



Optimizing Use of COVID-19 Personal Protective Equipment among Resident Physicians at a Veterans Affairs Hospital



Ronald Beaulieu, MD, Joanna Kimball, MD, Samuel Bailin, MD, Mike Lowry, MD, Jennifer Werthman, PhD, MBA, RN, Erin Gettler, MD, Chelsea Gorsline, MD, Kelly Lumpkins, MD, Bin Ni, MD, PhD, Karen Volpe, MD, Bryan Harris, MD, MPH, Todd Hulgan, MD, MPH, Anna Person, MD, Christina Fiske, MD, MPH, Milner Staub, MD

INTRODUCTION

- Correct Personal Protective Equipment (PPE) use prevents nosocomial spread of infection
- Low rates of correct PPE use among healthcare workers (HCWs) on a single acute care unit at Tennessee Valley Healthcare System prior to COVID-19 [Figure 1]
- Poor adherence to longstanding PPE protocols, prompted concern that HCWs would be at further increased COVID-19 exposure risk as PPE protocols evolved rapidly
- Resident physicians, due to rapid turnover and limited site-specific PPE training, theoretically even more at-risk of incorrect PPE use
- We aimed to assess and improve COVID-19 PPE use among internal medicine residents rotating at the VA TVHS in April 2020.

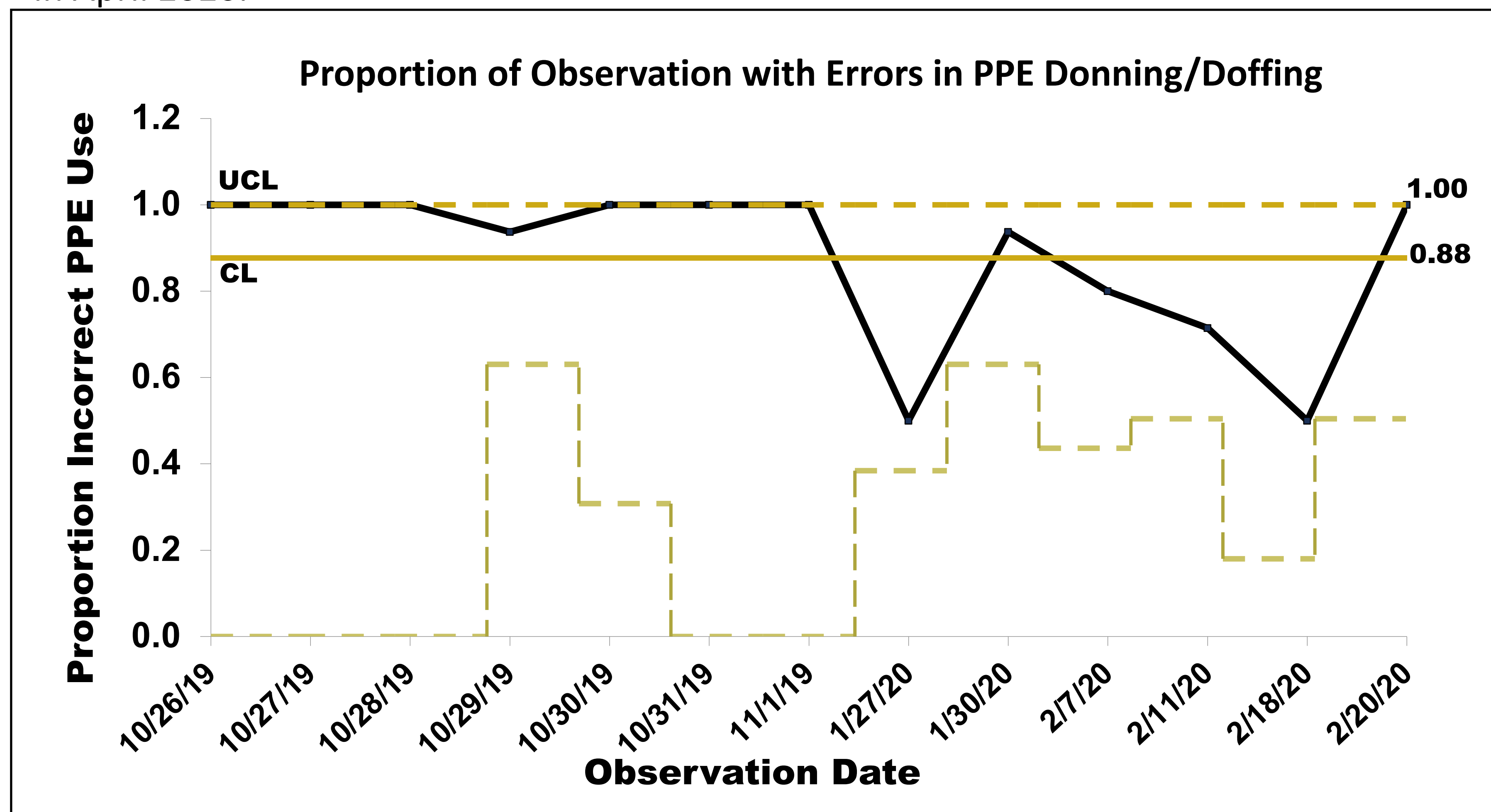
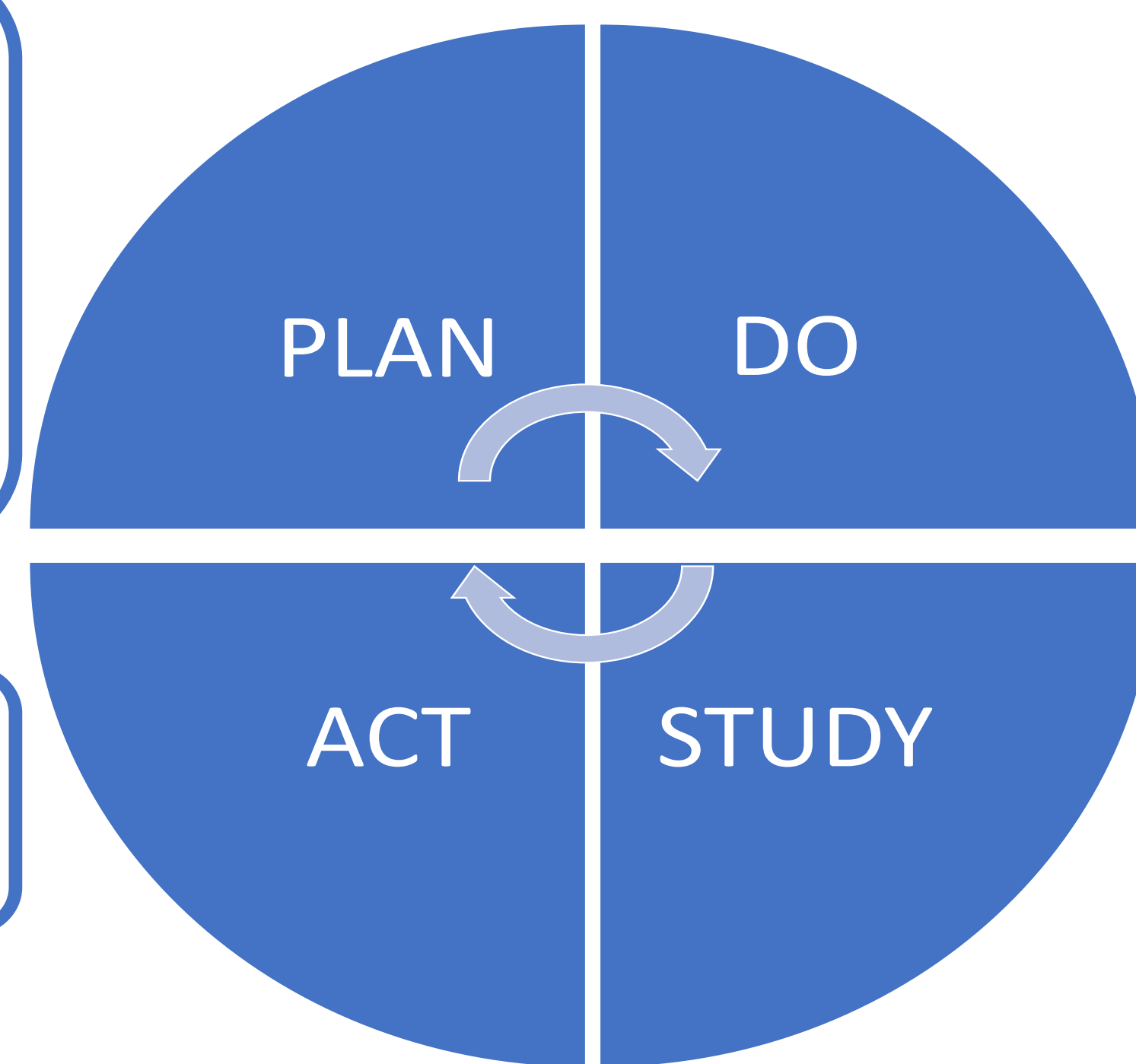


Figure 1: P-Chart shows proportion of observations in which PPE was not donned or doffed correctly. To be “correct,” all steps were performed correctly and in order. Upper control limit (UCL), control limit (CL), and lower control limit (LCL) were calculated by QI Macros Version 2019.01.

METHODS

- The study design was based on the plan, do, study, act (PDSA) model.
- Errors at each PPE don/doff step were documented.

- **Passive Education**
 - VA TMS modules
 - Guidance posters distributed
- **Active Education**
 - Video conference to review protocols every 2 weeks
 - In person testing with intervention



- Monday: pre-education survey sent to residents starting VA rotation.
- Wednesday: 1 hr virtual meeting to review protocols and Q&A
- Thursday & Friday: Initial observation & testing.
 - 1 week later: Follow up testing.

- Analysis of survey results and intervention rates during observations.

- Fit testing for new N95.
- Continued Education & Observation.

- Correct PPE use data from both observations were compared using McNemar’s test.
- Baseline and post-implementation resident surveys assessed PPE use knowledge and comfort.

RESULTS

- Pre-implementation survey response rate was 72% (21/29); 19/21(91%) reported knowing which PPE to use and 16/21(76%) reported knowing how to safely don/doff PPE. Twenty of 29 (69%) residents completed both observations.
- Errors decreased by 55% (p=0.0045) from 17/20 (85%) to 6/20 (30%) between initial and follow up observations. Errors were broken into categories (Figure 2).
- Post-project survey response rate was 16/29 (55%). All 16 reported knowing which PPE to use and how to safely don/doff PPE, and 11/16 (69%) residents felt both online and in-person interventions were helpful.

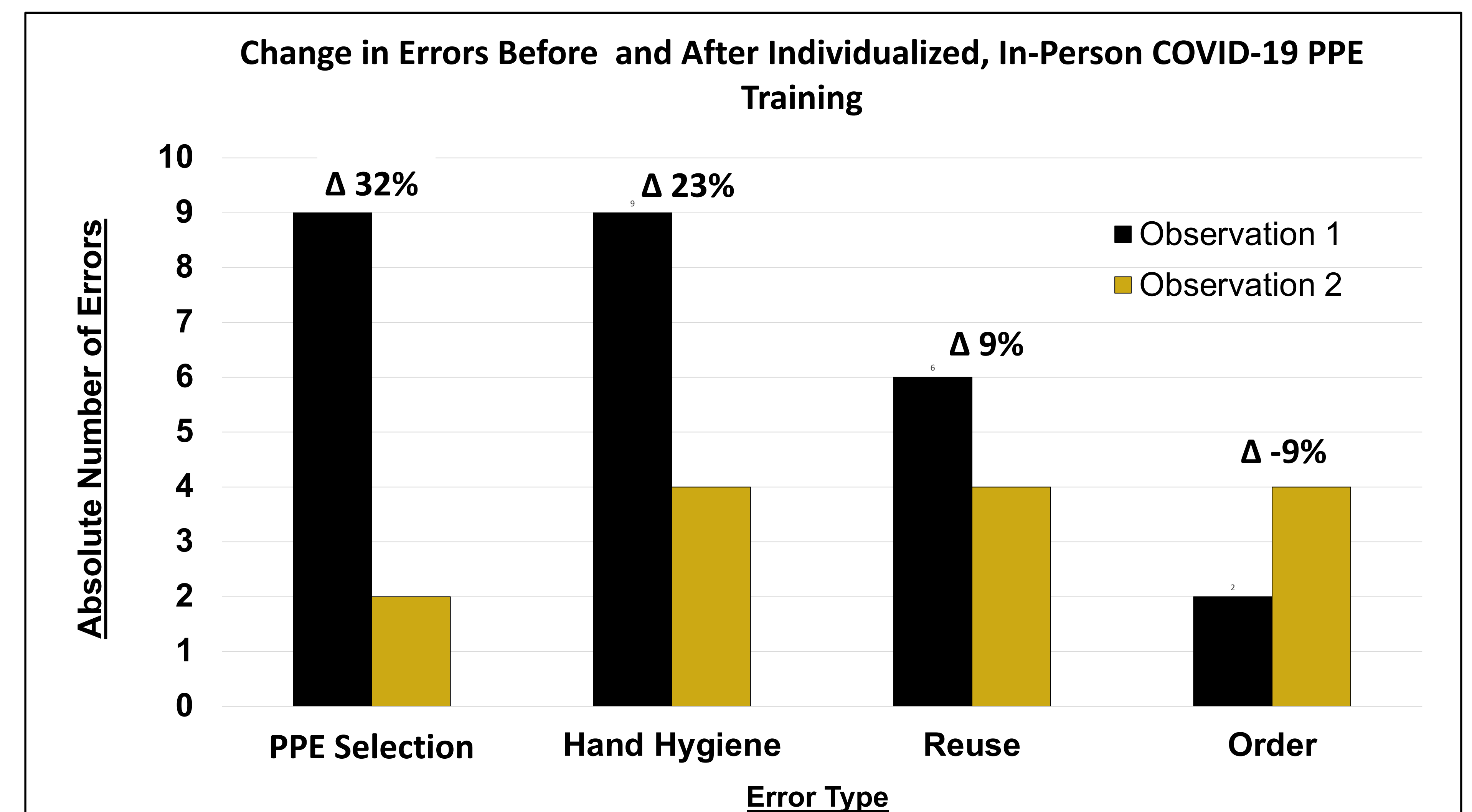


Figure 2: Errors in PPE adherence were categorized as errors in PPE selection, missing any hand hygiene step (hand hygiene errors), errors in the steps to safely clean and store select re-usable equipment (reuse errors) and whether any steps were omitted or out of sequence (order errors).

DISCUSSION

- Correct COVID-19 PPE use is essential to protect HCWs and patients.
- Just-in-time education intervention for PPE training may yield higher correct use compared to pre-recorded or online training
- Further dissemination of this successful intervention was limited by availability of infection prevention staff to personally meet with each resident twice to assess donning/doffing
- A variation of this training which includes a single infection prevention delegate meeting in person with the resident teams every two weeks to provide equipment, review COVID-19 donning and doffing procedure and to answer questions continues presently.

MS and JW receive support from the Office of Academic Affiliations, Department of Veterans Affairs, VA National Quality Scholars Program, with use of the facilities at the VA Tennessee Valley Healthcare System

