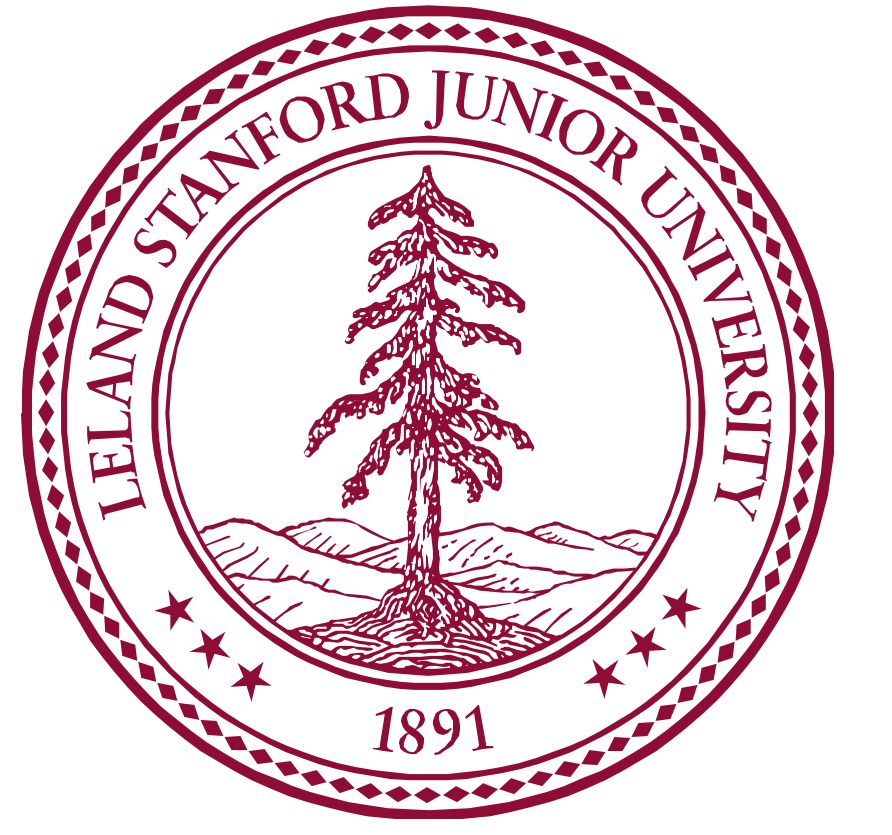




Lack of Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) transmission from a healthcare worker to a cohort of immunosuppressed patients during the Omicron variant surge, California, 2022



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Introduction

- Risk of transmission of SARS CoV 2 from healthcare workers to hospitalized patients increases during community surges of Covid19¹
- This risk is higher for patients who are immunosuppressed, particularly who have malignancies or have underwent organ transplants²
- We describe aversion of a potential outbreak during the January 2022 Omicron surge and discuss strategies to reduce transmission of SARS CoV 2 in healthcare settings

Objectives

- Describe a potential outbreak that was averted within a healthcare setting during a time of high community transmission
- Describe the patient characteristics of an immunosuppressed cohort in which there was no transmission of SARS CoV 2 despite close contact with a highly infectious case
- Discuss various infection prevention strategies that can reduce risk of SARS CoV 2 transmission in hospitals and healthcare settings

Description of Exposure Events

- Healthcare worker (HCW) was a physician without any comorbidities; fully vaccinated and boosted (Pfizer, December 2020, January 2021, October 2021); no prior infections
- No known sick contacts prior to starting on Solid Organ Transplant service, asymptomatic

Day 1

Day 2

-Negative SARS CoV 2 rtPCR (self collected, anterior nares, screening test)

-Awoke with mild fatigue which resolved prior to work

-Negative symptoms on daily screen

-Negative symptoms on daily symptom check screen

-Examined 7 patients (HCW wearing N95, patients unmasked except 1 who wore N95); 3 were same as Day 1

-Examined 7 patients (HCW wearing N95, patients unmasked)

-HCW worked ~6 hours w/ colleague who also wore N95

-HCW worked ~8 hours in close proximity w/ colleague who also wore N95

-During course of shift, HCW began feeling fatigue, sweats, chills and left work; repeat rtPCR (nasopharynx) collected at occupational health

-Resulted positive, cycle threshold 15.9

Results

Patient	Age/sex	Diagnosis and (date of transplant)	Day of Exposure*	Day of Follow Up Test(s)	Type of Test(s)	Test Result(s)**
1	56 F	Pre-heart	0	3, 5	Nasopharyngeal	Negative
2	62 M	Lung (8/2021)	0	3, 5	Nasopharyngeal, Mid-turbinate	Negative
3	46 F	Liver (4/2021)	-1, 0	5	Nasopharyngeal	Negative
4	62 F	Liver (2/2021)	-1	5, 5	Nasopharyngeal, Mid-turbinate	Negative
5	60 F	Kidney (4/2019)	-1,0	5	Mid-turbinate	Negative
6	65 M	Heart/Liver (12/2020)	-1	3, 5	Nasopharyngeal	Negative
7	70 M	Lung (11/2021)	-1	5	Mid-turbinate	Negative
8	55 M	Heart (10/2021)	-1, 0	5	Nasopharyngeal	Negative
9	56 F	Redo lung (8/2019 and 12/2021)	-1	4,5	Nasopharyngeal, Nasal	Negative

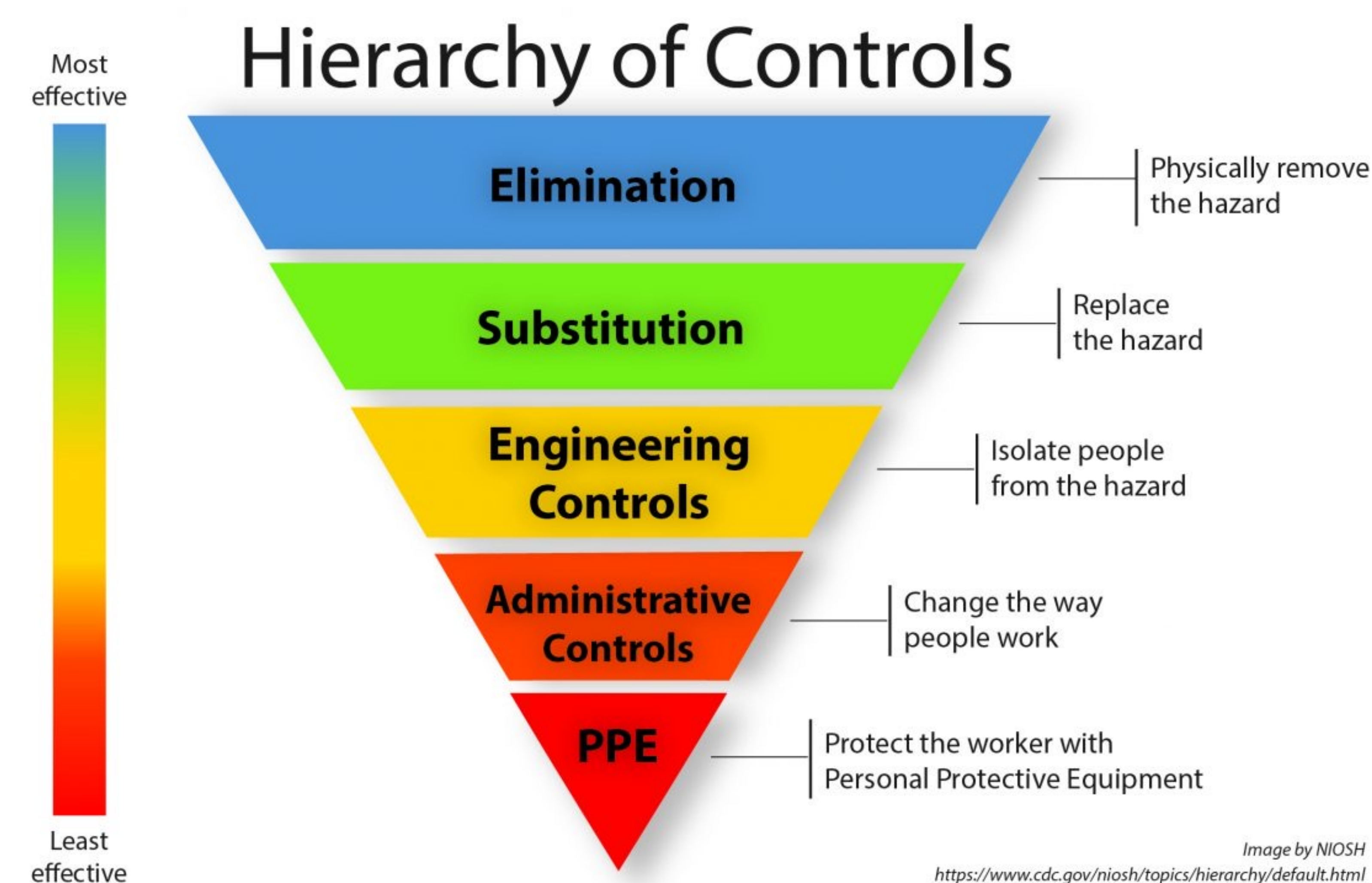
Table 1: Timing of Exposure & Diagnostics for Transplant Patients Exposed to an Infectious HCW

*Day 0 is the index case's symptom onset

**The exposed HCW that worked alongside the index case was also tested and remained negative on serial follow-up testing

Discussion

- Multiple layers of protection likely helped prevent transmission during these exposures³
- **Engineering Controls:**
 - Hospital rooms utilize 6 Air Changes Per Hour, which can remove infectious aerosols every 10 minutes. This can be increased to 12 ACH (as used in airborne isolation rooms) for high-risk patient wards, such as on immunocompromised services
- **Administrative Controls:**
 - Minimize duration of exposure: Close patient encounters were limited to less than 15 minutes. Strategies including use of video can minimize unwanted exposures.
 - Regular staff testing: allowed for same-day results to healthcare worker to minimize any further patient exposures
 - Daily symptom screening: can catch potential cases; however, limited when symptoms are nonspecific (fatigue) or inconsistent/resolved within short window
 - Vaccination requirement for staff: this can potentially reduce risk of acquisition of virus, duration of viral shedding, or overall viral load⁴
- **PPE:** Healthcare worker was wearing fit-tested N95 respirator during all patient encounters. This may be an important strategy during community surges given superior source control compared to surgical masks



Conclusions

- SARSCoV2 transmission dynamics are complex and involve many factors, including infectiousness of index case, duration of exposure, proximity, immune system of exposed persons, ventilation/air filtration, use of PPE by index case and exposed persons
- Reducing risk of transmission during community surges is an important task for protecting the health of immunocompromised cases
- Layered strategies utilizing a 'Hierarchy of Controls' model can help avert potential outbreaks in healthcare settings

References

1. Klompas M, Rhee C, Baker MA. Universal use of N95 respirators in healthcare settings when community coronavirus disease 2019 rates are high. *Clin Infect Dis* 2022;74:529–531
2. Shen C, Risk M, Schiopu E, et al. Efficacy of COVID-19 vaccines in patients taking immunosuppressants. *Ann Rheum Dis* 2022. doi: 10.1136/annrheumdis-2021-222045
3. Klompas M, Karan A. Preventing SARS-CoV-2 transmission in healthcare settings in the context of the omicron variant. *JAMA* 2022;327:619–620.
4. HEROES-RECOVER Network. Association of mRNA Vaccination With Clinical and Virologic Features of COVID-19 Among US Essential and Frontline Workers. *JAMA* 2022; 328(15):1523-1533.