

COVID-19 Pandemic Resources & Recommendations

Metered Dose Inhaler (MDI) Containers

Many patients infected with COVID-19 develop respiratory difficulties and require inhaled bronchodilator medications such as albuterol and levalbuterol. Because nebulizer therapy with bronchodilators may escalate the risk of virus spread through respiratory droplets that remain in the air, metered dose inhalers (MDI) have become the preferred mode of drug delivery for these patients. This has resulted in an increased use of these inhalers and could result in a shortage. In addition, a great deal of drug is wasted since these MDI canisters, which hold two to four weeks supply, are discarded once a patient is discharged from the hospital. A few strategies that have been implemented to decrease waste and cost include:

- Asking the patient to bring in their personal MDI device to use during their hospitalization.
- Label the MDI for the specific patient once it is distributed from the pharmacy so that it can be sent home with the patient at discharge.
- Utilize a common MDI canister, a patient-specific spacer, and a disinfection procedure between patients so that the MDI may be used for multiple patients.
 - Typical disinfecting protocols involve cleaning the mouthpiece with an alcohol prep pad before inserting it into a patient's individual spacer with a one-way valve, giving the patient the medication, then cleaning the mouthpiece again after use.
 - Risks associated with the disinfecting procedures include:
 - Common canisters may pose an infection risk for immunocompromised patients or patients on isolation precautions
 - Use of alcohol wipes were used to prevent bacterial contamination, however they may not be sufficient to disinfect the COVID-19 virus
 - Noncompliance with the protocol
- A new protocol was developed by Spectrum Health Butterworth Hospital in Michigan specifically for the COVID-19 pandemic and to prevent a potential drug shortage:
 - **Dispensing:** MDI is dispensed from pharmacy or automated dispensing cabinet and labeled by the nurse or pharmacist for the specific patient
 - **Implementation:** patients prescribed an MDI drug are given a patient-specific spacer device which is labeled for the specific patient
 - **Administration:** nurses or respiratory therapists (RT) attach the patient-specific MDI to the patient-specific spacer to deliver each dose
 - **Storage:** patient-specific spacer is stored in a plastic bag at the patient's bedside
 - **Discontinuation or Discharge:** nurses or RTs remove the patient-specific label from the MDI
 - **First Cleaning:** nurse or RT removes canister from plastic mouthpiece, wipe canister and plastic mouthpiece with disinfecting wipe for two minutes; after MDI is dry, canister and mouthpiece are reconnected, MDI is placed in a clean plastic bag and returned to pharmacy

Reference

1. Institute for Safe Medication Practices. (2020). *Nurse Advise-ERR*. Retrieved from Institute for Safe Medication Practices: <http://www.ismp.org/newsletters/nursing/issues/NurseAdviseERR202003pdf>

- **Pharmacy Reuse Assessment:** sanitized MDI is returned to a designated pharmacy area (spacers and dirty MDIs are not returned to the pharmacy); pharmacy staff assess the MDI for re-dispensing (i.e. check expiration date and number of doses remaining on counter)
- **Second Cleaning:** if MDI can be re-dispensed, pharmacy staff cleans the canister and plastic mouthpiece using a similar process as first cleaning; pharmacy staff reconnects the canister and plastic mouthpiece, seals the MDI in a plastic bag with tamper-evident tape and applies product labeling
- **Discharge:** MDI used during hospitalization does not go home with the patient; patient-specific spacers may be sent home with patients

Limit Use of Experimental COVID-19 Treatments

Antimalarial agents, **hydroxychloroquine** and **chloroquine**, are being used in other countries to treat SARS-CoV-2, the virus that causes COVID-19. However, effectiveness has not been proven in randomized controlled trials and these drugs are not currently approved by the U.S. Food and Drug Administration (FDA) for this indication. In the U.S., a prescription for either drug requires a diagnosis of lupus, malaria, rheumatoid arthritis, or porphyria cutanea tarda. There are reports of healthcare providers who have access to these drugs, ordering an excess supply for themselves, family and friends, even without a proper diagnosis or COVID-19 symptoms. There have also been reports of individuals accidentally consuming the drugs in toxic doses in an attempt to self-treat or prevent COVID-19. These two issues are contributing to a supply shortage of both drugs. To mitigate this problem, the following recommendations have been made:

- Restrict current supplies of hydroxychloroquine and/or chloroquine
 - Consider storing the drugs under lock and key with other controlled medications
- Standardize the dosing to prevent overdose
- Develop a protocol with your Pharmacy & Therapeutics Committee that outlines proper patient selection, use criteria, and standardized dosing to limit access and prevent dosing errors

There have been positive results in one French study on the use of **hydroxychloroquine in combination with azithromycin** to treat COVID-19. While the investigation involved a small sample size and was not a randomized controlled study, all patients treated with the combined drug therapy cleared the virus. There are major cardiac risks involved with this drug combination and patients should be monitored with an electrocardiogram (ECG) while on this investigational therapy.

- Hydroxychloroquine and chloroquine have caused:
 - Life-threatening cardiomyopathy
 - Ventricular arrhythmias and torsades de pointes
- Azithromycin may prolong the QT interval
 - If taken with hydroxychloroquine or chloroquine may further prolong the QTc.
- Elderly patients with underlying medical conditions may be at a higher risk for cardiac and hepatic side effect from these drugs.

Reference

1. Institute for Safe Medication Practices. (2020). *Nurse Advise-ERR*. Retrieved from Institute for Safe Medication Practices: <http://www.ismp.org/newsletters/nursing/issues/NurseAdviseERR202003pdf>

Safety Issues

Noncompliance with Safety Protocols

The COVID-19 pandemic has caused and will continue to cause an enormous amount of stress and anxiety for health care providers around the world. They are working long hours, under poorly staffed conditions, and lack proper personal protective equipment (PPE). This difficult working environment coupled with system failures can lead to “behavioral drift” and noncompliance with safety protocols that are normally in place. To combat behavioral drift, hospitals are evaluating areas that could benefit from additional reinforcement. One hospital utilizes a messaging system STAR which reminds staff to Stop, Think, Act, and Review before performing important patient care. While lapses in safety practices will likely occur, leadership and administrators should focus on critical safety measures that can be controlled, measure compliance, and support staff to adhere to them.

Infusion Pumps Outside of Patient Rooms

Many hospitals are having staff place infusion pumps close to the door or just outside the patient rooms in order to minimize entering the room, exposure to COVID-19 and use of PPE. Since long extension tubing must be used to facilitate this practice, the following recommendations are made to verify the patient, decrease infection risk and tubing misconnections, and ensure the right amount of drug is infused at the correct rate:

- Develop a protocol for cleaning pumps that are moved outside of the patient’s room
- Establish criteria for allowing pumps to be placed outside the room and exclude medications that adhere to tubing such as insulin
- Confirm that all tubing are secure, uninked, and do not pose as a tripping hazard
- Consider the dead space in the long tubing and institute processes for IV push, secondary infusion, low-flow infusion, and flushing techniques to ensure the medications reach the patient at the right time and rate
- Outline the patient verification process as well as the barcode scanning procedure for medications and solutions via the infusion pump
- Check with the pump manufacturer regarding the use of extension tubing and potential issues such as:
 - Delayed occlusion alarms at low flow rates (< 5 mL/hr)
 - Frequent occlusions and resistance at high flow rates (> 300 mL/hr)
 - High and low flow rates may not work with extension tubing
- Negative air flow may be hindered when the door is left open

Additional Issues to Consider with COVID-19

Swab Supply Shortage: hospitals are refraining from influenza testing in order to save swabs for COVID-19 testing.

Smart Pump Shortage: with a possible shortage of smart infusion pumps due to high use, hospitals should prioritize high-alert medication infusions and high-risk patients; implement procedures to safely administer gravity flow infusions without infusion pumps; institute effective pump disinfection procedures for efficient pump turn around.

Reference

1. Institute for Safe Medication Practices. (2020). *Nurse Advise-ERR*. Retrieved from Institute for Safe Medication Practices: <http://www.ismp.org/newsletters/nursing/issues/NurseAdviseERR202003pdf>

Communication Issues: communication is particularly difficult when wearing a mask. Remind staff to speak clearly and to read back verbal orders for verification.

Social Distancing: restrict visitors to the hospital, utilize technology (video conferencing, telemedicine, mobile applications) to communicate with caregivers, and allow staff to work from home when possible.

Standardize Treatment Times: coordinate the timing of care (i.e. assessments, treatments, medication administration) to minimize the need for nurses and respiratory therapists to enter a patient's room. When possible, adjust medication dosing to once a day, as opposed to multiple times daily.

Alcohol Withdrawal: anticipate the need for alcohol detoxification/withdrawal treatment as access to alcohol may become more limited in society.

Reference

1. Institute for Safe Medication Practices. (2020). *Nurse Advise-ERR*. Retrieved from Institute for Safe Medication Practices: <http://www.ismp.org/newsletters/nursing/issues/NurseAdviseERR202003pdf>