Back to Basics: Precautions Against Germ Transmission

Comment by a COVID Frontline Practitioner
Thank you for having this experience when I was a student. Learning to correctly use the PPE really helped me to feel less afraid stepping into rooms of COVID patients.

Topic: Hands-on-Practice Using Personal Protective Equipment (PPE)
Original Format: In Person, Group Interaction, Some Course Online Prep
Academic Level: Original project conducted by Graduate level students, but Undergraduate, Graduate, Doctoral students participated
Discipline: Interdisciplinary, Applicable for any student clinicians involved with patient care

Feedback/Participant Responses/Evaluation

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Background

This learning activity occurred during the 2014 Ebola Virus Disease (EVD) scare in the United States. When the academic semester started this activity was not part of the course's topical outline. However, because of developing national concerns related to Ebola, and fears voiced by students, content previously planned to be taught was shifted and reorganized so as to embrace this "teachable moment".

Despite the passing of time since Ebola has been a serious threat to Americans, the need for academicians to continue this activity within their healthcare curricula is still quite applicable. The COVID-19 pandemic clearly has caused a resurge in the need for students and practicing practitioners to feel extremely competent in how they protect themselves and patients from microbes as physically destructive as Ebola and the Coronavirus.

Along with national concerns, this activity also emerged as a result of reservations voiced by some Nurse Practitioner (NP) students working as Registered Nurses (RNs) while they attended graduate school. During the time when Ebola was an issue in this country, these practicing nurses came to this author's class and shared their anxieties related to what they described as unsafe work environments. They talked about some hospital facilities not having sufficient supplies of personal protective gear, and some clinic settings having "absolutely no" protective gear. They also expressed their own concerns in correctly applying and removing the Personal Protective Equipment (PPE) advocated by the Center for Disease Control (CDC) because of little, to no, prior experience performing the technique.

Students also shared concerns related to a number of practitioners in their workplaces lacking experience properly donning and doffing protective gear, with many failing to follow CDC guidelines. A number of students felt their work administrators were doing little to address these

concerns. As a result, these students revealed they did not want to go to work in their RN jobs and risk possible contracting the Ebola virus.

Realizing these students were asking for help, hearing global concerns on national news, and knowing nurses were not the only healthcare providers needing to protect themselves against potential Ebola exposure, this author in collaboration with the NP students enrolled in the author's course set out to address their concerns, and those of others. Within a few days the team developed an on-campus, multi-disciplinary, educational program with the aim of building confidence in how to properly protect oneself in the healthcare work environment when transmission of infectious agents is a concern.

We started with basic principles of infectious control (e.g., handwashing) since we believed having a secure grasp of foundational principles was vital. Therefore, the practice stations we developed started with fundamental infectious control measures and advanced to participants actively practicing donning and doffing of PPE, as per CDC guidelines for Ebola precautions.

Listed below are key elements students and the course faculty member felt were imperative to include in the program.

The event should be interdisciplinary since any health science student entering patient rooms during clinical experiences, no matter the reason, should know how best to protect themselves, patients and others from spread of infections.

Stations should be interactive, engage participants, offer hands-on learning opportunities and build on one another.

The last several stations should provide participants opportunities to practice applying and removing protective equipment.

Participants should be allotted time to practice outlined skills and rotate through the different stations at their own pace.

The CDC guidelines for isolation precautions and their sequence of donning and removing PPE items should be the teaching exemplar for all stations.

Nurse Practitioners and other Health Science students should take the lead in presenting the program. Students running the program function as facilitators at the various activity stations.

All student facilitators are expected to visit all parts of the program as active "participants", with the intent of practicing and self-checking their own level of competence.

When this project was presented during the height of the Ebola scare some of our local television and newspaper reporters attended the event and showcased what we (as the community) were doing to address the Ebola threat. Interestingly, each of the reporters completed each station and felt they too took helpful information away for themselves in terms of personal germ protection. The event was showcased on the nightly news and reported with numerous pictures in local newspapers. In the end, the publicity heightened the interest of many, and elicited numerous requests to help others formulate similar programs. This is truly a rewarding and much needed venture for faculties and students to invest the time in developing and conducting.

Purpose of Activity

- To provide healthcare students a safe, non-threatening environment to review principles of germ transmission and contamination, perform a self-check on their knowledge and skill in applying these principles, and spend time practicing donning and doffing PPE, per CDC guidelines.
- For students to walk-away feeling confident they know how to correctly apply and remove PPE so they have a lessened chance of infecting themselves, patients, and their family members.
- Reinforce general principles of controlling the spread of infections, rather than solely focusing on one particular virus such as Ebola.

Modifications for Current and Future Needs

1. During the time of the Ebola outbreak this activity was conducted on-campus. A face-to-face format seemed practical due to the interactive nature of each station, and the goal of a hands-on approach to learning. In instances whereby a discipline's program is taught predominantly on-line, perhaps this activity could be built into one of the few scheduled on-campus days. Or if this approach is not possible, maybe a virtual experience using 3-D glasses could be developed creating a virtual reality of donning and doffing.
2. This activity was integrated unexpectantly into a course because the faculty member saw an opportunity for a "teachable moment". As a result, the faculty member and students had to work with issues such as: minimal time to develop the program, scheduling conflicts between different disciplines, obtaining supplies on short notice, securing available classroom space, developing practice stations, and finding quick funds to buy equipment and supplies. When setting-up such programs having the opportunity to pre-plan well in advance is helpful for developing details, securing sufficient monetary funds, assembling supplies, engaging students from multiple disciplines, and scheduling practice dates around other class and campus activities.
3. In the original activity, the volume of people rotating through the various interactive stations were controlled to limit overcrowding stations and allow individuals ample time at each station. Today in the COVID-19 era controlling flow of traffic through stations will also help address current physical distancing and group-spacing standards.
4. During the Ebola crisis this activity was conducted indoors throughout three floors of a university building that mainly housed practice labs for health science students. So spacing was plentiful. With current COVID limitations on social interactions, this activity could

easily be conducted outside. For stations where rooms are needed, such as a decontamination room, tents would be practical.

5. Schedule this activity early in curricula of health science students. Use this as an introduction before any clinical rotations or practicums transpire. Then, to maintain a sense of competence in students as they progress through their programs of study, plan annual programs that are "*step-ups"* from prior programs, and that require more comprehensive usage of PPE. Possibly, another "*step-up*" scenario could be a mock disaster drill supposed caused by a microbe planted by a bioterrorist group.
6. The need to educate frontline individuals and future practitioners on appropriate care standards during pandemics such as COVID, has led to the federal government funding a number of relief and assistive grants for hospitals and higher education institutions to help offset education expenses. Since money is needed to buy PPE supplies and other materials, look to these federal dollars as possible monetary resources. Having authentic full protective suits available for practice can be costly.

Activity: *Back to Basics: Precautions Against Germ Transmission*

Directions:
Each of you will be at an assigned station. There are ten stations. The purpose of the activity is to allow Health Science students in the Pre-Med, Physician Assistant, Nursing, Physical Therapy, Occupational Therapy, Speech and Language, Medical Imaging… programs to come together to practice applying Personal Protective Equipment (PPE) per Center of Disease Control (CDC) guidelines. The activity should be self-directed and a non-threatening event, whereby participants move through stations at their own pace. For some participants the activity may be merely a review, for others just an affirmation they are following proper protocol, and for others an entirely new learning experience. Your main roles will be to affirm protective techniques of participants are correct, engage individuals in discussing basic principles of germ transmission along with Ebola precautions, and provide participants hands-on practice so they leave knowing how to properly protect themselves and others.

Information related to the purpose of each station is described below. Make sure you are able to discuss the distributed literature on the causative agent, infectious control measures, and CDC guidelines. You must be well versed in the information related to the theme of your assigned station. You are not expected to plan a presentation on your topic, but be able to discuss factual and scientific-based information with participants. Facilitators should not merely stand by their stations, but rather, engage participants in the learning process. You are responsible for designing and setting up your assigned station. See faculties for needed supplies like PPE.

STATIONS

Station 1: Introduction to the Program

Several human models at this station wear different types of PPE equipment (e.g., surgical mask versus N95 mask, face shields…). Question posed: *Is this what your everyday work attire will look like in the future?* Dialogue with participants related to this question. Station also includes a laptop computer showing a clip depicting frontline providers as "heroes." Participants receive the handout, *Application of Personal Protective Equipment* (CDC) discussing the correct procedure for applying PPE. Facilitators engage participants in discussing items at station.

Station 2: Correct Sequence of Donning

Participants are shown basic protective equipment items (e.g., surgical type mask, gowns, shoe and head covers, gloves…) that are typically applied before entering a patient room when spread of infection is a possibility. These items are hanging at the station (we used IV poles) and participants, while using the CDC handout from Station 1, are asked to put the items in correct sequence of application; just as if they were about to enter a room of concern.

Station 3: Correct Sequence of Doffing

Station 3 uses same format as Station 2. However, here participants are asked to arrange protective equipment in the sequence of removing items when exiting a room.

Station 4: Knowledge Building and Cover Gown Application (General Protection)

At this station facilitators share components of a CDC podcast related to the spread and transmission of Ebola (now might use Coronavirus). Facilitators engage participants in discussing key elements from the podcast. Before leaving Station 4 each participant applies a cover gown. Facilitators are preparing participants for upcoming stations where participants apply the rest of items used for general protection.

Station 5: Donning Practice

Participants should come to this station (placed close to Station 4, due to gown application) with cover gowns on. In lined-up bins are the remaining protective equipment (e.g., masks, goggles, gloves, shoe and head coverings…) participants would need to apply when entering a potentially contaminated room. Participants with guidance from facilitators practice applying protective gear in correct sequence per CDC guidelines (handout previously given) and as reviewed in prior stations.

Station 6: Doffing Practice and Handwashing Check

Participants at this station are asked to remove the protective gear donned in Station 5. Facilitators observe for correct sequence of removal and assist as applicable. Station activity concludes with participants washing their hands. Facilitators offer help as needed with proper handwashing procedures. Hands of participants are checked for completeness of washing. An Ultraviolet (UV) light and commercial product such as *Glo Germ* is used to show participants how effective their handwashing was, or wasn't.

Station 7: Ebola Gear Removal

In this area, participants practice assisting a simulated care provider to change out of PPE attire typically worn when using Ebola precautions. Complete PPE suits should be available. A care provider in a "patient room" will contact the person (Doffer) on the other side of the room's closed door via Walkie Talkie, or other similar communication device. The care provider notifies the Doffer and station participants he/she is about to exit the room. The Doffer and station participants instruct the person step-by-step on the proper removal of the contaminated gear. For example, the first step will be to instruct the person to step onto the "contaminated" pad. Next, the group participants will state the duct tape from around the cuff of the "contaminated" person's gloves needs to be removed. Participants will continue the instruction process for correct removal to the point where the "contaminated" person is instructed to step into the shower. There should be a designated shower area (mock) appropriately labeled.

Instructions for the Process of Removing PPE equipment in such situations as Ebola (or now COVID) are written on a long sheet of paper with large lettering. The paper is posted on the floor so participants can read the sequential steps as they instruct the "contaminated" person through the gear removal and decontamination process. The Facilitator (Doffer in this area) assists the "contaminated" person in removing the contaminated gear, as well as aids the station participants to verbalize the correct steps of the decontamination and removal process.

At the end of this session, as participants are exiting, the Doffer (Facilitator) will spray one or two individuals with a spray bottle containing pseudo contaminated fluid/secretions suggesting cross-contamination of these individuals. The individual/s sprayed are then escorted by the Doffer to Station 8 and the rest of the group exits the area with instructions to proceed to Station 9 and 10.

Station 8: Potential Ebola Contamination – Signs and Symptoms

This is the station where those individuals "sprayed" and "contaminated" from Station 7 must stop. Here their temperature is taken and they are given instructions and provided a handout on signs and symptoms of Ebola (or Coronavirus) they should watch for. Accompanied by a facilitator these individuals should exit the area through a different exit besides the exit used by those individuals who were not "contaminated". The concept is to convey "contaminated" individuals need to be separated from others. The participants that are "escorted" out via a different exit should be told they can re-enter to finish Station 9 and 10.

Station 9: Self-check on Properly Attiring Oneself

Prewrite a short scenario related to an adult patient who has some condition that requires care-providers wear gowns, masks, goggles, gloves, plus shoe and head covers. Have items in bins available for participants to apply. The scenario is posted on the door of a "patient" room. Participants are instructed to read the posted scenario. Next students are instructed by the

facilitator to "dress" so they can go in and check on the described patient. Facilitators should not instruct participants on what to put on, but rather give them a chance to "dress" correctly on their own. If assistance is needed on proper "gowning" then facilitators assist as needed. Once correctly "dressed" the participants proceed to Station 10.

Station 10:

This is ideally a simulation room with either manikins or patient actors. The patient in the room reflects the example from the case scenario at Station 9. Properly attired the station participants enter the "patient" room. The facilitators in the room model appropriate care, and briefly talk with the participants about how germs can be spread when caring for infectious individuals. Information is also reviewed on how care providers can easily infect other patients and themselves. Participants are centered around the patient's bed and encouraged to share thoughts, touch and ask questions. Facilitators also wear PPE gear since they are in an "infectious" room. As the group is exiting the room, they should be checked for proper removal of gear per CDC guidelines.

Feedback/Participant Responses/Evaluation

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