1yr [42] 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 [16, some effect 43] Growth retardation: none at 1yr [7, 44 (in asthma)]	1-2 spray in EACH nostril OD Max 2 spray EN BID (Kids <4yr not rec.) Also: sinusitis [acute if ≥12yr]	**$33** / ~120 doses (metered pump & nasal applicator in amber glass bottle) ◆ **Scented**	**v** (Flonase) ◆ **Storage**: shake gently before use
Mometasone furoate monohydrate **NASONEX** ▼ ~50ug (0.05%) aqueous nasal spray [vi] C			**Very Low:** ~0.5% HPA: no effect Growth retardation: none at 1yr [45]	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 [4,28] -effective prophylaxis if before isolated allergy exposure [3] (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.}			

✘ =non-formulary in Sask ▼=coverage by NIHB **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.[27]

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.[46]}

† **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 [20,47] **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[28]) –has rapid onset, but sometimes leaves a bitter taste & rarely sedation; useful for patients with mucosal irritation/nose bleeds.

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