WELCOME to

Science & Practices to Keep Workers Safe and Businesses Productive

as the COVID-19 Pandemic Changes

Session will start in less than 15 minutes

Please type your name, company, and email into chat box for attendance.
Face Coverings, Gloves, and Gowns: Science and Practice

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The Plan

- Public health goal and purpose
- Occupational hazard recognition and control
- Regulations and state orders
- Face coverings
- Gloves
- Gowns
- Resources
Public Health Goal: Break the Chain of Transmission

Coronavirus COVID-19
Transmission and infection

- Infected with coronavirus SARS-CoV-2
- Droplets containing virus in the air
- Droplets land in nose, mouth, possibly lungs
- Droplets fall on surfaces/objects
- On fingers from touching
- The droplets eventually get into nose and mouth

https://tinyurl.com/y7g7jmqv
Hazard Recognition and Occupational Risk

- Frequent, exposure to infected persons
- High potential for exposure
- Close contact with people without known infection
- Minimal contact with public or co-workers

https://www.osha.gov/SLTC/covid-19/hazardrecognition.html
Elimination
Physically remove the hazard

Substitution
Replace the hazard

Engineering Controls
Isolate workers from the hazard

Administrative Controls
Change the way work is performed

PPE
Protect the worker with personal protective equipment
PPE Decision Making

• Regulatory or state order requirement or recommendation?
• What is the occupational risk?
• Employer permits vs provides and requires?
• Choice of products
  • Protection and/or block transmission
  • Factors that influence compliance
Relevant OSHA Standards

• 29 CFR § 1910.132, General Requirements - Personal Protective Equipment.
  • 29 CFR § 1910.133, Eye and Face protection.
  • 29 CFR § 1910.138, Hand Protection
  • 29 CFR § 1910.145, Specification for Accident Prevention Signs and Tags.

• 29 CFR § 1910.1030, Blood Borne Pathogens

• CFR § 1910.1200 Hazard Communication

• Section 5(a)(1), **General Duty Clause** of the Occupational Safety and Health (OSH) Act of 1970

OSH Enforcement Policies For Coronavirus [https://content.govdelivery.com/accounts/USDOL/bulletins/28c71b5](https://content.govdelivery.com/accounts/USDOL/bulletins/28c71b5)

Dartmouth-Hitchcock
<table>
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<th>Jurisdiction</th>
<th>Requirement or Recommendation</th>
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| Federal            | Recommendations                | CDC: cloth face covering in public when unable to maintain social distance
OSHA: allow workers to wear masks                                                                                                           |
| Massachusetts      | Requirement                   | Customers and workers must wear face covering; may deny entry of refusers; some provisions vary by county                                    |
| New Hampshire      | Requirement                   | Retail, restaurant, golf course, and personal care services employees must wear cloth face coverings at all times                             |
|                    | Recommended                   | Other workers strongly recommended to wear when in close contact with others                                                                 |
| Vermont            | Requirement                   | Employers must require workers wear non-medical cloth face coverings when in presence of others. Retail cashiers may use sneeze guard      |

[https://tinyurl.com/yb8rtj2t](https://tinyurl.com/yb8rtj2t)
aerosols (<10 µm)
cough ($v_0=10$ m/s)
sneeze ($v_0=50$ m/s)
exhalation
large spray droplets (>0.1 mm)

1.5m >2m >6m

Huang at https://tinyurl.com/tyzjdth

Dartmouth-Hitchcock
Respirators

• Choice per CDC for high risk workers
  • NIOSH certified, N95 or better, disposable
  • Elastomeric, negative pressure, half or full mask
  • Powered Air Purifying
• Protect worker and others
• Short supply, reserve for Health Care Workers
OSHA Regulates Respirator Use

- OSHA 1910.134
  - Respiratory protection program
  - Fit testing
  - Management
- Regulatory relaxation of annual fit testing
Key Difference in N95s

Valved Respirator

Valved respirators protect the wearer from airborne hazardous contaminants

Unvalved Respirator

Unvalved respirators give the protection of both a respirator and a surgical mask

https://www.6thplanet.com/store/product/respirators_v.jpg
60% of Imported “Respirators” Fail to Protect

Other Face Coverings

Surgical masks

Cloth and other, non-medical masks
Efficacy of Other Face Coverings

• Primary Purpose
  • Prevent infected person from transmitting virus
  • *Surgical masks* vary by extent of fluid resistance: Level 1-3

• Secondary purpose
  • *Possible decrease wearer infection by catching droplets*
  • *Mixed evidence*
Homemade Mask Materials

Disposable surgical masks now on sale at NH liquor stores
Adding Elastic Nylon Overlayer Dramatically Increases Particle Capture

Comparative Analysis of N95 Against Reusable Face Masks

Filtration of particles \( \geq 1 \) micron is most important

Over 60 masks / materials were measured

“X” = avg. of six 2.5 minute cycles of testing

Note: Cotton masks are highly variable in filtration ability

NOTE: internal testing was performed with calibrated equipment with a standardized, but non-validated, process for a medical mask.

NOTE: the Mask the City mask is intended for community wear only. It is not a medical device.

https://www.nightingalesafe.com/
To Wear or Not to Wear: Face Coverings

**Pros**
- May be legally mandated
- Block transmission
  - User to others
  - Others to user?
- *May* reduce face touching
- Demonstrates seriousness

**Cons**
- Incorrect use *increases risk*
- False sense of security
- Uncertainty regarding personal protection
- Intolerance: Uncomfortable; interfere with communication, vision, safety; medical co-morbidity may require accommodation
- Psychosocial issues
Don’t: Wear your mask below your nose

Parker-Pope. How not to wear a mask. NYT. April 8, 2020
Don’t: Leave Your Chin Exposed

Parker-Pope. How NOT to wear a mask. NYT. April 8, 2020
Don’t: Wear your mask loosely with gaps in the sides
Don’t: Wear your mask so it covers just the tip of your nose

Parker-Pope. How NOT to wear a mask. NYT. April 8, 2020
Don’t: Push your mask under your chin to rest on your neck.
Do: Wear snugly over nose, mouth, and chin
# ACOEM Recommendations for Use of Cloth or Disposable Face Coverings in the Workplace During COVID-19

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[https://tinyurl.com/vbxur9z](https://tinyurl.com/vbxur9z)
Face Shield and Goggles

• **Goggles** protect eyes
  • From droplets, sprays and splashes
  • From fingers

• **Shields** protect face and eyes
  • From droplets, sprays splashes and
  • From fingers

• To protect respiratory system traditionally used with face covering/respirator
To Wear or Not Wear Face Shields

Pros

• Protection of eyes and face
• *May protect* upper respiratory tract – mixed evidence
• *Potential* accommodation for workers who can’t tolerate face coverings

Cons

• Limited supply
• Uncomfortable
• Can interfere with vision communication/safety
• Improper use/reuse and doffing/donning can increase infection risk
• Requires disinfection if reused

Perencivich. Moving PPE into the community. JAMA. 2020
To Wear or Not to Wear Gloves
(settings where gloves not usually required)

**Pros**
- Protect hands from contamination or contaminating
- *May* decrease likelihood of touching face

**Cons**
- False sense of security
- *Likely* to touch face with contaminated gloves
- Touch other people/surfaces with contaminated gloves
- Improper donning, doffing, disposal, storage, re-use contaminates self, others, and surfaces
Choice of Gloves - 1

• Non-sterile, disposable examination gloves meeting ASTM standards for health care workers
  • Nitrile, polypropylene, natural rubber tensile strength
• Chemical resistant gloves as PPE for workers per SDS label and OSHA standard
• Wash hands before donning and after doffing (Clean In/Clean Out)
• CDC provides contingency and crisis guidance for extended use and reuse
Choice of Gloves -2

- Non-health care uses to prevent virus transmission
  - CDC/OSHA call out specific job tasks when appropriate
  - Disposable, food grade vinyl gloves sufficient for low-medium risk
  - **BUT NOT** recommended for medium and low risk, hand washing preferred
Cleaning staff should wear disposable gloves and gowns for all tasks in the cleaning process, including handling trash.

Overalls, aprons, coveralls acceptable if laundered after use

PPE should be compatible with cleaning agents

SEQUENCE FOR PUTTING ON PERSONAL PROTECTIVE EQUIPMENT (PPE)

The type of PPE used will vary based on the level of precautions required, such as standard and contact, droplet or airborne infection isolation precautions. The procedure for putting on and removing PPE should be tailored to the specific type of PPE.

1. **GOWN**
   - Fully cover torso from neck to knees, arms to end of wrists, and wrap around the back
   - Fasten in back of neck and waist

2. **MASK OR RESPIRATOR**
   - Secure ties or elastic bands at middle of head and neck
   - Fit flexible band to nose bridge
   - Fit snug to face and below chin
   - Fit-check respirator

3. **GOGGLES OR FACE SHIELD**
   - Place over face and eyes and adjust to fit

4. **GLOVES**
   - Extend to cover wrist of isolation gown

USE SAFE WORK PRACTICES TO PROTECT YOURSELF AND LIMIT THE SPREAD OF CONTAMINATION

- Keep hands away from face
- Limit surfaces touched
- Change gloves when torn or heavily contaminated
- Perform hand hygiene
HOW TO SAFELY REMOVE PERSONAL PROTECTIVE EQUIPMENT (PPE)

EXAMPLE 2

Here is another way to safely remove PPE without contaminating your clothing, skin, or mucous membranes with potentially infectious materials. Remove all PPE before exiting the patient room except a respirator, if worn. Remove the respirator after leaving the patient room and closing the door. Remove PPE in the following sequence:

1. GOWN AND GLOVES
   - Gown front and sleeves and the outside of gloves are contaminated!
   - If your hands get contaminated during gown or glove removal, immediately wash your hands or use an alcohol-based hand sanitizer.
   - Grasp the gown in the front and pull away from your body so that the ties break, touching outside of gown only with gloved hands.
   - While removing the gown, fold or roll the gown inside-out into a bundle.
   - As you are removing the gown, peel off your gloves at the same time, only touching the inside of the gloves and gown with your bare hands. Place the gown and gloves into a waste container.

2. GOGGLES OR FACE SHIELD
   - Outside of goggles or face shield are contaminated!
   - If your hands get contaminated during goggle or face shield removal, immediately wash your hands or use an alcohol-based hand sanitizer.
   - Remove goggles or face shield from the back by lifting head band and without touching the front of the goggles or face shield.
   - If the item is reusable, place in designated receptacle for reprocessing. Otherwise, discard in a waste container.

3. MASK OR RESPIRATOR
   - Front of mask/respirator is contaminated — DO NOT TOUCH!
   - If your hands get contaminated during mask/respirator removal, immediately wash your hands or use an alcohol-based hand sanitizer.
   - Grasp bottom ties or elastics of the mask/respirator, then the ones at the top, and remove without touching the front.
   - Discard in a waste container.

4. WASH HANDS OR USE AN ALCOHOL-BASED HAND SANITIZER IMMEDIATELY AFTER REMOVING ALL PPE

PERFORM HAND HYGIENE BETWEEN STEPS IF HANDS BECOME CONTAMINATED AND IMMEDIATELY AFTER REMOVING ALL PPE
Conclusion

• Assess occupational risk
• Apply hierarchy of controls
• Comply with orders and regulations
• Face coverings/gloves/face shields, gowns least effective method to break chain of transmission
• Improper use of these materials increases risk!
Resources

• OSHA Regulation
  • Standards
    • https://www.osha.gov/SLTC/covid-19/standards.html
  • COVID-19 Interim Enforcement Response Plan
  • Regulatory relief

• Face covering state orders
  • https://tinyurl.com/yb8rtj2t

• ACOEM Recommendations Regarding Wearing Face Coverings in the workplace
  • https://tinyurl.com/vbxur9z

• Strategies for Optimizing Use of PPE