

Q Are face shields able to be shared among multiple individuals? If so, what type of sanitizing is recommended between users?

Face shields (during normal times) MUST be used in compliance with the manufacturer's instructions (single use) . In the event PPE shortages present, they can be cleaned and disinfected and once disinfected used by multiple people. I have seen single use face shields used several times – however they don't last very long – especially the head bands! A Cl2 solution is appropriate , as well as any of the EPA LIST N substances for sanitization : <https://www.epa.gov/pesticide-registration/list-n-disinfectants-use-against-sars-cov-2-covid-19>

As with all sanitizing agents – there must be sufficient residence time for the agent to work – hence a spray and air dry seems to be most apropos.

Q: What about KN95 masks? That's all I can get

If KN95 masks are available – and other prioritized respirators cannot be acquired, they can be used if training and fit testing occur. My experience has been that many folks do not pass the fit tests with these respirators, especially those with ear straps. I note – respirators approved under other countries' standards cited in the presentation should be prioritized over re-use of respirators approved by NIOSH.

Q: I am standards for confused. If there are known protective standards for all healthcare workers than why are they not being used in every healthcare setting. How do you bridge the gap and make it better for all

I am not sure that I completely understand your question – however the lapse from standards (or the suspension of enforcement by regulatory bodies) occurs when equipment and supplies are not available – and the alternative would create a higher hazard. This is a site specific decision (no PPE or re-use available) on the part of the safety officer and user. When the availability of PPE is uniform – all standrds should be applied equally.

Q: How are masks engineering controls? I am confused!

I believe you may be using the terminology MASKS and RESPIRATORS interchangeable in your comment – which they are not. A respirator, when properly used and fit tested – protects an individual (PPE) from a toxin. A mask is basically a face shield (what some consider an engineering control) which engineers your toxin away from others breathing zone – so that PPE is not required. (and don't get hung up on the verbiage – look at the results of proper use of each!). Think of a mask as a ONE WAY valve – while it does not things from entering your lungs it directs the exhaled air away do that it does not affect others.

Q: Any data about surgical masks in combo with a face shield? The purpose of this configuration is to cover the exhalation valve of a respirator with source control – the surgical mask – hence – they each perform their part. The respirator remains an n-95 AND THE FDA approved surgical mask stops the exhalation of particulates (COVID and others) into a sterile environment. Neither does the job of the other – the additional protection is for others in the sterile environment.

Q: Are the silicone face mask inserts ok to use if they don't break the seal of the mask?

The silicone inserts I am familiar with are subsequently covered with cloth covering – to extend the “space” in front of the nose/mouth (breathing zone). These are not part of a respirator system – and hence there is no seal to be broken when they are used with a cloth face covering. If they were to be used under a “NIOSH approved respirator” – and I cannot see how this can occur or what value it would add - they would be acceptable if they did not break the seal of the respirator or change its fit, form or function ,

Q: what is considered a face covering?

Great Question – Respirators are tested/certified by NIOSH and Surgical Masks are tested/certified by FDA. Face Shields are tested to an ANSI standard by independent labs (ISEA). Conversely – EVERYTHING else that covers the mouth and nose is considered a Face Covering, and there is not a certification test (at the moment) to identify if these work or for what purpose. (It is ASSUMED they provide barrier protection from the source (which is why they are required now) and somewhere between 10% and 50% protection to the wearer from some large sizes of solid materials and aerosols. (I must stress – this protection to the wearer is minimal).

Q: What about ASTM 3 surgical masks with a face shield

ASTM 3 masks protect against a high level of SPRAY and SPLATTER and are typically used in dental operations. They are not certified as respirators. HOWEVER in this time of “ALTERNATIVES”, think of it as using a double face shield. (The face shield probably protects the mucus membranes of the eyes as well.)

Q: Where can you go for a fit test? Fit tests are provided by QUALIFIED people. This should be identified in your written respirator program – however you can also contact your respirator manufacturer or local safety and health officials who may be able to help. Typically – Fit tests are required annually, so they are offered by training providers who perform annual OSHA training (respirator training is required annually).

Q: How do you set up a fit testing program? First, you will need to determine the type of fit testing you are going to perform, based on the Protection Factor needed from the respirator you will provide to workers (and you must ensure this is the appropriate respirator for the identified hazard). If this is a COVID situation (where you can achieve a Protection Factor of 10 from a Qualitative fit test) - the Bittrex/saccharin protocols are appropriate. These are inexpensive and relatively easy to learn to use.

Quantitative fit testing allow for higher protection factors [up to 10,000!] (the ratio of the inside versus outside toxins) and is performed with machinery to measure particulate inside and outside the respirator simultaneously.

Next – equipment must be provided/purchased. Again QLFT equipment is not expensive (150\$) while Quantitative equipment may cost thousands. You'll want this fit test process determination documented in your written respirator program. All individuals who are to be fit tested will need a medical clearance. Finally – training for fit testers must be provided and checked to ensure they are competent. In my federal system, we require fit testers to perform X3 fit tests a year to maintain/demonstrate competency.

While this sounds like an elaborate effort, it is needed to ensure quality and efficacy of the Fit Tests.

Q: Do APRs need to be fit tested? Yes – if they are tight fitting. Loose fitting PAPR do not require a fit test (as this is no seal to test). Escape masks do not require a fit test or a medical approval – however they do require annual training when present in the workplace.

Q: Please address K95

KN95 respirators are Chinese made and are similar in function and performance to N-95s, when used in compliance with a respirator program (training, medical approval and fit testing). They may be used as a respirator when currently approved and in date respirators are not available, if fit testing and inspections occur. The Chinese standard they are tested to – requires a higher flow rate as well as a CO2 clearance test for the KN-95 , so again performance is as good as an N-95 when placed in service appropriately.

Q: Does UV-C Light (found in home air filters) actually work to kills viruses like covid? Yes, however this is a qualitative statement at the present (we do not know all the specifics to quality control the process used in UV-C respirator disinfection). It works, however we do not have a rapid test to show at which specific level, timeframe, which respirators etc.

Q: What is the best way to improve HVAC clean air flow: UV-C, Bi-polar ionization or filters? Thank you Evelyn Turner, Charleston SC Each situation is different, as particle or aerosol size and characteristics differ. And each HVAC system is different (flow rates/air exchange ratio etc.), so this is a question best answered by your HVAC technical engineer. The ASHRAE have identified that when properly installed, MERV filters can be expected to reduce COVID concentrations. They have also opined that in concert with 6 air exchanges and hour, and a safety zone of 15 feet around air intakes, COVID reduction in HVAC air may be expected with MERV 13 rated filters.

Q: Can I put my N-95 in my So-Clean CPAP machine next to my bed? While this may work in some cases – we do not know the efficacy of these machines against the viral load and specific material found in each respirator. The best I can say is yes, you can put it there, however disinfection may NOT occur!

Q: Face shield vs goggles? Face shields protect the face from flying particles and splashes, as well as aerosols. Goggles and safety glasses protect the eyes from particulates (glasses with side shields), liquids (vented goggles) or gases (non-vented goggles). In all cases EXCEPT blood borne pathogens protection, Face Shields are required to be used with eye protection (glasses or goggles).

Q: Thoughts on self standing HEPA filter machines in exam rooms to help with ventilation? These machines will not help with ventilation, however they may reduce the viral load (or other particulates) in a room if air is recirculated. An air exchange ratio of 6 air exchanges an hour will reduce COVID concentrations by dilution when used with a properly designed HVAC system. I am not aware of similar testing for free standing HEPA equipment, however one can estimate it from the CFM rating found on the label of the unit. Most machines have a low CFM rating (in many cases for noise reduction.)

Hence – if the room you are in 10x10x10 (1,000 cubic feet) and the machine is rated at 100 cfm (6,000 cubic feet per hour) it will exchange the air in the room 6X in the course of the hour (assuming uniform dilution) , a good air exchange ratio.

Q: UV light? Yes - UV light kills viruses, however it must be installed or used in compliance with a manufacturers requirement to work properly, so one size does not fit all! Exterior sunlight is difficult to quantify for continuous UV concentrations. The UV-C wavelengths are best at “virus killing” and the corona virus is a very weak virus – however it does not take a large viral load to infect. Unless used in very specific situations – which do not change – there are a good amount of uncertainties in the use of UV-C.

Q: What is the timeframe for particles being suspended in the air?. Heavy particles (about 95% or exhaled droplets) are heavy and drop rapidly – within seconds, within about a meter of the source. The remaining light nuclei remain suspended for an extended period of time and are affected by air flow, wind, etc. - they travel a good distance – which reduces the immediate concentration in the initial 2m. (they don't stay put!) What does this tell us?? What we already know – the MOST DANGEROUS location is immediately in front of an infected individual who coughs/spits/signs etc. And most of what (s)he has exhaled in on the ground in a few seconds!!!

Q: thoughts on dental offices and use of aerosol generating procedures such as ultrasonic scalers and air polishers and high speed hand pieces These are procedures which require protection including face shields (to protect mucous membranes) and respirators. Depending upon the design of the room, disinfection may be required within close proximity (2 m) of generation of the aerosols.

Q: Is it worth buying a home filter with uv c light? UV C light is the most energetic, hence it kills viruses. But it must also be used carefully, and as such you must follow manufacturer's instructions for installation in your home (and there are home units). Be cautious, there are warranted home units however it's not difficult to be overexposed to UV-C if they are installed incorrectly or you stay in a location for a long period of time where these are located. Now – that said – most installations are at heights for these pieces of equipment (e.g. over 8') and the target area for COVID disinfection is the breathing zone – 4-6 feet – hence their utility (disinfection within the 6 foot initial range) MAY not be the best.