On September 24, 2020, ASPR TRACIE hosted the webinar, *COVID-19: Optimizing Healthcare Personal Protective Equipment and Supplies.* During this webinar, presenters from the public and private sectors discussed strategies to optimize the supply of respirators and PPE, crisis capacity strategies, respirator and mask testing, disinfection and decontamination, acquisition and distribution, use management, supply chain, licensure, and future trends.

Due to the large number of questions received during the question and answer session, speakers were not able to respond to all of the questions during the webinar. These questions were sent to panelists and their answers are provided in this document. NOTE: Questions that were similar or covered the same topic area were consolidated and/or reworded to streamline the Q&A.

Question 1: Communication can be difficult, particularly with PAPRs and elastomeric respirators. Any suggestions on hands-free communication devices or other techniques?

Answers:

- NIOSH does not evaluate and approve sub-components; they only evaluate and approve complete respirator assemblies. Communication assemblies are either integrated into the hood or facepiece or offered as accessories which attach to the facepiece and are part of the approved configuration. NIOSH evaluates the impact of integrating accessory components of differing sizes and weight to the facepiece to ensure that no hazards are created for the user in terms of reduced protection. A variety of commercial solutions are available that utilize voice-activated microphones that may be able to be used with a loose fitting PAPR for two-way communication. Make sure that any boom or other microphones work with any internal PAPR head suspension or headbands.
- A variety of commercial solutions are available that utilize voice-activated microphones that can be used with a PAPR for two-way communication. Elastomeric respirators are more difficult but for two-way radio and aviation communications there are a few models of modified elastomerics with a microphone and cord attachment that allow connection to radio jacks.
- We are using wearable communication devices or “badges” in some areas to communicate hands free while wearing a PAPR or other PPE. These badges leverage an enterprise-class WIFI network to allow our care teams to receive alerts and notifications audibly, as well as communicate with individual or groups of colleagues using voice control. These devices are lightweight and also have an earpiece that can be added for hearing under PAPRs. The device and earpiece have generally been very well received in terms of overall comfort and functionality. Frontline managers reported the use of badges in COVID situations was very helpful, and it was used by frontline staff and leadership alike.

Question 2: Is there a formula for determining the number of PAPR units required for a hospital? What methods are used to distribute units?

Answers:

- ASPR TRACIE's Hospital Personal Protective Equipment Planning Tool- designed to help hospitals determine approximate PPE needs based on special pathogen category and a number of facility specific variables.
- CDC's PPE Burn Rate Calculator- allows healthcare facilities and other workplaces to enter the quantity of their current stock of various types of personal protective equipment (PPE) and calculate an average consumption rate (burn rate). Based on the burn rate, they can estimate their remaining PPE supply. Non-healthcare facilities such as correctional facilities may also find this tool useful.
    - To use the calculator, enter the number of full boxes of each type of PPE in stock (gowns, gloves, surgical masks, respirators, and face shields, for example) and the total number of patients at your facility. The tool will calculate the average consumption rate, also referred to as a "burn rate," for each type of PPE entered in the spreadsheet. This information can then be used to estimate how long the remaining supply of PPE will last, based on the average consumption rate. Using the calculator can help facilities make order projections for future needs.

Question 3: Is there a list of approved respirators?

Answer: Refer to Dr. Ross's presentation, specifically slide 21. On this slide, she provides the following resources:

- NIOSH Certified Equipment List (list of respirators approved by NIOSH)
- Exhibit 1 (list of respirators authorized under the EUA for Imported, Non-NIOSH-Approved Disposable Filtering Facepiece Respirators)
- Appendix A (list of respirators authorized under the Non-NIOSH-Approved Disposable Filtering Facepiece Respirators Manufactured in China)
- FDA COVID-19 Emergency Use Authorizations for Medical Devices
- FDA PPE EUAs
- NIOSH Considerations for Selecting Respirators for Your Health Care Facility
- NIOSH Counterfeit Respirators/ Misrepresentation of NIOSH-Approval

Question 4: Is there a standard regarding fit testing for respirators when we have several different vendor and styles that come in when available?

Answers:

- The Occupational Safety and Health Administration (OSHA) (29 CFR 1910.134) requires an initial and then subsequent annual respirator fit test to confirm the fit of any respirator that forms a tight seal on the wearer's face before it is used in the workplace. Qualitative fit testing involves using the respirator under a hood with a bitter or sweet aerosol and making sure the wearer cannot detect the odor while performing various head movements and speaking. Quantitative fit testing involves attaching the mask to a counter and directly monitoring any air leak during performance of the same skills. Either method is acceptable for healthcare workers wearing filtering facepiece respirators. You must follow manufacturers

recommendations for the appropriate fit testing process for each different respirator in use.

- On March 14, 2020, the U.S. Department of Labor's Occupational Safety and Health Administration (OSHA) issued new temporary enforcement guidance for respirator fit testing in healthcare during COVID-19 Outbreak. The guidance is available on the OSHA website https://www.osha.gov/memos/2020-03-14/temporary-enforcement-guidance-healthcare-respiratory-protection-annual-fit. This temporary enforcement guidance temporarily suspends the annual fit testing requirement of N95 filtering facepiece respirators. However, initial fit tests for healthcare personnel with the same model, style, and size respirator are still required. Therefore, if you are using a different model, style, or size respirator, this would require an initial fit test be performed. If you have additional questions, we suggest contacting OSHA. To reach your regional or area OSHA office, you can go to OSHA's Regional & Area Offices webpage (https://www.osha.gov/contactus/bystate) or call 1-800-321-OSHA (6742).
    - Information on fit testing during emerging infectious disease outbreaks is available on the NIOSH science blog: https://blogs.cdc.gov/niosh-science-blog/2020/04/01/fit-testing-during-outbreaks/
- In an enforcement memo dated April 8 2020, OSHA expanded this guidance to include all workplaces and expanded it to cover all types of filtering facepiece respirators (FFRs). In that memorandum, OSHA states; "In the absence of quantitative or qualitative fit-testing capabilities required under mandatory Appendix A to 29 CFR § 1910.134 Appendix A, the following additional guidance is provided to assist with decision-making with respect to use of N95s or other FFRs. Most respirator manufacturers produce multiple models that use the same basic head form for size/fit. Manufacturers may have a crosswalk (i.e., a list of their respirators with equivalent fit). Therefore, if a user's respirator model (e.g., model x) is out of stock, employers should consult the manufacturer to determine if it recommends a different model (e.g., model y or z) that fits similarly to the model (x) used previously by employees." Accordingly, OSHA added additional time limited guidance to OSHA field offices; "During this COVID-19 pandemic, OSHA field offices should exercise additional enforcement discretion regarding compliance with 29 CFR § 1910.134(f) when an employer switches to an equivalent-fitting make/model/size/style N95 or other filtering facepiece respirator without first performing an initial quantitative or qualitative fit test. Where the use of respiratory protection is required and an employer fails to comply with any other requirements, such as initial fit testing, maintenance, care, and training in the Respiratory Protection standard, cite the applicable section(s) of 29 CFR § 1910.134." OSHA states that a good faith effort to comply with 29 CFR 1910.134 includes stressing the importance of visual inspection, user seal checks and proper training as part of an overall respiratory protection program. IMPORTANT NOTE: This OSHA guidance is time limited to the current Covid-19 public health emergency. Consult the respirator manufacturer for this information.
- Access the following resources for additional information:
    - Filtering Out Confusion: FAQs about Respiratory Protection
    - NIOSH Respirator Trusted-Source Information

- CDC Summary of Respirator Fit Test Requirements
- 3M Center for Respirator Protection

Question 5: As we move into flu season, for facilities that are using crisis or contingency standards for N95 respirators with reuse based on either UV decontamination or a 5x5 paper bag storage process, can either of those processes be used for N95s used for influenza? Does the FDA EUA apply for N95 conservation only as it relates to SARS-COV-2 or does it also apply to influenza during the pandemic? It will be impossible for us, at the healthcare facility level, to disentangle use like that.

Answers:

- As a result of the Public Health Emergency associated with COVID-19, there is a shortage of FFRs intended for use by healthcare workers. To address that shortage, the March 2, 2020 EUA letter permits NIOSH-approved FFRs to be distributed to healthcare workers to prevent wearer exposure to pathogenic biological airborne particulates during FFR shortages resulting from the COVID-19 outbreak.
    - CDC released guidance on Decontamination and Reuse of Filtering Facepiece Respirators using Contingency and Crisis Capacity Strategies. Decontamination and subsequent reuse of FFRs should only be practiced as a crisis capacity strategy in the face of shortages during COVID-19.
- The FDA EUAs discussed during the webinar are scoped to COVID-19. As mentioned during the webinar, before FDA can issue an EUA, the HHS Secretary declares that circumstances exist justifying the authorization. To date, FDA has authorized decontamination systems for PPE using the following modalities: moist heat/steam, vaporized hydrogen peroxide and ozone, and vaporized hydrogen peroxide. It has not issued an EUA for UV decontamination.
- In OSHA's enforcement guidance they state "Note that, according to NIOSH, only respirator manufacturers can reliably provide guidance on how to decontaminate their specific models of FFRs. In the absence of manufacturers' recommendations, third parties (e.g., respiratory protection or other industrial hygiene consultants) may also provide guidance or procedures on how to decontaminate respirators without impacting respirator performance. Further, the effectiveness of using any of the methods mentioned in this guidance should be explored with specific filtering facepiece respirator models and with manufacturer, and, if needed, third party expert, input and support to better understand the impact on respirator performance, including filtration and fit, and structural integrity (including integrity of head straps and other parts)." Employers should consult the EUA and respirator manufacturer regarding the ability to decontaminate specific respirator models prior to decontamination. Not all respirator models will be able to be decontaminated with each method for which an FDA EUA has been issued.

Question 6: Since we are conserving N95 respirators, can medical staff wear the same N95 (assigned to only them) that was used in a COVID patient's room when seeing non-COVID patients (e.g., flu, TB)? And can masks be re-used for non-COVID surgical procedures after being disinfected using an approved method?

Answer:

- The CDC provides Strategies for Optimizing the Supply of N95 Respirators. CDC's Strategies for Optimizing the Supply of N95 FFRs were written to follow a continuum using the surge capacity approach in the order of conventional (everyday practice), contingency (expected shortages), and crisis (known shortages) capacities. A Contingency Capacity Strategy is extended use of N95s.
    - *Extended use refers to the practice of wearing the same N95 respirator for repeated close contact encounters with several different patients, without removing the respirator between patient encounters. Extended use is well suited to situations wherein multiple patients with the same infectious disease diagnosis, whose care requires use of a respirator, are cohorted (e.g., housed on the same hospital unit). When practicing extended use of N95 respirators, the maximum recommended extended use period is 8–12 hours.*
- Healthcare providers should not use the same N95 filtering facepiece respirator from a COVID positive patient to a COVID negative patient. While it may be necessary to re-use N95 respirators when caring for patients with other infectious diseases requiring respiratory protection (e.g., measles, tuberculosis, or varicella), it should be noted that contact transmission poses a risk to HCP who implement this practice. Ideally, N95 respirators should not be re-used by HCP who care for patients with COVID-19 then care for other patients with other infectious diseases that require respiratory protection. Additional information is available on the CDC webpage, *Implementing Filtering Facepiece Respirator (FFR) Reuse, Including Reuse after Decontamination, When There Are Known Shortages of N95 Respirators.*
- CDC released guidance on Decontamination and Reuse of Filtering Facepiece Respirators using Contingency and Crisis Capacity Strategies. Decontamination and subsequent reuse of FFRs should only be practiced as a crisis capacity strategy in the face of shortages.
- Please access FDA's webpage on Decontamination Systems for Personal Protective Equipment EUAs for a list of decontamination systems that have been authorized for decontaminating FFRs.

Question 7: Is there documentation that states that N95s can only be doffed a total of 5 times before decontamination or discarding?

Answer: The CDC provides Strategies for Optimizing the Supply of N95 Respirators. CDC's Strategies for Optimizing the Supply of N95 FFRs were written to follow a continuum using the surge capacity approach in the order of conventional (everyday practice), contingency (expected shortages), and crisis (known shortages) capacities. Re-use refers to the practice of using the same N95 respirator by one healthcare worker for multiple encounters with different patients but removing it (i.e. doffing) after each encounter. This practice is often referred to as "limited reuse" because restrictions are in

place to limit the number of times the same respirator is reused. If manufacturer guidance on how many times a particular FFR can be donned is not available, the CDC recommends limiting the number of uses to no more than five per device based on published data on changes in FFR fit from a limited number of FFR models over multiple donnings. It may be possible to don some models of FFRs more than five times (Degesys, Nida F., et al. "Correlation Between N95 Extended Use and Reuse and Fit Failure in an Emergency Department." JAMA (2020)). Fit performance during limited reuse should be monitored by the respiratory protection program manager or appropriate safety personnel.

Question 8: Is there a protocol for cleaning surfaces including using UV lights?

Answer:

- The effectiveness of UV light disinfection is highly dependent on frequency, duration, and distance from the source. If these variables are not carefully controlled, UV may not be effective. UV may also damage some surfaces over time. Generally, chemical virucidal agents are preferred to UV on non-porous surfaces.
- In some cases, UVGI light disinfection of surfaces has been used after chemical surface cleaning. This second treatment adds another method of disinfection.
- It is important to use light in the 254 nm wavelength also known as UVGI. UVC lights at 185 nm produce ozone. This range is also not optimal for denaturing the viral protein (x) in the mRNA virus.
- The light must not be shadowed. Dust and other debris on the surface will reduce UVC effectiveness. For full coverage, the UVC light may need to be repositioned or use multiple lights. It is important to measure the intensity of light in and determine the exposure time needed for disinfection.
- Access the following resources for general surface cleaning and disinfecting:
  - CDC Guidelines for Cleaning and Disinfecting your Facility
  - EPA Disinfectant Use and COVID-19

Question 9: We were told not to write on the respirator itself (e.g., name, date, etc.)- is that accurate or if its allowable, is there guidance on where to write and with what?

Answers:

- It is not recommended to write on the FFR due to risk of tearing the respirator material with the writing utensil. A preferred method would be to attach a tag to the FFR rather than write on it with an alcohol-based marker. This tag should not perforate the straps or filter area because that may cause additional damage.
- If writing on the respirator is required use soft tip writing utensils and inspect the filter material. You may also consider using tags on elastic straps to record key information.
- OSHA has guidance indicating that it is okay to write on the straps, but they counsel against writing on the filter material.
- The employer should check with the manufacturer regarding markings on the body or straps of the filtering facepiece respirator.

Question 10. Many healthcare organizations are facing shortages on N95 masks due to soiled masks. This is even when using a decontamination method like UVGI. Many of the masks are being thrown out prior to decontamination due to the masks being soiled. Would giving the virus time to deactivate be a better method with a mask that is soiled by sweat or makeup since the mask will have the same user?

Answers:

- NIOSH and FDA recommend discarding and not reusing any mask that is visibly damaged or soiled. Damage and soiling may negatively impact respirator performance.
- It is very difficult to decontaminate a soiled respirator as the proteins and organic matter on the soiled material protect the virus from deactivation. Therefore, it is critical that the soiled respirators be discarded. It is also strongly encouraged that individuals refrain from wearing makeup at locations where the respirator contacts the skin. This is also true for PAPR hoods as it is much more difficult to decontaminated these for the next user if the person is wearing makeup.
  Additional References:
  - https://www.osha.gov/video/respiratory_protection/maintenance_transcript.html
  - https://www.health.state.mn.us/facilities/patientsafety/infectioncontrol/rpp/comp/fittest.html
- Like many healthcare organizations, as supplies of N95 respirators were very sparse, we followed federal and state health authority guidance to use preprocessing techniques to extend our supplies. Managing soiled and stained respirators was a concern as these cannot be reprocessed. Accordingly, we worked closely with our teams to encourage proper usage, which included avoiding makeup. We are fortunate that our inventories are in better shape and we no longer need to rely on reprocessing protocols.

Question 11. Regarding storing Filtering Facepiece Respirator (FFR) in paper bag for 5 days as discussed by the presenters:

A. Does this practice inactivate the virus? If so, does this also mean the FFR is considered decontaminated?

Answers:

- There are currently no studies evaluating SARS-CoV-2 persistence on FFRs at specific environmental parameters. Any mask that is reused without a validated decontamination method should be handled as though it is contaminated.
- Because COVID-19 viral particles are not known to survive on porous surfaces beyond 5 days, there should be no viable viral particles remaining after 5 days of storage assuming that the bag and mask are dry. However, some skin bacteria from the user, fungi, or spores of other types could remain on the mask so the mask should not be considered 'disinfected' and should be re-used by the same provider.
- According to CDC's Implementing Filtering Facepiece Respirator (FFR) Reuse, Including Reuse after Decontamination, When there are Known Shortages of N95 Respirators: " The healthcare staff member can wear one N95 FFR each day and store

it in a breathable paper bag at the end of each shift with a minimum of five days between each N95 FFR use, rotating the use each day between N95 FFRs. This will provide some time for pathogens on it to "die off" during storage. This strategy requires a minimum of five N95 FFRs per staff member, provided that healthcare personnel don, doff, and store them properly each day."

B. Is there a product that could be sprayed on the FFR while in the bag to assist in killing the virus over the 5 days?

Answers:

- There are no products that are generally safely applied to fabric-based FFR to enhance virucidal activity while safely preserving the integrity of the mask fabric over time. You may wish to check with your FFR manufacturer for further information.
- Spraying products on the FFR may result in residuals which might then potentially be inhaled by the wearer. Unless this method has been evaluated for safety and efficacy, and the respirator manufacturer has been consulted, the respirator should not be sprayed with anything.

Question 12: Where can healthcare organizations purchase 3M N95 masks? All of our vendors do not currently have them available.

Answer:

- Healthcare and EMS organizations should continue to place PPE orders through commercial vendors since most PPE manufacturers have increased production. In addition, healthcare and EMS organizations can request through their local, state or territorial emergency management agencies and health departments for PPE until commercial orders are fulfilled. Request for federal assistance for PPE can then occur through state/territorial emergency management agencies. In the meantime, PPE preservation strategies to extend duration of organizationally available PPE should occur.
- Since the pandemic began, 3M has delivered nearly 100 million N95 respirators directly to hospitals in the U.S. and more than 100 million to FEMA and the U.S. Strategic National Stockpile. We have huge increases in demand for some of our products, and some health care facilities have increased their PPE consumption by up to 20 times. While we can deliver more PPE as we invest more in manufacturing infrastructure, the demand severely outstrips supply. We are making more respirators than ever before and doing all we can to meet the need. During this pandemic, 3M continues to rely on the healthcare supply chain distribution channel as this is best suited to reach customers in the most efficient manner. 3M recommends communicating and establishing your personal protection equipment needs, including respirators, masks and hand sanitizer, directly with your primary distributor. For more information please access https://www.3m.com/3M/en_US/company-us/coronavirus/3m-covid-19-faqs/.