Fit testing and user seal checking have different uses and, as outlined in the preamble to the U.S. Occupational Safety and Health Administration (OSHA) legislation for respiratory protection (Title 42, Code of Federal Regulations, Part 1910.134), one cannot be substituted for the other.

Started a question on the relative effectiveness of “fit testing” and “user seal checking” (previously referred to as “fit checking”), members and moderators exchanged information resources and discussed fit testing and user seal checking methods and uses for various respirators.

**Key Points**

- A fit-test is a method used to select a respirator that provides an adequate level of protection and a comfortable fit. Fit tests, specifically of disposable respirators, should be completed prior to initial use, whenever a different respirator facepiece (size, style, model or make) is used, and at regular intervals (e.g., annually) to ensure continued adequate fit. A fit test is not intended to be a substitute for training but it helps educate staff on the correct donning method.

- There are two types of fit tests: qualitative and quantitative
  - A qualitative fit test relies on the wearer's subjective response to taste, odor, or irritation.
  - A quantitative fit test uses a mechanical system of detecting face piece leakage. This method is rarely used in resource-limited settings due to the high cost of equipment and the need for trained personnel.

- New users should be fit tested and trained in proper donning technique, and should conduct user seal checks each time the respirator is put on. See presentation below on proper donning technique.

- A user seal check is a method for determining whether a respirator has been put on and adjusted to fit properly. It is performed every time a respirator is put on.
  - There is a limited amount of quality data to support the efficacy of user seal checks, and should not be used as a substitute for fit tests because they are often less accurate. One study found that the user seal check wrongly indicated that the mask fitted on 18-31% of occasions, and wrongly indicated that it did not fit on 21-40% of occasions (Derrick et al. 2005).
  - For disposable respirators, user seal check involves simple breathing exercises. To ensure a secure face to respirator seal, breathe in and out forcefully. The top layer of the respirator should billow out slightly on exhalation and collapse inward on inhalation, indicating that the respirator has a protective seal. Leaks may be detected on breathing in by a slight coolness on the skin at the respirator/skin interface. If leaks are detected, apply more pressure to the area. If you cannot achieve a proper fit, do not enter the contaminated area.

- For powered respirators, user seal checking involves negative and positive pressure checks. For the positive pressure check, close off the exhalation valve and exhale gently into the facepiece. The face fit is considered satisfactory if a slight positive pressure can be built up inside the facepiece without any evidence of outward leakage of air at the seal. For the negative pressure check, close off the inlet opening of the canister or cartridge by covering with the palm of the hand or by replacing the filter seal, and inhale gently so that the facepiece collapses slightly, and hold the breath for ten seconds. If the facepiece remains in its slightly collapsed condition and no inward leakage of air is detected, the tightness of the respirator is considered satisfactory.

- The fit of a respirator to an individual is important, and variations between models and populations are common. Fit testing should be conducted in order to choose appropriate models and sizes for a given group of people. Moderator Grigory Volchenkov, MD reports that in Russia, qualitative fits tests showed that 98-100% of health care workers pass with 3M 9320 or 9322 respirators, and about 95% pass with Russian FFP2 respirator Alina-P. By contrast, Dr. Derrick reports that the 3M 6000 series respirators had higher fit rates than filtering face piece (FFP) respirators in China.
• The nose piece of many respirators must be adjusted in order to fit people with flatter faces or smaller noses. Moderator Paul Jensen provided respirator nose clips drawing.
• The quality of disposable respirators varies greatly and poorly constructed respirators provide little protection because of face seal leak and bad filters.
• A powered respirator gives a much higher level of protection than a disposable one. It does not require fit testing, and can be used by bearded subjects. If a large-scale fit testing program is not feasible, it may be advisable to purchase and use a small number of powered respirators instead.
• An alternative “multi-donning” fit-test method was discussed, which may be more accurate and take the same amount of time as a traditional fit test (Campbell et al. 2005).

Key References
• 3M respirator fit test kits and resources: http://multimedia.3m.com/mws mediawebserver?66666UuZjcFSLXTt4x&VMXT2EVuQEcuZgVs6EVs6E666666--. http://solutions.3m.com/wps/portal/3M/en_US/Health/Safety/Products/Two/

Enrich the GHDonline Knowledge Base
Please consider replying to this discussion with the following information

• Information on brands or models which are good for specific populations
• Experience using powered respirators in low-resource settings
• Knowledge of simplified fit testing procedures

Recommendations
You may also be interested in the following content in GHDonline communities

• Proper donning technique and respirator fit testing demonstration (Resource)
• Discussion Brief: Using particulate respirators for TB Infection Control
• Face Masks and Respirators: Protection Factors, Selection, Fit Testing, and Respirator Demonstrations (Resource)

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