# Journal Club

## BACKGROUND AND OVERVIEW

**Article Title**

Artificial intelligence (AI) use for personal protective equipment training, remediation, and education in health care
Preda et al (2025) Am J Infect Control; DOI 10.1016/j.ajic.2025.03.020

**Purpose**

To assess the efficacy of **Surgical XR AI-PPE** (**SXR AI-PPE**) in training and remediating health care workers (**HCW**) in correct personal protective equipment (**PPE**) donning and doffing techniques

**Background**

Correctly donning and doffing PPE are critical skills for HCWs, with incorrect usage being associated with nosocomial infections. Nevertheless, nearly 90% of HCW were unaware of incorrect donning and doffing techniques. Training & regular monitoring can fill these gaps, but are often impractical due to resource limitations and perceived professional boundaries

## METHODS

**Study design & methods**

Single-center, mixed-methods, prospective study involving 293 HCWs in Sydney, Australia

- Cross sectional study for the 293 HCW (75% medical students)
- Pre-post / longitudinal analysis (only done with 20 medical students)

**Selection & enrollment**

Inclusion: had previously completed both basic hand hygiene and PPE online modules in past year
Exclusion: if they were physically unable to perform the necessary steps of donning

**Outcome measures**

**Accuracy** (correct PPE usage) and **speed** with donning + doffing (hand hygiene, gown, mask, eyewear, hat, gloves)

- Accuracy over time (only in the 20 med student cohort)

## RESULTS

**Summary of study results, focusing on outcomes**

| Percent failed | Hand hygiene | Gown | Mask | Eyewear | Hat | Gloves |
|---|---|---|---|---|---|---|
| Donning | 29% | 50% | 23% | 43% | 10% | 14% |
| Doffing | 4% | 0% | 1% | 0% | 21% | 0% |

| PPE time (seconds) | Before | After | Difference |
|---|---|---|---|
| Donning | 208 | 193 | 15 sec (7.2%) |
| Doffing | 195 | 173 | 22 sec (11.3%) |

| Percent failing (n=20) | Hand hygiene | | Gown | | Mask | | Eyewear | | Hat | | Gloves | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | DoNN | DoFF | DoNN | DoFF | DoNN | DoFF | DoNN | DoFF | DoNN | DoFF | DoNN | DoFF |
| Baseline | **5** | **10** | **40** | 0 | **5** | **15** | **25** | 0 | **5** | **20** | **10** | 0 |
| 3 months | **5** | **5** | **15** | 0 | **5** | **5** | **5** | 0 | **5** | **5** | 0 | 0 |
| 6 months | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

## Brief summary of main discussion points & study limitations

**Overview**

It's a cool concept, but the article reads a little like an advertisement

> "*Each participant started by logging in to their individual…account via facial recognition. Trials were recorded…with both natural and artificial light…to mimic variable clinical settings such as wards and outpatient clinics*"

That being said, I don't take major issues with it. They highlight some appropriate points in the discussion: Simulation-based learning is effective, low technologic barriers to entry (only need a camera), and avoids potential issues with the hierarchy of medicine

**Limitations**

- Likely conflicts of interest
- No comparison group (and no statistical significance)
- Generalizability: Heavily skewed towards medical students