

PERSONAL PROTECTIVE EQUIPMENT (PPE)

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BEST OUTCOMES**
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**PROJECT
FIRSTLINE**

CDC'S National Training Collaborative
for Healthcare Infection Prevention & Control



Kentucky Public Health
Prevent. Promote. Protect.

PROJECT FIRSTLINE



Project Firstline is a national collaborative led by the U.S. Centers for Disease Control and Prevention (CDC) to provide infection control training and education to frontline healthcare workers and public health personnel. The Kentucky Infection Prevention Training Center is proud to partner with the Kentucky Department of Public Health and Project Firstline. Funding for the Kentucky Infection Prevention Training Center (KyIP) is provided through the Centers for Disease Control and Prevention (CDC) Epidemiology and Laboratory Capacity (ELC) Enhancing Detection grant supplement award to the Kentucky Department for Public Health (KDPH). CDC is an agency within the Department of Health and Human Services (HHS). The contents of this simulation skill packets do not necessarily represent the policies of CDC or HHS and should not be considered an endorsement by the Federal Government.

OBJECTIVES

At the end of the skill stations, participants will be able to:

- 1. **Identify** patient care situations where eye protection is appropriate
- 2. **Select** gown type appropriate for a variety of fluid exposures
- 3. **Identify** correct order of donning and doffing gown, gloves, eye protection/face shield, and respiratory protection
- 4. **Identify** when to clean your hands when donning and doffing personal protective equipment (PPE)

PRE-BRIEF

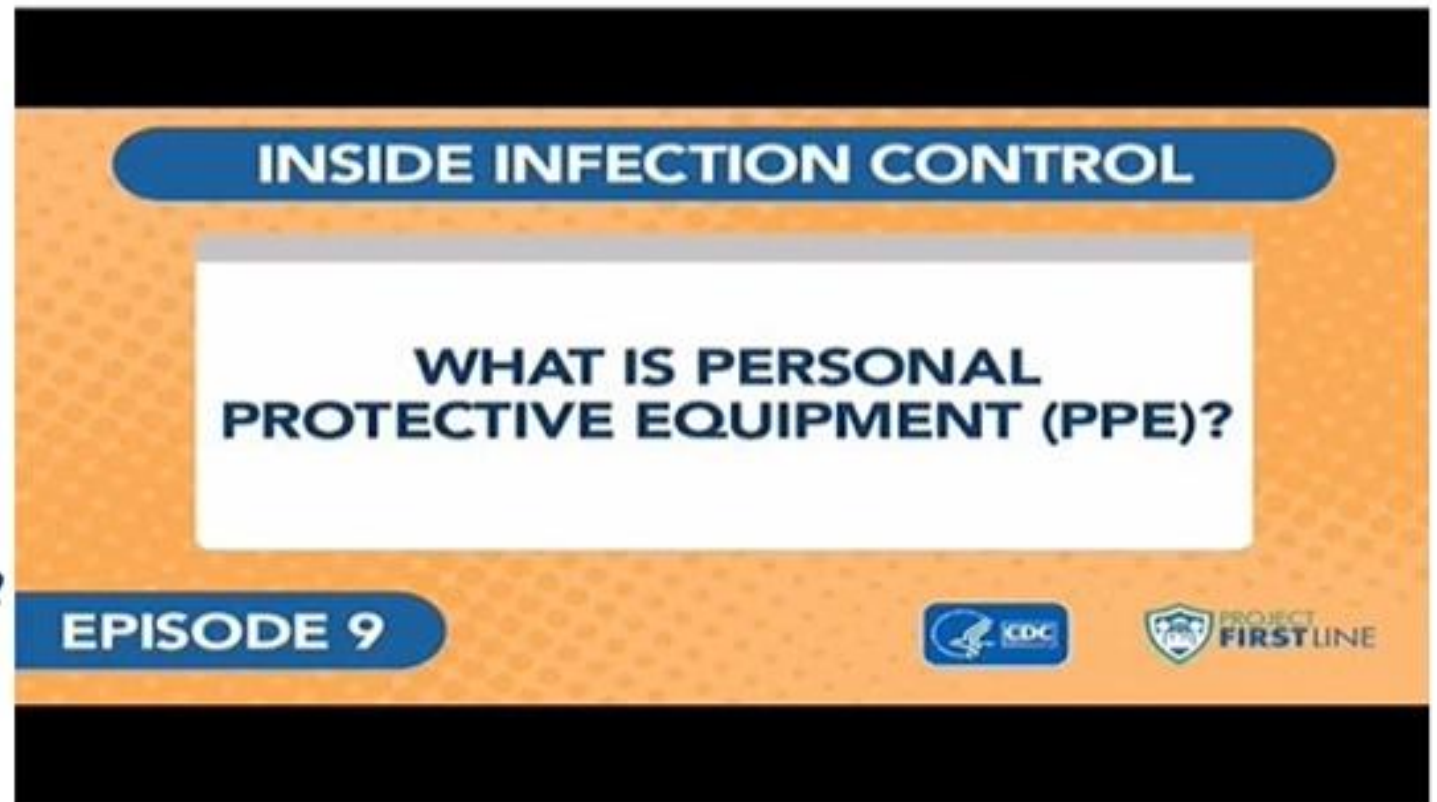
Project Firstline

CDC

Dr. Abby Carlson, MD

Episode 9:

What is Personal Protective Equipment (PPE)?



(CDC, 2020a)

PRE-BRIEF

Using the right PPE at the right time
prevents the spread of germs
in health care facilities



PRE-BRIEF

Using the right PPE at the right time
prevents the spread of germs
in health care facilities



- PPE used in the healthcare setting **PROTECTS** the wearer and **PROTECTS** others around us
- PPE in the healthcare setting consists of **eye protection, gloves, gowns, masks**
- PPE is important, but it is *just one part* of infection control
- Wear the **RIGHT PPE** at the **RIGHT TIME, EVERY TIME**, in order to protect yourself and others

EYE PROTECTION

- **Eye protection** (goggles or a face shield) **protects the eyes** from direct exposure to **germs** by adding a barrier
- In addition to getting in through the nose and mouth, or being inhaled into the lungs, **germs** can also enter our body through **the tear ducts of the eyes**, and cause infections
- Some **germs** can also infect cells in the **eyes** directly
- Whatever is used to **protect your eyes** should allow you to **see clearly and do your work safely**

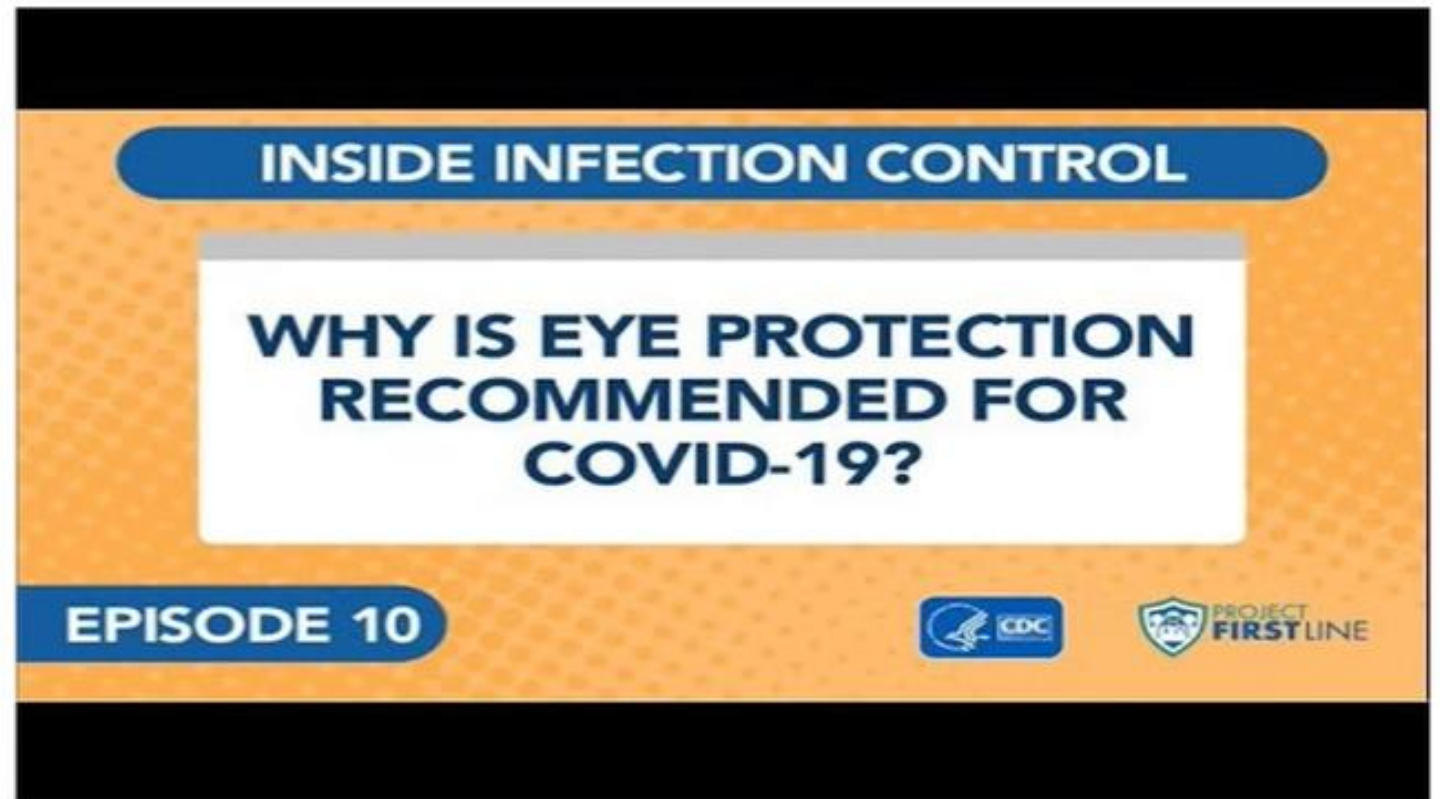
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CDC

Dr. Abby Carlson, MD

Episode 10:

Why is Eye Protection Recommended
for COVID-19?



(CDC, 2020a)

SIMULATION STATION I – EYE PROTECTION (COUGHING PATIENT)

This simulation demonstrates the use of eye protection when caring for a coughing patient

Coordinating Module/Packet Title: Personal Protective Equipment

Simulation Title: Cough Simulation

Developed by the Kentucky Infection Prevention Training Center (KyIP, 2022). Used with permission.

SIMULATION STATION I - REVIEW

- ☐ What did you think of the simulation?
- ☐ Did you notice anything wrong with the position of the healthcare worker in relation to the patient?
- ☐ What could have happened to this healthcare worker in the absence of eye protection?

Have you ever witnessed a situation where a spray or splash occurred, and eye protection was not worn?



Developed by the Kentucky Infection Prevention Training Center (KylP, 2022).
Used with permission.

EYE PROTECTION

TAKE AWAY POINTS:

- ❑ **Germ**s can enter your body through the **eyes** and the tear ducts
- ❑ **Germ**s can also **infect** cells in the **eyes** directly, causing irritation and inflammation
- ❑ **Respiratory droplets** that can carry **germs** that can land on your **eyes** and travel from your **eyes** to reach the “**target zones**” of the nose, mouth, back of the throat, and lungs
- ❑ **Avoid** standing directly in front of the spray or splash hazard source (such as your patient), to **decrease** potential exposure
- ❑ **Always wear eye protection** when there is a **risk** of cough, splash or spray (Follow your facility guidelines for wearing eye protection)

Eye protection is not enough when worn alone. Use with other infection control practices, such as hand hygiene and additional PPE

GOWNS

- The **Advancement of Medicine Instrumentation (AAMI)** provides standards for PPE including gowns.
 - Focuses on spray impact, liquid penetration, resistance to bloodborne pathogens by viral penetration
 - Ranges from 1 (least protective) to 4 (most protective)

Level 1: Minimal Risk *(standard isolation, cover gown for visitors, basic patient care)*

Level 2: Low Risk *(blood draws, suturing, ICU, pathology lab)*

Level 3: Moderate Risk *(arterial blood draw, inserting an IV, Emergency Department, Trauma Cases)*

Level 4: High Risk *(long, fluid intense procedures, surgery, when infectious diseases are suspected (non-airborne))*

GOWNS

- ❑ Avoid brushing up against surfaces in the patient care area, or your work area (reduces chance for transmission of pathogens)
- ❑ Wear a **gown** for **direct patient contact** if the patient has uncontained secretions or excretions
- ❑ Wear the **right gown** for the **right task (AAMI level 1-4)**
- ❑ **Gowns** that are not clearly marked with a designated AAMI level, should be physically inspected for the attributes needed for protection prior to wearing
- ❑ **Fasten the gown completely for maximum coverage**
- ❑ Sanitize or wash your hands with soap and water **before and after** removal of the gown
- ❑ **Dispose** of the **gown** in the proper receptacle, as directed by your facility (some gowns are laundered)

Coordinating Module/Packet Title: Personal Protective Equipment

Simulation Title: Isolation Gowns-Unrated Cover and AAMI Levels 1, 2, 3, and 4

SIMULATION STATION 2 - REVIEW

- ☐ What did you think of the simulation?
- ☐ Did you notice the differences in the fluid resistance of the gowns?
- ☐ Do you feel that the simulation adequately demonstrates the differences in the levels of gowns?
- ☐ How could wearing a gown that is inappropriate for the task, attribute to pathogen transmission to another person or surface?

GOWNS

TAKE AWAY POINTS:

- ☐ Choose the **appropriate level gown** for the appropriate task
- ☐ **Remove the gown correctly**, to prevent self-contamination and to prevent contamination of the environment and others
- ☐ **Remove your gown:**
 - ☐ **When** it gets **soiled**
 - ☐ **Before** moving to the next patient or task
 - ☐ To prevent self-contamination and to prevent contamination of the environment and others
- ☐ Make sure that your **gown fits properly** and that it doesn't touch other surfaces while you're wearing it
- ☐ Clothing (i.e. scrubs) are not considered to be PPE
- ☐ **Gowns** designed for use as PPE are intended to be worn as a single gown
- ☐ **Clean your hands** after removal and disposal of the gown

ACTIVITY PPE 2-1

SELECTING TYPE OF GOWN FOR PATIENT SCENARIO

- The **Advancement of Medicine Instrumentation (AAMI)** provides standards for PPE including gowns.

Level 1: Minimal Risk (*standard isolation, cover gown for visitors, basic patient care*)

Level 2: Low Risk (*blood draws, suturing, ICU, pathology lab*)

Level 3: Moderate Risk (*arterial blood draw, inserting an IV, Emergency Department, Trauma Cases*)

Level 4: High Risk (*long, fluid intense procedures, surgery, when infectious diseases are suspected (non-airborne)*)

I. Resident in long term care facility currently in isolation for a multi-drug resistant organism. Continent of stool and urine.

Level I or Unrated

Rationale: Unrated and level I gowns are appropriate for contact with minimal amounts of body fluids. If the resident is in isolation and care involves contact with minimal amounts of fluids during personal hygiene, movement, or general care, then either a Level I or unrated isolation gown is appropriate.

ACTIVITY PPE 2-1

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Level 4: High Risk (*long, fluid intense procedures, surgery, when infectious diseases are suspected (non-airborne)*)

II. Patient in emergency department with multiple trauma and involved in resuscitation.

Level 3 or Level 4

Rationale: In this circumstance, it can reasonably anticipated that the healthcare worker may come into contact with body fluids in quantities that could soak a portion of the gown. Therefore, higher levels of protection are needed so Level 3 or Level 4 gowns would be appropriate.

GLOVES



(CDC, 2020a)

Coordinating Module/Packet Title: Personal Protective Equipment

Simulation Title: Glove Contamination

GLOVES ARE NOT ENOUGH

Wearing gloves is NOT a substitute for cleaning your hands.



- ▶ Your hands can get contaminated while wearing or removing gloves.
- ▶ Cleaning your hands after removing your gloves will help prevent the spread of potentially deadly germs.

CONTAMINATION DURING
GLOVE REMOVAL IS COMMON

Protect Yourself.
Protect Your Patients.



Who do your **#CLEANHANDSCOUNT** for?



www.cdc.gov/HandHygiene

This material was developed by CDC. The Clean Hands Count Campaign is made possible by a partnership between the CDC Foundation and GOJO.

When using alcohol-based hand sanitizer:

PUT PRODUCT
ON HANDS AND
RUB HANDS
TOGETHER

COVER ALL
SURFACES
UNTIL HANDS
FEEL DRY

THIS SHOULD
TAKE AROUND
20 SECONDS



(CDC, 2019)

GLOVES

- **TAKE AWAY POINTS:**

- ☐ **Sanitize or wash your hands with soap and water before** putting on your **gloves**, every time
- ☐ Wear **gloves** correctly, **covering all exposed surfaces** of your hands
- ☐ **Remove gloves** correctly, to help avoid hand contamination
- ☐ **Do not wear double layers of gloves**
- ☐ **Do not attempt to sanitize gloves**
- ☐ **New patient, new gloves, every time**
- ☐ **Sanitize or wash your hands with soap and water after** removal of **gloves**, every time

DONNING PPE

The order that PPE is donned (put on)

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

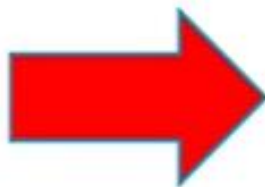


U.S. Department of
Health and Human Services
Centers for Disease
Control and Prevention

(CDC, 2017;
CDC 2020b)

DOFFING PPE- OPTION 1

You can risk spreading germs and contaminating yourself or others by **not doffing in the correct order**,



HOW TO SAFELY REMOVE PERSONAL PROTECTIVE EQUIPMENT (PPE) EXAMPLE 1

There are a variety of ways to safely remove PPE without contaminating your clothing, skin, or mucous membranes with potentially infectious materials. Here is one example. **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. GLOVES

- Outside of gloves are contaminated!
- If your hands get contaminated during glove removal, immediately wash your hands or use an alcohol-based hand sanitizer
- Using a gloved hand, grasp the palm area of the other gloved hand and peel off first glove
- Hold removed glove in gloved hand
- Slide fingers of ungloved hand under remaining glove at wrist and peel off second glove over first glove
- Discard gloves in 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 or ear pieces
- If the item is reusable, place in designated receptacle for reprocessing. Otherwise, discard in a waste container



3. GOWN

- Gown front and sleeves are contaminated!
- If your hands get contaminated during gown removal, immediately wash your hands or use an alcohol-based hand sanitizer
- Unfasten gown ties, taking care that sleeves don't contact your body when reaching for ties
- Pull gown away from neck and shoulders, touching inside of gown only
- Turn gown inside out
- Fold or roll into a bundle and discard in a waste container



4. 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



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



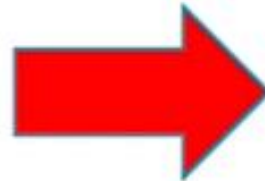
PERFORM HAND HYGIENE BETWEEN STEPS IF HANDS
BECOME CONTAMINATED AND IMMEDIATELY AFTER
REMOVING ALL PPE



(CDC, 2017;
CDC 2020b)

DOFFING PPE- OPTION 2

You can **risk spreading germs and contaminating yourself** or others by **not doffing in the correct order**,



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



(CDC, 2017;
CDC 2020b)

ACTIVITY PPE 2-B

SELECTING ELEMENTS OF PPE FOR PATIENT SCENARIO

- Please turn to Resource PPE 2B
- Selecting elements of PPE for Patient Scenario
- This involves selecting the correct pieces of PPE, putting them on correctly and in correct order, taking them off correctly and in the correct order, and performing hand hygiene at the correct times.

ACTIVITY PPE 2-B

SELECTING ELEMENTS OF PPE FOR PATIENT SCENARIO

1. Patient in hospital for pneumonia. Patient is coughing sporadically. Continent and cooperative.

<i>List pieces of PPE to be used for this scenario and rank them according to order you would put them on (don):</i>	<i>Rank those pieces of PPE in order of their removal (doff):</i>	<i>Indicate when hand hygiene would be performed during this process:</i>
☐ Gown ☐ Gloves ☐ Face shield/eye protection ☐ Respiratory protection	☐ Gown ☐ Gloves ☐ Face shield/eye protection ☐ Respiratory protection	

ACTIVITY PPE 2-B

SELECTING ELEMENTS OF PPE FOR PATIENT SCENARIO

1. Patient in hospital for pneumonia. Patient is coughing sporadically. Continent and cooperative.

<i>List pieces of PPE to be used for this scenario and rank them according to order you would put them on (don):</i>	<i>Rank those pieces of PPE in order of their removal (doff):</i>	<i>Indicate when hand hygiene would be performed during this process:</i>
3*Gloves 1 Face shield/eye protection 2 Respiratory protection	1* Gloves 2 Face shield/eye protection 3 Respiratory protection	Before entering room; before removal of PPE; after removal of gloves (if worn); after removal of other PPE
Rationale: A patient cough may disperse respiratory particles into the face/eyes of the healthcare worker. Mask and face shield protect the face and eyes. * Gloves may be worn, depending upon the patient contact anticipated to occur during that encounter. Remove most contaminated items first; then proceed with removal in alphabetical order.		

ACTIVITY PPE 2-B

SELECTING ELEMENTS OF PPE FOR PATIENT SCENARIO

3. Patient having nasogastric tube inserted. Is uncooperative, spitting, and coughing

<i>List pieces of PPE to be used for this scenario and rank them according to order you would put them on (don):</i>	<i>Rank those pieces of PPE in order of their removal (doff):</i>	<i>Indicate when hand hygiene would be performed during this process:</i>
☐ Gown ☐ Gloves ☐ Face shield/eye protection ☐ Respiratory protection	☐ Gown ☐ Gloves ☐ Face shield/eye protection ☐ Respiratory protection	

ACTIVITY PPE 2-B

SELECTING ELEMENTS OF PPE FOR PATIENT SCENARIO

3. Patient having nasogastric tube inserted. Is uncooperative, spitting, and coughing

<i>List pieces of PPE to be used for this scenario and rank them according to order you would put them on (don):</i>	<i>Rank those pieces of PPE in order of their removal (doff):</i>	<i>Indicate when hand hygiene would be performed during this process:</i>
3 Gown 4 Gloves 2 Face shield/eye protection 1*Respiratory protection	4 Gown 1 Gloves 2 Face shield/eye protection 3*Respiratory protection	Before entering room; before removal of PPE; after removal of gloves (if worn); after removal of other PPE.
Rationale: In this situation, body fluids may come into contact with face, eyes, and clothing of healthcare worker so maximal protection is appropriate. Remove most contaminated items first.		

DEBRIEF

- **PPE** is used in healthcare both to **protect YOU** and to **protect OTHERS**.
- **Eye protection** is recommended to **prevent germs from being introduced to the eyes** either directly (e.g., blood splashes, respiratory droplets generated during coughing or suctioning) or from **touching the eyes** with contaminated fingers or other objects.
- Using **gowns and gloves** is an important strategy for infection control.
- **Gowns and gloves protect you** and **keep you from accidentally spreading germs** into your environment.
- **Gowns and gloves must be worn properly** to be effective.
- It is important to **apply and remove PPE** in the **right order**, and to **clean your hands** at the **right time, every time**.
- **PPE** is just **ONE tool** we use to help with infection control
(CDC, 2020a)



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