The COVID-19 pandemic is rapidly evolving and has placed a tremendous strain on the health care system. As we all come together to address this crisis, we know that health care resources continue to be limited in supply. With pharmacy personnel being one of the most accessible health care professionals on the front line, it is important that they stay safe and be protected. Pharmacists must be well informed about safety and have enough access to personal protective equipment (PPE) to keep themselves, their staff, and their families safe.

Here is information on the proper use of PPE, types of PPE, and strategies for conserving PPE during this pandemic.

**Resources on Proper and Effective Use of PPE**

PPE is defined by OSHA as “specialized clothing or equipment is worn by an employee for protection against infectious material.” Prevention is the best measure of avoiding infection, as there is no cure available for COVID-19. For PPE to be effective, users should adhere strictly to proper procedures for putting on (donning) and taking off (doffing) PPE.

Keep informed by knowing the facts about PPE. The CDC provides these resources for health care workers related to the selection of and uses for PPE:

- **Interim Infection Prevention and Control Recommendations for Patients with Suspected or Confirmed Coronavirus Disease 2019 (COVID-19) in Healthcare Settings.** This resource provides full guidance on PPE use in COVID-19 response.

- **Sequence for Putting on and Safely Removing PPE and videos by the CDC.** This resource is an illustrated step-by-step guide on how to don and doff PPE. While these videos are intended for Ebola, the principles are the same for the coronavirus outbreak.

- **Frequently Asked Questions about Personal Protective Equipment.** This resource provides more information regarding gowns, gloves, and respirators.

- **Considerations for Selecting Protective Clothing used in Healthcare for Protection against Microorganisms in Blood and Body Fluids.** This resource provides broader guidance about protective clothing, not specific to COVID-19.

In addition to CDC guidance, all health care workers should be fully aware and informed with facility-specific and state-specific guidance on PPE use, donning and doffing procedures, and conservation. Be aware that the shortage of PPE may necessitate alternative guidance to protect health care workers and patients.
Types of PPE\textsuperscript{1,2}

Specific PPE should be selected based on the type of exposure, appropriateness for the task, and the fit to the individual. The table below outlines the different types of PPE that can be used during the COVID-19 pandemic based on CDC guidance. PPE is currently in limited supply, and use should be determined by the facility based on the likelihood of exposure to patients with COVID-19.

| Gowns or Coveralls | CDC advises that gown selection should be based on the risk level of the health care provider. Available gowns include isolation gowns or surgical gowns. The use of a specific gown type is dependent on low-, medium-, or high-risk levels of the workplace setting. It is important to have a reputable procurement source for purchasing gowns to ensure the quality of the PPE. The standards for gowns are developed by the American National Standards Institute (ANSI) and the Association for the Advancement of Medical Instrumentation (AAMI). Coveralls, unlike gowns, provide continuous whole-body protection including the back, lower legs, and sometimes head and feet as well. Gowns tend to be easier to put on and take off. Coveralls are typically more difficult to take off correctly. For patients, the CDC is recommending nonsterile, disposable patient isolation gowns that are used for routine patient care in health care settings. These can be used for patients with suspected or confirmed COVID-19. Patients in isolation do not require a gown.\textsuperscript{2} |
| Gloves | CDC recommends the use of nonsterile disposable patient examination gloves for suspected or confirmed COVID-19 patients in health care settings. When purchasing gloves, confirm it is from a reputable source and has the American Society for Testing and Materials (ASTM) standard on the back of the box to ensure product quality. Double gloving is not currently being recommended when caring for patients with suspected or confirmed COVID-19. According to CDC Guidance, extended-length gloves can be used but are not being recommended at this time. General reminders when using gloves: When wearing gloves, work from “clean to dirty” to limit opportunities for “touch contamination.” Don’t touch your face or adjust PPE with contaminated gloves. Don’t touch environmental surfaces except as necessary during patient care. Disposable gloves should be discarded. Do not wash. Change gloves after each patient and if torn or heavily soiled. |
### Face Protection

- **Masks** protect nose and mouth and should fully cover nose and mouth to prevent fluid penetration.
- **Goggles** protect eyes and should fit snugly over and around eyes.
  > NOTE: Personal glasses are not a substitute for goggles.
- **Face shields** protect face, nose, mouth, and eyes and should cover the forehead, extend below the chin, and wrap around sides of the face.

### Respiratory Protection

- **N95 Respirators**
  - N95 Respirators are CDC/NIOSH-approved and worn to protect the wearer from droplets. They filter out 95% of very small (0.3 microns) particles, including bacteria and viruses.
  - The N95 Respirator must be professionally fit-tested yearly to ensure effectiveness.
  - Respirator Fit Testing: Understand WHO needs to get fitted, HOW to get tested, and follow up yearly to ensure the sizing has not changed. Click here for additional guidance on fit testing by the CDC.

- **Face Masks**
  - Face masks are loose-fitting and provide only barrier protection against droplets, including large respiratory particles.
  - Face masks are cleared by the FDA, are disposable, and should be discarded after each patient encounter. However, please review conservation strategies based on CDC guidance and your individual facility’s emergency management plan.

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### Shortages of Recommended PPE

The CDC emphasizes that PPE is one of the levels in the hierarchy of controls (Figure 1). By maximizing engineering or administrative controls, the need for PPE may be decreased. However, shortages may occur even with an emphasis on additional controls.

CDC is encouraging leaders to consider Strategies for Optimizing the Supply of N95 Respirators. For health care facilities seeking to make the best use of the N95 respirators available to them, the
CDC provides a Checklist for Healthcare Facilities: Strategies for Optimizing the Supply of N95 Respirators during the COVID-19 Response. When outdated N95 respirators are available, CDC has provided Release of Stockpiled N95 Filtering Facepiece Respirators Beyond the Manufacturer-Designated Shelf Life: Considerations for the COVID-19 Response as guidance.

Pharmacy practices that provide sterile compounding services should be aware that USP has issued a Response to Shortages of Garb and Personal Protective Equipment (PPE) for Sterile Compounding During COVID-19 Pandemic. The USP response addresses gowns, gloves, face masks, hair covers, and shoe covers.

Boards of Pharmacy in various states have generated ideas for PPE conservation. Pharmacy personnel should review and implement this guidance in their practice.

If your practice or facility has an infection-control specialist, you should consult them for guidance on the approval of PPE conservation methods specific to your organization, facility, or practice.

References: