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State of Utah  
Department of Commerce  
Division of Occupational and Professional Licensing

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**VACCINE ADMINISTRATION PROTOCOL**  
**Standing Order to Administer Immunizations and Emergency Medications**  
Revised September 2023

In compliance with Utah Code §§ 58-17b-620; 58-17b-102(16), (17), (56), (57)(b) and (c); and 58-17b-502(1)(i) of Utah's Pharmacy Practice Act, a licensed Utah pharmacist may administer medications for a fee pursuant to this Vaccine Administration Protocol. The pharmacist may also delegate administration to a licensed Utah pharmacy intern or pharmacy technician, if the delegating pharmacist provides on-site, direct supervision to the delegatee. A pharmacy intern and pharmacy technician may not delegate the administration of a vaccine to another person.

Each pharmacist who administers medications or delegates such administration, and each pharmacy intern and pharmacy technician who administers medications, shall have completed all of the training and continuing education required by Utah Admin. Code §§ R156-17b-309 and R156-17b-621 of the Pharmacy Practice Act Rules.

**Vaccines**

To protect people from preventable infectious diseases, each trained pharmacist, pharmacy intern, or pharmacy technician may administer the following vaccines to eligible patients for all appropriate ages, according to indications and contraindications recommended in current guidelines from the Advisory Committee on Immunization Practices (ACIP) of the U.S. Centers for Disease Control and Prevention (CDC) and/or local or state health departments:

Influenza	Hepatitis B	Tetanus-Diphtheria Toxoids
Hepatitis A	Meningococcal	Pneumococcal
Varicella	Herpes Zoster	Haemophilus Influenza type b
Measles-Mumps-Rubella	Human Papilloma Virus	Tetanus-Diphtheria Acellular Pertussis
Inactivated Polio	COVID-19 (SARS-CoV-2)	Respiratory Syncytial Virus

Striking through the name of any of the above vaccines will indicate deletion from this protocol.

The above-listed vaccines, and any vaccines not listed in this Vaccine Administration Protocol, may also be administered by a licensed Utah pharmacist pursuant to a prescription from a licensed prescriber. The pharmacist may delegate administration to a licensed Utah pharmacy intern or pharmacy technician, if the delegating pharmacist provides on-site, direct supervision to the delegatee. A pharmacy intern and pharmacy technician may not delegate the administration of a vaccine to another person.

### **Patient Screening**

Before a vaccination is dispensed for administration:

1. the vaccine candidate or legal guardian shall be questioned regarding the candidate's:
  - a. previous adverse events after immunization;
  - b. food or drug allergies;
  - c. current health conditions;
  - d. recent receipt of blood or antibody products;
  - e. immunosuppression;
  - f. pregnancy; and
  - g. underlying diseases;
2. the administering or delegating pharmacist shall review the vaccine, and the vaccine candidate's screening information; and
3. the vaccine candidate or legal guardian shall be informed of the specific benefits and risks of the vaccine(s) offered, and provided the appropriate Vaccine Information Statement(s).

### **Adverse Events**

1. In the course of treating adverse events following immunization, the pharmacist is authorized to administer, or supervise the administration by a pharmacy intern or pharmacy technician, the following:
  - a. Diphenhydramine 1.25 mg/kg, maximum dose of 50 mg per dose orally, for mild allergic reactions including hives or itching;
  - b. Epinephrine-intramuscular to patients in a dose appropriate for their stated weight, followed by an immediate call to Emergency Medical Services for any signs and symptoms consistent with anaphylaxis:
    - Epinephrine IM 0.3 mg for patient weight greater than 30 kg;
    - Epinephrine IM 0.15 mg for patient weight 15 - 30 kg; and
    - Epinephrine IM 0.01 mg/kg for patient weight less than 15 kg.
  - c. If Emergency Medical Services has not arrived and symptoms are still present, the dose of epinephrine may be repeated up to every 5 minutes for up to 3 doses total, depending on the patient's response.
  - d. If any medications are administered for an adverse immunization reaction, the pharmacy staff shall call Emergency Medical Services or provide patient assessment by an on-site licensed independent practitioner.
  - e. The pharmacist, pharmacy intern, or pharmacy technician may provide cardiopulmonary resuscitation as needed.

2. For adverse events, the administering or delegating pharmacist shall complete and submit the Vaccine Adverse Event Reporting System (VAERS) form to the CDC, to the undersigned licensed practitioner, and to the patient's primary care practitioner, if known.
3. The pharmacy shall post in a prominent place in the pharmacy an emergency plan to be implemented in case of an adverse event. Such plan shall include:
  - a. the phone number of the local EMS;
  - b. the phone number of the undersigned licensed practitioner; and
  - c. the roles of:
    - i. the administering or delegating pharmacist,
    - ii. any administering pharmacy intern or pharmacy technician; and
    - iii. other participants; and
  - d. dosing instructions for epinephrine and diphenhydramine according to this protocol

#### **Reporting to Utah Statewide Immunization Information System (USIIS)**

1. The pharmacist, pharmacy intern, or pharmacy technician shall report an administered vaccine to the Utah State Immunization Information System (USIIS) electronic registry within one week of administration. Register for USIIS:  
[http://www.usiis.org/howtoparticipate\\_provider.shtml](http://www.usiis.org/howtoparticipate_provider.shtml).
2. The pharmacist, pharmacy intern or pharmacy technician shall maintain perpetual record of all vaccines administered, including the:
  - a. patient name;
  - b. primary care practitioner (if known);
  - c. vaccination date;
  - d. name, address, title of administering or delegating pharmacist;
  - e. name of vaccine;
  - f. manufacturer; and
  - g. lot number.

**Protocol/Order**

**As the authorizing licensed practitioner:**

- **I shall periodically review (not less than annually) the activities of the authorized pharmacy personnel (pharmacists, pharmacy interns, and pharmacy technicians) who administer vaccines under this protocol.**
  
- **My authorization shall be valid for one year from the date indicated below, unless otherwise revoked or extended in writing.**
  
- **I understand that I need not review the administration of vaccines pursuant to a written prescription from a licensed prescriber, and that such vaccines shall be administered pursuant to the instructions from the licensed prescriber on the prescription.**

**(Signature on this protocol by a licensed practitioner is required ONLY for vaccines administered according to this VACCINE ADMINISTRATION PROTOCOL, without a written prescription by a licensed prescriber)**

Licensed Practitioner Name	
Licensed Practitioner Address	
City, State	
Zip	
Practitioner License Number	
State of Licensure	
Authorized Pharmacy(ies)	

The licensed pharmacist(s), pharmacy intern(s), and pharmacy technician(s) employed by the pharmacy or pharmacies listed above who have received the required training in accordance with Utah Admin. Code §§ R156-17b-309 and R156-17b-621 of the Pharmacy Practice Act Rules are authorized to administer vaccines pursuant to:

- (1) This VACCINE ADMINISTRATION PROTOCOL Standing Order to Administer Vaccines and Emergency Medications; or
- (2) A written prescription by a licensed prescriber.

**Licensed Practitioner Signature:** \_\_\_\_\_  
**Date:** \_\_\_\_\_



SPENCER J. COX  
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DEIDRE M. HENDERSON  
*Lieutenant Governor*

# UTAH DEPARTMENT OF COMMERCE

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## Division of Professional Licensing

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April 10, 2024

### **Vaccine Administration Guidance document**

In accordance with Utah Code §§ 58-17b-620; 58-17b-102(16), (17), (56), (58)(b) and (c); and 58-17b-502(1)(i) of Utah's Pharmacy Practice Act, this guidance document outlines the protocols and responsibilities for licensed Utah pharmacists, pharmacy interns, and pharmacy technicians engaged in vaccine administration.

This Vaccine Administration Guidance document has been established to facilitate the lawful administration of vaccines by licensed Utah pharmacists, pharmacy interns, and pharmacy technicians. The guidance document covers eligibility criteria, training requirements, vaccine administration, patient screening, adverse event management, and reporting obligations.

- A licensed Utah pharmacist may administer medications for a fee under this guidance document.
- A licensed Utah pharmacist may delegate vaccine administration to a licensed Utah pharmacy intern or pharmacy technician, provided the delegating pharmacist offers onsite, direct supervision to the delegate.
- Pharmacy interns and pharmacy technicians are not permitted to delegate vaccine administration to another individual.

All personnel involved in medication administration, including pharmacists, pharmacy interns, and pharmacy technicians, must have completed the requisite training and continuing education in accordance with Utah Admin. Code §§ R156-17b-309 and R156-17b-621 of the Pharmacy Practice Act Rules.

Pharmacists, pharmacy interns, and pharmacy technicians may administer vaccines according to guidelines established by the Advisory Committee on Immunization Practices (ACIP) of the U.S. Centers for Disease Control and Prevention (CDC) and/or local or state health departments, taking into consideration indications and contraindications for all appropriate age groups. Vaccines may also be administered by a licensed Utah pharmacist pursuant to a prescription from a licensed prescriber.

Before administering a vaccine, the following steps must be taken:

The vaccine candidate or legal guardian should be questioned regarding the candidate's:

- a. Previous adverse events after immunization.
- b. Food or drug allergies.
- c. Current health conditions.
- d. Recent receipt of blood or antibody products.
- e. Immunosuppression.
- f. Pregnancy.
- g. Underlying diseases.

The administering or delegating pharmacist must review the vaccine and the vaccine candidate's screening information.

The vaccine candidate or legal guardian should be informed of the specific benefits and risks of the vaccine(s) offered and provided with the appropriate Vaccine Information Statement(s).

In the event of an adverse event following immunization, the following actions may be taken:

- a. Mild allergic reactions (including hives or itching) may be treated with oral Diphenhydramine at a dose of 1.25 mg/kg, with a maximum dose of 50 mg per dose.
- b. For suspected anaphylaxis, Epinephrine may be administered intramuscularly based on patient weight. Emergency Medical Services should be immediately contacted:
  - Epinephrine IM 0.3 mg for patients weighing over 30 kg.
  - Epinephrine IM 0.15 mg for patients weighing 15 - 30 kg.
  - Epinephrine IM 0.01 mg/kg for patients weighing less than 15 kg.
- c. If Emergency Medical Services have not arrived and symptoms persist, Epinephrine may be repeated up to every 5 minutes for up to 3 doses, depending on the patient's response.
- d. In the event of any medication administration for an adverse immunization reaction, pharmacy staff should call Emergency Medical Services or seek assessment by an on-site licensed independent practitioner.
- e. Cardiopulmonary resuscitation may be administered as needed.

For adverse events, the administering or delegating pharmacist must complete and submit a Vaccine Adverse Event Reporting System (VAERS) form to the CDC, the undersigned licensed practitioner, and the patient's primary care practitioner, if known.

The pharmacy shall maintain and have readily available an emergency plan for adverse events, including:

- a. The phone number of local Emergency Medical Services (EMS).
- b. The phone number of the undersigned licensed practitioner.
- c. The roles of the administering or delegating pharmacist, any administering pharmacy intern or pharmacy technician, and other participants.
- d. Dosing instructions for epinephrine and diphenhydramine as per this guidance document.

All pharmacists, pharmacy interns, and pharmacy technicians must report administered vaccines to the Utah State Immunization Information System (USIIS) electronic registry within one week of administration. Registration information for USIIS is found at <https://immunize.utah.gov/usiis-provider-facilities/>.

This Vaccine Administration Guidance document ensures compliance with Utah's Pharmacy Practice Act and promotes safe and effective vaccine administration by licensed pharmacy professionals.

# Therapeutic Interchange

## Dosing Allergy:

### Therapeutic Interchange Doses for Nasal Antihistamines<sup>1</sup>

Medication	Usual Adult Dose
Azelastine (Astelin 137 mcg/spray, Astepro 0.15%)	1 to 2 sprays q nostril twice daily
Olopatadine (Patanase) 0.6%	2 sprays q nostril twice daily

### Therapeutic Interchange Doses for Nasal Steroids<sup>1</sup>

Medication	Lower Dosage Equivalents (Adult)	Lower Dosage Equivalents (Pediatric)
Beclomethasone 42 mcg (Beconase AQ 0.042%)	1 to 2 sprays q nostril twice daily	Age 6-12 years: 1 to 2 sprays q nostril twice daily
Budesonide 32 mcg (Rhinocort Aqua)	1 spray q nostril once daily	Age 6-11 years: 1 spray q nostril once daily
Ciclesonide 50 mcg (Omnaris)	2 sprays q nostril once daily	Age 6-12 years: 2 sprays q nostril once daily
Flunisolide Soln 25 mcg (Nasalide/Nasarel Soln 0.025%)	2 sprays q nostril twice daily	Age 6-14 years: 2 sprays q nostril twice daily
Fluticasone 50 mcg (Flonase and generic)	2 sprays q nostril once daily	Age 4-12 years: 1 spray q nostril once daily
Fluticasone 27.5 mcg (Veramyst)	2 sprays q nostril once daily	Age 2-11 years: 1 to 2 sprays q nostril once daily
Mometasone 50 mcg (Nasonex)	2 sprays q nostril once daily	Age 2-11 years: 1 spray q nostril once daily
Triamcinolone 55 mcg (Nasacort AQ and generic)	2 sprays q nostril once daily	Age 6-11 years: 1 spray q nostril once daily

### Therapeutic Interchange Doses for Non-Sedating Antihistamines<sup>1</sup>

Medication	Cetirizine (Zyrtec)	Desloratadine (Clarinet)	Fexofenadine (Allegra)	Levocetirizine (Xyzal)	Loratadine (Claritin, Alavert)
Usual Adult Dose	10 mg daily OTC	5 mg daily	60 mg twice daily, or 180 mg daily (extended-release) OTC	5 mg daily	10 mg daily OTC

### Therapeutic Interchange Doses for Combination Non-Sedating Antihistamines / Pseudoephedrine<sup>1</sup>

Medication	Usual Adult Dose
Cetirizine 5 mg/ pseudoephedrine 120 mg (ZyrtecD and generic OTC)	1 tab twice daily
Desloratadine 2.5 mg/ pseudoephedrine 120 mg (Clarinet D 12 hour)	1 tab twice daily
Desloratadine 5 mg/ pseudoephedrine 240 mg (Clarinet D 24 hour)	1 tab once daily
Fexofenadine 60 mg/ pseudoephedrine 120 mg (Allegra D 12 hour and generic OTC)	1 tab twice daily
Fexofenadine 180 mg/ pseudoephedrine 240 mg (Allegra D 24 hour and generic OTC)	1 tab once daily
Loratadine 5 mg/ pseudoephedrine 120 mg (Claritin D 12 hour, Alavert Allergy and Sinus, and generic OTC)	1 tab twice daily
Loratadine 10 mg/ pseudoephedrine 240 mg (Claritin D 24 hour and generic OTC)	1 tab once

	daily
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**Therapeutic Interchange Doses for Epinephrine Autoinjectors<sup>1,a</sup>**

EpiPen 0.3 mg/0.3 mL	Twinject 0.3 mg/0.3 mL	Auvi-Q 0.3 mg/0.3 mL
EpiPen Jr. 0.15 mg/0.3 mL	Twinject 0.15 mg/0.15 mL	Auvi-Q 0.15 mg/0.15 mL

<sup>a</sup> EpiPen, Twinject, Auvi-Q, and generic injectable epinephrine may all be interchanged with each other at appropriate doses.

## Asthma / COPD:

**Therapeutic Interchange for Albuterol Inhalers<sup>1</sup>**

Medication	Usual Adult Dose	FDA-Approved Indications
Albuterol (Proventil HFA, Ventolin HFA, ProAir HFA, ProAir RespiClick, ProAir Digihaler, and generics)	1 to 3 puffs every 4 to 12 hours	Asthma, Exercise-induced bronchospasm
Levalbuterol tartrate (Xopenex HFA and generics)	1 to 3 puffs every 4 to 12 hours	Asthma

**Therapeutic Interchange Doses for Inhaled Long-Acting Beta Agonists<sup>1</sup>**

Medication	Usual Adult Dose	FDA-Approved Indications <sup>b</sup>
Indacaterol (Arcapta Neohaler) 75 mcg per capsule/inhalation	1 capsule inhaled once daily	COPD
Olodaterol (Striverdi Respimat) 2.5 mcg per inhalation	2 inhalations once daily	COPD
Salmeterol (Serevent Diskus) 50 mcg per inhalation	1 inhalation every 12 hours	Asthma, COPD, Exercise-induced bronchospasm

<sup>b</sup> Use of a long-acting beta agonist for the treatment of asthma without a concomitant ICS is contraindicated.

**Therapeutic Interchange Doses for Nebulized Long-Acting Beta Agonists<sup>1</sup>**

Medication	Usual Adult Dose	FDA-Approved Indications
Arformoterol (Brovana) 15 mcg per vial for nebulization	1 vial nebulized twice daily	COPD
Formoterol (Perforomist) 20 mcg per vial for nebulization	1 vial nebulized twice daily	COPD

**Therapeutic Interchange Adult Doses for Inhaled Steroids<sup>1,3-5</sup>**

Medication	Low total daily dose	Medium total daily dose	High total daily dose
Beclomethasone dipropionate HFA (QVAR RediHaler) 40 mcg/inhalation 80 mcg/inhalation	80 to 240 mcg 1-3 inhalations twice daily 1 inhalation twice daily	240 to 480 mcg 3-6 inhalations twice daily 2-3 inhalations twice daily	> 480 mcg > 6 inhalations twice daily > 3 inhalations twice daily
Budesonide (Pulmicort Flexhaler) 90 mcg/inhalation 180 mcg/inhalation	180 to 400 mcg 1-2 inhalations twice daily 1 inhalation twice daily	>400 to 800 mcg 3-4 inhalations twice daily 2 inhalations twice daily	> 800 mcg > 5 inhalations twice daily > 3 inhalations twice daily
Ciclesonide (Alvesco) 80 mcg/inhalation 160 mcg/inhalation	80 to 160 mcg 1 inhalation twice daily Use lower strength	160 to 320 mcg 1-2 inhalations twice daily 1 inhalations twice daily	> 320 mcg > 2 inhalations twice daily > 1 inhalations twice daily

Medication	Low total daily dose	Medium total daily dose	High total daily dose
Fluticasone propionate 44 mcg/inhalation 110 mcg/inhalation 220 mcg/inhalation	88 to 264 mcg  1-3 inhalations twice daily 1 inhalations twice daily Use lower strength	264 to 440 mcg  3-5 inhalations twice daily 2 inhalations twice daily 1 inhalation twice daily	> 440 mcg  > 5 inhalations twice daily > 2 inhalations twice daily > 1 inhalation twice daily
Fluticasone propionate 50 mcg/inhalation 100 mcg/inhalation 250 mcg/inhalation	100 to 250 mcg  1-2 inhalations twice daily 1 inhalation twice daily Use lower strength	250 to 500 mcg  3-5 inhalations twice daily 2 inhalations twice daily 1 inhalation twice daily	> 500 mcg  > 5 inhalations twice daily > 2 inhalations twice daily > 1 inhalation twice daily
Fluticasone propionate (ArmonAir RespiClick) MDPI 55 mcg, 113 mcg, 232 mcg/inhalation	110 mcg  1 inhalation twice daily	226 mcg  1 inhalation twice daily	464 mcg  1 inhalation twice daily
Fluticasone furoate (Arnuity Ellipta) 50, 100, 200 mcg/inhalation	100 mcg  1 inhalation once daily	N/A	200 mcg  1 inhalation once daily
Mometasone (Asmanex Twisthaler) <sup>c</sup> 220 mcg/inhalation  <i>Also available in 110 mcg/inhalation, which is labeled for children</i>	220 mcg  1 inhalation (220 mcg) once daily in the evening	220 to 440 mcg  220 mcg dose = 1 inhalation daily in the evening  440 mcg/day either as 1 inhalation twice daily or 2 inhalations once daily in the evening	> 440 mcg  For the 880 mcg/day dose, use 2 inhalations twice daily
Mometasone furoate (Asmanex HFA) <sup>c</sup> 100 mcg/actuation 200 mcg/actuation	200 mcg  1 inhalation (100 mcg) twice daily  <i>Note: The product labeling starting dose is 2 puffs twice daily, which is higher than the equivalent dose of 200 mcg/day as recommended from clinical guidelines.</i>	200 to 400 mcg  For 200 mcg dose, use 100 mcg/actuation at 1 puff twice daily.  For 400 mcg dose, use 100 mcg/actuation at 2 puffs twice daily.	> 400 mcg  For 400 mcg dose, use 100 mcg/actuation at 2 puffs twice daily.  For 800 mcg dose, use 200 mcg/actuation at 2 puffs twice daily

<sup>c</sup> See GINA 2022 guidelines for information on equivalence

**Therapeutic Interchange Doses for Inhaled Combination Steroids / Long-Acting Beta Agonists<sup>1,3-5</sup>**

Medication	Dose	Interval	FDA-approved Indications
<b>Low-dose Daily Corticosteroid Equivalents</b>			
Fluticasone furoate/vilanterol (Breo Ellipta) DPI	100/25 mcg	1 inhalation daily	Asthma, COPD
Budesonide/formoterol (Symbicort Aerosol) HFA MDI	80/4.5 mcg	2 inhalations twice daily	Asthma, COPD
Fluticasone propionate/salmeterol (Advair HFA) HFA MDI	45/21 mcg	2 inhalations twice daily	Asthma

Medication	Dose	Interval	FDA-approved Indications
Fluticasone propionate/salmeterol (Advair Diskus or authorized generic, Wixela Inhub) DPI	100/50 mcg	1 inhalation twice daily	Asthma, COPD
Fluticasone propionate/salmeterol (AirDuo RespiClick or Digihaler, or authorized generic) MDPI	55/14 mcg	1 inhalation twice daily	Asthma
Mometasone/formoterol (Dulera Aerosol) HFA MDI	100/5 mcg	1 inhalation twice daily <sup>d</sup>	Asthma
<b>Medium-dose Daily Corticosteroid Equivalents</b>			
Budesonide/formoterol (Symbicort Aerosol) HFA MDI	160/4.5 mcg	2 inhalations twice daily	Asthma, COPD
Fluticasone propionate/salmeterol (Advair HFA) HFA MDI	115/21 mcg	2 inhalations twice daily	Asthma
Fluticasone propionate/salmeterol (Advair Diskus or authorized generic, Wixela Inhub) DPI	250/50 mcg	1 inhalation twice daily	Asthma, COPD
Fluticasone propionate/salmeterol (AirDuo RespiClick or Digihaler, or authorized generic) MDPI	113/14	1 inhalation twice daily	Asthma
Mometasone/formoterol (Dulera Aerosol) HFA MDI	100/5 mcg	2 inhalations twice daily	Asthma
<b>High-dose Daily Corticosteroid Equivalents</b>			
Fluticasone furoate/vilanterol (Breo Ellipta) DPI	200/25 mcg	1 inhalation daily	Asthma
Fluticasone propionate/salmeterol (Advair HFA) HFA MDI	230/21 mcg	2 inhalations twice daily	Asthma, COPD
Fluticasone propionate/salmeterol (Advair Diskus or authorized generic, Wixela Inhub) DPI	500/50 mcg	1 inhalation twice daily	Asthma
Fluticasone propionate/salmeterol (AirDuo RespiClick or Digihaler, or authorized generic) MDPI	232/14 mcg	1 inhalation twice daily	Asthma
Mometasone/formoterol (Dulera Aerosol) HFA MDI	200/5 mcg	2 inhalations twice daily	Asthma

<sup>d</sup> Mometasone/formoterol was not studied at this low-dose equivalent

**Therapeutic Interchange Doses for Inhaled Long-Acting Muscarinic Antagonists / Long-Acting Beta Agonists<sup>1,3</sup>**

Medication	Usual Adult Dose	FDA-Approved Indications
Acclidinium bromide/formoterol fumarate (Duaklir Pressair) 400/12 mcg per inhalation	1 inhalation twice daily	COPD
Glycopyrrolate/formoterol (Bevespi Aerosphere) 9/4.8 mcg per inhalation	2 inhalations twice daily	COPD
Glycopyrrolate/indacaterol (Utibron Neohaler) 15.6/27.5 mcg per capsule/inhalation	1 capsule inhaled twice daily	COPD
Tiotropium/olodaterol (Stiolto Respimat) 2.5/2.5 mcg per inhalation	2 inhalations once daily	COPD
Umeclidinium/vilanterol (Anoro Ellipta) 62.5/25 mcg per inhalation	1 inhalation once daily	COPD

**Therapeutic Interchange Doses for Inhaled Long-Acting Muscarinic Antagonists<sup>1</sup>**

Medication	Usual Adult Dose	FDA-Approved Indications
Acclidinium (Tudorza Pressair) 400 mcg per inhalation	1 inhalation twice daily	COPD
Glycopyrrolate (Seebri Neohaler) 15.6 mcg per capsule/inhalation	1 capsule inhaled twice daily	COPD
Tiotropium (Spiriva HandiHaler) 18 mcg per capsule	1 capsule (2 inhalations) once daily	COPD

Medication	Usual Adult Dose	FDA-Approved Indications
Tiotropium (Spiriva Respimat) 1.25 mcg <sub>e</sub> , 2.5 mcg <sub>f</sub> per inhalation	2 inhalations once daily	Asthma, COPD
Umeclidinium (Incruse Ellipta) 62.5 mcg per inhalation	1 inhalation once daily	COPD

<sup>e</sup> Approved asthma dosing: 1.25 mcg/inhalation, 2 inhalations once daily

<sup>f</sup> Approved COPD dosing: 2.5 mcg/inhalation, 2 inhalations once daily

#### Therapeutic Interchange Doses for Nebulized Long-Acting Muscarinic Antagonists<sup>1</sup>

Medication	Usual Adult Dose	FDA-Approved Indications
Glycopyrrolate (Lonhala Magnair) 25 mcg per vial for nebulization	1 vial nebulized twice daily	COPD
Revefenacin (Yuperli) 175 mcg per vial for nebulization	1 vial nebulized once daily	COPD

**Therapeutic Interchange for Insulins<sup>1,3</sup>**

<b>Humulin Insulins</b>		<b>Novolin Insulins</b>	
Humulin R 100 units/mL		Novolin R 100 units/mL	
Humulin N 100 units/mL		Novolin N 100 units/mL	
Humulin 70/30 100 units/mL		Novolin 70/30 100 units/mL	
<b>Long-Acting Insulins</b>	<b>Rapid-Acting Insulins</b>	<b>Insulin Mixes</b>	
Lantus 100 units/mL (insulin glargine)	Apidra 100 units/mL (insulin glulisine)	Humalog Mix 75/25 100 units/mL	
Basaglar 100 units/mL (insulin glargine)	Humalog 100 units/mL and 200 units/mL (insulin lispro)	NovoLog Mix 70/30 100 units/mL	
Semglee 100 units/mL (insulin glargine)	Admelog 100 units/mL (insulin lispro)	—	
Rezvoglar 100 units/mL (insulin glargine)	Lyumjev 100 units/mL and 200 units/mL (insulin lispro-aabc)	—	
Levemir 100 units/mL (insulin detemir)	NovoLog 100 units/mL (insulin aspart)	—	
Tresiba 100 units/mL and 200 units/mL (insulin degludec)	Fiasp 100 units/mL (insulin aspart)	—	
Toujeo 300 units/mL (insulin glargine)	—	—	

Insulin clinical issues:

1. *When interchanging insulin brands, the pharmacist will counsel the patient to monitor glucose and notify the provider of any change in glucose control. Products and doses may be interchanged unit for unit in most cases.*
2. *Use 80% of the dose when switching from Toujeo to another long-acting insulin.*
3. *Lantus, Basaglar, Rezvoglar, and Semglee can be interchanged using the same dosage regimen.* 4. *Long-acting insulins may only be interchanged with Levemir per this protocol during therapy **initiation** with long-acting insulin.*
5. *Lyumjev and Fiasp have a more rapid onset of action than other rapid-acting insulins. Recommended dosing is at the start of a meal or up to 20 minutes after starting a meal, not prior to a meal. Lyumjev is not labeled for pump use.*
6. *Insulin vials and pens may be interchanged as long as drug concentration remains the same, the patient is aware of the change and is counseled on how to administer the correct dose.*

**References:**

1. Lexi-Drugs [database online]. Hudson, OH. Lexi-Comp, 2023. Accessed April 2023.
2. Drugdex [database online]. Greenwood Village, CO: Truven Health Analytics, 2023.