

BREATHE EASILY: PHARMACY INHALER REVIEW

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OBJECTIVES

- Identify frequently used inhalers by pharmacologic class.
- Discuss common inhaler technique and administration errors.



SHORT-ACTING BETA₂-AGONIST BRONCHODILATORS

relax tight muscles in airways and offer quick relief of symptoms such as coughing, wheezing and shortness of breath for 3-6 hours

ProAir[®] Digihaler™
117 mcg
albuterol sulfate
DBI (A)

ProAir[®] HFA
100 mcg
albuterol sulfate
DBI (A, G)

ProAir[®] RespiClick[®]
117 mcg
albuterol sulfate
inhalation powder
DBI (A)

Proventil[®] HFA
120 mcg
albuterol sulfate
DBI (A)

Ventolin[®] HFA
90 mcg
albuterol sulfate
DBI (A, G)

Xopenex[®] HFA[®]
50 mcg
levosalbutamol tartrate
DBI (A, G)

LONG-ACTING BETA₂-AGONIST BRONCHODILATORS

relax tight muscles in airways and offer lasting relief of symptoms such as coughing, wheezing and shortness of breath for at least 12 hours

Serevent[®] Diskus[®]
90 mcg
salmeterol xinafoate
inhalation powder
DBI (A, C)

Striverdi[®] Respimat[®]
2.5 mcg
olodaterol hydrochloride
DBI (C)

INHALED CORTICOSTEROIDS

reduce and prevent swelling of airway tissue; they do not relieve sudden symptoms of coughing, wheezing or shortness of breath

Alvesco[®] HFA
80, 160 mcg
ciclesonide
DBI (A)

ArmonAir[®] Digihaler™
55, 113, 232 mcg
fluticasone propionate
inhalation powder
DBI (A)

ArmonAir[®] RespiClick[®]
55, 113, 232 mcg
fluticasone propionate
inhalation powder
DBI (A)

Amuity[®] Ellipta[®]
50, 100, 200 mcg
fluticasone furoate
inhalation powder
DBI (A)

Asmanex[®] HFA
100, 200 mcg
mometasone furoate
DBI (A)

Asmanex[®] Twisthaler[®]
110, 220 mcg
mometasone furoate
inhalation powder
DBI (A)

Flovent[®] Diskus[®]
50, 100, 250 mcg
fluticasone propionate
inhalation powder
DBI (A)

Flovent[®] HFA
44, 110, 220 mcg
fluticasone propionate
DBI (A)

Palmicort Flexhaler[®]
90, 180 mcg
budesonide
inhalation powder
DBI (A)

QVAR[®] Redhaler™
40, 80 mcg
beclomethasone dipropionate
DBI (A)

COMBINATION MEDICATIONS

contain both inhaled corticosteroid and long-acting beta₂-agonist (LABA)

Advair Diskus[®]
100/50, 250/50, 500/50 mcg
fluticasone propionate and salmeterol xinafoate
DBI (A, C, G)

Advair[®] HFA
45/21, 115/21, 230/21 mcg
fluticasone propionate and salmeterol xinafoate
DBI (A, G)

AirDuo[®] Digihaler™
55/14, 113/14, 232/14 mcg
fluticasone propionate and salmeterol xinafoate
inhalation powder
DBI (A)

AirDuo[®] RespiClick[®]
55/14, 113/14, 232/14 mcg
fluticasone propionate and salmeterol xinafoate
inhalation powder
DBI (A, G)

Breo[®] Ellipta[®]
100/25, 200/25 mcg
fluticasone furoate and vilanterol inhalation powder
DBI (A, C)

Dulera[®]
100/5, 200/5 mcg
mometasone furoate and formoterol fumarate dihydrate
DBI (A)

Symbicort[®]
90/4.5, 180/4.5 mcg
budesonide and formoterol fumarate dihydrate
DBI (A, C, G)

Wixela[™] Inhub™
100/50, 250/50, 500/50 mcg
fluticasone propionate and vilanterol xinafoate
inhalation powder
DBI (A, C)

Anoro[®] Ellipta[®]
82.5/25 mcg
umeclidinium and vilanterol inhalation powder
DBI (C)

Bevespi Aerosphere[®]
9/4.8 mcg
glycopyrrolate and formoterol fumarate
DBI (C)

Stiolto[®] Respimat[®]
2.5/2.5 mcg
tiotropium bromide and olodaterol
DBI (C)

Trelegy[®] Ellipta[®]
200/62.5/25 mcg, 100/62.5/25 mcg
fluticasone furoate, umeclidinium and vilanterol inhalation powder
DBI (A, C)

Breztri Aerosphere™
180/9/4.8 mcg
budesonide, glycopyrrolate and formoterol fumarate
DBI (C)

MUSCARINIC ANTAGONISTS (ANTICHOLINERGIC)

relieve cough, sputum production, wheeze and chest tightness associated with chronic lung diseases

Short-acting
Atrovent[®] HFA
17 mcg
ipratropium bromide
DBI (C)

Long-acting
Incruse[®] Ellipta[®]
82.5 mcg
umeclidinium inhalation powder
DBI (C)

Spiriva[®] HandiHaler[®]
18 mcg
tiotropium bromide inhalation powder
DBI (C)

Spiriva[®] Respimat[®]
1.25, 2.5 mcg
tiotropium bromide
DBI (A, C)

Tudorza[™] Pressair™
400 mcg
acetylcholine bromide inhalation powder
DBI (C)

COMBINATION MEDICATIONS

contain muscarinic antagonist and beta₂-agonist

Short-acting
Combivent[®] Respimat[®]
20/100 mcg
tiotropium bromide and albuterol
DBI (C)

Long-acting
Duaklir[®] Pressair[®]
400, 12 mcg
acetylcholine bromide and formoterol fumarate dihydrate
DBI (C)

BIOLOGICS

target cells and pathways that cause airway inflammation; delivered by injection or IV

Cinqair[®]
raxizumab
DBI (A)

Dupixent[®]
dupilumab
DBI (A)

Fasenra[™]
bambicizumab
DBI (A)

Nucala[®]
mepolizumab
DBI (A)

Xolair[®]
omalizumab
DBI (A)

BRONCHIAL THERMOPLASTY

A minimally invasive procedure that uses mild heat to reduce airway smooth muscle, leading to fewer severe asthma flares, ER visits, and days lost from activities.
www.btrforasthma.com



PDE4 INHIBITORS

ease lung inflammation and reduce cough

Daliresp[®]
250, 500 mcg
roflumilast
DBI (C)

INHALED MEDICATIONS

SHORT-ACTING BETA₂-AGONIST (SABA)

- Mechanism of action: act on beta₂ receptors resulting in smooth muscle relaxation and bronchodilation
 - Duration of action: 3-6 hours
 - Onset of action: 10-20 minutes for initial response, peak 2-3 hours
- Indications:
 - Asthma
 - COPD
- Common side effects:
 - Tachycardia, tremor, shakiness
- Available Products:
 - Albuterol (ProAir, Ventolin, Proventil)
 - Levalbuterol (Xopenex)

AllergyAsthmaNetwork.org
800.878.4403

SHORT-ACTING BETA₂-AGONIST BRONCHODILATORS

relax tight muscles in airways and offer quick relief of symptoms such as coughing, wheezing and shortness of breath for 3-6 hours

Product	Strength	Formulation	Device	Indications
ProAir [®] Digihaler [™]	117 mcg	albuterol sulfate	Digihaler	AAA A
ProAir [®] HFA	100 mcg	albuterol sulfate	HFA	AA G
ProAir [®] RespiClick [®]	117 mcg	albuterol sulfate inhalation powder	RespiClick	AAA A
Proventil [®] HFA	120 mcg	albuterol sulfate	HFA	AA A
Ventolin [®] HFA	90 mcg	albuterol sulfate	HFA	AA G
Xopenex [®] HFA [®]	59 mcg	levalbuterol tartrate	HFA	AA G

relax tight muscles in airways and offer quick relief of symptoms such as coughing, wheezing and shortness of breath for 3-6 hours

LONG-ACTING BETA₂-AGONIST (LABA)

- Mechanism of action: act on beta₂ receptors resulting in smooth muscle relaxation and bronchodilation
 - Duration of action: 12-24 hours
 - Onset of action: 10-20 minutes for initial response, peak 2-3 hours
- Indications:
 - COPD
 - Asthma (only in combination with ICS)
- Common side effects:
 - Cough, musculoskeletal pain, pharyngitis, rhinitis, throat irritation

- Available Products:
 - Olodaterol (Striverdi)
 - Salmeterol (Serevent)



INHALED CORTICOSTEROIDS (ICS)

- Mechanism of action: reduce airway inflammation
 - Duration of action: 12-24 hours
 - Onset of action: 12-24 hours for initial response, **peak 2-4 weeks**
- Indications:
 - Asthma
- Common side effects:
 - Thrush, hoarseness, respiratory infections
- Available Products:
 - Beclomethasone (Qvar)
 - Budesonide (Pulmicort)
 - Ciclesonide (Alvesco)
 - Fluticasone (ArmonAir, Arnuity, Flovent)
 - Mometasone (Asmanex)



MUSCARINIC ANTAGONISTS – SHORT ACTING

- Mechanism of action: Inhibit muscarinic receptors on airway smooth muscle causing bronchodilation
 - Duration of action: 4-8 hours
 - Onset of action: 15 min for initial response, peak 1-2 hours
- Indications:
 - COPD
- Common side effects:
 - Dry mouth, bitter/abnormal taste, bronchitis
- Available Products:
 - Ipratropium (Atrovent) – *short acting*



MUSCARINIC ANTAGONISTS – LONG ACTING

- Mechanism of action: Inhibit the M3 receptor on airway smooth muscle causing bronchodilation
 - Duration of action: 12-24 hours
 - Onset of action: 60 min for initial response, peak 1-3 hours
- Indications:
 - COPD
 - Asthma – tiotropium only
- Common side effects:
 - Cough, nasopharyngitis, dry mouth
- Available Products:
 - Aclidinium (Turdorza)
 - Tiotropium (Spriva)
 - Umeclidinium (Incruse)



COMBINATION INHALERS

- Short-acting beta₂-agonist + short-acting muscarinic antagonist (SABA/SAMA)
- Inhaled corticosteroids + long-acting beta₂-agonist (ICS/LABA)
- Long-acting beta₂-agonist + long-acting muscarinic antagonist (LABA/LAMA)
- Inhaled corticosteroids + long-acting beta₂-agonist + long-acting muscarinic antagonist (ICS/LABA/LAMA)

SHORT-ACTING BETA₂- AGONIST (SABA)

MUSCARINIC ANTAGONISTS

- Duration of action: 4-5 hours
 - Onset of action: 15 min for initial response, peak 60 min
 - Indications:
 - COPD
 - Common side effects:
 - Headache, bronchitis, cough
- Available Products:
 - Ipratropium / albuterol (Combivent)



INHALED CORTICOSTEROIDS

LONG-ACTING BETA₂- AGONIST (LABA)

- Duration of action: 12-24 hours
- Onset of action: 5-30 min for initial response, peak 2-4 weeks
 - Formoterol onset of 5 minutes and can be considered for acute symptoms
- Indications:
 - Asthma
 - COPD

- Available Products:
 - Budesonide / Formoterol (Symbicort)
 - Fluticasone / Salmeterol (Advair, AirDuo, Wixela)
 - Fluticasone / Vilanterol (Breo)
 - Mometasone / Formoterol (Dulera)



LONG-ACTING BETA₂- AGONIST (LABA)

MUSCARINIC ANTAGONISTS

- Duration of action: 12-24 hours
- Onset of action: 20-30 minutes for initial response, 2-5 days for peak
- Indications:
 - COPD
- Available Products:
 - Acclidinium / Formoterol (Duaklir)
 - Glycopyrrolate / Formoterol (Bevespi)
 - Tiotropium / Olodaterol (Stiolto)
 - Umeclidinium / Vilanterol (Anoro)



INHALED CORTICOSTEROIDS

LONG-ACTING BETA₂-AGONIST (LABA)

MUSCARINIC ANTAGONISTS

- Duration of action: 12-24 hours
- Indications:
 - COPD
 - *Asthma – Trelegy only*
- Available Products:
 - Budesonide / Formoterol / Glycopyrrolate (Breztri)
 - Fluticasone / Vilanterol / Umeclidinium (Trelegy)



INHALATION DEVICES

INHALER DEVICE TYPES

Metered dose
inhalers
(MDI)

Soft mist
inhalers (SMI)

Dry powder
inhalers (DPI)

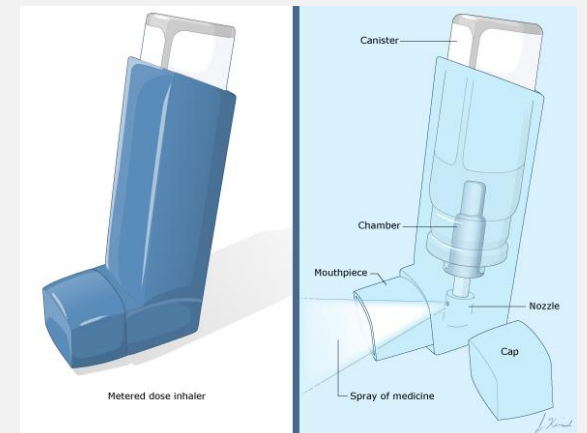
METERED DOSE INHALERS

HOW TO USE

- First dose preparation:
 1. Shake & prime before use (4 puffs)
 2. Repeat if not used / dropped per manufacturer
- Daily use:
 1. Remove cap & shake
 2. Breathe out away from inhaler
 3. Close lips on mouthpiece
 4. Breathe in slowly and deeply, press down on actuator
 5. Remove inhaler and hold breath for ~10 sec
- Cleaning:
 - Clean device weekly per manufacturer recommendations

COMMON ERRORS

- Poor coordination
- Not shaking or priming
- Aiming inhaler at roof of mouth or tongue
- Multiple sprays into spacer/VHC
- Using an empty inhaler



METERED DOSE INHALERS

SHORT-ACTING BETA₂-AGONIST (SABA)

- ProAir HFA
- Ventolin
- Proventil
- Xopenex

MUSCARINIC ANTAGONISTS

- Atrovent HFA – *short-acting*

INHALED CORTICOSTEROIDS

- Qvar Redihaler*
- Flovent HFA
- Alvesco
- Asmanex HFA

COMBINATION INHALERS

- Advair HFA
 - Symibcort
 - Dulera
- ICS / LABA

- Bevespi
- LABA / LAMA

- Breztri
- ICS / LABA / LAMA

* Qvar Redihaler is a breath-actuated MDI

QVAR REDIHALER

- Breath-actuated MDI
 - Less coordination required
- Should not be used with a spacer or valved holding chamber
- Not ideal for young children



METERED DOSE INHALERS

ADVANTAGES

- Portable and compact
- Easy to use
- Generic availability for some products
- Can be used with spacer or valved holding chamber

DISADVANTAGES

- Coordination required
- Mouth deposition
- Xopenex – no dose counter

SOFT MIST INHALERS

HOW TO USE:

- First dose preparation:
 1. Insert cartridge
 2. Turn-open-press until cloud is visible, then repeat 3 more times
- Daily use:
 1. Turn
 2. Open
 3. Press
- Cleaning:
 - Mouthpiece – once weekly with clean, damp cloth

COMMON ERRORS

- Cartridge not fully inserted
- Not activating for first dose
- Releasing dose early
- Not releasing dose
- Using an empty inhaler
- Breath timing



1. SPIOLTO® RESPIMAT® Product monograph
2. Dalby RN, et al. Med Devices (Auckl). 2011;4:145-155.
3. Dalby R, et al. Int J Pharm. 2004;283(1-2):1-9.
4. Ciciliani AM, et al. Int J Chron Obstruct Pulmon Dis. 2017;12:1565-1577.

Image from: <https://www.respimat.com/>

SOFT MIST INHALERS

LONG-ACTING BETA₂- AGONIST (LABA)

- Striverdi Respimat

MUSCARINIC ANTAGONISTS

- Spiriva Respimat

COMBINATION INHALERS

- Combivent Respimat SABA / SAMA

- Siocto Respimat LABA / LAMA

SOFT MIST INHALERS

ADVANTAGES

- Use lower dosages
- Requires less coordination
- Slower dose release
 - Less mouth deposition
 - Improved lung deposition
- Can be used with spacer or valved holding chamber

DISADVANTAGES

- Three-month expiration once cartridge is punctured
- Few products available

DRY POWDER INHALERS

SHORT-ACTING BETA₂-AGONIST (SABA)

- ProAir RespiClick
- ProAir Digihaler

LONG-ACTING BETA₂-AGONIST (LABA)

- Serevent Diskus

MUSCARINIC ANTAGONISTS

- Incruse Ellipta
- Spiriva Handihaler
- Tudorza Pressair

INHALED CORTICOSTEROIDS

- ArmonAir RespiClick
- ArmonAir Digihaler
- Arnuity Ellipta
- Asmanex Twisthaler
- Flovent Diskus
- Pulmicort Flexhaler

COMBINATION INHALERS

- Advair Diskus
- AirDuo RespiClick
- AirDuo Digihaler
- Breo Ellipta
- Wixela Inhub

ICS / LABA

- Anoro Ellipta
- Duaklir Pressair

LABA / LAMA

- Trelegy Ellipta

ICS / LABA / LAMA

DRY POWDER INHALERS

ADVANTAGES

- Small and portable
- Quick administration
- Requires less coordination

DISADVANTAGES

- Slowly breaths won't deliver full doses
- Cannot be used with spacer or valved holding chamber
- Humidity can clump medication

ELLIPTA / DISKUS / INHUB

HOW TO USE

- First dose preparation – none!
- Daily use:
 1. Load dose
 2. Breathe out and away from inhaler
 3. Place mouth on mouthpiece and breath in QUICKLY and deeply
 4. Remove inhaler and hold breath for ~10 sec
- Cleaning – none!

COMMON ERRORS

- Not loading dose
- Moving inhaler when dose is loaded
- Not inhaling quickly enough
- Breathing into inhaler
- Covering vent holes



Serevent Diskus
Flovent Diskus
Advair Diskus



Arnuity Ellipta
Breo Ellipta
Anoro Ellipta
Incruse Ellipta
Trelegy Ellipta



Wixela InHub

CAPSULE INHALERS

HOW TO USE

- First dose preparation – none!
- Daily use:
 1. Open Handihaler
 2. Insert capsule and close mouthpiece
 3. Press green piercing button
 4. Breathe out and away from inhaler
 5. Place mouth on mouthpiece, holding inhaler horizontally
 6. Breathe in QUICKLY and deeply
 7. Remove inhaler and hold breath for ~10 sec
 8. Repeat steps 4-7
 9. Empty capsule shell into trash
- Cleaning
 - Rinse device with warm water
 - Let air dry for 24 hours

COMMON ERRORS

- Swallowing capsules
- Not puncturing capsule
- Not taking second breath



TWISTHALER

HOW TO USE

- First dose preparation – none!
- Daily use:
 1. Load dose by twisting cap counterclockwise to remove
 2. Breathe out and away from inhaler
 3. Place mouth on mouthpiece, holding horizontally
 4. Breath in QUICKLY and deeply
 5. Remove inhaler and hold breath for ~10 sec
 6. Replace cap by rotating clockwise until it clicks
- Cleaning – none!

COMMON ERRORS

- Covering vent holes
- Loading dose via cap removal



FLEXHALER

HOW TO USE

- First dose preparation
 - Twist grip in one direction, then back in the other direction until it clicks once
- Daily use:
 1. Hold inhaler upright and remove cap
 2. Twist grip as far as it goes in one direction, then back in the other direction until it clicks
 3. Breathe out and away from inhaler
 4. Place mouth on mouthpiece and breath in **QUICKLY** and deeply
 5. Remove inhaler and exhale normally
- Cleaning
 - Clean with dry tissue weekly

COMMON ERRORS

- Incorrectly loading dose
- Not inhaling quickly enough
- Breathing into inhaler
- Covering vent holes



RESPICLICK

HOW TO USE

- First dose preparation – none!
- Daily use:
 1. Load dose by opening cap until hear “click”
 2. Breathe out and away from inhaler
 3. Place mouth on mouthpiece and breath in **QUICKLY** and deeply
 4. Remove inhaler and hold breath for ~10 sec
- Cleaning
 - Wipe out mouthpiece with dry cloth as needed

COMMON ERRORS

- Not loading dose
- Moving inhaler when dose is loaded
- Not inhaling quickly enough
- Breathing into inhaler
- Covering vent holes
- Loading multiple doses



PRESSAIR

HOW TO USE

- First dose preparation – none!
- Daily use:
 1. Load dose by pressing button until control window turns green
 2. Breathe out and away from inhaler
 3. Place mouth on mouthpiece and breath in **QUICKLY** and deeply
 4. Remove inhaler and hold breath for ~10 sec
 5. If control window is red, done. If window is green, repeat steps 2-4
- Cleaning – none!

COMMON ERRORS

- Not loading dose
- Moving inhaler when dose is loaded
- Not inhaling quickly enough
- Breathing into inhaler



NON-TECHNIQUE ERRORS

Non-
adherence

Duplication in
therapy

Frequency
errors

Inhaler
confusion

Spacers /
valved holding
chambers

PRODUCT SELECTION

Indication

Insurance
preference

Cost

Device
preference

Dosing
frequency

Expiration
dates

QUESTIONS?

Contact Information:

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SHORT-ACTING BETA₂-AGONIST BRONCHODILATORS

relax tight muscles in airways and offer quick relief of symptoms such as coughing, wheezing and shortness of breath for 3-6 hours

ProAir® Digihaler™
117 mcg albuterol sulfate
DBI A

ProAir® HFA
100 mcg albuterol sulfate
DBI A G

ProAir® RespiClick®
117 mcg albuterol sulfate inhalation powder
DBI A

Proventil® HFA
120 mcg albuterol sulfate
DBI A

Ventolin® HFA
90 mcg albuterol sulfate
DBI A G

Xopenex® HFA
50 mcg levosalbutamol sulfate
A G

LONG-ACTING BETA₂-AGONIST BRONCHODILATORS

relax tight muscles in airways and offer lasting relief of symptoms such as coughing, wheezing and shortness of breath for at least 12 hours

Serevent® Diskus®
90 mcg salmeterol xinafoate inhalation powder
DBI A C

Striverdi® Respimat®
2.5 mcg olodaterol hydrochloride
DBI C

INHALED CORTICOSTEROIDS

reduce and prevent swelling of airway tissue; they do not relieve sudden symptoms of coughing, wheezing or shortness of breath

Alvesco® HFA
80, 160 mcg ciclesonide
DBI A

ArmonAir® Digihaler™
55, 113, 232 mcg fluticasone propionate inhalation powder
DBI A

ArmonAir® RespiClick®
55, 113, 232 mcg fluticasone propionate inhalation powder
DBI A

Amuity® Ellipta®
50, 100, 200 mcg fluticasone furoate inhalation powder
DBI A

Asmanex® HFA
100, 200 mcg mometasone furoate
DBI A

Asmanex® Twisthaler®
110, 220 mcg mometasone furoate inhalation powder
DBI A

Flovent® Diskus®
50, 100, 250 mcg fluticasone propionate inhalation powder
DBI A

Flovent® HFA
44, 110, 220 mcg fluticasone propionate
DBI A

Palmicort Flexhaler®
90, 180 mcg budesonide inhalation powder
DBI A

QVAR® Redhaler™
40, 80 mcg beclomethasone dipropionate
DBI A

COMBINATION MEDICATIONS

contain both inhaled corticosteroid and long-acting beta₂-agonist (LABA)

Advair Diskus®
100/50, 250/50, 500/50 mcg fluticasone propionate and salmeterol inhalation powder
DBI A C G

Advair® HFA
45/21, 115/21, 230/21 mcg fluticasone propionate and salmeterol inhalation powder
DBI A G

AirDuo® Digihaler™
55/14, 113/14, 232/14 mcg fluticasone propionate and salmeterol inhalation powder
DBI A

AirDuo® RespiClick®
55/14, 113/14, 232/14 mcg fluticasone propionate and salmeterol inhalation powder
DBI A G

Breo® Ellipta®
100/25, 200/25 mcg fluticasone furoate and vilanterol inhalation powder
DBI A C

Dulera®
100/5, 200/5 mcg mometasone furoate and formoterol fumarate dihydrate
DBI A

Symbicort®
90/4.5, 180/4.5 mcg budesonide and formoterol fumarate dihydrate
DBI A G G

Wixela™ Inhub™
100/50, 250/50, 500/50 mcg fluticasone propionate and vilanterol inhalation powder
DBI A C

Anoro® Ellipta®
82.5/25 mcg umedacium and vilanterol inhalation powder
DBI C

Bevespi Aerosphere®
9/4.8 mcg glycopyrrolate and formoterol fumarate
DBI C

Stiolto® Respimat®
2.5/2.5 mcg tiotropium bromide and olodaterol
DBI C

Trelegy® Ellipta®
200/62.5/25 mcg, 100/62.5/25 mcg fluticasone furoate, umedacium and vilanterol inhalation powder
DBI A C

Breztri Aerosphere™
180/9/4.8 mcg budesonide, glycopyrrolate and formoterol fumarate
C

contain both long-acting beta₂-agonist (LABA) and long-acting muscarinic antagonist (LAMA)

contain inhaled corticosteroid, long-acting beta₂-agonist (LABA) and long-acting muscarinic antagonist (LAMA)

MUSCARINIC ANTAGONISTS (ANTICHOLINERGIC)

relieve cough, sputum production, wheeze and chest tightness associated with chronic lung diseases

Short-acting
Atrovent® HFA
17 mcg ipratropium bromide
DBI C

Long-acting
Incruse® Ellipta®
82.5 mcg umedacium bromide inhalation powder
DBI C

Spiriva® HandiHaler®
16 mcg tiotropium bromide inhalation powder
C

Spiriva® Respimat®
1.25, 2.5 mcg tiotropium bromide
DBI A C

Tudorza™ Pressair™
400 mcg acclidium bromide inhalation powder
DBI C

COMBINATION MEDICATIONS

contain muscarinic antagonist and beta₂-agonist

Short-acting
Combivent® Respimat®
20/100 mcg propidium bromide and albuterol
DBI C

Long-acting
Duaklir® Pressair®
400, 12 mcg acclidium bromide and formoterol fumarate dihydrate
DBI C

BIOLOGICS

target cells and pathways that cause airway inflammation; delivered by injection or IV

Cinqair®
raxizumab
A

Dupixent®
dupilumab
A

Fasenra™
bambizumab
A

Nucala®
mepolizumab
A

Xolair®
omalizumab
A

BRONCHIAL THERMOPLASTY

A minimally invasive procedure that uses mild heat to reduce airway smooth muscle, leading to fewer severe asthma flares, ER visits, and days lost from activities.
www.btrforasthma.com
A



PDE4 INHIBITORS

ease lung inflammation and reduce exacerbations

Daliresp®
250, 500 mcg roflumilast
C