

Deep South Biosafety



Worker Training Program

**DONNING AND DOFFING  
PERSONAL PROTECTIVE  
EQUIPMENT USING AN  
APPROVED LOW-OUTPUT  
EBOLA CHECKLIST: A  
SIMULATION EXPERIENCE**

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**EBOLA**

**HIV**

**SARS**

**HBV**

**MERS**

**MALARIA**

**UAB** THE UNIVERSITY OF  
ALABAMA AT BIRMINGHAM

Knowledge that will change your world

## PRESENTATION OBJECTIVES:

- Discuss how simulation can be used to train future health professionals
- Describe the spectrum of healthcare simulation
- Identify benefits of using checklists for high-risk procedures, like donning and doffing personal protective equipment during an infectious disease response
- Explain how checklists can be used in various health care professions

# The Deep South Biosafety Worker Training Program (WTP)

## ABOUT:

One of eight institutions funded in 2016 by the **National Institute of Environmental Health Sciences (NIEHS)** to provide infectious disease safety training for a range of high risk occupations.



## WHAT WE DO:

- **Four (4) levels of trainings** (awareness, operations, train-the-trainer, and refresher/simulation)
  - Chain of infection and routes of exposure
  - Infection control measures
  - Exposure risk assessment and categorization
  - Relevant government standards, regulations and guidelines
  - Hand-on training using PPE
  - Review of infectious disease resources
- Develop a cadre of workers equipped with the skills and knowledge needed to protect themselves in an ID response.



# DEEP SOUTH BIOSAFETY WTP

SUMMER HEALTH PROFESSIONS EDUCATION PROGRAM

# Summer Health Professions Education Program (SHPEP)

- Free summer enrichment program for college students interested in health professions
- Funded by the Robert Wood Johnson Foundation
- Implemented at 13 universities across the nation
- Special focus on students underrepresented in health professions



# Educational Opportunities

- 1) Instruction on health science topics, scientific writing and critical reasoning
- 2) Lectures on health disparities and determinants of health outside of clinical settings
- 3) Clinical exposure and shadowing
- 4) Community-based experiences, including primary health care in underserved populations
- 5) Career development activities with one-on-one sessions and mock interviews
- 6) Simulated patient care experiences in numerous fields
- 7) Workshops on study skills, life skills, time management skills, and financial literacy
- 8) Leadership development exercises and team-building skills

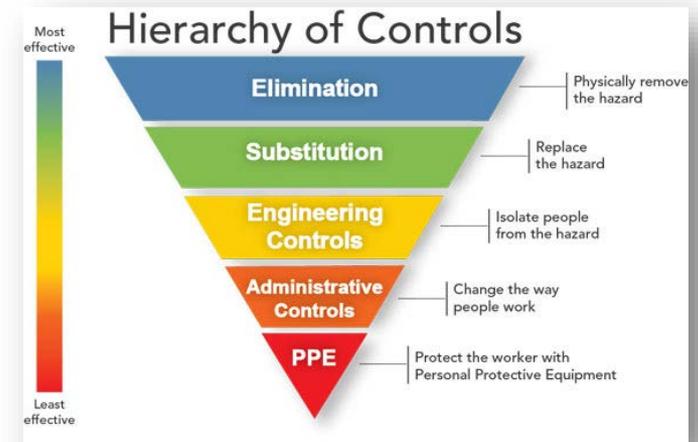
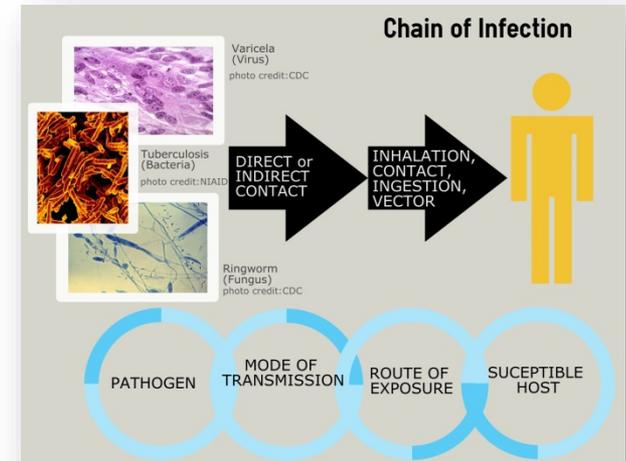
# The Deep South Biosafety WTP & SHPEP

Provided awareness and operations training to over 70 SHPEP participants.



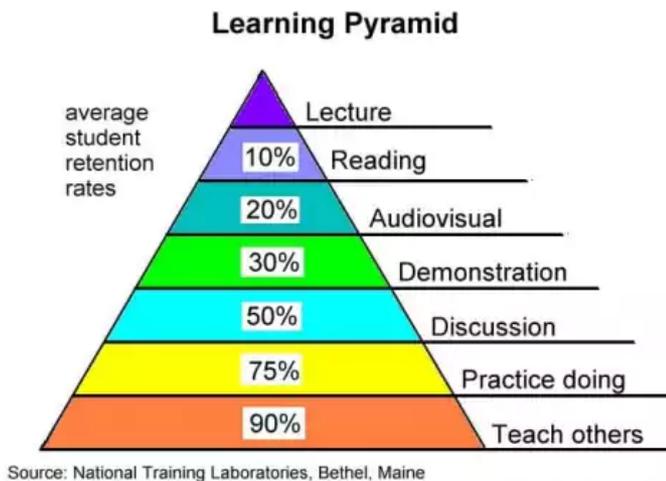
# Awareness Course Learning Objectives

1. Understand key elements of the chain of infection
2. Recognize basic facts about selected infectious diseases
3. Identify how workers in affected occupations may be exposed
4. Define key steps in worker protection and infection control
5. Understand relevant government standards, regulations, and guidelines



# Operations Course

- 4 hour, instructor-led classroom course
- Builds on information in the Awareness-level course
- Utilizes procedural-based simulation (don/doff PPE using checklist)



# Operations Course Learning Objectives

1. Compare and contrast the utilization and benefits of personal protective equipment (PPE) available from various learner institutions
2. Identify two to three infectious disease resources that can be used to guide PPE selection in response to an Ebola or other infectious disease event.
3. Don and doff appropriate low and/or high output PPE for Ebola virus disease using an approved Ebola virus disease checklist
4. Evaluate adherence to the low and/or high output checklist and ability to don and doff PPE without being contaminated

# Donning/Doffing Practice Sessions

1. Participants divide into groups of 3.
2. Inventory and arrange PPE so it is easily accessible.
3. One person acts as Donning Expert (DE) and reads directions while partner dons PPE for low output EVD. Observers watches and monitors.
4. After completely donned, DE checks for coverage.



# Donning/Doffing Practice Sessions



5. *Instructor checks for any potential breaches and applies GloGerm.*
6. DE reads doffing instructions and helps partner remove PPE according to guidelines for low output PPE. Observers watches and guides as DE inspects HCW for any signs of contamination.
7. *Once fully doffed, an instructor uses a UV flashlight to check HCW for contamination.*



**8. Switch roles!**

# What is simulation?

“Simulation is a technique – not a technology– to replace or amplify real experiences with guided experiences that evoke or replicate substantial aspects of the real world in a fully interactive manner.”

Qual. Saf. Health Care, 2004  
-David Gaba. Qual. Saf.



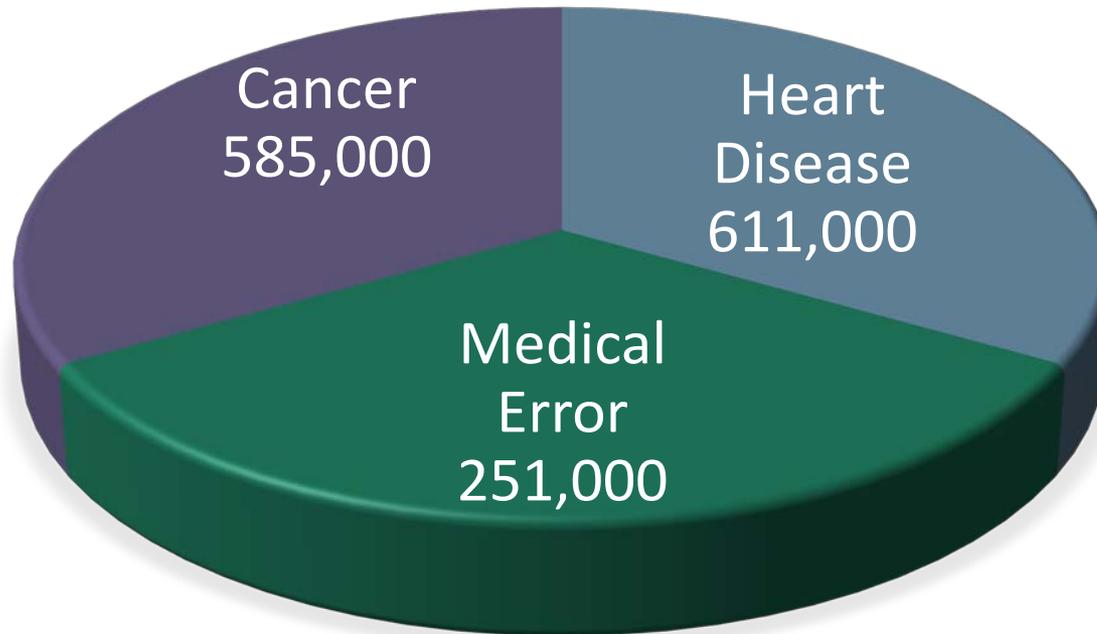
# Why simulate?

- Puts patient and learner safety first
- Optimizes learning conditions
- Provides valuable feedback
- Integrates multiple skills



(Agency for Healthcare Research and Quality, AHRQ Issue Brief: Health Care Simulation To Advance Safety: Responding to Ebola and Other Threats, February 2015.)

# Implications for patient safety



# SPECTRUM OF HEALTHCARE SIMULATION



In Sim



In Situ



Immersive



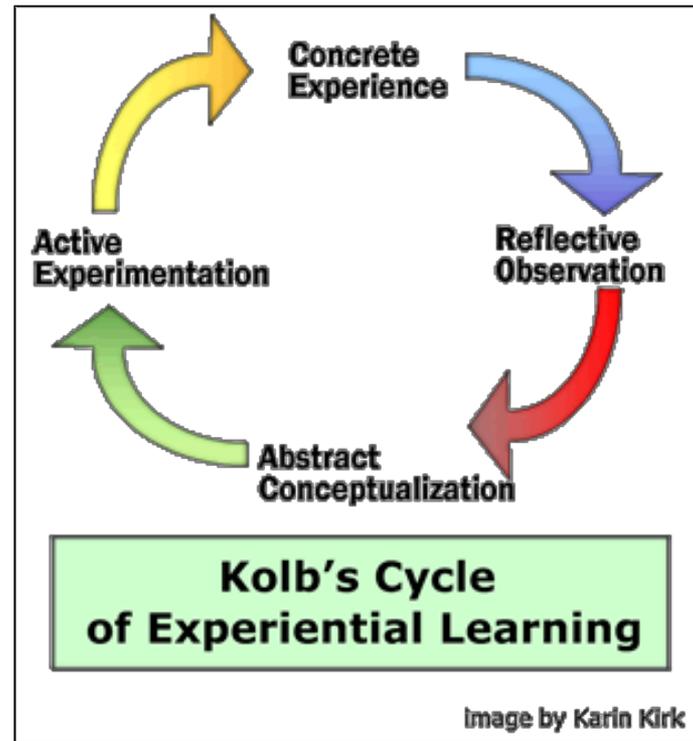
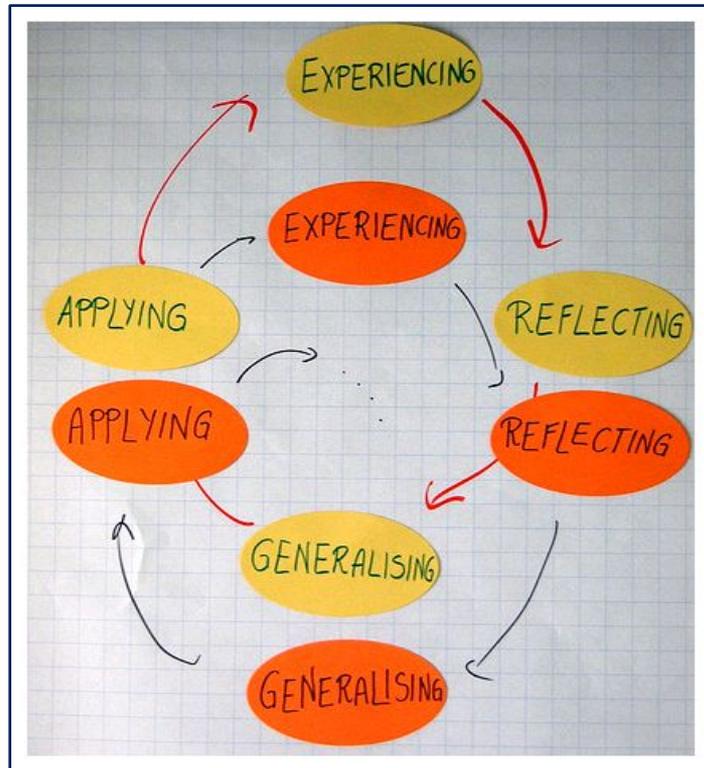
Procedural

# Simulation Phases



# Debrief

Allows students to reflect on experiences and generalize what they learned to other settings.



# Simulation is a Spectrum

**Role  
Play**

Task  
Trainer

Standardized  
Patient

High Fidelity  
Manikin

Hybrid  
Simulation

Virtual  
Simulation

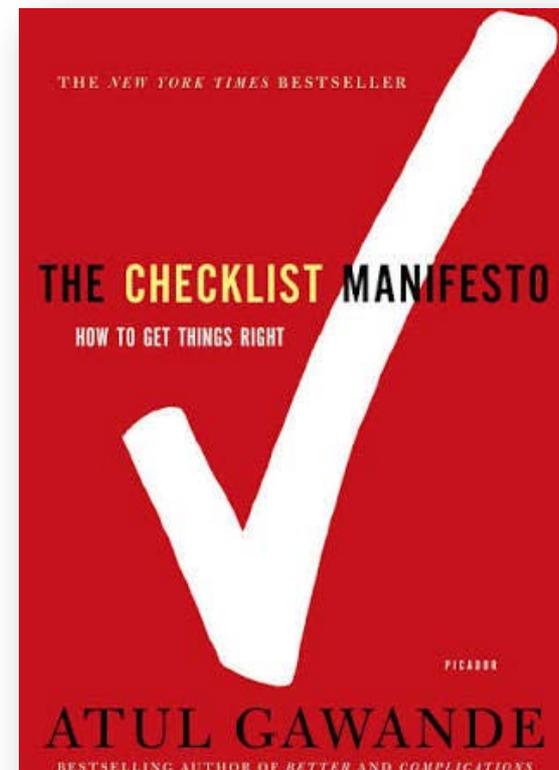


# IMPORTANCE OF A CHECKLIST

# The Importance of Checklists

Medicine can benefit from the use of checklist, especially in complex, high-risk situations.

1. Task list
2. Troubleshooting list
3. Coordination list
4. Discipline list
5. To-do list



# Task list

**Task list:** a step-by-step recital of standard operating procedures that must be followed in the correct order.

FOR DE TO USE AND PROVIDE FEEDBACK TO HEALTHCARE WORKER	DE
<b>PPE Donning Checklist for Low-Output Ebola Patient</b>	completed
<b>PRIOR TO ENTERING DONNING AREA</b>	
Use restroom if needed	
Remove all jewelry	
Remove all clothing and undergarments (e.g. bra, panties, boxers, briefs)	
Put on disposable undergarments and scrubs	
Put on reusable footwear	
Ensure that fingernails are trimmed, hair is pulled back and secured in a low ponytail or bun	
Ensure that there is no excess facial hair	
Secure eyewear firmly with tourniquet if needed	
<b>AFTER ENTERING DONNING AREA</b>	
Take and record vital signs (Heart Rate, Blood Pressure, and Temperature)	
Hydrate	
Wash hands	
Inspect all exposed skin for wounds, cuts, and scrapes	
<b>If there is any break in exposed skin, YOU MAY NOT DON OR CARE FOR THE PATIENT</b>	
Sitting down, apply clear plastic boot covers	
Apply blue surgical mid-calf boot covers	
Place blue bouffant cap on head, make sure all hair is covered under the cap	
Put on N95 mask and check fit. Be sure to not crosscut the straps. The top strap goes high on the crown of the head, and the low strap goes to the back of the head. Ensure both are on the bouffant cap.	
Put on blue impermeable gown. Tie inner and outer tie loosely.	
Put on white hood.	
Put on face shield or white hood.	
Perform hand hygiene with an alcohol-based hand rub (ABHR) and let dry.	
Apply long green inner gloves bringing the cuffs of the gown over the inner glove.	
Apply long blue outer gloves over the long green inner gloves ensuring gown cuffs are covered.	
Perform final inspection before entering the patient care area. Move around in the suit to ensure the PPE is properly secured.	
Perform safety stop. Any concerns before you enter?	
Sign log book and record time entering room.	
Enter the patient care area	

Donning Checklist

FOR DE TO USE AND PROVIDE FEEDBACK TO HEALTHCARE WORKER	DE
<b>PPE Doffing Checklist for Low-Output Ebola Patient Care</b>	completed
<b>DE Key Points To Remember:</b>	
1) Remind healthcare workers to avoid reflexive actions that may put them at risk, such as touching their face	
2) Remind healthcare workers not to perform any tasks until you complete reading the instructions, have eye contact and direct them to begin	
3) Disinfect your outer-gloved hands immediately after handling any healthcare worker PPE at any point in the doffing process using an EPA-registered disinfectant wipe or ABHR.	
<b>Enter to Doffing PPE</b>	
<b>DE:</b> Lay out doffing pad (insect for tears), waste disposal bag, open EPA-registered disinfectant wipes, container, Alcohol Based Hand Rub (ABHR), position one chair as doffing pad, and obtain extra gloves. DE donned in complete PPE with doffing checklist. Include hand/round near doffing pad to place above supplies.	
<b>HCW:</b> Ensure that you are in the appropriate decontamination zone & DE is present and donned in complete PPE.	
<b>HCW:</b> Stand on the doffing pad. Do not step off of the doffing pad until instructed.	
<b>DE:</b> Ask healthcare worker if they experienced contamination via cut, needle stick, mucous membrane exposure, or direct skin contact. If so, the infectious disease practitioner and the attending should be notified immediately to activate healthcare worker safety plan.	
<b>Begin Doffing PPE</b>	
<b>HCW:</b> Inspect the PPE to assess for visible contamination, cuts, or tears before starting to remove. If any PPE is visibly contaminated, then disinfect using an EPA-registered disinfectant wipe. Let them dry.	
<b>HCW:</b> Disinfect outer gloves. Disinfect outer-gloved hands with an EPA-registered disinfectant wipe or ABHR from an automatic dispenser. Let them dry.	
<b>HCW:</b> Remove blue mid-calf boot covers. Sit down in chair on doffing pad and ensure that the gown covers your knees. Place outside of blue boot covers and pull gently to remove blue mid-calf boot covers. Ensure clear plastic, inner boot covers remain. You may use both hands in this step.	
<b>HCW:</b> Stand up	
<b>HCW:</b> Disinfect outer gloves. Disinfect outer-gloved hands with an EPA-registered disinfectant wipe or ABHR from an automatic dispenser. Let them dry.	
<b>HCW:</b> Disinfect chair. Disinfect chair with an EPA-registered disinfectant wipe. Let it dry.	
<b>HCW:</b> Disinfect outer gloves. Disinfect outer-gloved hands with an EPA-registered disinfectant wipe or ABHR from an automatic dispenser. Let them dry.	
<b>HCW:</b> Remove outer gloves. Remove and discard outer gloves taking care not to contaminate inner gloves during removal process.	
<b>HCW:</b> Disinfect gloves. Disinfect gloved hands with an EPA-registered disinfectant wipe or alcohol gel from an automatic dispenser. Let them dry.	
<b>HCW:</b> Remove face shield. Keeping eyes closed tightly and hold your breath when doing this, remove the full face shield by leaning forward at the waist, grabbing the rear strap and pulling it over the head, gently allowing the face shield to fall forward and discard. Avoid touching the front surface of the face shield.	

Doffing Checklist (pg. 1-3)

FOR DE TO USE AND PROVIDE FEEDBACK TO HEALTHCARE WORKER	DE
<b>PPE Doffing Checklist for Low-Output Ebola Patient Care</b>	completed
<b>HCW:</b> Disinfect gloves. Disinfect gloved hands with an EPA-registered disinfectant wipe or ABHR from an automatic dispenser. Let them dry.	
<b>HCW:</b> Remove hood. While keeping eyes closed tightly and holding breath, reach hands behind head and pull hood up and over the front of the head towards the face and discard onto doffing pad. <b>The DE was assist with the hood removal as needed.</b>	
<b>HCW:</b> Disinfect gloves. Disinfect gloved hands with an EPA-registered disinfectant wipe or ABHR from an automatic dispenser. Let them dry.	
<b>HCW:</b> Remove Gown. Depending on gown design and location of fasteners, the healthcare worker can either untie fasteners, receive assistance by the PPE expert to unfasten the gown (if needed), or gently break fasteners. Avoid contact of scrubs or disposable garments with outer surface of gown during removal. Pull gown away from body, rolling inside out and touching only the inside of the gown.	
<b>HCW:</b> Disinfect gloves. Disinfect gloved hands with an EPA-registered disinfectant wipe or ABHR from an automatic dispenser. Let them dry.	
<b>DE:</b> Doffing expert disinfect gloves (GLOVES NEUTRALIZED) DE will now disinfect gloves, remove gloves, and put on new pair of gloves.	
<b>HCW:</b> Using the back of chair to balance, remove clear plastic boot covers. As you remove one plastic boot cover, place that foot on the clean area floor, off of the doffing pad. Then, slowly but purposefully remove the other plastic boot cover, place that foot on the clean area floor, completely off of the doffing pad.	
<b>HCW:</b> Disinfect gloves. Disinfect gloved hands with an EPA-registered disinfectant wipe or ABHR from an automatic dispenser. Let them dry.	
<b>HCW:</b> Remove gloves. Remove and discard gloves.	
<b>HCW:</b> Perform Hand Hygiene. Perform hand hygiene with an ABHR and let dry.	
<b>HCW &amp; DE:</b> Put on new pair of gloves. Hold your hand out, palms up, and the DE will drop a clean pair of gloves into your hands.	
<b>HCW:</b> Remove Bouffant Cap and N95 respirator. While keeping eyes closed tightly and holding breath, remove the bouffant cap and N95 respirator by tilting the head slightly forward, grasping the back of the bouffant cap and both elastic bands of the N95, and remove without touching the front of the N95 respirator. Drop bouffant cap and N95 respirator onto doffing pad.	
<b>HCW:</b> Disinfect new gloves. Disinfect gloved hands with an EPA-registered disinfectant wipe or ABHR from an automatic dispenser. Let them dry.	
<b>HCW:</b> Remove gloves. Remove and discard gloves.	
Remove the first glove by pinching at the wrist and pulling up and away from the hand, thereby inverting the glove and exposing the uncontaminated inner surface. Using the uncontaminated inner surface of the first removed glove, pinch the wrist of the other remaining glove and pull up and away to discard, dropping both gloves on the doffing pad.	
<b>HCW:</b> Perform Hand Hygiene. Perform hand hygiene with an ABHR and let dry.	
<b>DE Final Inspection:</b> Perform a final inspection of healthcare worker for any indication of contamination of the uncontaminable garments. If contamination is identified, immediately inform infection prevention team or occupational safety and health coordinator or their designees before exiting PPE removal area.	

FOR DE TO USE AND PROVIDE FEEDBACK TO HEALTHCARE WORKER	DE
<b>PPE Doffing Checklist for Low-Output Ebola Patient Care</b>	completed
<b>Exit Doffing Area</b>	
<b>HCW:</b> Sign log book and record time	
<b>HCW:</b> Shower. Showers are recommended at each shift's end for healthcare workers performing high risk patient care (e.g., exposed to large quantities of blood, body fluids, or secret). Showers are also suggested for healthcare workers spending extended periods of time in the Ebola patient room.	
<b>HCW:</b> Hydrate with water or non-caffeinated sports drinks	
<b>HCW:</b> Protocol Evaluation/Method Assessment. Healthcare worker should meet with the appropriate person to review patient care activities.	

# CDC update on Dallas Ebola Response, 10-12-2014



Texas Health Presbyterian Hospital  
Photo by Joe Raedle/Getty Images

- “...at some point there was a breach in protocol and that breach in protocol resulted in this infection.”
- “The care of Ebola can be done safely, but it is hard to do it safely. It requires meticulous and scrupulous attention to infection control, and even a single inadvertent innocent slip can result in contamination.”

- Tom Frieden, Former Director, CDC  
Press Briefing (10/12/14)

# Articles and Studies on the use of Checklists

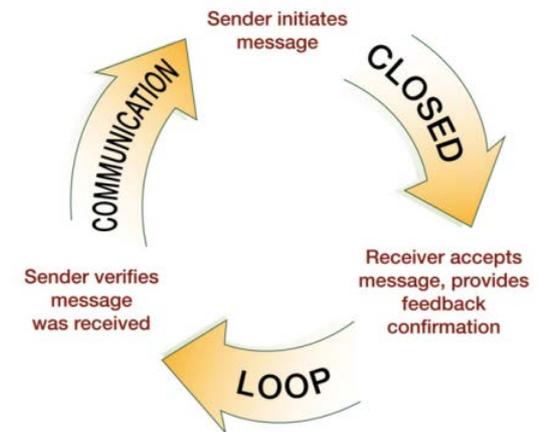
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# Article Conclusions

- Decrease surgically associated morbidity and mortality
- Prevent communication failures and reduce complications
- Encourages teamwork and communication
- Can be implemented in most settings

# Other Techniques Practiced

- Inventory supplies before starting
- DE assist healthcare workers only when needed (minimal contact)
- Slow, deliberate movements
- Closed loop communication
- Red flag words
- Continuously scan PPE and the environment for any risks or hazards
- Doffing expert should always be in the same level of PPE as person doffing



# Benefits to Students

- Experience working on interprofessional teams
- Improve communication and teamwork
- Develop skills and techniques students can take with them through their career
- Importance of checklist, regardless of issue or occupation

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## ADDITIONAL INFORMATION

Additional information about our consortium and the trainings offered can be found on our website:

<https://www.soph.uab.edu/dsb>.