

**COPD THERAPEUTIC GUIDELINES
PHYSICIAN RECOMMENDATIONS**

Resident Name: _____
Date of Birth: _____ Room #: _____
Physician Name: _____
Date: _____

Principles for Prescribing:

- 1) Consult the nurse Assessment tool and establish staging of COPD (MRC scale) based on spirometry result or symptoms and current medication regiment.
- 2) Adjust level of maintenance treatment. For optimal pharmacotherapy, refer to **APPENDIX I-II-III**.
- 3) For respiratory medication device recommendation consult **APPENDIX IV: COPD: INHALATION DEVICES CHART**
- 4) Use an evaluative tool (CAT score) to assess response to current regiment.
- 5) Set a date for re-evaluation in 2 weeks.
- 6) Provide prescriptions for early treatment of exacerbation.in line with the COPD Caregiver Action Plan (antibiotic and prednisone)

CAUTIONARY NOTE: when possible limit exposure to inhaled corticosteroids, employing de-prescribing initiatives when appropriate.

1. Staging of COPD Based on Symptoms and Spirometry in Older Adults³

Check appropriate grade of MRC (Medical Research Council dyspnea scale) according to symptoms or FEV1 results (forced expiratory volume in one second) found by spirometry.

	COPD Stage	*MRC	Symptom / Quality	FEV₁
<input type="checkbox"/>	At Risk	1	Smoker or ex-smoker-Breathless with strenuous exercise	≥ 80%
<input type="checkbox"/>	Mild	2	Short of breath when hurrying on the level or walking up a slight hill	≥80%
<input type="checkbox"/>	Moderate	3	Walks slower than people of the same age on the level or stops for breath while walking at own pace on the level	50-79%
<input type="checkbox"/>	Severe	4	Stops for breath after walking 100 yards or after a few minutes on the level	50-79%
<input type="checkbox"/>	Very Severe	5	Too breathless to leave the house or breathless while dressing	30 -49% (severe) < 30% (very severe)

Physician diagnosis decision (after consulting the nurse protocol)

- Resident does not appear to have signs and symptoms of COPD
 - COPD diagnosis confirmed by spirometry
 - COPD diagnosis confirmed by symptoms
 - Resident is suspected of having COPD
- Referral for spirometry testing
- Spirometry is impossible

2. Recommended Approach²

O'Donnell et al

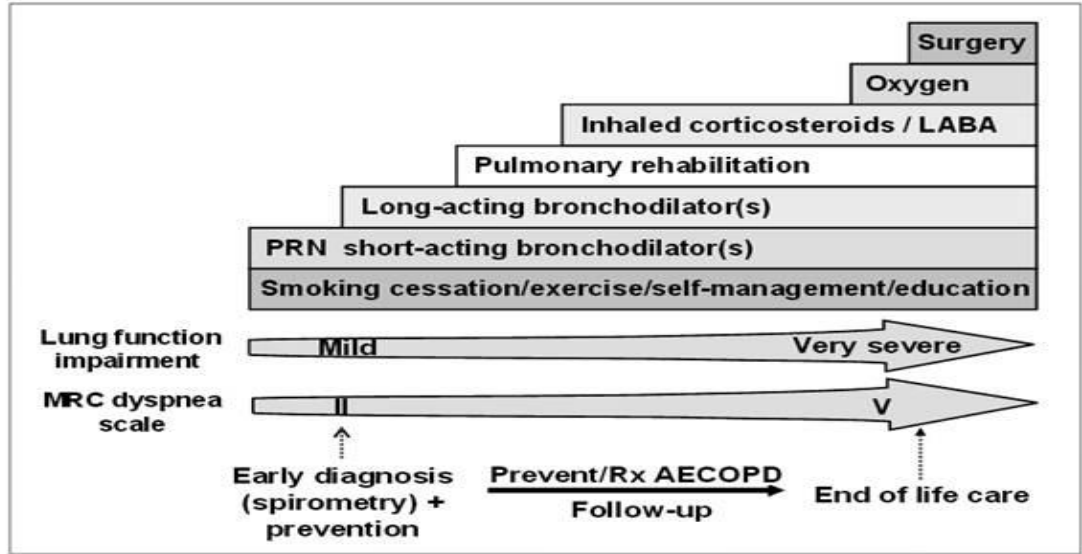
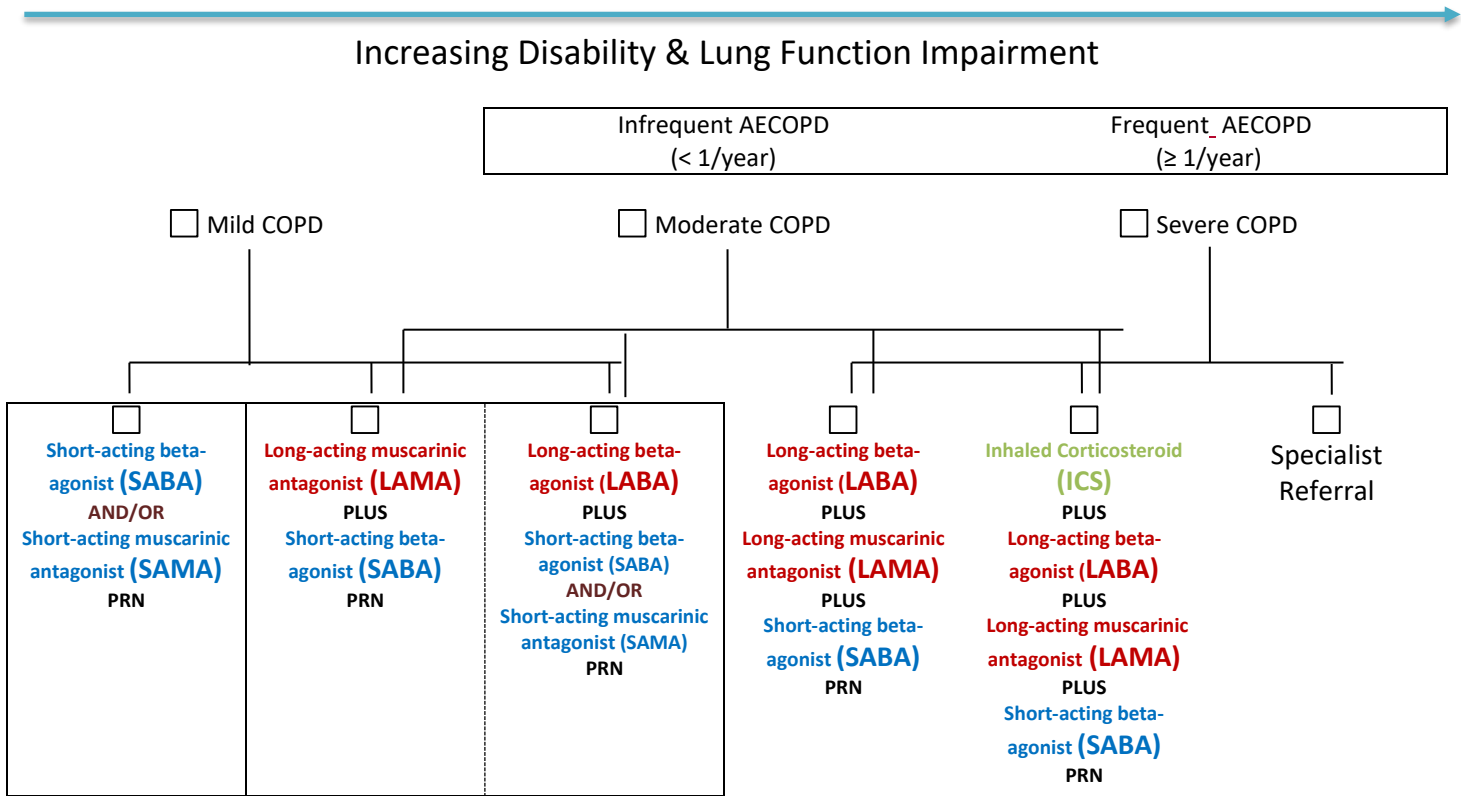


Figure 1) A comprehensive approach to the management of chronic obstructive pulmonary disease (COPD). AECOPD Acute exacerbation of COPD; LABA Long-acting beta₂-agonist; MRC Medical Research Council; PRN As needed; Rx Treatment

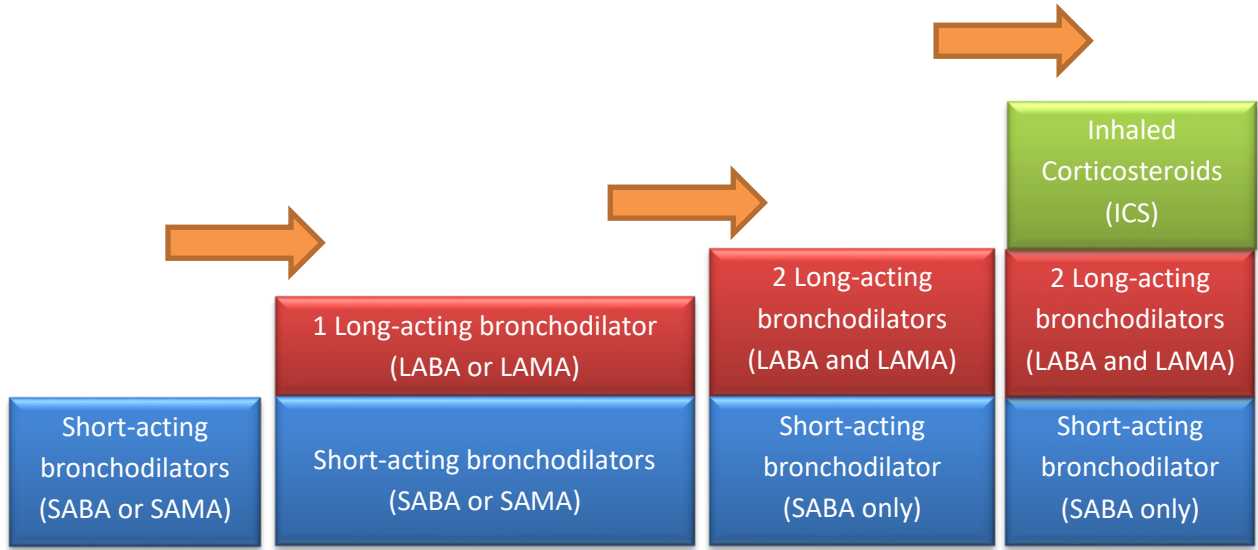
Yes	No	N/A	
<input type="checkbox"/>	<input type="checkbox"/>		Vaccinations influenza
<input type="checkbox"/>	<input type="checkbox"/>		Vaccinations pneumococcal
<input type="checkbox"/>	<input type="checkbox"/>		If still smoking, resident participates in a smoking cessation program
<input type="checkbox"/>	<input type="checkbox"/>		Initially adequate COPD medication therapy
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Initially have adequate oxygen therapy (if not needed N/A)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Resident exercise regularly
<input type="checkbox"/>	<input type="checkbox"/>		Self-management/ Education is possible
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Resident has completed a program of pulmonary rehabilitation
<input type="checkbox"/>	<input type="checkbox"/>		Resident had a specialist consult

3. APPENDIX I-Recommendations for Optimal Pharmacotherapy in COPD^{2,3}

Check all boxes applicable to current patient therapy progression.



➔ Stepwise escalation in therapy based on initial staging of COPD and response to therapy using an evaluative scale



²O'Donnell et al, *Canadian Thoracic Society Recommendations for Management of COPD*, 2008

³RxFiles, *COPD – New Drugs, New Devices and Considerations for Best Practice*, 2015

APPENDIX II: COPD PRESCRIBING GUIDE

1. Mild COPD - Guide to Medication Decision-Making³

	Inhaled Medication	Dose/Regimen	Role in Stable COPD	Dosing Frequency	Additional Rational for Selection
<input type="checkbox"/>	Physiotherapy (Per Physiotherapy Protocol)				
<input type="checkbox"/>	Diet Management (Per Dietary Guide)				
<input type="checkbox"/>	SABA ± SAMA – MILD COPD				
	Short-Acting Beta₂-Agonist (SABA)				<p>Binds to β₂ pulmonary receptors, which ↑ cAMP; cAMP responsible for relaxation of bronchial smooth muscle; 1st line in mild COPD</p> <p>Improves COPD Symptoms</p> <p>Does not reduce exacerbations</p> <p>Useful as “rescue” therapy due to short onset (salbutamol <5 min; faster than SAMA)</p> <p>Adverse events (AE): tremor, ↑ nervousness, ↑HR, ↑QT, headache, ↓K⁺, ↑ insulin secretion</p>
<input type="checkbox"/>	Salbutamol (Aiomir, Ventolin Diskus, Ventolin HFA, generics)				
<input type="checkbox"/>	Terbutaline (Bricanyl Turbuhaler)				
	Short-Acting Muscarinic Antagonist (SAMA)		<p>LABA or LAAC preferred to regular use of short-acting bronchodilator.</p>		<p>Binds unselectively to pulmonary muscarinic receptors, reducing smooth muscle contraction; duration 4-6 hours, 1st line in mild COPD</p> <p>Improves COPD symptoms</p> <p>Does not reduce exacerbations</p> <p>Adverse events (AE) similar to LAMA</p> <p>↓ incidence of dry mouth vs tiotropium (less potent)</p>
<input type="checkbox"/>	Ipratropium (<i>Atrovent HFA, generics</i>)				
	SAMA + SABA Combination		<p>Alternative to short-acting beta-2 agonist plus ipratropium as separate inhalers.</p>	<p>Four times daily (in place of long-acting bronchodilator), and/or as-needed²</p>	<p>Useful as prn therapy in any stage of COPD, and as treatment for acute exacerbations of COPD</p> <p>In AECOPD, use high dose, may continue long-acting agents</p>
<input type="checkbox"/>	Salbutamol/ipratropium (<i>Combivent Respimat, Combivent UDV, generics</i>)				
<input type="checkbox"/>	Fenoterol/ipratropium (Duovent UDV)				

³ RxFiles, COPD – New Drugs, New Devices and Considerations for Best Practice, 2015

2. Moderate COPD - Guide to Medication Decision-Making³

	Inhaled Medication	Dose/Regimen	Role in Stable COPD	Dosing Frequency	Additional Rational for Selection	
LAMA + SABA or LABA + SABA ± SAMA – MODERATE						
	Long-Acting Beta-2 agonists (LABAs)		First-line option for mild or moderate disease. Can combine LABA and LAMA.		Slow to dissociate from pulmonary β_2 receptors, resulting in long-lasting bronchodilation.	
<input type="checkbox"/>	Formoterol fumarate (Foradil)			Twice daily		AE: tremor, \uparrow HR. Similar AE to SABAs, but less substantial.
<input type="checkbox"/>	Formoterol fumarate dihydrate (Oxeze Turbuhaler)			Twice daily	Fastest onset: indacaterol, formoterol, olodaterol, and vilanterol (< 5 min)	
<input type="checkbox"/>	Indacaterol (<i>Onbrez Breezhaler</i>)			Once daily		Higher indacaterol doses not available in North America due to potential for cardiovascular risk.
<input type="checkbox"/>	Salmeterol (Serevent Diskus, Serevent Diskhaler)			Twice daily		
	Long-Acting Muscarinic Antagonist (LAMA)					
<input type="checkbox"/>	Aclidinium (<i>Tudorza Genuair</i>)			Twice daily	Tiotropium: may \downarrow COPD exacerbations by 20-30% per year AE: dry mouth, cough, constipation, urinary retention, headache Tiotropium, glycopyrronium: may accumulate in renal impairment; clinical significance unknown Fastest onset: glycopyrronium (<15 min)	
<input type="checkbox"/>	Glycopyrronium (Seebri Breezhaler)			Once daily		
<input type="checkbox"/>	Tiotropium (Spiriva HandiHaler, Spiriva Respimat)			Once daily		
<input type="checkbox"/>	Umeclidinium (Incruse Ellipta)			Once daily		

³2015 RxFiles, COPD – New Drugs, New Devices and Considerations for Best Practice,

3. Severe to Very Severe COPD - Guide to Medication Decision-Making³

	Inhaled Medication	Dose/Regimen	Role in Stable COPD	Dosing Frequency	Additional Rational for Selection
LAMA + LABA + SABA or ICS/LABA + LABA + SABA – SEVERE					
	Combination LABA/LAMA		First-line option for mild or moderate disease. Can combine LABA and LAMA.		Decreased cost and increased convenience vs using a LAMA + LABA in separate inhalers Evidence suggests a statistically significant, although not clinically significant, ↑ in quality of life and lung function, except for olodaterol/tiotropium which demonstrated a clinically meaningful improvement in SGRQ vs. tiotropium, or olodaterol alone Dual therapy is reasonable in patients poorly controlled on monotherapy
<input type="checkbox"/>	Indacaterol/Glycopyrronium (Ultibro Breezhaler)			Once daily	
<input type="checkbox"/>	Olodaterol/Tiotropium (Inspiroto Respimat)			Once daily	
<input type="checkbox"/>	Vilanterol/Umeclidinium (Anoro Ellipta)			Once daily	
<input type="checkbox"/>	acridinium bromide/formoterol fumarate dihydrate inhalation powder (Dulcirkir Genuair)			Twice Daily	
	Corticosteroid		Combine with LABA and/or LAMA		
<input type="checkbox"/>	Fluticasone (Flovent HFA, Flovent Diskus)			Twice daily	
<input type="checkbox"/>	Beclomethasone dipropionate (Qvar)			Twice daily	
<input type="checkbox"/>	Budesonide (Pulmicort Turbuhaler, Pulmicort Nebuamp)			Twice daily	
<input type="checkbox"/>	Ciclesonide (Alvesco)			Once daily	
<input type="checkbox"/>	Mometasone furoate (Asmanex Twisthaler)		Once daily		
	Combination LABA/Corticosteroid		For severe or very severe COPD with frequent exacerbations despite use of LABA and/or LAMA. Can combine with LAMA.		Addition of ICS further ↓ exacerbations vs LABA alone; useful in severe COPD if frequent exacerbations Triple therapy (LAMA + LABA + ICS) is rational – may ↑ quality of life and lung function Fluticasone furoate more potent / longer lasting vs fluticasone propionate
<input type="checkbox"/>	Formoterol/Budesonide (Symbicort Turbuhaler)			Twice daily	
<input type="checkbox"/>	Formoterol/Mometasone furoate (Zenhale)			Twice daily	
<input type="checkbox"/>	Salmeterol/Fluticasone propionate (Advair Diskus, Advair)			Twice daily	
<input type="checkbox"/>	Vilanterol/Fluticasone furoate (Breo Ellipta)			Twice daily	
<input type="checkbox"/>	Oxygen (Per Oxygen Protocol)				

³ RxFiles, COPD – New Drugs, New Devices and Considerations for Best Practice, 2015

APPENDIX III: Ontario Drug Benefit (ODB) Formulary Limited Use (LU) Code Easy Reference Guide








LU Code	Criteria	Generic Name	Brand Name	Formulary Cost
N/A	Please note that all LAMAs are listed as a General Benefit			
132	<p>For the treatment of asthma in patients who are using optimum anti-inflammatory treatment and are still experiencing breakthrough symptoms</p> <p>Note: This drug is not for relief of acute symptoms</p>	Formoterol fumarate	Foradil 12 mcg	\$ 50.53 per 60 doses
		Formoterol fumarate dihydrate	Oxeze Turbuhaler 6mcg	\$33.65 per 60 doses
		Formoterol fumarate dihydrate	Oxeze Turbuhaler 12mcg	\$44.80 per 60 doses
		Salmeterol Xinafoate	Serevent Diskhaler 50mcg	\$56.10 per 60 doses
256-259	<p>For the vast majority of patients, a metered dose inhaler is the preferred therapy. Nebulizer therapy will be reimbursed for patients who are unable to use a metered dose inhaler, including an inhaler with a spacer attachment, or a turbuhaler.</p>	Ipratropium Bromnide / Salbutamol	Combivent UDV 500mcg/2.5mg/2.5mL	\$1.2814 per dose
256	Patients who have a tracheostomy	Ipratropium Bromnide / Salbutamol	Combivent UDV 500mcg/2.5mg/2.5mL	\$1.2814 per dose
257	Patients with cystic fibrosis in whom nebulizer therapy is indicated	Ipratropium Bromnide / Salbutamol	Combivent UDV 500mcg/2.5mg/2.5mL	\$1.2814 per dose
258	Patients with severe mental or physical disabilities	Ipratropium Bromnide / Salbutamol	Combivent UDV 500mcg/2.5mg/2.5mL	\$1.2814 per dose
259	Patients who have previously used nebulizer therapy within the last 12 month period	Ipratropium Bromnide / Salbutamol	Combivent UDV 500mcg/2.5mg/2.5mL	\$1.2814 per dose
260	Children aged 6 years or less	Budesonide	Pulmicort Turbuhaler 100mcg	\$31.27 per 200 doses
			Pulmicort Turbuhaler 200mcg	\$63.86 per 200 doses
261	Patients who have a tracheostomy	Budesonide	Pulmicort Turbuhaler 100mcg	\$31.27 per 200 doses
			Pulmicort Turbuhaler 200mcg	\$63.86 per 200 doses
262	Patients with cystic fibrosis in whom nebulizer therapy is indicated	Budesonide	Pulmicort Turbuhaler 100mcg	\$31.27 per 200 doses
			Pulmicort Turbuhaler 200mcg	\$63.86 per 200 doses
263	Patients with severe mental or physical disabilities	Budesonide	Pulmicort Turbuhaler 100mcg	\$31.27 per 200 doses
			Pulmicort Turbuhaler 200mcg	\$63.86 per 200 doses
264	Patients who have previously used nebulizer therapy within the last 12 month period	Budesonide	Pulmicort Turbuhaler 100mcg	\$31.27 per 200 doses
			Pulmicort Turbuhaler 200mcg	\$63.86 per 200 doses

330	For the treatment of asthma in patients who are using optimum anti-inflammatory treatment and are still experiencing breakthrough symptoms	Budesonide & Formoterol Fumarate Dihydrate	Symbicort 100 Turbuhaler Symbicort 200 Turbuhaler	\$64.56 per 120 doses \$83.88 per 120 doses
		Mometasone Furoate & Formoterol Fumarate Dihydrate	Zenhale 50mcg & 5mcg Zenhale 100mcg & 5mcg Zenhale 200mcg & 5mcg	\$70.56 per 120 doses \$89.556 per 120 doses \$108.54 per 120 doses
		Salmeterol Xinafoate & Fluticasone Propionate	Advair Diskus 50/100mcg Advair Diskus 50/250mcg Advair Diskus 50/500mcg	\$81.3929 per 60 doses \$97.4299 per 60 doses \$138.3141 per 60 doses
391	For patients with moderate to severe COPD with persistent respiratory symptoms despite an adequate trial of, or an intolerance to, a regularly scheduled short-acting bronchodilator AND a long-acting anticholinergic	Salmeterol Xinafoate	Serevent Diskus 50mcg	\$56.10 per 60 doses
443	For patients with moderate to severe COPD with persistent respiratory symptoms despite an adequate trial of, or an intolerance to, a regularly scheduled short-acting bronchodilator AND a long-acting anticholinergic. Note: The dose of Onbrez per day.	Indacaterol	Onbrez Breezhaler 75mcg	\$1.55 per dose
456	For the long-term treatment of patients with moderate to severe chronic obstructive pulmonary disease (COPD-see notes below) who have a history of exacerbations and have had an inadequate response to a long-acting bronchodilator (i.e., long-acting beta-2 agonist (LABA), or long-acting muscarinic antagonist (LAMA)).	Fluticasone Furoate & Vilanterol	Breo Ellipta 100mcg & 25mcg	\$120 per 30 doses
459	For the long-term treatment of patients with moderate to severe chronic obstructive pulmonary disease (COPD-see notes below) who have had an inadequate response to a long-acting bronchodilator (i.e., long-acting beta-2 agonist (LABA), or long-acting muscarinic antagonist (LAMA)).	Indacaterol & Glycopyrronium	Ultibro Breezhaler 110mcg & 50mcg	\$2.68 per dose
		Umeclidinium & Vilanterol	Anoro Ellipta 62.5mcg & 25mcg	\$81.00 per 30 doses

All drug products in Appendix I have indefinite authorization period. Ontario Drug Formulary, 201

APPENDIX IV: - Adapted from Rxfiles COPD: INHALATION DEVICES CHART

There is no evidence to suggest one device works better than another. Poor inhaler technique: ↓ efficacy. Pt device dissatisfaction: ↓ adherence.

DEVICE	RespiMAT	MDI	HandiHaler, Breezhaler	Turbuhaler	Diskus	Genuair	Ellipta
	salbutamol/ipratropium COMBIVENT tiotropium SPIRIVA tiotropium/olodaterol INSPIOLTO 	ipratropium ATROVENT salbutamol VENTOLIN 	HandiHaler: tiotropium SPIRIVA Breezhaler: glycopyrronium SEEBRI glycopyrronium/indacaterol ULTIBRO indacaterol ONBREZ 	formoterol OXEZE formoterol/budesonide SYMBICORT 	salbutamol VENTOLIN 	aclidinium TUDORZA aclidinium/formoterol DUAKLIR 	umeclidinium INCRUSE vilanterol/fluticasone BREO vilanterol/umeclidinium ANORO 
Description	Uses a mechanical energy to deliver a "soft mist" of medication over ~1.5 seconds.	Delivers aerosolized stream of medication over ~0.2 seconds.	Capsules containing medication are pierced, then powder inside is inhaled	Dry powder inhaler containing a reservoir of medication.	Dry powder inhaler containing single dose blisters of medication.		
PROS	Low inspiratory flow ≈ 20L/min required		Breath-actuated: reduces need for hand-breath coordination				
	<ul style="list-style-type: none"> Slower actuation may improve technique vs MDI DOSE COUNTER: numbered by interval (frequency of interval varies by medication); loading base locks to signal empty COMBIVENT RespiMAT has cost advantage over COMBIVENT nebulas. Note: Pharmacies should pre-load the RespiMAT canister before dispensing RESPIMAT inhaler may facilitate medication delivery for residents with cognitive impairment or difficulty synchronizing breathing to actuation. 	<ul style="list-style-type: none"> Suitable for all ages. Note: spacer strongly recommended regardless of age (see comments below). Spacer with a mask available for cognitive impairment, frail, < 5 years old, etc. Can be used with mechanical ventilation (e.g. in critical care units) 	<ul style="list-style-type: none"> Rattling or whirring heard if capsule's contents inhaled correctly. Can look to view empty capsules (and Breezhaler has clear capsules). Low inspiratory effort needed DOSE COUNTER: each capsule equals 1 dose; thus no dose 	<ul style="list-style-type: none"> Few steps, easy to use (compared to HandiHaler or Breezhaler). Dose is not lost even if base is twisted multiple times; however dose counter will no longer be accurate DOSE COUNTER: every 20th dose numbered to give approximation of doses remaining 	<ul style="list-style-type: none"> DOSE COUNTER: displays exact number of remaining doses 	<ul style="list-style-type: none"> Simple to use & less errors during dose preparation vs HandiHaler Provides visual (window changes green → red) & audible ("click") feedback when dose taken correctly In one study, majority of patients (80%) preferred Genuair over HandiHaler. DOSE COUNTER: every 10th dose numbered; loading button locks to signal empty 	<ul style="list-style-type: none"> Simple to use; one step to open & load dose. Sub-analysis of RCT data: 95% of asthmatics able to use correctly after only one demonstration In one study, majority of patients (>60%) preferred Ellipta over MDI, Diskus, or HandiHaler. DOSE COUNTER: displays exact number of remaining doses with large numbers
CONS	<ul style="list-style-type: none"> Requires reasonable strength to spring-load dose Incorrect rate of inhalation results in cough Not approved for patients under 18 years of age or for use with a spacer New device to the market - limited real-world experience (available and in use outside of Canada for several years) Requires priming (until mist is visible, then 3 more sprays) if first time use OR if not used for ≥ 21 days. Requires priming (x 1 spray) if not used for ≥ 3 (COMBIVENT) or ≥ 7 days (SPIRIVA/INSPIOLTO). 	<ul style="list-style-type: none"> DOSE COUNTER most devices lack dose counter Spacer may be cumbersome; however, if using only at home in the morning/evening, additional burden is low. Susceptible to freezing Requires priming (x 4 sprays) if not used for ≥ 5 days Inhaler actuation should be synchronised with inspiration to ensure optimum delivery of drug to the lungs. In patients who find coordination of a pressurised metered dose inhaler difficult, a spacer may be used with VENTOLIN® HFA 	<ul style="list-style-type: none"> Multi-step process: may be difficult to use for patients with poor manual dexterity (eg: arthritic hands, Parkinson's disease) or cognitive impairment Capsules are packaged in foil blisters; may be difficult to remove (for some) and are light and moisture sensitive Patients have been known to swallow capsules instead of inhaling them. Pieces of capsule may be inhaled if pierced more than once. 	<ul style="list-style-type: none"> Tipping device before inhalation (e.g. upside down) can expel the dose When empty, remaining desiccant can still be heard - patients may think there are doses left DOSE COUNTER: displays a "zero", but it can be difficult to tell when the indicator reaches this mark Humidity/moisture (e.g. exhaling into device, storing in bathroom) can clump drug in reservoir 	<ul style="list-style-type: none"> Medications for Diskus inhalers tend to be among the most expensive in their class 	<ul style="list-style-type: none"> Some patients may experience a bitter taste with aclidinium New device to the market - limited real-world experience. 	<ul style="list-style-type: none"> No way to identify if proper inspiratory effort is being achieved Short expiry date (6 weeks) after removal from protective packaging
					Requires sharp, forceful inhalation of breath to get full dose - some patients (e.g. < 5 years old, some COPD patients with severe symptoms) will be unable to achieve adequate flow rate.		

COPD=chronic obstructive pulmonary disease **MDI**=metered dose inhaler **RCT**=randomized controlled trial More inhalation devices listed & compared at www.rxfiles.ca

☑ **Use a spacer with an MDI:** ☑ drug delivery to lungs;☑ need for hand-breath coordination; ☑ systemic absorption; ☑ local adverse effects e.g. hoarseness & thrush with corticosteroids, dry mouth with anticholinergics.

☑ **If on more than one inhaler:** (1) consider using the same device for all medications; (2) use the bronchodilator first & the anti-inflammatory last; (3) wait ~5 minutes between puffs of different medications.

☑ **Nebulizer/compressor solution:** (available for budesonide, ipratropium, salbutamol, and salbutamol/ipratropium) expensive without added benefit versus spacer except possibly in very young & very old,

drug entering room air may ☑ infection transmission, time consuming, & can affect eyes. Useful during exacerbations for patients in too much distress to use proper inhaler technique, but spacer preferred.

☑ **General inhaler technique:** (1) prepare dose, (2) breathe out, (3) inhale medication, (4) hold 10 seconds, (5) breathe out. (See [RxFiles Inhaler Technique.](#)) May take a **second breath** from dry powder

devices to ensure the entire dose is inhaled. Rinsing mouth (and spitting) after anticholinergics and corticosteroids decreases side effects. Best to wait ~1 minute between puffs of the same medication.

Additional Information:

Most DPIs contain lactose. This lactose is often derived from milk; trace amounts of residual milk protein has caused allergies in a few case reports.

Lactose-free: **BRICANYL** Turbuhaler; **PULMICORT** Turbuhaler; all MDIs; all Respimats. Note: lactose-intolerant patients can still use a lactose-containing inhaler.

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