

Infection Control in Respiratory Therapy Practices

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Introduction

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Objectives

- Discuss the prevalence of Respiratory Infections
- Explore commonly used respiratory treatments for these infections
- Introduce infection prevention practices with respiratory treatments



What are the infection control practices that should be utilized with respiratory treatment delivery?

Why infection prevention matters



Acute respiratory infections cause approximately 4 million deaths per year globally.



Unnecessary
Unwanted
Illnesses

Respiratory Illness can lead to.....

- Pneumonia
 - Bacterial
 - Viral
 - Aspiration

How are these illnesses acquired?

Droplets in the air

On contaminated surfaces

By using dirty equipment

From Each Other

Treatment Options

Antibiotics

Nebulizers/Inhalers

Steroids

Chest Physiotherapy

Problems with treatments



Antibiotic
Resistance

Time
consuming

Not
properly
delivered

Patient
Adherence

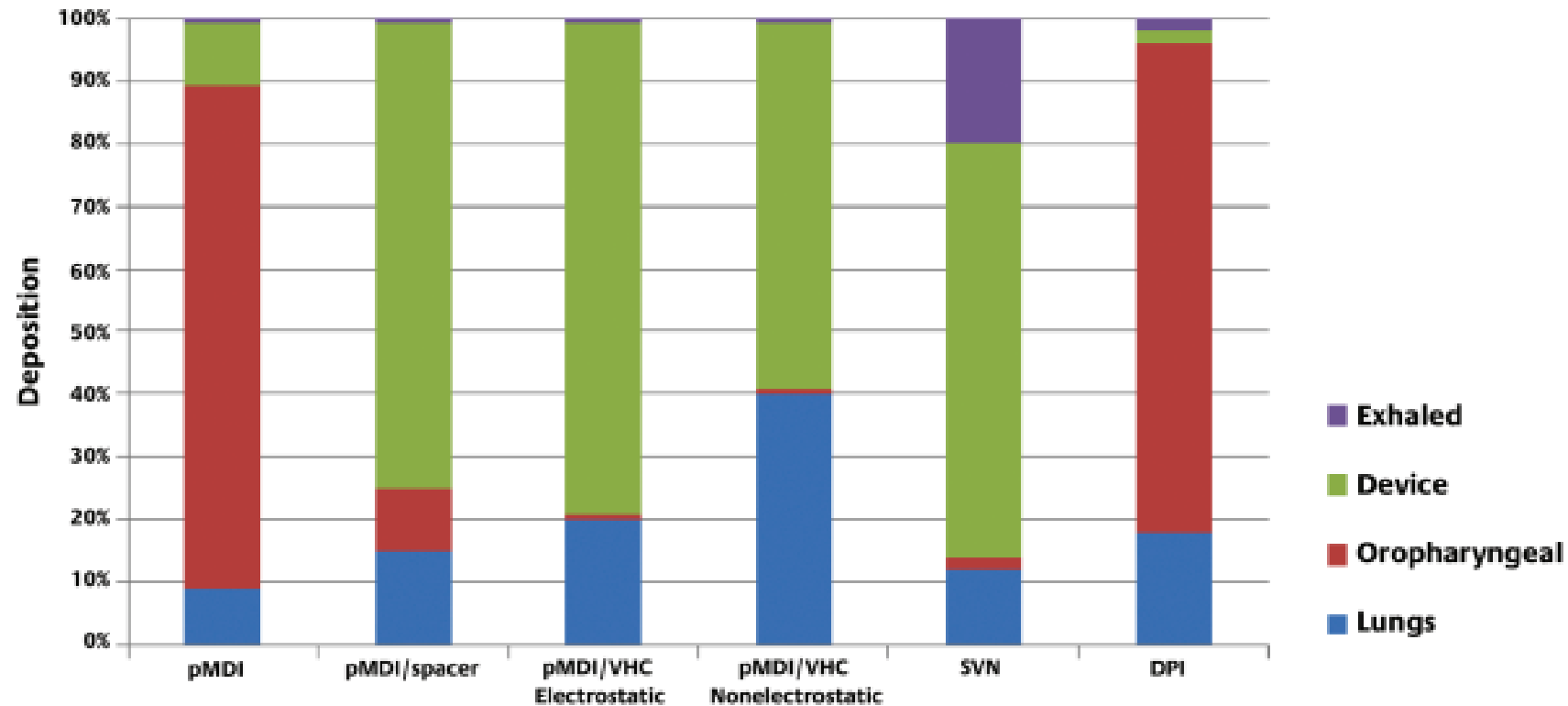


Figure 2. Drug deposition with common aerosol inhaler devices. Shown by color are the varying percentages of drug lung deposition and drug loss in the oropharynx, device, and exhaled breath.

pMDI = pressurized metered-dose inhaler; VHC = valved holding chamber;
SVN = small-volume nebulizer; DPI = dry-powder inhaler

(Modified, with permission, from Reference 1 and Reference 7)



Do I give
Respiratory
Treatments
correctly?

Inhalers







- Quick
- Deliver Bronchodilators, combination medications and steroids
 - MDI
 - DPI
- Respimat

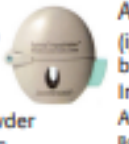



Medication and Device Lists

Common Inhalers Available in the United States

Anticholinergics/ β_2 -Agonist Combination

 Stiolto® Respimat® (tiotropium bromide and olodaterol) Inhalation Spray <small>Boehringer Ingelheim Pharmaceuticals, Inc.</small>	 Utibron™ Neohaler® (indacaterol and glycopyrrolate) Inhalation Powder <small>Sunovion Pharmaceuticals Inc.</small>	 Anoro® Ellipta® (umeclidinium and vilanterol) Inhalation Powder <small>GlaxoSmithKline</small>	 Bevespi Aerosphere™ (glycopyrrolate and formoterol fumarate) Inhalation Aerosol <small>AstraZeneca Pharmaceuticals</small>
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Anticholinergics

 Atrovent® HFA (ipratropium bromide HFA) Inhalation Aerosol <small>Boehringer Ingelheim Pharmaceuticals, Inc.</small>	 Tudorza™ Pressair™ (aclidinium bromide) Inhalation Powder <small>Forest Pharmaceuticals, Inc.</small>	 Incruse® Ellipta® (umeclidinium) Inhalation Powder <small>GlaxoSmithKline</small>	 Seebri™ Neohaler® (glycopyrrolate) Inhalation Powder <small>Sunovion Pharmaceuticals Inc.</small>
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β_2 -Agonists

 ProAir® HFA (albuterol sulfate) Inhalation Aerosol <small>Teva Specialty Pharmaceuticals</small>	 ProAir® RespiClick® (albuterol sulfate) Inhalation Powder <small>Teva Specialty Pharmaceuticals</small>	 Proventil® HFA (albuterol sulfate) Inhalation Aerosol <small>3M Pharmaceuticals Inc.</small>	 Arcapta™ Neohaler™ (indacaterol) Inhalation Powder <small>Novartis Pharmaceuticals</small>	 Striverdi® Respimat® (olodaterol) Inhalation Spray <small>Boehringer Ingelheim Pharmaceuticals, Inc.</small>
 Xopenex® HFA (levalbuterol tartare) Inhalation Aerosol <small>Sunovion Pharmaceuticals Inc.</small>	 Ventolin® HFA (albuterol sulfate HFA) Inhalation Aerosol <small>GlaxoSmithKline</small>	 Serevent® Diskus® (salmeterol xinafoate) Inhalation Powder <small>GlaxoSmithKline</small>	 Serevent® HFA (salmeterol xinafoate) Inhalation Aerosol <small>GlaxoSmithKline</small>	

Corticosteroids

 Alvesco® (ciclesonide) Inhalation Aerosol <small>Accomed</small>	 Asmanex Twisthaler® (mometasone) Inhalation Powder <small>Schering Corporation</small>	 Flovent® Diskus® (fluticasone propionate) Inhalation Powder <small>GlaxoSmithKline</small>	 ArmonAir™ RespiClick® (fluticasone propionate) Inhalation Powder <small>Teva Specialty Pharmaceuticals</small>	
 Arnuity® Ellipta® (fluticasone furoate) Inhalation Powder <small>GlaxoSmithKline</small>	 Flovent® HFA (fluticasone propionate) Inhalation Aerosol <small>GlaxoSmithKline</small>	 Pulmicort® Flexhaler® (budesonide) Inhalation Powder <small>AstraZeneca LP</small>	 QVAR® (beclomethasone dipropionate) Inhalation Aerosol <small>Teva Specialty Pharmaceuticals</small>	 Aerospan® (flunisolide) Inhalation Aerosol <small>Mylan Pharmaceuticals</small>

β_2 -Agonist/Corticosteroid Combination

 Advair® Diskus® (fluticasone propionate and salmeterol) Inhalation Powder <small>GlaxoSmithKline</small>	 Advair® HFA (fluticasone propionate and salmeterol xinafoate) Inhalation Aerosol <small>GlaxoSmithKline</small>	 Breo® Ellipta® (fluticasone furoate and vilanterol) Inhalation Powder <small>GlaxoSmithKline</small>	 Relenza® (zanamivir) Inhalation Powder <small>GlaxoSmithKline</small>
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What to look for?

Expiration dates

Type of inhaler

Patients' ability to take a deep
breath

Remaining Dose Count

Last time delivery device was
used

How often do I Prime an Inhaler?

Table 11. Priming requirements for commercially available pMDIs (Modified, with permission, from Reference 1)

Short-Acting Bronchodilators

Generic Name	Brand Name	Time to Prime	No. of Sprays
Albuterol Sulfate HFA	Proventil® HFA	New and when not used for 2 weeks	4
	Ventolin® HFA	New and when not used for 14 days	4
Levalbuterol HCl	Xopenex HFA™	New and when not used for 3 days	4
Ipratropium Bromide HFA	Atrovent HFA®	New and when not used for 3 days	2
Ipratropium Bromide/ Albuterol Sulfate Combination	Combivent® HFA	New and when not used for 24 hours	3

Inhaled Corticosteroids

Generic Name	Brand Name	Time to Prime	No. of Sprays
Beclomethasone Propionate HFA	QVAR™	New and when not used for 10 days	2
Ciclesonide	Alvesco®	New and when not used for 10 days	3
Fluticasone Propionate	Flovent® HFA	New	4
		Not used more than 7 days or if dropped	1

Combination Drugs

Generic Name	Brand Name	Time to Prime	No. of Sprays
Budesonide combined with Formoterol	Symbicort® HFA	New and not used more than 7 days or if dropped	2

Metered Dose Inhaler (MDI)

- Patient actuated device
- Can be rinsed and dried daily
- Requires hand/breath coordination



Dry Powder Inhaler (DPI)

- Inspiratory ability effects drug delivery
- Careful with exhalation





Figure 20. Currently available dry-powder aerosol formulations in the United States categorized by design features (see text description of design features)

Nebulizers



Jet Nebulizer



Mesh Nebulizer



How do I....

- Store
- Clean
- Dispose
- Has anyone checked the compressor filters?



CPAP/Bi Pap Machines



Opportunities for prevention

Machines

Filters

Masks

Water Chambers

Tubing/Hoses

Cleaning Schedule

How do we prevent infections?

Vaccinations

- Pneumonia
- Covid
- Shingles
- TB

Proper Medication Utilization

- Complete as prescribed

Infection Control Processes

- Hand Hygiene
- Disinfection/Cleaning
- Storage
- Patient Education



SD PROJECT **FIRSTLINE**

CDC's National Training Collaborative
for Healthcare Infection Prevention & Control

www.sdprojectfirstline.org

**Keeping
this guy
healthy
and
smiling is
our job!**



Questions?



References

<https://www.ahrq.gov/hai/quality/tools/cauti-ltc/modules/resources/guides/infection-prevent.html>

<https://www.cdc.gov/nchs/data/nvsr/nvsr70/nvsr70-09-tables-508.pdf>

<https://www.aarc.org/education/online-courses/aerosol-devices/>