

# PREVENTING INFECTION: HOW TO DRESS YOUR STAFF AND WOUNDS



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Describe PHMB and the mechanism of action.



Identify the types of wounds or indications for use of PHMB



Review the regulatory requirements for personal protective equipment (PPE) in the healthcare setting.



Describe challenges related to healthcare provider compliance with isolation gowns.



Identify strategies to increase compliance with proper isolation gowning practices.

# OBJECTIVES

# **PHMB ANTIMICROBIAL DRESSINGS**



# WHAT IS PHMB?

- Polyhexamethylene Biguanide – a highly effective antiseptic that is effective against both gram + and gram – bacteria as well as yeast and fungi.
- PHMB dressings are proven to help to resist bacterial colonization of the dressing and inhibit bacterial penetration through the dressing.

**Source:** Chirag B. Shah, PH.D.; Hansen P. Swaniker, BS; Brian J. Dowd, MBA; et al. Efficacy and Mode of Action of a New PHMB Impregnated Polyurethane Foam Dressing. Covidien whitepaper, 2009. Print.

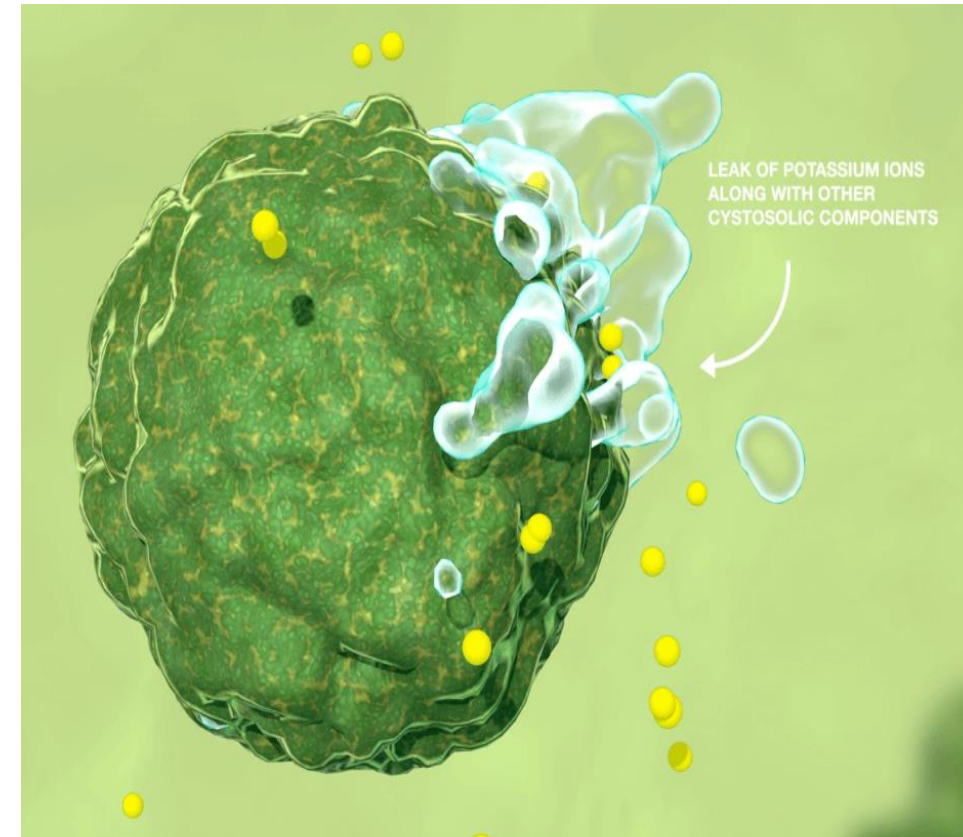
# HOW DOES PHMB WORK?

- Mixture of Polymers

As positively charged molecules, they attach to the negatively charged bacterial cell membranes, causing lysis by membrane destruction.

Adheres and disrupts the target cells' membrane causing the leak of the components of cytoplasm

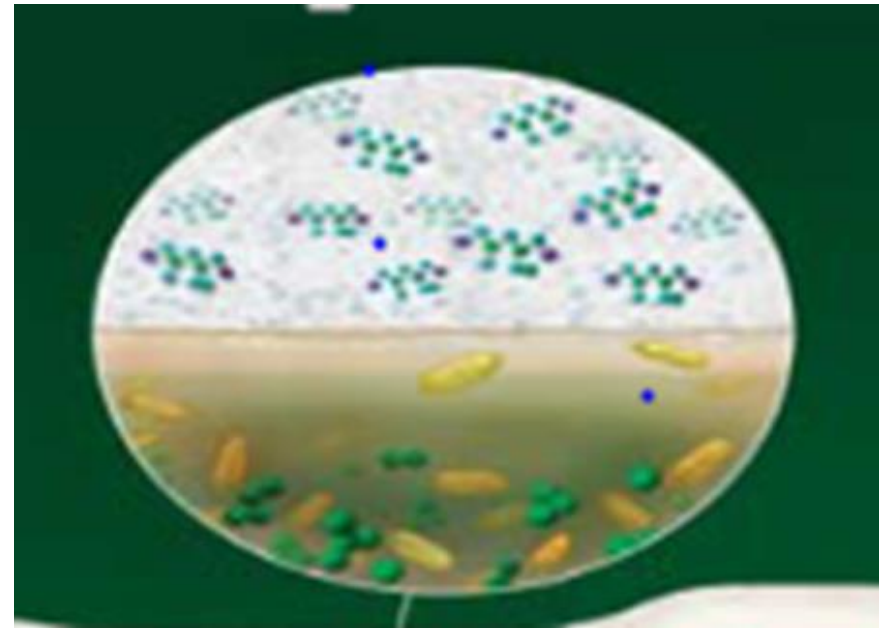
- Attaches to and lyses the cell wall leaving nothing left to mutate or replicate.



Source: <http://www.activheal.com/wound-care-dressing-range/phmb-foam-dressing/wound-bed-preparation-vital-step-healing-process/>

# PHMB BENEFITS:

- Less cytotoxic than other antiseptics
- Does not negatively impact epithelialization
- Has no known resistance
- It is active wet or dry
- Cost effective



**Source:** Butcher, M. (2012) PHMB: An effective antimicrobial in wound bioburden management *British Journal of Nursing*, (Tissue Versatility Supp), 21- 12.

# PHMB BENEFITS:

Good clinical safety

Target action on bacterial cells

No known risks of absorption

No known toxic risks

Low risk on contact sensitization

# PHMB BENEFITS:

Sustainability of the active pharmaceutical ingredient

To assist in the management of reducing the bacterial burden

Reduce wound pain

Reduce wound malodor

Reduce slough and non-viable tissue within the wound

Increase formation of granulation tissue.



# PHMB PRODUCT OFFERINGS

Rolls

Super Sponges

Gauze

Sponges

Packing Strips

Foams

Foam Disc





## RESOURCES AVAILABLE:

- Clinical Studies
- White Papers
- Consensus Documents
- Literature
- CEUs

## SOURCES:

<http://www.activheal.com/wound-care-dressing-range/phmb-foam-dressing/wound-bed-preparation-vital-step-healing-process/>

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<https://www.woundsresearch.com/article/7494>

# PERSONAL PROTECTIVE EQUIPMENT

01

Personal protective equipment (PPE) is last line of defense against harmful pathogens.

02

Balancing:

- Patient and staff safety
- Prevention of healthcare acquired infections (HAIs)
- Changing regulatory environment

03

Isolation gowns are a critical element of PPE

# HISTORY OF PPE IN HEALTHCARE IN THE U.S.

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**1970's** • **Centers for Disease Control and Prevention (CDC) issued Isolation Techniques for Use in Hospitals describing use of cover gowns and gloves in 1970.**

**1980's** • Concerns about emergence of antibiotic resistant pathogens led to the 1983 CDC Guideline for Isolation Precautions in Hospitals.

- Universal precautions introduced to prevent HIV transmission in 1985.
- Occupational Safety and Health Administration (OSHA) proposed rule to prevent occupational exposure to bloodborne pathogens in 1989.

**2000's** • CDC issued Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents, which remains in effect today and addresses the use PPE in detail.

**2010's** • World Health Organization (WHO) developed Personal Protective Equipment for Use in a Filovirus Disease Outbreak in 2016 covering PPE for exposure to Ebola and Marburg viruses

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# PPE IN INFECTION PREVENTION

Critical for prevention of emerging diseases including:

- Ebola hemorrhagic fever
- Pandemic influenza
- Avian influenza
- Hepatitis B
- Hepatitis C
- Severe acute respiratory syndrome (SARS)

Prevention of healthcare associated infections (HAIs)



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# OSHA REQUIREMENTS FOR PPE

## Employer Responsibilities:

Performing hazard assessment

Providing appropriate PPE

Training employees to use PPE

Maintaining PPE

Reviewing/updating PPE  
program

## Employee Responsibilities:

Wearing PPE properly

Attending PPE training

Caring for/cleaning PPE

Informing supervisor of PPE  
replacement needs

# STANDARD PRECAUTIONS

Primary strategy for prevention of transmission of infectious agents with all patients

Regardless of suspected or confirmed presence of an infectious agent

Includes:

- Hand hygiene
- Respiratory hygiene/etiquette
- Appropriate patient placement
- Proper handling of patient care equipment
- Environmental cleaning
- Safe injection practices and handling of needles and sharps



# TRANSMISSION- BASED PRECAUTIONS

For patients known or suspected to be colonized or infected with certain epidemiologically important pathogens



Described for the 3 principal routes of transmission:

- Contact
- Droplet
- Airborne

# CONTACT PRECAUTIONS

01

Prevent transmission of infectious agents spread by:

- Direct contact
- Indirect contact

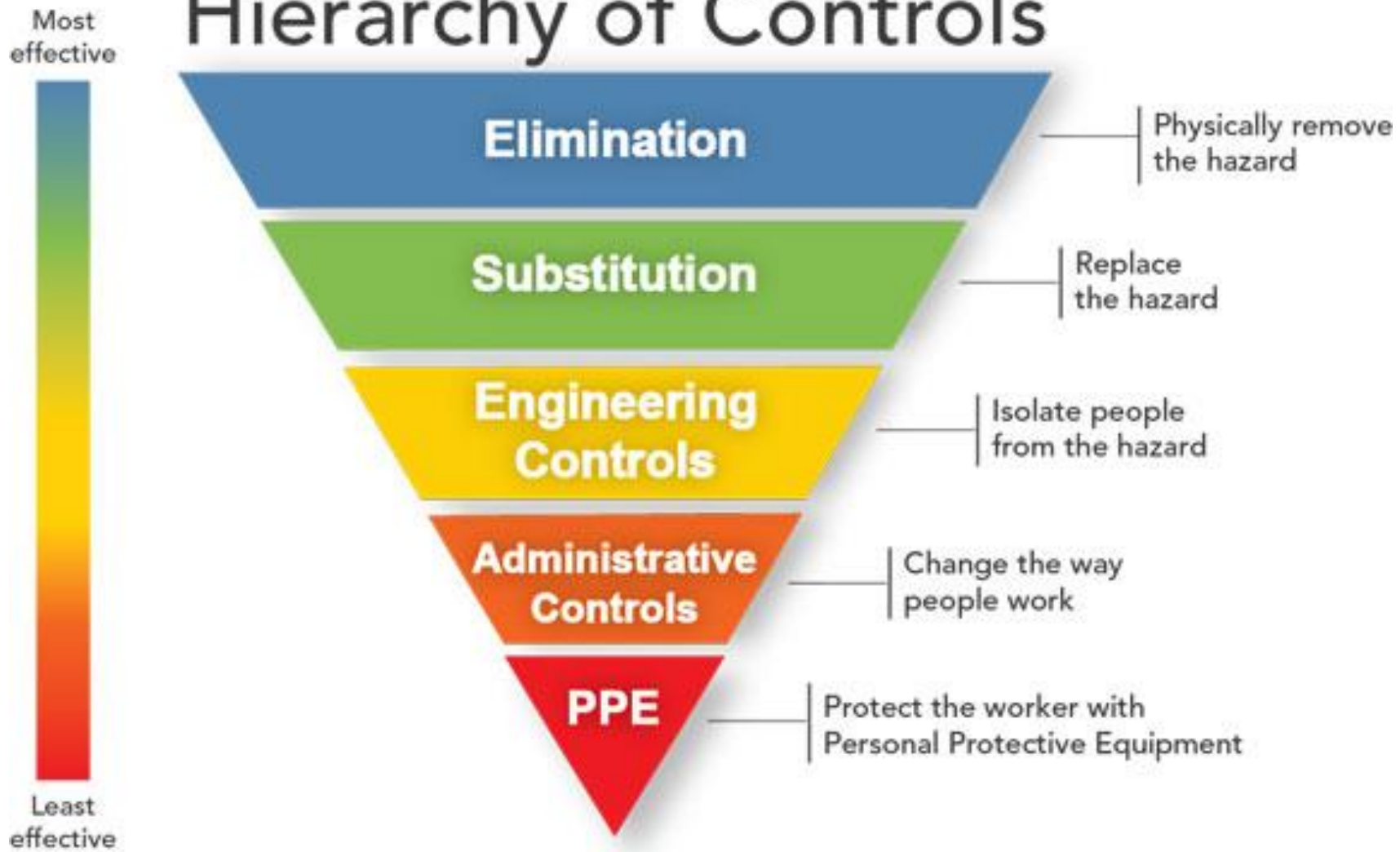
02

Gown and gloves recommended for interactions involving contact with patient or potentially contaminated areas of environment

03

Donned upon entry and discarded before exiting patient room

# Hierarchy of Controls



# ELEMENTS OF PPE IN THE HEALTHCARE SETTING



# ISOLATION GOWN SELECTION

Type of isolation gown chosen based on:

- Nature of patient interaction
- Anticipated degree of contact with infection material
- Potential for blood and body fluid penetration of the barrier

ANSI/AAMI standards consider entire gown a critical zone

Entire gown must achieve claimed barrier performance

Open-backed gowns do not meet critical zone parameters and cannot be rated



# PROPER ISOLATION GOWN USE

Wear	Wear gown when anticipating clothing will have direct contact with patient, equipment, or potentially contaminated environmental surfaces.
Don gown	Don gown upon entry to patient room
Remove	Remove gown and observe hand hygiene before leaving patient room
Ensure	After gown removal, ensure clothing and skin do not contact potentially contaminated environmental surfaces

Lack of availability of equipment and/or training

Lack of time to don equipment

Difficulties in donning, doffing, or use

Thermal discomfort

Poor fit

Problems with neck designs and tie closures

Restriction of movement

Perceived compromise to dexterity

Underestimation of situational risk

## CHALLENGES RELATED TO ISOLATION GOWN COMPLIANCE

# CONSEQUENCES OF NON- COMPLIANCE WITH PROPER ISOLATION GOWNING

PPE only effective when used correctly

Noncompliance and poor donning/doffing can lead to disease transmission

Failure to fasten neck can result in:

Drooping of gown in front

Reduced mobility

Exposure of chest and shoulders

Increased likelihood of pathogen exposure and cross-contamination

Lack of PPE compliance can result in citations from regulatory agencies





Standardize the practice

Use nationally recognized standards



Product selection to promote compliance

Over the head donning

Thumb hook wrists

Waist tie with overlapping back panel

# STRATEGIES TO IMPROVE COMPLIANCE WITH ISOLATION GOWNING PROCEDURES

# STRATEGIES TO IMPROVE COMPLIANCE WITH ISOLATION GOWNING PROCEDURES

Provide initial and ongoing training as required by OSHA:

When use of PPE is necessary

What elements of PPE must be used

How to properly put on, take off, adjust, and wear PPE

Limitations of the PPE

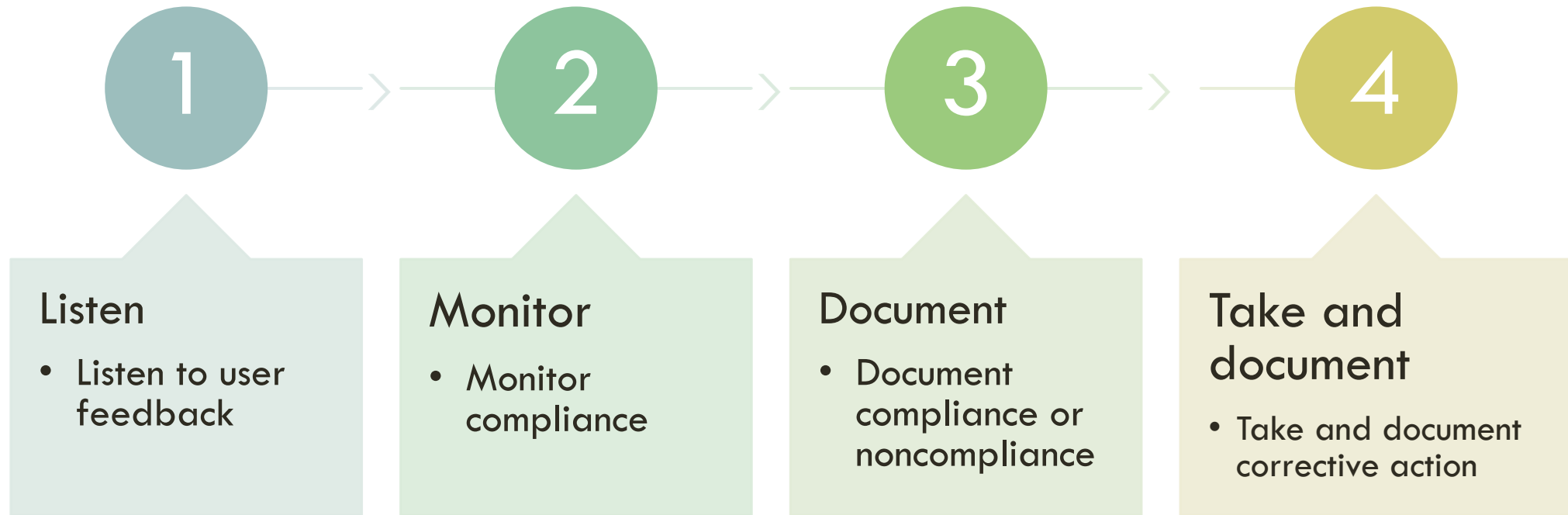
Proper care, maintenance, useful life, and disposal of PPE

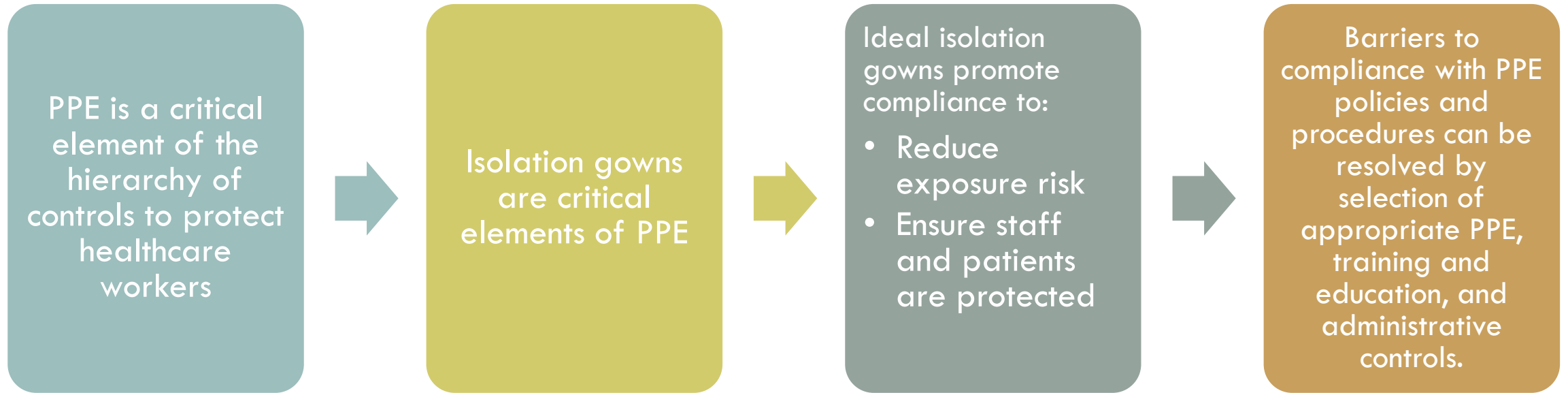
Incorporate creative approaches to PPE training

Fluorescent lotions or powders to provide visual feedback

Require return demonstrations

# STRATEGIES TO IMPROVE COMPLIANCE WITH ISOLATION GOWNING PROCEDURES





# SUMMARY