University of Rochester Respirator Training
Training Objectives

- Why the respirator is necessary, how improper use, fit or maintenance can compromise the protective effect
- Limitations and capabilities of the respirator
- Use in emergency situations
- Inspection, putting on and use of the respirator and seal checks
- Maintenance and storage
- Symptoms of a malfunctioning respirator
- General requirements of use
Why Respiratory Protection Is Necessary

- Air contaminants/hazardous atmospheres come from a variety of sources:
  - Dusts
  - Aerosols/mists
  - Metal fumes
  - Vapors
  - Gases
  - Biological agents
  - Oxygen-deficient atmospheres
Control of Respiratory Hazards

- The primary means to control respiratory hazards is through the use of control measures such as ventilation, enclosures, isolation, substitution of less toxic materials, or work practice modifications.
Control of Respiratory Hazards

- When effective control measures are not feasible, or while they are being instituted, appropriate respirators must be used.
What is a Respirator?

- Respirators are devices that protect workers from inhaling harmful substances.
- These substances can be in the form of airborne vapors, gases, dust, fogs, fumes, mists, smoke, spray.
- Some respirators also ensure that workers do not breathe air that contains dangerously low levels of oxygen (O2) or other Immediately Dangerous to Life or Health (IDLH) conditions.
- University employees are not allowed to work in IDLH atmospheres.
What is a Respirator?

- Is a filtering facepiece a respirator?
  - Yes, it’s designed to protect the wearer

- How about a one-strap mask?
  - Yes, it's a respirator, but it’s an unapproved respirator; therefore not allowed here.

- What about a surgical mask?
  - No, it’s designed to protect the patient.
Two Classes of Respirators

1) *Air-purifying respirators* - respirators with an air-purifying filter, cartridge, or canister that remove specific air contaminants such as dusts, fumes, mists, vapors, or fibers by passing ambient air through an air-purifying element.

2) *Atmosphere-supplying respirators* - provide clean breathing air from an uncontaminated source (SCBA).
Air Purifying Respirators (Particulate)

- Tight-fitting respirator
- Negative pressure
- Only for use against particles
- One of most common types used
- No facial hair or any interferences with the sealing surface is allowed
- Fit testing is required (for both + and - pressure tight fitting coverings)
Air Purifying Respirators
Filter or Cartridge Depends on Contaminant

- Tight-fitting respirator
- Negative pressure
- No facial hair or any interferences with the sealing surface is allowed
- Fit testing is required (for both + and - pressure tight fitting coverings)
Powered Air-Purifying Respirator (PAPR)

- An air-purifying respirator that uses a blower to force the ambient air through air-purifying elements to the respirator
- Can be loose fitting or tight fitting
- Always positive pressure
Classes of Particulate Filters

- Three series of filters and each has three levels of efficiency

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N for Not resistant to oil
R for Resistant to oil
P for oil Proof
Cartridge

- Different use than filters
  - Chemicals, solvents, etc.

- Color coding system indicates contaminants that cartridges will filter
  - e.g. yellow = organic vapors
  - green = ammonia
Cartridge Changeout

Factors Affecting Cartridge Service Life

- chemical concentration
- work rate
- temperature
- humidity

- Must have an End of
  Service Life Indicator or a change schedule
All Filters, Cartridges

- Used in the workplace are labeled
- Are color coded with the NIOSH approval label
- The label is not to be removed and remains legible
Selection of Respirators

Must select and provide an appropriate respirator based on the respiratory hazards to which the worker is exposed and workplace and user factors that affect respirator performance and reliability.

All respirators used at U of R must be NIOSH approved.
Selecting the Correct Respirator

Assess the hazard(s) posed by the environment in which you will be working.

1) What type of contaminant is present?
2) What is the form of the contaminant?
3) How toxic is the contaminant?
4) What is the concentration of the contaminant?

If unable to answer, work with your supervisor or EH&S for answers to these questions.
Usual Types of Air Purifying Respirator

- Half mask/Dust mask
- Full facepiece (Elastomeric)
Powered Air Purifying Respirator

Loose-Fitting Powered Air-Purifying Respirator (PAPR)

Hood Powered Air-Purifying Respirator (PAPR)
Medical Evaluation

- Using a respirator may place a physiological burden on employees that varies with the type of respirator worn, the job and workplace conditions in which the respirator is used, and the medical status of the employee.

- Medical questionnaire and examinations shall be administered confidentially.
Medical Evaluations

- Must be provided before fit testing and before an employee is required to use a respirator

- Must be performed by a physician or licensed health care professional (PLHCP) using a medical questionnaire (from Appendix C of standard) or initial medical screening that obtains the same information

- Follow-up exam provided if necessary, based on employee’s initial evaluation
Additional Medical Evaluations if:

- Employee reports medical problems related to respirator use
- PLHCP, supervisor, or program administrator indicates need for reevaluation
- Observations during fit testing, program evaluation, etc. indicate need
- Change in workplace conditions result in increase in physiologic burden
Fit Testing

- Must be fit tested before any use of a negative or positive pressure tight-fitting facepiece
- With the same make, model, style, and size of respirator that will be used
- Whenever a different respirator facepiece (size, style, model or make) is used
- At least annually thereafter
- Whenever changes in the employee’s physical condition that could affect respirator fit
  - e.g. facial scarring, dental changes, cosmetic surgery, or an obvious change in body weight.
In Summary

- Fit Tests must be performed:

  1) Prior to initial use
  2) Whenever a different facepiece is used
  3) Annually
  4) When changes in an employee’s physical condition occur
  5) Employee indicates that fit is poor
Medical Evaluation and Clearance

- Must be achieved before using any respirator, including voluntary use

Respirator Fit Testing

Applies to Tight-fitting Facepieces, your fit test will be based on the type of respirator used

Before using any respirator be sure to perform a positive and negative user seal check
Respirator Facepiece Seal

- Shall prohibit facial hair that comes between the sealing surface of the facepiece and the face or that interferes with valve function.

- Shall prohibit any other condition that interferes with the face-to-facepiece seal or valve function.

- Shall ensure that corrective glasses or goggles or other personal protective equipment is worn in a manner that does not interfere with the seal of the facepiece to the face of the user.
User Seal Check

- A user seal check must be performed each time the user puts on the respirator.

- The purpose of the user seal check is to subjectively assure that there is an adequate seal of the facepiece to the face of the wearer.
User Seal Checks

Positive Pressure User Seal Check

Negative Pressure User Seal Check
Donning the N95 Respirator

1. With one hand, hold the respirator to your face

2. While holding the respirator in place, slip the head harness over your head

3. Adjust and tighten the head harness straps until the respirator fits snugly to your face, tighten the straps from the bottom up
Performing User Seal Checks

- Perform a user seal check before each wearing
- Have clean hands
- Always follow manufacturer’s instructions
- A respirator that does not fit properly, is not used correctly or is poorly maintained can leak and expose you to contaminants
Important Facts About Air Purifying Respirators

- A respirator that is improperly used or maintained, or that does not fit correctly may leak, resulting in exposure to contaminants.

- Air purifying respirators (APRs) cannot be used in oxygen-deficient atmospheres (less than 19.5% oxygen), for substances having poor warning properties, or in any atmospheres that are Immediately Dangerous to Life or Health (IDLH).
Symptoms of a Malfunctioning Respirator

You must monitor your respirator. You will know your respirator is not working properly if:

- you can smell or taste the contaminant
- breathing becomes difficult
- you become dizzy or feel sick
- the manufacturer’s recommended service life of the filters or cartridges expires
- the respirator is damaged
Respirator Maintenance and Care

- Maintain in sanitary condition
- Store to prevent damage or contamination from dust, sunlight, extreme temperatures, excessive moisture, and damaging chemicals
- Packed or stored to prevent deformation of the facepiece and exhalation valve
- Inspect before use, after use, and during cleaning
- Make no repairs on your own
Inspect The Respirator Before Each Use

- Ensure that no holes or tears are present.
- Inspect for cracked, scratched or loose-fitting lenses. For a full facepiece respirator, check for missing mounting clips.
- Ensure that the metal nose clip forms easily over the bridge of the nose on disposable respirators.
- Check webbing/strap/harness for breaks.
- Look for deterioration of elasticity.
- Test excessively worn head harness.
- Ensure the valve and valve seats are free of dust particles or dirt that may cause a poor seal or reduce efficiency.
Inspect The Respirator Before Each Use

- Look for missing or defective valve covers.
- Ensure that the filter and mask are certified for use together.
- Check the filter to see that they are approved for the hazard.
- Inspect both the filter threads and facepiece threads for wear.
- Check the filter housing for cracks or dents.
- Check the end of service life indicator for gas masks.
- Check the expiration date
Inspect Before Use and Clean Your Respirator After You Use It

- After using your respirator, you should clean and inspect it. As you clean, be sure to look for:
  - Cracks or chips in the face plate
  - Cracks or holes in the breathing tube or airlines
  - Worn or frayed straps
  - Worn or damaged fittings
  - Bent or corroded buckles
  - Improperly seated valves
Storing Respirators

- Store your respirator in a clean, sealable container (e.g. plastic bag) away from:
  - Dust
  - Sunlight
  - Heat
  - Extreme cold
  - Moisture
  - Damaging Chemicals
Emergency Use

- If the respirator becomes damaged, malfunctions, or you detect signs of exposure, you must leave the area immediately.
- In the event of an emergency, leave the area immediately. Do not remove your mask until you are in an area that is free of contamination.
- Any respirators maintained for use (e.g. SCBA) in emergency situations shall be inspected at least monthly.
- Shall be checked for proper function before and after each use.
Do You Have Any Questions on These Issues?

- Why the respirator is necessary, how improper use, fit or maintenance can compromise the protective effect
- Limitations and capabilities of the respirator
- Use in emergency situations
- Inspection, putting on and use of the respirator and seal checks
- Maintenance and storage
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Any Questions??

Ask your provider

Call Environmental Health and Safety’s
Occupational Safety Unit

275-3241