Respiratory Protection Program

October 15, 2018

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1.0 PURPOSE AND APPLICABILITY

Eastern Virginia Medical School (EVMS) is an academic medical center engaged in teaching, research, and patient care. The EVMS environment may contain harmful dusts, fibers, fumes, mists, gases, smokes, sprays, bio-aerosols, vapors, aerosol-transmitted diseases (ATDs) such as viruses and tuberculosis, or other airborne hazards. To ensure that all members of the EVMS community are protected from such hazards, EVMS attempts to eliminate hazardous exposures where possible and uses engineering, administrative, and work practice controls to minimize hazardous exposures that cannot be eliminated. Appropriate respirators shall be provided and used when effective engineering controls and other types of workplace controls are not feasible, or during the period that they are being implemented. The use of respirators is the last line of defense to protect employees from inhalation hazards and, in accordance with the Occupational Safety and Health Administration's (OSHA) Respiratory Protection Standard, 29 CFR 1910.134, employers that permit or require the use of respirators must establish and maintain a respiratory protection program (RPP).

This RPP applies to all faculty, staff, residents, students, volunteers, and temporary employees who, due to the nature of their work or academic program, are required to wear respirators. Unless otherwise agreed upon by EVMS, contractors and their employees are not covered under the RPP and EVMS shall ensure that contractors are obligated, by agreement, to comply with OSHA standards.

2.0 RPP RESPONSIBILITIES

2.1 Respirator Program Administrator (RPA)

The Environmental Health & Safety (EH&S) Occupational Safety Officer has been designated as the Respirator Program Administrator (RPA). The RPA has received appropriate training and has been given authority for:

2.1.1 Conducting a hazard assessment with the input of the EVMS Academic Occupational Health and Safety Committee (AOHSC), selecting the appropriate level of respiratory protection for each task or job title with potential exposure and recording this information in the "Respirator Assignments by Task or Location" in Appendix A of this RPP.

2.1.2 Developing and monitoring respirator maintenance procedures.

2.1.3 Coordinating the purchase, maintenance, repair, and replacement of respirators.

2.1.4 Routinely evaluating the effectiveness and making necessary changes to the RPP with input from the AOHSC.

2.1.5 Coordinating medical evaluations and fit testing to ensure that they are provided at a reasonable time and place.

2.1.6 Maintaining all aspects of respirator training and fit testing records.

2.1.7 Ensuring that all medical clearance and medical evaluations have been completed and are kept in accordance with the requirements of this RPP.

2.1.8 Maintaining a copy of this written RPP and program evaluations, and ensuring that they are readily accessible to anyone in the program.

2.2 EVMS Academic Occupational Health and Safety Committee (AOHSC)

The EVMS Academic Occupational Health and Safety Committee (AOHSC) assists the RPA by assisting in evaluating the RPP, reviewing annual respiratory surveillance and referring respiratory safety issues across the EVMS campus to the RPA.

Occupational Health

2.2.1 Perform annual TB risk assessment.
2.2.2 Update Medical Questionnaire.
2.2.3 Review Medical Questionnaires and grant medical clearances for fit testing.

2.3 Department Administrators/Supervisors and/or Program Directors

Department Administrators, Supervisors and/or educational Program Directors are responsible for:

2.3.1 Participating in the hazard assessment process by evaluating all potential exposures to respiratory hazards, including exposure to chemicals, ATD pathogens and communicating this information to the RPA as necessary.

2.3.2 Sharing responsibility and communicating with the RPA in identifying respirator users and/or tasks for which respirators may be required.

2.3.3 Ensuring that required respirator users in their departments/units follow the procedures outlined in the RPP including, but not limited to, reviewing departmental lists to identify respirator users who require fit testing, allowing respirator users time during work hours to complete the requirements of TB and respirator training, testing, and communicating any concerns to the RPA.

2.3.4 Ensuring that respirator users under their supervision (including new hires and temporary employees) have received the medical evaluation, appropriate training, and annual fit testing. Note: Department Administrators/Supervisors must notify the RPA of any temporary employees that require fit testing within three (3) business days of such temporary employee being hired.

2.3.5 Purchasing and ensuring the availability of appropriate respirators and accessories.

2.3.6 Being aware of tasks requiring the use of respiratory protection.

2.3.7 Enforcing the proper use of respiratory protection when necessary.

2.3.8 Ensuring that respirators are properly cleaned, maintained, and stored according to the RPP.

2.3.9 Continually monitoring work areas and operations to identify hazards.

2.4 Required Respirator Users

Faculty, staff, residents, temporary employees working under EVMS supervision, students, and volunteers in areas where the RPA has determined that respirator use is required for employment or as part of an educational program are considered Required Respirator Users. All Required Respirator Users must adhere to all requirements of this RPP.

2.5 Voluntary Respirator Users.

Employees in areas or jobs where the RPA has determined that respirator use is not necessary to protect the health of the respirator user, but still wish to wear a respirator, are considered Voluntary Respirator Users. The RPA shall authorize the voluntary use of respiratory protective equipment on a case-by-case basis upon request, depending on specific workplace conditions and the results of the medical evaluations and fit test. All Voluntary Respirator Users must receive the approval of their supervisor and shall have all the responsibilities of Required Respirator Users. The RPA will also provide Voluntary Respirator Users with a copy of Appendix D: Information for Employees Using Respirators When Not Required Under the Standard (29 CFR 1910.134 Appendix D).

3.0 RESPIRATOR SELECTION

3.1 Hazard Assessment

3.1.1 General Hazard Assessments

The RPA, with input from supervisors and respirator users, will conduct a general hazard assessment for each teaching, research, clinical and/or administrative area. The hazard assessment will determine what, if any, work areas contain airborne hazards that may be present in daily operations or in foreseeable maintenance or emergency situations and necessitate participation in the RPP. The hazard assessment will include the following:

3.1.1.1 Identification of potential exposures including ATDs.

3.1.1.2 A review of work processes and EVMS Occupational Health surveillance records to determine where potential exposures may occur and levels of potential exposure for all tasks and locations. Certain clinical departments, based on their population and historical data, are considered medium risk and shall be subject to fit testing annually, while others may only require fit testing when annual surveillance is significant as determined by the RPA and the EVMS Occupational Health Medical Director.

3.1.1.3 Where possible, objective determination of monitoring exposure levels will be performed by EH&S or a third party as needed.

3.1.1.4 Discussions with student program directors to determine which students are enrolled in programs, where they will be exposed to respiratory hazards or airborne infectious diseases. Discussions will also include where respirator use may potentially be deemed necessary.

3.1.2 AOHSC Hazard Assessments

The AOHSC shall review the annual TB respiratory surveillance statistics and other respiratory safety issues across the EVMS campus. They will determine which tasks or areas may be required to wear respirators on a temporary basis, a permanent basis as well as those required by the general hazard assessments. The documentation of such additional determinations (including the tasks and positions affected) will be made in the AOHSC minutes and will be provided to the RPA.

3.1.3 Updated Hazard Assessments

The RPA will review and update hazard evaluations as needed, such as when an employee, supervisor, or program director identifies or anticipates: a new exposure, changes to existing work/program conditions and exposures. Each department is responsible for notifying the RPA if/when a change to work

processes occur, or new materials (e.g. paint, solvents, etc.) are used. If it is determined that respiratory protection is needed, all elements of this program will be in effect for those tasks and the program will be updated accordingly.

3.2 NIOSH Equipment

The RPA is responsible for all respirator selections for use in the RPP. Whenever possible, respirators shall be selected from a sufficient number of brands, models, and sizes so the respirator is acceptable to and correctly fits the user. The RPP will only use respirators that are on the National Institute for Occupational Safety and Health (NIOSH) certified equipment list. Equipment issued to respirator users under this RPP may include:

3.2.1 Filtering facepiece respirators (FFR) are disposable, negative-pressure, air purifying respirators where an integral part of the facepiece or the entire facepiece is made of filtering material. These respirators are designed to be used once and then properly disposed of in a biohazard receptacle. The FFR respirators do not supply oxygen and therefore cannot be used to enter an atmosphere that is oxygen-deficient.

3.2.1.1 The N95 disposable respirator is a general term for a filtering facepiece (FFR) negative pressure air-purifying respirator with NIOSH-approved N95 filters or filter material.

3.2.1.2 The N95 respirator is used by the majority of the EVMS population. It is used for protection against certain particles/dusts, transmission of *M. tuberculosis* and other airborne infectious diseases.

3.2.2 Air-purifying respirators (APR) are elastomeric, tight-fitting respirators with either a filter, canister, or cartridge designed to remove specific air contaminants from the ambient air by passing through an air-purifying element. APRs must be tested and approved by NIOSH for use in specific types of contaminated atmospheres. These respirators do not supply oxygen and therefore cannot be used to enter an atmosphere that is oxygen-deficient.

3.2.3 Powered air-purifying respirators (PAPR) are air-purifying respirators that use a blower to force ambient air through air-purifying elements and into the respirator facepiece, helmet, or hood. These respirators do not supply oxygen and therefore cannot be used to enter an atmosphere that is oxygen-deficient.

The full list of NIOSH Certified Equipment can be found at the CDC website.

4.0 RESPIRATOR USE CLEARANCE PROCESS

4.1 Medical Evaluation

In accordance with Appendix B: The EVMS Medical Evaluation Process state, all respirator users must have an initial medical evaluation and be cleared for respirator use by EVMS Occupational Health prior to being fit tested, or wearing a respirator. The medical evaluation questionnaire must be completed online unless otherwise approved by EVMS Occupational Health. The questionnaire consists of questions outlined in Appendix C: OSHA respirator medical evaluation questionnaire.

Once cleared for respirator use, a medical reevaluation including the completion of a new medical questionnaire will be required annually or whenever:

4.1.1 The respirator user reports medical signs or symptoms that are related to the ability to use a respirator;

4.1.2 EVMS Occupational Health, the respirator user's supervisor, or the RPA requests a reevaluation;

4.1.3 Observations made during fit testing or program evaluation indicate a need for reevaluation (e.g., the employee experiences claustrophobia or difficulty breathing during the fit test);

4.1.4 A change occurs in workplace conditions (e.g., physical work effort, protective clothing, or temperature) that may result in a substantial increase in the physiological burden placed on an employee wearing a respirator;

4.1.5 The respirator user has completed a medical questionnaire but has not been medically cleared and 91 days or longer have passed since the respirator user completed a medical questionnaire;

4.1.6 The respirator user was medically cleared but has not been fit tested and 91 days or longer have passed since the respirator user was medically cleared.

4.2 Training

Training prior to being fit tested shall be conducted in accordance with the EVMS Respirator Use Clearance Process is attached as Appendix B. All training materials shall be developed by the RPA and, at a minimum, will include:

4.2.1 The general requirements of the OSHA Respiratory Protection standard;

4.2.2 The specific circumstances under which respirators are to be used;

4.2.3 Respiratory hazards to which employees are potentially exposed during routine and emergency situations;

4.2.4 Why the respirator is necessary and how proper fit, usage, and maintenance can ensure the protective effect of the respirator as well as how improper fit, usage or maintenance can compromise the protective effect of the respirator;

4.2.5 The limitations and capabilities of the respirators that will be used such as:

4.2.5.1 How/when to use the respirators, including emergency situations and situations in which the respirator malfunctions;

4.2.5.2 How to inspect, put on (don), remove (doff), use, and check the seals of the respirator (to ensure there are no air leaks);

4.2.5.3 The procedures outlined in this program for maintenance, storage, cleaning, and disposal of respirators. Employees who are issued PAPRs shall be instructed in procedures for charging and maintaining the batteries, and for checking the air flow rate;

4.2.5.4 How to recognize medical signs and symptoms that may limit or prevent the effective use of respirators;

4.2.5.5 How and when to dispose of, or safely decontaminate a respirator that has been contaminated with chemicals or hazardous/infectious biological materials;

4.2.6 During the fit test, the employee will also receive training on how to handle the respirator, have it fitted properly, test its facepiece-to-face seal, wear it in normal air to familiarize themselves with the respirator, and finally to wear it in a test atmosphere. Every respirator user will receive fitting instructions, including demonstrations and practice in how the respirator should be worn, how to adjust it, and how to perform a user seal check as outlined in Appendix E of this RPP. (29 CFR 1910.134 Appendix B-1.);

4.2.7 Additional training will be provided when there is a change in the type of respiratory protection used, or when inadequacies in the employee's knowledge or use of the respirator indicate that they have not retained the required understanding or skill.

4.3 Fit Test

The respirator user must be fit tested for a respirator and have a fit test record completed after being medically cleared and completing the training, in accordance with Appendix B: EVMS Respirator Use Clearance Process. The fit test will be conducted by trained individuals in EH&S, or department fit testers that have received training by EH&S. The fit test shall be conducted using OSHA-Accepted Fit Test Protocols as outlined in Appendix D: Selected Fit Test Protocols.

5.0 RESPIRATOR USE

5.1 All respirator users will follow procedures for proper use of their respirators under conditions specified by this program and in accordance with the training they receive on the use of each particular model or type of respirator. The appropriate types of respirators to be used and the exposure conditions are listed in Appendix A: Respirator Assignments by Task or Location.

5.2 Respirators relying on a tight facepiece-to-face seal must not be worn when conditions prevent a good seal. Such conditions may be a beard, long mustache, sideburns, razor stubble, scars, other facial deformities, piercings, and temple pieces on glasses. In addition, the absence of one or both dentures can seriously affect the fit of a facepiece.

5.3 Employees and supervisors are expected to be diligent in observing practices pertaining to ensuring the safe use of respirators. To ensure proper protection, the respirator user will perform a user seal check, in accordance with manufacturer's instructions and the training provided at the time of the fit test; this will be done for every respirator the individual is tested in. Employees who wear corrective glasses or other personal protective equipment must wear these during their fit testing to ensure that it does not interfere with the facepiece seal.

5.4 When filtering facepiece respirators are used, respirators should be discarded after each use, and sooner if breathing becomes difficult or if the respirator is damaged, soiled, or contaminated.

5.5 Employees must leave the respirator use area:

5.5.1 To adjust their respirator if the respirator is not fitting correctly or impeding their ability to work.

5.5.2 To wash their face if the respirator is causing discomfort and/or rash.

5.5.3 To change the respirator, filters, cartridges, or canister elements.

5.5.4 To inspect the respirator if it stops functioning as intended, such as detection of vapor or gas breakthrough, changes in breathing resistance or leakage of the facepiece (e.g., fogging of eyeglasses).

6.0 STORAGE, REUSE, MAINTENANCE AND CARE OF RESPIRATORS

6.1 Training

Employees who use reusable respiratory equipment will be instructed on proper care, use, cleaning, and storage.

6.1.1 Storage and Reuse

6.1.2 PAPRs

The hose and pump portions of PAPR are reusable and will be cleaned and stored after use. The hood must be discarded after each use. PAPRs must be stored at room temperature in a dry area that is protected from exposure to hazardous contaminants as per the manufacturer's instructions.

6.1.3 Half and Full Face Respirators

These respirators are reusable and should be cleaned after each use. Half and Full Face Respirators must be stored at room temperature in a dry area that is protected from exposure to hazardous contaminants.

6.1.4 Disposable Filtering Facepiece Respirators

When caring for infectious patients in clinical areas, disposable filtering facepiece respirators, such as the N95, must be discarded after each patient encounter or sooner if no longer in working condition (contaminated, structural defects, wear, etc.). Disposable filtering facepiece respirators in non-clinical areas must be discarded when the respirator is no longer in its original working condition (contaminated, structural defects, wear, etc.).

6.2 Inspection, Maintenance, and Repairs

6.2.1 All respirators must be inspected by the user prior to each use. Inspections should include a check of:

6.2.1.1 The condition of the various parts including, but not limited to, the facepiece, head straps, valves, and cartridges, canisters, or filters.

6.2.1.2 All rubber or plastic parts, for pliability and signs of deterioration.

6.2.1.3 For PAPR - connecting tubes or hoses, air flow, and batteries.

6.2.2 Defective disposable respirators will be discarded and replaced. Defective reusable respirators will be turned in to EH&S for repair, adjustment, or disposal.

6.3 Cleaning and Disinfection

6.3.1 The disposable N95 respirators do not need to be cleaned or disinfected. The N95 respirator should be disposed of as medical waste after contact with a patient.

6.3.2 Reusable respirators will be cleaned with mild soap and warm water and air dried before storing in a plastic bag for reuse, as described in Appendix F: Respirator Cleaning Procedures.

6.3.3 Reusable respirators issued for the exclusive use of an employee will be cleaned and disinfected by the user as often as necessary to maintain a sanitary condition.

6.3.4 Reusable respirators used in fit testing and training will be cleaned and disinfected after each use.

7.0 PROGRAM EVALUATION

7.1 The RPA and AOHSC will conduct a periodic evaluation of the RPP to ensure that all aspects of the program meet the requirements of the OSHA Respiratory Protection standard and that the RPP is being implemented and updated effectively to protect employees from respiratory hazards. This evaluation will be done as needed, but at least annually.

7.2 Program evaluation will include, but is not limited to:

7.2.1 A review of the written program.

7.2.2 Periodic review of RPP audits conducted by EVMS Internal Audit (IA).

7.2.3 A review of feedback obtained from employees (to include respirator fit, selection, use, and maintenance issues).

7.2.4 Amendment of the RPP and/or appendices as necessary to reflect any procedural changes that are implemented as a result of program evaluation will be communicated to respirator users and their supervisors. The program shall be updated as necessary to reflect those changes in workplace conditions affecting respirator use.

8.0 RECORDKEEPING.

8.1 The RPA will ensure that the following records are maintained as follows:

8.1.1 Medical clearance and medical evaluation forms shall be retained by EVMS Occupational Health and shall be made available in accord with the OSHA Access to Employee Exposure and Medical Records standard (29 CFR 1910.1020), and maintained as a confidential record as follows:

8.1.1.1 Employees – for thirty (30) years after an employee's separation or termination.

8.1.1.2 Students – maintained in accordance with the Occupational Health Record Retention Policy.

8.1.1.3 Temporary Employees and Volunteers – maintained in accordance with the Occupational Health Record Retention Policy.

8.2 Fit test records shall be maintained by EH&S until the next fit test, not to exceed three (3) years.

8.3 Training records shall be maintained by EH&S until the next training, not to exceed three (3) years.

8.3.1 A copy of this RPP shall be kept by EH&S and made available via the EVMS myPortal website.

Appendix A: Respirator Assignments by Task or Location

Task or Location	Potential Exposure	Respiratory Protection	Department or Program	Role or Job Title
Performing aerosol-generating procedures on patients suspected or confirmed with a disease requiring Airborne Precautions or present when such procedures are performed including: Sputum induction; Bronchoscopy; Aerosolized administration of medications; Pulmonary function testing; or Other clinical procedures that may aerosolize infectious agents	Infectious aerosols	N95 respirator or a more protective respirator (such as a PAPR)	*Ghent Family Medicine* *Portsmouth Family Medicine* *Internal Medicine - General* *Internal Medicine - Pulmonary* *Internal Medicine - Infectious Disease* *Internal Medicine - Geriatrics* *Internal Medicine - Diabetes* *Internal Medicine - Shared Clinical* *Other Clinical Departments on an ad hoc basis, as determined by AOHSC*	*Physicians;* *Nurse Practitioners;* *Physician Assistants and* *on an ad hoc basis, as determined by AOHSC.*
Performing aerosol-generating procedures on patients suspected or confirmed with influenza cases or present during such procedures	Infectious aerosols	N95 respirator or a more protective respirator (such as a PAPR)	*Ghent Family Medicine* *Portsmouth Family Medicine* *Internal Medicine - General* *Internal Medicine- Pulmonary* *Internal Medicine - Infectious Disease* *Internal Medicine - Geriatrics* *Internal Medicine - Diabetes* *Internal Medicine - Shared Clinical* *Other Clinical Departments on an ad hoc basis, as determined by AOHSC*	*Physicians;* *Nurse Practitioners;* *Physician Assistants and* *on an ad hoc basis, as determined by AOHSC*

Task or Location	Potential Exposure	Respiratory Protection	Department or Program	Role or Job Title
Entry into airborne infection isolation room or other area occupied by patients suspected or confirmed with a disease requiring Airborne Precautions	Infectious aerosols	N95 respirator or a more protective respirator (such as a PAPR)	*Ghent Family Medicine* *Portsmouth Family Medicine* *Internal Medicine - General* *Internal Medicine - Pulmonary* *Internal Medicine - Infectious Disease* *Internal Medicine - Geriatrics* *Internal Medicine - Diabetes* *Internal Medicine – Shared Clinical* *Other Clinical Departments on an ad hoc basis, as determined by AOHSC*	*Physicians;* *Nurse Practitioners;* *Physician Assistants and* *on an ad hoc basis, as determined by AOHSC*
Performing, or present during, routine patient care and support operations on a patient suspected or confirmed with M. Tuberculosis or other disease requiring airborne precautions	Infectious aerosols	N95 respirator or a more protective respirator (such as a PAPR)	*Ghent Family Medicine* *Portsmouth Family Medicine* *Internal Medicine - General* *Internal Medicine - Pulmonary* *Internal Medicine - Infectious Disease* *Internal Medicine - Geriatrics* *Internal Medicine - Diabetes* *Internal Medicine - Shared Clinical* *Other Clinical Departments on an ad hoc basis, as determined by AOHSC*	*Physicians; Care manager I and II; Case Manager; CDR Clinical Research (Non-RN); Health Info Services Clerk; HIV Case Manager Supervisor; Intake Coordinator; LPN;LPN Supervisor; Medical Assistant (I, II, and Lead);Medical Receptionist; Nurse Practitioner (I and II);Physician Assistants; Office Manager; Program Administrative Coordinator; Program Manager; Referral Coordinator; Registered Nurse; and* *on an ad hoc basis, as determined by AOHSC*

Task or Location	Potential Exposure	Respiratory Protection	Department or Program	Role or Job Title
Residents and Fellows performing, or present during, routine patient care and support operations on a patient suspected or confirmed with a disease requiring Airborne Precautions	Infectious aerosols	N95 respirator or a more protective respirator (such as a PAPR)	*Ghent Family Medicine Residency* *Portsmouth Family Medicine Residency* *Internal Medicine: General Residency* *Internal Medicine: Pulmonary Residency* *Internal Medicine: Infectious Disease Residency* *Internal Medicine – Geriatrics Residency* *Internal Medicine – Diabetes Residency* *Emergency Medicine Residency* *Surgery Residency* *Fellowships for any of the above or other Residency or Fellowship Programs on an ad hoc basis, as determined by AOHSC*	*Resident* *Fellow*
Perform chemical sterilization of an area occupied by a patient suspected or confirmed with a disease requiring Airborne Precautions	Infectious aerosols	PAPR with a loose-fitting facepiece	*EH&S*	*Radiation Safety Officer* *Biological Safety Officer* *Occupational Safety Officer* *Chemical & Environmental Safety Officer* *Assistant Radiation Safety Officer* *EH&S Technician*
		Project or Clinical Trial Review	*EVMS Institutional Biosafety Committee*	

Task or Location	Potential Exposure	Respiratory Protection	Department or Program	Role or Job Title
Laboratory operations involving chemical hazards of a respiratory nature	Infectious aerosols chemical hazards, dust, fumes or unknown hazards	N95 respirator or a more protective respirator (such as a PAPR)	*On an ad hoc basis, as determined by AOHSC*	*On an ad hoc basis, as determined by AOHSC*
Non-human primate users		N95 respirator or a more protective respirator (such as a PAPR)	*On an ad hoc basis, as determined by AOHSC*	*On an ad hoc basis, as determined by AOHSC*
Emergency or general maintenance in EVMS facilities where suspected or confirmed chemical hazards, airborne diseases, exist, where hazards are unknown, or where work will generate dust, fumes or other respiratory hazards	Infectious aerosols chemical hazards, dust, fumes or unknown hazards	N95 respirator or a more protective respirator (such as a PAPR)	*Facilities*	*Director of Facilities* *Assistant Director of Facilities* *Maintenance Supervisor* *Senior Maintenance Engineer* *Maintenance Engineer* *Locksmith*

Task or Location	Potential Exposure	Respiratory Protection	Department or Program	Role or Job Title
Perimeter establishment, crowd control, emergency operations, general policing and security during campus emergencies, HAZMAT incidents, or in a laboratory or clinical areas where suspected or confirmed chemical hazards, airborne diseases exist, where hazards are unknown, or where dust, fumes or other respiratory hazards may exist	Infectious aerosols chemical hazards, dust, fumes or unknown hazards	N95 respirator or a more protective respirator (such as a PAPR) as determined by EVMS Police and Public Safety	*Police & Public Safety*	*Public Safety Officer* *Public Safety Corporal* *Police Investigator* *Public Safety Sergeant* *Police Officer I and II* *Police Sergeant* *Police Lieutenant* *Chief of Police* *Emergency Management and Fire Safety Specialist*
Laboratory or workplace operations when EH&S has determined that engineering controls have failed or at the direction of EH&S	Chemical, dust, or other laboratory respiratory hazards	N95 respirator or a more protective respirator (such as a PAPR)	*On an ad hoc basis, as determined by AOHSC*	*On an ad hoc basis, as determined by AOHSC*
Academic programs with clinical or laboratory rotations	Infectious aerosols or chemical hazards	N95 respirator or a more protective respirator (such as a PAPR)	*Doctor of Medicine*	*All M1 & Rising M3 Students* *M4 Students as directed by Program*
			Master of Physician Assisting	*PA2 Students*
			Master of Surgical Assisting	*SA1 & SA2 Students*
			Pathologists' Assistant Master's	*All students*

Appendix B: EVMS Respirator Use Clearance Process

I. Population and Clearance Periods

All individuals identified in Appendix A: Respirator Assignments by Task or Location must complete the EVMS Respirator Use Clearance Process based on the schedule below. Areas with designated compliance responsibility shall develop a process to ensure that all such individuals complete the Respirator Use Clearance Process during the period indicated. The process developed shall be the same between types of respirator users, but each area with compliance responsibility may develop its own process to achieve compliance provided that it complies with the Mandatory Requirements for Clearance as outlined in Section II.

Type of Respirator User:		**Compliance Responsibility:**	**Clearance Period:**
New Employees		EH&S	At hire
Existing employees hired before October 1 of each year.		Institutional Compliance	During Institutional Compliance Annual Faculty & Staff Training
New Residents		EH&S	During new resident orientation
Returning Residents		Institutional Compliance	During Institutional Compliance Annual Resident Training
Temporary Employees		Department Administrators/Supervisors with EH&S	At hire
Volunteers		Department Administrators/Supervisors with EH&S	When on campus
Students	M1	EH&S coordinates with Program Directors	The fall season of the student's 1st year
	M2	EH&S coordinates with Program Directors	The spring season of the student's 2nd year
	PA1	EH&S coordinates with Program Directors	The winter season of the student's 1st year
	SA1	EH&S coordinates with Program Directors	The fall season of the student's 1st year
	SA2	EH&S coordinates with Program Directors	The fall season of the student's 2nd year
	Lab	Research assistant will make arrangements	Pending circumstances

II. Mandatory Requirements for Clearance

In order to complete the Respirator Use Clearance Process, areas with compliance responsibility shall ensure that all respirator users complete the following steps:

A. Step 1: Medical Evaluation

I. In order to complete the medical evaluation, the respirator user must complete the online medical questionnaire. Upon receipt of the questionnaire, Occupational Health will review the medical questionnaire and make a medical determination as to whether a respirator can be safely worn. In some instances, the review may consist of follow-up questions or may require a physical examination or a review of tests, consultations, or other procedures as deemed necessary by the Director of Occupational Health. The recommendation shall also be given to the respirator user. It is the responsibility of the respirator wearer to follow up with any request by Occupational Health for additional information. Failure to do so promptly will result in the respirator user not being medically cleared and/or having to submit an updated questionnaire.

II. Upon completion of the review, EVMS Occupational Health will provide a written recommendation, either clearing the employee for respirator use or specify any restrictions or limitations on use. Examples of restrictions and limitations may indicate the type of respirator that can be worn, the duration that it may be worn, and the acceptable level of exertion while wearing the respirator, or that a respirator may not be worn. The recommendation shall be entered into EVMS Occupational Health Management Software (OHM) or given to the individual designated by the area with compliance responsibility.

a. Step 2: Training

Training may be completed: in person, at EH&S, online via Blackboard, and other electronic course delivery systems that EVMS may deem appropriate. For training completed online/electronically, the respirator user must successfully pass a quiz.

b. Step 3: Fit Test

i. *Appointment*: Upon medical clearance and completion of training, the respirator user shall be notified that they are cleared to make an appointment for a fit test. Unless otherwise agreed to by the fit tester, all fit tests must be scheduled in advance. Respirator users who do not make an appointment, have not completed the medical clearance and training, or who were medically cleared more than 90 days ago will not be fit tested.

ii. *Facial Hair:* Respirator users may not have facial hair that interferes with the facepiece seal. Fit testers reserve the right to turn away any respirator users who are not clean shaven or who appear to have facial hair that will interfere with the facepiece seal. Any respirator user turned away will be required to make another appointment.

iii. *Fit Test*

1. Before conducting a fit test, the fit tester must confirm that the medical clearance was completed no more than 90 days ago and that the training has been completed.

2. Only fit testers who are in, or have been trained by EH&S may complete a fit test. All fit tests shall be completed using a qualitative fit test (QLFT) or quantitative fit test (QNFT) method in which the fit tester has been trained.

3. Respirator users who are fit tested at the department level, but are unable to pass a fit test successfully, shall be referred to EH&S. If the failure to pass the fit test is a result of facial hair, the respirator user will be required make another appointment for a rescheduled fit test and must be clean-shaven for the rescheduled fit test.

4. Religious Exemption: Religious exemptions for facial hair may be requested by completing the Religious Exemption Form and shall be evaluated by EVMS Human Resources.

iv. *Fit Test Records*

1. Department Fit Test. A fit test record, in a form and format determined by EH&S, must be completed for every respirator user who is fit tested at the department level, including those individuals who are unable to pass a fit test. The fit test record shall be returned to EH&S and the individual designated by the area with compliance responsibility.

2. EH&S Fit Test. A fit test record must be completed for every respirator user who is fit tested by EH&S, including respirator users who are unable to pass a fit test. Such fit test record may be recorded in OHM or in the form and format deemed appropriate by EH&S.

3. Other Documentation. If a fit test has been completed outside of EVMS (i.e., another hospital) within the past three (3) months, the fit test record may be accepted at the sole discretion of the EH&S.

III. <u>Exemptions</u>

Individuals who, due to health reasons, cannot be medically cleared; those who are unable to pass a fit test with any respirator; those who have requested, and been granted, a religious exemption; and individuals who use PAPR shall be granted an

exemption from the Respirator Use Clearance Process during the Clearance Periods. Except for religious exemptions, an exemption granted by the RPA under any given Clearance Period does not guarantee exemption from any future period unless criteria to meet an exemption has been met. Whenever an individual is deemed exempt, the

area with responsibility for compliance shall notify the appropriate Department Administrators/Supervisors and/or Program Directors that other arrangements, such as reassignment or use of a PAPR, must be made for the individual if/when circumstances dictate that a tight-fitting respirator must be worn.

IV. Non-Compliance

Unless deemed exempt, individuals who do not complete the Respirator Use Clearance Process in the required timeframes, and who are notified by the area with compliance responsibility, shall be considered non-compliant and subject to disciplinary action per EVMS Policy. Such non-compliance shall first be reported to Department Administrators/Supervisors and/or Program Directors for appropriate and timely action. If non-compliance continues, it should be reported to EVMS Institutional Compliance who shall notify oversight areas as follows:

a. Faculty: Department Chairs and Faculty Affairs & Professional Development

b. Staff: Department Chairs and Human Resources

c. Residents: Residency Program Directors and Graduate Medical Education

d. Students: Student Affairs and Program Deans

e. Temporary Employees: Department Chairs and Temp Agencies

f. Volunteers: Department Chairs and Human Resources

Appendix C: Medical Clearance Questionnaire

OSHA Respirator Medical Evaluation Questionnaire (Mandatory)

NOTE: This form is intended for example purposes only. All medical questionnaires for EVMS must be completed online and submitted to OH electronically.

To the employer: Answers to questions in Section 1, and to question 9 in Section 2 of Part A, do not require a medical examination.

To the employee: Your employer must allow you to answer the questionnaire during normal working hours, or at a time and place that is convenient to you. To maintain your confidentiality, your employer or supervisor must not look at or review your answers, and your employer must tell you how to deliver or send this questionnaire to the healthcare professional who will review it.

Part A Section 1. (Mandatory) The following information must be provided by every employee who has been selected to use any type of respirator (please print).

1. Today's date:
2. Your name:
3. Your age (to nearest year):
4. Sex (circle one): Male/Female
5. Your height: ft. in.
6. Your weight: lbs.
7. Your job title:

8. A phone number where you can be reached by the healthcare professional who reviews this questionnaire (include the Area Code):
9. The best time to phone you at this number:
10. Has your employer told you how to contact the healthcare professional who will review this questionnaire (circle one): Yes/No
11. Check the type of respirator you will use (you can check more than one category):

    a. ___ N, R, or P disposable respirator (filter-mask, non-cartridge type only).

    b. ___ Other type (for example, half- or full-facepiece type, powered-air purifying, supplied-air, self-contained breathing apparatus).

12. Have you worn a respirator (circle one): Yes/No If "yes," what type(s):

Part A. Section 2. (Mandatory) Questions 1 through 9 below must be answered by every employee who has been selected to use any type of respirator (please circle "yes" or "no").

	YES	NO
Do you *currently* smoke tobacco, or have you smoked tobacco in the last month?	☐	☐
Have you *ever had* any of the following conditions?		
Seizures	☐	☐
Diabetes (sugar disease)	☐	☐
Allergic reactions that interfere with your breathing	☐	☐
Claustrophobia (fear of closed-in places)	☐	☐
Trouble smelling odors	☐	☐
Have you *ever had* any of the following pulmonary or lung problems?		
Asbestosis	☐	☐
Asthma	☐	☐
Chronic bronchitis	☐	☐
Emphysema	☐	☐
Pneumonia	☐	☐
Tuberculosis	☐	☐
Silicosis	☐	☐
Pneumothorax (collapsed lung)	☐	☐
Lung cancer	☐	☐
Broken ribs	☐	☐
Any chest injuries or surgeries?	☐	☐
Any other lung problem that you've been told about?	☐	☐
Do you *currently* have any of the following symptoms of pulmonary or lung illness?	☐	☐
Shortness of breath?	☐	☐
Shortness of breath when walking fast on level ground or walking up a slight hill or incline?	☐	☐
Shortness of breath when walking with other people at an ordinary pace on level ground?	☐	☐
Have to stop for breath when walking at your own pace on level ground?	☐	☐

	YES	NO
Shortness of breath when washing or dressing yourself?	☐	☐
Shortness of breath that interferes with your job?	☐	☐
Coughing that produces phlegm (thick sputum)?	☐	☐
Coughing that wakes you early in the morning?	☐	☐
Coughing that occurs mostly when you are lying down?	☐	☐
Coughing up blood in the last month?	☐	☐
Wheezing?	☐	☐
Wheezing that interferes with your job?	☐	☐
Chest pain when you breathe deeply?	☐	☐
Any other symptoms that you think may be related to lung problems?	☐	☐
Have you *ever had* any of the following cardiovascular or heart problems?		
Heart attack	☐	☐
Stroke	☐	☐
Angina	☐	☐
Heart failure	☐	☐
Swelling in your legs or feet (not caused by walking)	☐	☐
Heart arrhythmia (heart beating irregularly)	☐	☐
High blood pressure	☐	☐
Any other heart problem that you've been told about	☐	☐
Have you *ever had* any of the following cardiovascular or heart symptoms?		
Frequent pain or tightness in your chest	☐	☐
Pain or tightness in your chest during physical activity	☐	☐
Pain or tightness in your chest that interferes with your job	☐	☐
In the past two years, have you noticed your heart skipping or missing a beat	☐	☐
Heartburn or indigestion that is not related to eating	☐	☐
Any other symptoms that you think may be related to heart or circulation problems	☐	☐
Do you *currently* take medication for any of the following problems?		
Breathing or lung problems	☐	☐
Heart trouble	☐	☐

	YES	NO
Blood pressure	☐	☐
Seizures	☐	☐
If you've used a respirator, have you *ever had* any of the following problems? *(If you've never used a respirator, check the following space and go to question 9.)*	☐	☐
Eye irritation	☐	☐
Skin allergies or rashes	☐	☐
Anxiety	☐	☐
General weakness or fatigue	☐	☐
Any other problem that interferes with your use of a respirator	☐	☐
Would you like to talk to the healthcare professional who will review this questionnaire about your answers to this questionnaire?	☐	☐
Questions 10 to 15 below must be answered by every employee who has been selected to use either a full-facepiece respirator or a self-contained breathing apparatus (SCBA). For employees who have been selected to use other types of respirators, answering these questions is voluntary.		
Have you *ever* lost vision in either eye (temporarily or permanently)?	☐	☐
Do you *currently* have any of the following vision problems?		
Wear contact lenses	☐	☐
Wear glasses	☐	☐
Color blind	☐	☐
Any other eye or vision problem	☐	☐
Have you *ever had* an injury to your ears, including a broken eardrum	☐	☐
Do you *currently* have any of the following hearing problems?		
Difficulty hearing	☐	☐
Wear a hearing aid	☐	☐
Any other hearing or ear problem	☐	☐
Have you *ever had* a back injury?	☐	☐
Do you *currently* have any of the following musculoskeletal problems?		
Weakness in any of your arms, hands, legs, or feet	☐	☐
Back pain	☐	☐
Difficulty fully moving your arms and legs	☐	☐
Pain and stiffness when you lean forward or backward at the waist	☐	☐

	YES	NO
Difficulty fully moving your head up or down	☐	☐
Difficulty fully moving your head side to side	☐	☐
Difficulty bending at your knees	☐	☐
Difficulty squatting to the ground	☐	☐
Climbing a flight of stairs or a ladder carrying more than 25 lbs.	☐	☐
Any other muscle or skeletal problem that interferes with using a respirator	☐	☐

Part B. Any of the following questions, and other questions not listed, may be added to the questionnaire at the discretion of the healthcare professional who will review the questionnaire.

	YES	NO
In your present job, are you working at high altitudes (over 5,000 feet) or in a place that has lower than normal amounts of oxygen?	☐	☐
If "yes," do you have feelings of dizziness, shortness of breath, pounding in your chest, or other symptoms when you're working under these conditions?	☐	☐
At work or at home, have you ever been exposed to hazardous solvents, hazardous airborne chemicals (e.g., gases, fumes, or dust), or have you come into skin contact with hazardous chemicals?	☐	☐
If "yes," name the chemical(s) if you know them:_____ _____		
Have you ever worked with any of the materials, or under any of the conditions, listed below?		
Asbestos	☐	☐
Silica (e.g., in sandblasting)	☐	☐
Tungsten/cobalt (e.g., grinding or welding this material)	☐	☐
Beryllium	☐	☐
Aluminum	☐	☐
Coal (for example, mining)	☐	☐
Iron	☐	☐
Tin	☐	☐
Dusty environments	☐	☐
Any other hazardous exposures If "yes," describe these exposures: _____	☐	☐
List any second jobs or side businesses you have: _____	☐	☐

	YES	NO
List your previous occupations:	☐	☐
List your current and previous hobbies:	☐	☐
Have you been in the military services? If "yes," were you exposed to biological or chemical agents (either in training or combat)	☐	☐
Have you ever worked on a HAZMAT team?	☐	☐
Other than medications for breathing and lung problems, heart trouble, blood pressure, and seizures mentioned earlier in this questionnaire, are you taking any other medications for any reason (including over-the-counter medications)? If "yes," name the medications if you know them: _____	☐	☐
Will you be using any of the following items with your respirator(s)?		
HEPA Filters	☐	☐
Canisters (for example, gas masks)	☐	☐
Cartridges	☐	☐
How often are you expected to use the respirator(s) (circle "yes" or "no" for all answers that apply to you)?		
Escape only (no rescue)	☐	☐
Emergency rescue only	☐	☐
Less than 5 hours per week	☐	☐
Less than 2 hours per day	☐	☐
2 to 4 hours per day	☐	☐
Over 4 hours per day	☐	☐
During the period you are using the respirator(s), is your work effort:		
Light (less than 200 kcal per hour) If "yes," how long does this period last during the average shift: ___ hrs. ___ mins.	☐	☐
Examples of a light work effort are sitting while writing, typing, drafting, or performing light assembly work; or standing while operating a drill press (1-3 lbs.) or controlling machines:		
Moderate (200 to 350 kcal per hour) If "yes," how long does this period last during the average shift: ___ hrs. ___ mins.	☐	☐

YES NO

Examples of moderate work effort are sitting while nailing or filing; driving a truck or bus in urban traffic; standing while drilling, nailing, performing assembly work, or transferring a moderate load (about 35 lbs.) at trunk level; walking on a level surface about 2 mph or down a 5- degree grade about 3 mph; or pushing a wheelbarrow with a heavy load (about 100 lbs.) on a level surface.

Heavy (above 350 kcal per hour)
If "yes," how long does this period last during the average shift: ___ hrs. ___ mins. ☐ ☐

Examples of heavy work are lifting a heavy load (about 50 lbs.) from the floor to your waist or shoulder; working on a loading dock; shoveling; standing while bricklaying or chipping castings; walking up an 8-degree grade about 2 mph; climbing stairs with a heavy load (about 50 lbs.).

Will you be wearing protective clothing and/or equipment (other than the respirator) when you're using the respirator? ☐ ☐
If "yes," describe this protective clothing and/or equipment:

Will you be working under hot conditions (temperature exceeding 77 deg. F)? ☐ ☐

Will you be working under humid conditions? ☐ ☐

16. Describe the work you'll be doing while you're using your respirator(s):

17. Describe any special or hazardous conditions you might encounter when you're using your respirator(s) (for example, confined spaces, life-threatening gases):

18. Provide the following information, if you know it, for each toxic substance that you'll be exposed to when you're using your respirator(s):

    Name of first toxic substance:

    Estimated maximum exposure level per shift:

    Duration of exposure per shift:

    Name of second toxic substance:

    Estimated maximum exposure level per shift:

    Duration of exposure per shift:

    Name of third toxic substance:

    Estimated maximum exposure level per shift:

    Duration of exposure per shift:

    The name of any other toxic substances that you'll be exposed to while using your respirator:

19. Describe any special responsibilities you'll have while using your respirator(s) that may affect the safety and well-being of others (for example, rescue, security):

Appendix D: Selected Fit Test Protocols

Fit Testing Procedures (Mandatory)

Part I. OSHA-Accepted Fit Test Protocols

A. Fit Testing Procedures--General Requirements.

The employer shall conduct fit testing using the following procedures. The requirements in this appendix apply to all OSHA-accepted fit test methods, both QLFT and QNFT.

1. The test subject shall be allowed to pick the most acceptable respirator from a sufficient number of respirator models and sizes so that the respirator is acceptable to, and correctly fits, the user.

2. Prior to the selection process, the test subject shall be shown how to put on a respirator, how it should be positioned on the face, how to set strap tension and how to determine an acceptable fit. A mirror shall be available to assist the subject in evaluating the fit and positioning of the respirator.

3. The test subject shall be informed that he/she is being asked to select the respirator that provides the most acceptable fit. Each respirator represents a different size and shape, and if fitted and used properly, will provide adequate protection.

4. The test subject shall be instructed to hold each chosen facepiece up to the face and eliminate those that obviously do not give an acceptable fit.

5. The more acceptable facepieces are noted in case the one selected proves unacceptable; the most comfortable mask is donned and worn at least five minutes to assess comfort. Assistance in assessing comfort can be given by discussing the points in the following item A.6. If the test subject is not familiar with using a particular respirator, the test subject shall be directed to don the mask several times and to adjust the straps each time to become adept at setting proper tension on the straps.

6. Assessment of comfort shall include a review of the following points with the test subject and allowing the test subject adequate time to determine the comfort of the respirator.

    a. Position of the mask on the nose
    b. Room for eye protection
    c. Room to talk
    d. Position of mask on face and cheeks

7. The following criteria shall be used to help determine the adequacy of the respirator fit:

    a. Chin properly placed;
    b. Adequate strap tension not overly tightened;
    c. Fit across nose bridge;
    d. Respirator of proper size to span distance from nose to chin;

e. Tendency of respirator to slip;
f. Self-observation in mirror to evaluate fit and respirator position.

8. The test subject shall conduct a user seal check, either the negative and positive pressure seal checks described in Appendix B-1 or those recommended by the respirator manufacturer which provide equivalent protection to the procedures in Appendix B-1. Before conducting the negative and positive pressure checks, the subject shall be told to seat the mask on the face by moving the head from side-to-side and up and down slowly while taking in a few slow deep breaths. Another facepiece shall be selected and retested if the test subject fails the user seal check tests.

9. The test shall not be conducted if there is any hair growth between the skin and the facepiece sealing surface, such as stubble beard growth, beard, mustache or sideburns which cross the respirator sealing surface. Any type of apparel which interferes with a satisfactory fit shall be altered or removed.

10. If a test subject exhibits difficulty in breathing during the tests, she or he shall be referred to a physician or other licensed health care professional, as appropriate, to determine whether the test subject can wear a respirator while performing her or his duties.

11. If the employee finds the fit of the respirator unacceptable, the test subject shall be given the opportunity to select a different respirator and to be retested.

12. Exercise regimen. Prior to the commencement of the fit test, the test subject shall be given a description of the fit test and the test subject's responsibilities during the test procedure. The description of the process shall include a description of the test exercises that the subject will be performing. The respirator to be tested shall be worn for at least 5 minutes before the start of the fit test.

13. The fit test shall be performed while the test subject is wearing any applicable safety equipment that may be worn during actual respirator use which would interfere with respirator fit.

14. Test Exercises.

    a. Employers must perform the following test exercises for all fit testing methods prescribed in this appendix, except for the CNP quantitative fit testing protocol and the CNP REDON quantitative fit testing protocol. For these two protocols, employers must ensure that the test subjects (i.e., employees) perform the exercise procedure specified in Part I.C.4(b) of this appendix for the CNP quantitative fit testing protocol, or the exercise procedure described in Part I.C.(b) of this appendix for the CNP REDON quantitative fit-testing protocol. For the remaining fit testing methods, employers must ensure that employees perform the test exercises in the appropriate test environment in the following manner:

        1) Normal breathing. In a normal standing position, without talking, the subject shall breathe normally.
        2) Deep breathing. In a normal standing position, the subject shall breathe slowly and deeply, taking caution so as not to hyperventilate.

3) Turning head side to side. Standing in place, the subject shall slowly turn his/her head from side to side between the extreme positions on each side. The head shall be held at each extreme momentarily so the subject can inhale at each side.

4) Moving head up and down. Standing in place, the subject shall slowly move his/her head up and down. The subject shall be instructed to inhale in the up position (i.e., when looking toward the ceiling).

5) Talking. The subject shall talk out loud slowly and loud enough so as to be heard clearly by the test conductor. The subject can read from a prepared text such as the Rainbow Passage, count backward from 100, or recite a memorized poem or song.

Rainbow Passage

When the sunlight strikes raindrops in the air, they act like a prism and form a rainbow. The rainbow is a division of white light into many beautiful colors. These take the shape of a long round arch, with its path high above, and its two ends apparently beyond the horizon. There is, according to legend, a boiling pot of gold at one end. People look, but no one ever finds it. When a man looks for something beyond reach, his friends say he is looking for the pot of gold at the end of the rainbow.

6) Grimace. The test subject shall grimace by smiling or frowning. (This applies only to QNFT testing; it is not performed for QLFT.)

7) Bending over. The test subject shall bend at the waist as if he/she were to touch his/her toes. Jogging in place shall be substituted for this exercise in those test environments such as shroud type QNFT or QLFT units that do not permit bending over at the waist.

8) Normal breathing. Same as exercise (1).

b. Each test exercise shall be performed for one minute except for the grimace exercise which shall be performed for 15 seconds. The test subject shall be questioned by the test conductor regarding the comfort of the respirator upon completion of the protocol. If it has become unacceptable, another model of respirator shall be tried. The respirator shall not be adjusted once the fit test exercises begin. Any adjustment voids the test, and the fit test must be repeated.

B. Qualitative Fit Test (QLFT) Protocols

1. General

a. The employer shall ensure that persons administering QLFT are able to prepare test solutions, calibrate equipment and perform tests properly, recognize invalid tests, and ensure that test equipment is in proper working order.

b. The employer shall ensure that QLFT equipment is kept clean and well maintained so as to operate within the parameters for which it was designed.

2. Saccharin Solution Aerosol Protocol

The entire screening and testing procedure shall be explained to the test subject prior to conducting the screening test.

a. Taste threshold screening. The saccharin taste threshold screening, performed without wearing a respirator, is intended to determine whether the respirator user being tested can detect the taste of saccharin.

1) During threshold screening as well as during fit testing, subjects shall wear an enclosure about the head and shoulders that is approximately 12 inches in diameter by 14 inches tall with at least the front portion clear and that allows free movements of the head when a respirator is worn. An enclosure substantially similar to the 3M hood assembly, parts # FT 14 and # FT 15 combined, is adequate.

2) The test enclosure shall have a 3/4-inch (1.9 cm) hole in front of the test subject's nose and mouth area to accommodate the nebulizer nozzle.

3) The test subject shall don the test enclosure. Throughout the threshold screening test, the test subject shall breathe through his/her slightly open mouth with tongue extended. The subject is instructed to report when he/she detects a sweet taste.

4) Using a DeVilbiss Model 40 Inhalation Medication Nebulizer or equivalent, the test conductor shall spray the threshold check solution into the enclosure. The nozzle is directed away from the nose and mouth of the person. This nebulizer shall be clearly marked to distinguish it from the fit test solution nebulizer.

5) The threshold check solution is prepared by dissolving 0.83 gram of sodium saccharin USP in 100 ml of warm water. It can be prepared by putting 1 ml of the fit test solution (see (b)(5) below) in 100 ml of distilled water.

6) To produce the aerosol, the nebulizer bulb is firmly squeezed so that it collapses completely, then released and allowed to fully expand.

7) Ten squeezes are repeated rapidly and then the test subject is asked whether the saccharin can be tasted. If the test subject reports tasting the sweet taste during the ten squeezes, the screening test is completed. The taste threshold is noted as ten regardless of the number of squeezes actually completed.

8) If the first response is negative, ten more squeezes are repeated rapidly and the test subject is again asked whether the saccharin is tasted. If the test subject reports tasting the sweet taste during the second ten squeezes, the screening test is completed. The taste threshold is noted as twenty regardless of the number of squeezes actually completed.

9) If the second response is negative, ten more squeezes are repeated rapidly and the test subject is again asked whether the saccharin is tasted. If the test subject reports tasting

the sweet taste during the third set of ten squeezes, the screening test is completed. The taste threshold is noted as thirty regardless of the number of squeezes actually completed.

10) The test conductor will take note of the number of squeezes required to solicit a taste response.

11) If the saccharin is not tasted after 30 squeezes (step 10), the test subject is unable to taste saccharin and may not perform the saccharin fit test.

Note to subsection 3. (a): If the test subject eats or drinks something sweet before the screening test, he/she may be unable to taste the weak saccharin solution.

12) If a taste response is elicited, the test subject shall be asked to take note of the taste for reference in the fit test.

13) Correct use of the nebulizer means that approximately 1 ml of liquid is used at a time in the nebulizer body.

14) The nebulizer shall get thoroughly rinsed in water, shaken dry, and refilled at least each morning and afternoon or at least every four hours.

b. Saccharin solution aerosol fit test procedure.

1) The test subject may not eat, drink (except for plain water), smoke, or chew gum for 15 minutes before the test.

2) The fit test uses the same enclosure described in 3.(a) above.

3) The test subject shall don the enclosure while wearing the respirator selected in section I.A. of this appendix. The respirator shall be properly adjusted and equipped with a particulate filter(s).

4) A second DeVilbiss Model 40 Inhalation Medication Nebulizer or equivalent is used to spray the fit test solution into the enclosure. This nebulizer shall be clearly marked to distinguish it from the screening test solution nebulizer.

5) The fit test solution is prepared by adding 83 grams of sodium saccharin to 100 ml of warm water.

6) As before, the test subject shall breathe through the slightly open mouth with tongue extended, and report if he/she tastes the sweet taste of saccharin.

7) The nebulizer is inserted into the hole in the front of the enclosure and an initial concentration of saccharin fit test solution is sprayed into the enclosure using the same number of squeezes (either 10, 20 or 30 squeezes) based on the number of

squeezes required to elicit a taste response as noted during the screening test. A minimum of 10 squeezes is required.

8) After generating the aerosol, the test subject shall be instructed to perform the exercises in section I.A.14. of this appendix.

9) Every 30 seconds the aerosol concentration shall be replenished using one half the original number of squeezes used initially (e.g., 5, 10, or 15).

10) The test subject shall indicate to the test conductor if at any time during the fit test the taste of saccharin is detected. If the test subject does not report tasting the saccharin, the test is passed.

11) If the taste of saccharin is detected, the fit is deemed unsatisfactory and the test is failed. A different respirator shall be tried and the entire test procedure is repeated (taste threshold screening and fit testing).

12) Since the nebulizer has a tendency to clog during use, the test operator must make periodic checks of the nebulizer to ensure that it is not clogged. If clogging is found at the end of the test session, the test is invalid.

3. Bitrex® (Denatonium Benzoate) Solution Aerosol Qualitative Fit Test Protocol

The Bitrex® (Denatonium benzoate) solution aerosol QLFT protocol uses the published saccharin test protocol because that protocol is widely accepted. Bitrex® is routinely used as a taste aversion agent in household liquids which children should not be drinking and is endorsed by the American Medical Association, the National Safety Council, and the American Association of Poison Control Centers. The entire screening and testing procedure shall be explained to the test subject prior to the conduct of the screening test.

a. Taste Threshold Screening.

The Bitrex® taste threshold screening, performed without wearing a respirator, is intended to determine whether the respirator user being tested can detect the taste of Bitrex.

1) During threshold screening as well as during fit testing, subjects shall wear an enclosure about the head and shoulders that is approximately 12 inches (30.5 cm) in diameter by 14 inches (35.6 cm) tall. The front portion of the enclosure shall be clear from the respirator and allow free movement of the head when a respirator is worn. An enclosure substantially similar to the 3M hood assembly, parts #14 and #15 combined, is adequate.

2) The test enclosure shall have a 3/4 inch (1.9 cm) hole in front of the test subject's nose and mouth area to accommodate the nebulizer nozzle.

3) The test subject shall don the test enclosure. Throughout the threshold screening test, the test subject shall breathe through his or her slightly open mouth with tongue extended. The subject is instructed to report when he/she detects a bitter taste.

4) Using a DeVilbiss Model 40 Inhalation Medication Nebulizer or equivalent, the test conductor shall spray the Threshold Check Solution into the enclosure. This nebulizer shall be clearly marked to distinguish it from the fit test solution nebulizer.

5) The Threshold Check Solution is prepared by adding 13.5 milligrams of Bitrex® to 100 ml of 5% salt (NaCl) solution in distilled water.

6) To produce the aerosol, the nebulizer bulb is firmly squeezed so that the bulb collapses completely, and is then released and allowed to fully expand.

7) An initial ten squeezes are repeated rapidly and then the test subject is asked whether the Bitrex® can be tasted. If the test subject reports tasting the bitter taste during the ten squeezes, the screening test is completed. The taste threshold is noted as ten regardless of the number of squeezes actually completed.

8) If the first response is negative, ten more squeezes are repeated rapidly and the test subject is again asked whether the Bitrex® is tasted. If the test subject reports tasting the bitter taste during the second ten squeezes, the screening test is completed. The taste threshold is noted as twenty regardless of the number of squeezes actually completed.

9) If the second response is negative, ten more squeezes are repeated rapidly and the test subject is again asked whether the Bitrex® is tasted. If the test subject reports tasting the bitter taste during the third set of ten squeezes, the screening test is completed. The taste threshold is noted as thirty regardless of the number of squeezes actually completed.

10) The test conductor will take note of the number of squeezes required to solicit a taste response.

11) If the Bitrex® is not tasted after 30 squeezes (step 10), the test subject is unable to taste Bitrex® and may not perform the Bitrex® fit test.

12) If a taste response is elicited, the test subject shall be asked to take note of the taste for reference in the fit test.

13) Correct use of the nebulizer means that approximately 1 ml of liquid is used at a time in the nebulizer body.

14) The nebulizer shall be thoroughly rinsed in water, shaken to dry, and refilled at least each morning and afternoon or at least every four hours.

b. Bitrex® Solution Aerosol Fit Test Procedure.

1) The test subject may not eat, drink (except plain water), smoke, or chew gum for 15 minutes before the test.

2) The fit test uses the same enclosure as that described in 4.(a) above.

3) The test subject shall don the enclosure while wearing the respirator selected according to section I.A. of this appendix. The respirator shall be properly adjusted and equipped with any type particulate filter(s).

4) A second DeVilbiss Model 40 Inhalation Medication Nebulizer or equivalent is used to spray the fit test solution into the enclosure. This nebulizer shall be clearly marked to distinguish it from the screening test solution nebulizer.

5) The fit test solution is prepared by adding 337.5 mg of Bitrex® to 200 ml of a 5% salt (NaCl) solution in warm water.

6) As before, the test subject shall breathe through his or her slightly open mouth with tongue extended, and be instructed to report if he/she tastes the bitter taste of Bitrex.

7) The nebulizer is inserted into the hole in the front of the enclosure and an initial concentration of the fit test solution is sprayed into the enclosure using the same number of squeezes (either 10, 20 or 30 squeezes) based on the number of squeezes required to elicit a taste response as noted during the screening test.

8) After generating the aerosol, the test subject shall be instructed to perform the exercises in section I.A.14. of this appendix.

9) Every 30 seconds the aerosol concentration shall be replenished using one half the number of squeezes used initially (e.g., 5, 10 or 15).

10) The test subject shall indicate to the test conductor if at any time during the fit test the taste of Bitrex® is detected. If the test subject does not report tasting the Bitrex, the test is passed.

11) If the taste of Bitrex® is detected, the fit is deemed unsatisfactory and the test is failed. A different respirator shall be tried and the entire test procedure is repeated (taste threshold screening and fit testing).

C. Quantitative Protocols (QNFT)

1. General

   a. The employer shall ensure that persons administering QNFT are able to calibrate equipment and perform tests properly, recognize invalid tests, calculate fit factors properly and ensure that test equipment is in proper working order.

   b. The employer shall ensure that QNFT equipment is kept clean, and is maintained and calibrated according to the manufacturer's instructions so as to operate at the parameters for which it was designed.

2. Ambient Aerosol Condensation Nuclei Counter (CNC) Quantitative Fit Testing Protocol

a. Portacount® Fit Test Requirements

1) Check the respirator to make sure the sampling probe and line are properly attached to the facepiece and that the respirator is fitted with a particulate filter capable of preventing significant penetration by the ambient particles used for the fit test (e.g., NIOSH 42 CFR 84 series 100, series 99, or series 95 particulate filter) as per the manufacturer's instruction.

2) Instruct the person to be tested to don the respirator for five minutes before the fit test starts. This purges the ambient particles trapped inside the respirator and permits the wearer to make certain the respirator is comfortable. This respirator user shall already have been trained on how to wear the respirator properly.

3) Check the following conditions for the adequacy of the respirator fit: Chin properly placed; Adequate strap tension, not overly tightened; Fit across nose bridge; Respirator of proper size to span distance from nose to chin; Tendency of the respirator to slip; Self-observation in a mirror to evaluate fit and respirator position.

4) Have the person wearing the respirator do a user seal check. If leakage is detected, determine the cause. If leakage is from a poorly fitting facepiece, try another size of the same model respirator, or another model of respirator.

5) Follow the manufacturer's instructions for operating the Portacount® and proceed with the test.

6) The test subject shall be instructed to perform the exercises in section I. A. 14. of this appendix.

7) After the test exercises, the test subject shall be questioned by the test conductor regarding the comfort of the respirator upon completion of the protocol. If it has become unacceptable, another model of respirator shall be tried.

b. Portacount® Test Instrument

1) The Portacount® will automatically stop and calculate the overall fit factor for the entire set of exercises. The overall fit factor is what counts. The Pass or Fail message will indicate whether or not the test was successful. If the test was a Pass, the fit test is over.

2) Since the pass or fail criterion of the Portacount® is user programmable, the test operator shall ensure that the pass or fail criterion meet the requirements for minimum respirator performance in this Appendix.

3) A record of the test needs to be kept on file, assuming the fit test was successful. The record must contain the test subject's name; overall fit factor; make, model, style, and size of respirator used; and date tested.

3. Controlled Negative Pressure (CNP) Quantitative Fit Test Protocol - (omitted - not used)

4. Controlled Negative Pressure (CNP) REDON Quantitative Fit Testing Protocol - (omitted - not used)

Appendix D to Sec. 1910.134: (Mandatory) Information for Employees Using Respirators When Not Required Under the Standard

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Respirators are an effective method of protection against designated hazards when properly selected and worn. Respirator use is encouraged even when exposures are below the exposure limit, to provide an additional level of comfort and protection for workers. However, if a respirator is used improperly or not kept clean, the respirator itself can become a hazard to the worker. Sometimes, workers may wear respirators to avoid exposures to hazards, even if the amount of hazardous substance does not exceed the limits set by OSHA standards. If your employer provides respirators for your voluntary use, or if you provide your own respirator, you need to take certain precautions to be sure that the respirator itself does not present a hazard.

You should do the following:

1. Read and heed all instructions provided by the manufacturer on use, maintenance, cleaning and care, and warnings regarding the respirator's limitations.

2. Choose respirators certified for use to protect against the contaminant of concern. NIOSH, the National Institute for Occupational Safety and Health of the U.S. Department of Health and Human Services, certifies respirators. A label or statement of certification should appear on the respirator or respirator packaging. It will tell you what the respirator is designed for and how much it will protect you.

3. Do not wear your respirator into atmospheres containing contaminants for which your respirator is not designated to protect against. For example, a respirator designed to filter dust particles will not protect you against gases, vapors or very small solid particles of fumes or smoke.

4. Keep track of your respirator so that you do not mistakenly use someone else's respirator.

Appendix E: User Seal Check Procedures

User Seal Check Procedures (Mandatory)

The respirator user who uses a tight-fitting respirator is to perform a user seal check to ensure that an adequate seal is achieved each time the respirator is put on. Either the positive and negative pressure checks listed in this appendix or the respirator manufacturer's recommended user seal check method shall be used. User seal checks are not substitutes for qualitative or quantitative fit tests.

I. Facepiece Positive and/or Negative Pressure Checks.

A. *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 most respirators, this method of leak testing requires the wearer to first remove the exhalation valve cover before closing off the exhalation valve and then carefully replacing it after the test.

B. *Negative pressure check.* Close off the inlet opening of the canister or cartridge(s) by covering with the palm of the hand(s) or by replacing the filter seal(s), inhale gently so that the facepiece collapses slightly, and hold the breath for ten seconds. The design of the inlet opening of some cartridges cannot be effectively covered with the palm of the hand. The test can be performed by covering the inlet opening of the cartridge with a thin latex or nitrile glove. If the facepiece remains in its slightly collapsed condition and no inward leakage of air is detected, the tightness of the respirator is considered satisfactor*y.*

II. Manufacturer's Recommended User Seal Check Procedures.

The respirator manufacturer's recommended procedures for performing a user seal check may be used instead of the positive and/or negative pressure check procedures provided that the employer demonstrates that the manufacturer's procedures are equally effective.

Appendix F: Respirator Cleaning Procedures

Respirator Cleaning Procedures (Mandatory)

These procedures are provided for employer use when cleaning respirators. They are general in nature, and the employer as an alternative may use the cleaning recommendations provided by the manufacturer of the respirators used by their employees, provided such procedures are as effective as those listed herein Appendix B-2. Equivalent effectiveness simply means that the procedures used must accomplish the objectives set forth in Appendix B-2, i.e., must ensure that the respirator is properly cleaned and disinfected in a manner that prevents damage to the respirator and does not cause harm to the user.

I. Procedures for Cleaning Respirators.

A. Remove filters, cartridges, or canisters. Disassemble facepieces by removing speaking diaphragms, demand and pressure-demand valve assemblies, hoses, or any components recommended by the manufacturer. Discard or repair any defective parts.

B. Wash components in warm (43 deg. C [110 deg. F] maximum) water with a mild detergent or with a cleaner recommended by the manufacturer. A stiff bristle (not wire) brush may be used to facilitate the removal of dirt.

C. Rinse components thoroughly in clean, warm (43 deg. C [110 deg. F] maximum), preferably running water. Drain.

D. When the cleaner used does not contain a disinfecting agent, respirator components should be immersed for two minutes in one of the following:

1. Hypochlorite solution (50 ppm of chlorine) made by adding approximately one milliliter of laundry bleach to one liter of water at 43 deg. C (110 deg. F); or,

2. Aqueous solution of iodine (50 ppm iodine) made by adding approximately 0.8 milliliters of tincture of iodine (6-8 grams ammonium and/or potassium iodide/100 cc of 45% alcohol) to one liter of water at 43 deg. C (110 deg. F); or,

3. Other commercially available cleansers of equivalent disinfectant quality when used as directed, if their use is recommended or approved by the respirator manufacturer.

E. Rinse components thoroughly in clean, warm (43 deg. C [110 deg. F] maximum), preferably running water. Drain. The importance of thorough rinsing cannot be overemphasized. Detergents or disinfectants that dry on facepieces may result in dermatitis. In addition, some disinfectants may cause deterioration of rubber or corrosion of metal parts if not completely removed.

F. Components should be hand-dried with a clean lint-free cloth or air-dried.

G. Reassemble facepiece, replacing filters, cartridges, and canisters where necessary.

H. Test the respirator to ensure that all components work properly.