# Supplementary Materials

Detailed overview of design features according to category (layout vs physical environment)

**Equipment layout and availability**

Issue 1: HCWs unknowingly stepped between “clean” and “dirty” zones

* Three doffing zones were created: a red “dirty” zone for the initial stages of the doffing process, a yellow “caution/warm” zone to be used once body coverings have been removed, and a final green “clean” zone for when all equipment was removed. Zone lines were demarcated with thick coloured tape both on the ground and up the walls to improve visibility.
* Tactile feedback was added by placing a long peg of wood (dowel) underneath the tape as an attempt to help the participant feel the raised tape if they stepped on the line.
* A transition (buffer) area was taped close to the red zone to safeguard against Secondary HCWs getting too close to the Primary during the doffing procedure.
* Chevrons were taped to the ground to highlight the anticipated direction of travel. Red chevrons pointing towards the “dirty” zone were for HCWs to follow when entering the patient room. Green chevrons were for HCWs to follow when transitioning from the “caution/warm” zone to the “clean” zone.

Issue 2: Cleaning materials were not always easily accessible

* Disinfectant wipes and hand sanitizer were attached to the wall. This removed the necessity of an additional surface to rest them on (that would also require additional cleaning).
* Automatic hand sanitizers that dispense solution without being touched by the user were used.
* Height at which containers were attached to the wall was important: a user will place her hands underneath the hand sanitizer, but will reach to the top of the wipe container to remove a wipe. Side by side placement was selected to ensure wipes could be removed from the container without the user reaching underneath the hand sanitizer.

Issue 3: Disposal bins were not always easily accessible

* A disposal bin was provided in each zone and was colour coded appropriately.
* Bins were positioned away from the line separating the dirty from the caution zone, and from the dirty to the clean zone. This was to prevent items falling into a “cleaner” zones if not placed in the bin correctly (e.g., because the bin is too full).
* Bins were positioned so that HCWs had an unrestricted view of themselves in the mirror.
* Each disposal bin was placed at arms reach from the wipes dispensers to prevent unnecessary movement within the anteroom.
* Size of the disposal bin was an important consideration since it determined how fast the bin filled up while doffing. We selected a size that ensured at least one full doff could be achieved.
* Disposal bin positioning is outlined on the floor to make it clear where a bin should be located (if removed). The lines used also acted as warnings to prevent users from stepping too close to the bins and potentially brushing up against the bin in contaminated equipment

Issue 4: Lack of equipment to perform a visual contamination check

* A mirror was placed in each zone to enable the Primary HCW to inspect for breaches and gross contamination.
* Mirrors were positioned close to cleaning materials to prevent unnecessary movement between items during the doffing process.
* Each mirror was affixed to the wall (not left resting on the floor) at a height that accommodated the best viewing for users of different heights.

Issue 5: Seating increased contamination risk

* Hand rails were provided for HCWs to steady themselves when removing shoe covers (if applicable). The use of a chair, stool or bench (as used by many institutions) may not always be possible given the often-limited amount of space available within doffing areas. These items are also difficult to clean and increase the chance of cross contamination as an HCW sits down without any protection to remove shoe covers (shoe covers are often one of the last items to doff).
* The handrail was located close to where it was anticipated shoe-covers would be removed. We positioned the hand rail close to the demarcation line since most protocols required users to remove one foot from a shoe cover and step across to the “cleaner” zone.

**Physical environment**

Issue 1: Size of doffing area had significant impact on doffing safety

* Regardless of anteroom size, the space provided for doffing should be restricted to a particular area to prevent unnecessary movement (and spread of contamination) within the anteroom. The doffing area was restricted to smaller four foot by four foot zones.