

Effectiveness of COVID Prevention Strategies for Protecting Healthcare Workers at an Academic Medical Center in Vermont

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Purpose and Background: Protecting healthcare workers (HCW) from COVID is of great concern in healthcare. Data collected early in the pandemic suggested the risk of infection in HCWs was three times higher compared to the community. This study aimed to investigate the effectiveness of COVID prevention strategies implemented at the University of Vermont Medical Center (UVMC), which included personal protective equipment (PPE), prompt testing and isolation of patients, widely available testing for staff, work restrictions for infected and exposed employees, and vaccination. The research questions were: (1) Are HCWs at higher risk of COVID than Vermont residents in general? (2) What are the exposure sources for HCWs infected with COVID? (3) What are the relative risks of medical center, household, and community exposures? (4) What is the impact of vaccination on COVID incidence among HCWs?

Methods: Study subjects included all 11,597 employees (“HCWs”) who worked at UVMC at any time between March 1, 2020 and October 31, 2021. HCWs were required to report COVID symptoms, exposures, and out-of-state travel to Employee Health. Nurses interviewed callers, arranged testing, provided results, and carried out contact tracing, documenting this information in a database, along with vaccination data obtained from in-house clinics and required reporting of vaccination. After obtaining IRB approval, the study team analyzed data extracted from this database. Reported COVID exposures were coded as household/family/intimate partner, community, travel, or medical center and the relative risks of each type of exposure were compared. The weekly incidence of COVID among HCWs was compared to that in the state population, using data publicly available from the State of Vermont.

Results: The incidence of COVID among HCWs was very similar to the statewide incidence until 4 weeks after HCW vaccination began, when cases among HCWs dramatically decreased. Among 411 HCW infections, 48% were judged to have been acquired from exposure to an infected household or family member or intimate partner, 16% from community exposures, 11% during travel, and 3% from work-related exposures (which were predominantly exposures to other staff), with the remaining 22% unknown. Among 975 exposure events, the relative risk of acquiring COVID after household exposure vs. work exposure was 16.4 ($p < .01$), and of community exposure vs. work exposure was 6.5 ($p < .01$). For household exposures, vaccination decreased the risk by one third.

Conclusions: The array of COVID mitigation strategies implemented at UVMC effectively protected HCWs during the first year and a half of the pandemic. HCWs were at no greater risk of acquiring COVID than the general population and the risk of acquiring COVID-19 at work was exceedingly small. Exposures outside the hospital, in particular to household, family, or intimate partners, carried the greatest risk of infection, especially among the unvaccinated.

Nursing implications: Nurses can contribute to a safe healthcare environment during future epidemics of respiratory infections or a resurgence of COVID by implementing a comprehensive strategy to include not only PPE, but testing, quarantine, and isolation of both patients and staff with symptoms of or exposure to disease, and vaccination.