

## Emergency Preparedness

EP-46

### Infection Prevention Resources to Respond to the Initial Coronavirus Disease Pandemic at an Academic Medical Center

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**Background:** Infection prevention specialists (IPS) are relied on as subject matter experts, providing guidance and support within healthcare facilities. During the coronavirus disease (COVID-19) pandemic, infection prevention (IP) department resources were heavily taxed, creating an increased IP staffing need. The objective of this study is to quantify the additional IP resources needed to support pandemic response at a large, academic medical center.

**Methods:** Pre-pandemic, our IP department included 12 full-time IPS, providing support to a 1315-bed hospital, 138 outpatient clinics, and 2 ambulatory surgery centers. The increased level of organizational support needed for the COVID-19 pandemic response required more full-time employees (FTE) to assist in managing additional duties. Duties included: conducting employee cluster investigations and contact tracing; reviewing positive COVID-19 lab specimens reported each shift to ensure appropriate isolation and bed placement; developing and reviewing COVID-19 related protocols across multiple hospital areas; and instituting a clinical case review process with infectious disease (ID) physicians to respond to call questions about testing, isolation requirements, and discontinuation criteria in complex patients.

**Results:** The first known COVID-19 positive patient was admitted on 3/17/2020. Department call volumes peaked between May 2020 and end of June 2020. Calls during that time frame totaled 2,825 with an average of 202 calls daily. In response our IP department added 6 additional FTE. These FTE consisted of 2 reassigned bedside nurses and 4 contract nurses, supporting the 24/7 on-call service from 3/31/2020- 4/6/2021. Physician support increased to 2 dedicated epidemiologists managing COVID-19 guidance and IPS escalation needs, and a 24/7 on-call clinical review team, involving 16 ID physicians was implemented.

**Conclusions:** A pandemic response effort can have a major impact on infection prevention staffing resources. Repurposing and/or onboarding non-IP staff and training them to support concrete IP processes can be an effective strategy to reduce strain on department resources.

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### Is *Pneumocystis jirovecii* Transmitted by the Airborne Route?

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**Background:** *Pneumocystis jirovecii* (*p.jirovecii*) is a fungus responsible for causing opportunistic *Pneumocystis pneumonia* (PCP) in immunocompromised patients. Currently the Centers for Disease Control and Prevention (CDC) recommends following standard precautions while also avoiding placing a PCP patient in the same room with an

immunocompromised patient. There has been recent scientific evidence that indicates *P.jirovecii* may be transmitted by the airborne route. The purpose of this literature review is to evaluate the recent research findings to assess whether escalating transmission-based precautions from droplet to airborne isolation is necessary to best prevent transmission of *P.jirovecii* in the immunocompromised oncologic patient population at a 514-bed inpatient comprehensive cancer center.

**Methods:** PubMed was utilized to identify articles describing PCP outbreaks, the fungal characteristics, and mode of transmission. The articles reviewed comprised of systematic reviews, case control, and case report studies published between years 2016 through 2021, with one influential case control study published in 2010. The patient population studied in the outbreaks included those with heart, kidney, or liver transplants and patient populations with other immunocompromising conditions.

**Results:** Nine articles, including 4 systematic reviews, 4 case control studies, and 1 case report were reviewed. The scientific evidence of the fungal characteristics, mode of transmission, and occurrence of clusters of PCP cases favored the hypothesis that airborne transmission is possible. There are still some unknowns including the length of time that the fungal cysts can remain in the air and if the cysts are spread via droplet or aerosolized route.

**Conclusions:** Despite the recent findings demonstrating possible airborne transmission, until further studies increase the strength of evidence for airborne transmission, droplet precautions should be considered for PCP patients to prevent transmission in the immunocompromised population.

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### Stewardship of Personal Protective Equipment (PPE) During a Pandemic

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**Background:** The use of PPE is fundamental in protecting healthcare workers (HCWs) from being exposed to SARS-CoV2. The pandemic caused global PPE shortages forcing institutions to address appropriate utilization and conservation. Initial efforts to limit PPE distribution to avoid misuse and frequent changes in public health guidance created confusion and apprehension amongst HCWs.

**Methods:** Infection Prevention and Control (IP&C) implemented a PPE stewardship initiative, consisting of daily rounds on patients positive or suspected of COVID-19. Principles included: 1.) supporting HCWs caring for these patients, 2.) assure implementation of infection prevention principles for a safe environment, 3.) advise on appropriate PPE and isolation precautions with respect to patient acuity, and 4.) promote best practices aligning with the most up-to-date guidance. Rounds addressed questions and concerns regarding PPE availability and utilization. We partnered with Nursing and Respiratory Therapy to alleviate demands on IP & C. The "PPE Spotters" team, monitored and optimized PPE utilization, supply, and distribution; provided training on donning/doffing, PAPR use, PPE reuse; and provided general support to HCWs for questions.

**Results:** We measured number of isolation days of confirmed or suspected patients with COVID-19 and the numbers of N95 masks distributed to units during the 4-week period before (18.2 mask per isolation day) and the 8-week period after (3.0 masks per isolation day) the PPE Spotter team was formed. Our PPE stewardship efforts successfully limited N95 misuse as community COVID-19 burden increased.

**Conclusions:** This multi-disciplinary resource, particularly during periods of evolving PPE guidance and supply chain insecurity, was vital. Additionally, it expanded the pool of staff to advocate for HCW safety and IP&C principles.

All HCWs can benefit from learning about this novel model that can be adapted to any institution and various scenarios. We recently adopted this model to support staff in psychiatry with an influx of patient volumes and their needs.

## Environment of Care

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### Addressing Water Age to Manage Legionella Pneumophila

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**Background:** A Minnesota Hospital established a Water Management Program (WMP) aligned with Centers for Medicare and Medicaid Services (CMS) and American National Standards Institute/American Society of Heating, Refrigerating and Air-Conditioning Engineers (ANSI/ASHRAE) Standard 188 with the goal to mitigate the risk of waterborne pathogen disease, namely Legionella pneumophila. Initial culture-based validation testing yielded positive Legionella results at distal locations including patient rooms in the potable water systems. Water quality monitoring confirmed low levels of free residual oxidant (FRO) disinfectant, leading to higher Legionella positives. This lower FRO was identified as a problem caused by high water age, defined by a long period of stagnation of water in the potable systems. To address the water age, the hospital's water management team (WMT) implemented a flushing program as part of ongoing verification and validation protocols.

**Methods:** Based on industry standards, the WMT focused on achieving a minimal control limit of 0.2 ppm (parts per million) of FRO to reduce water age on hot water systems. The WMT's solution included automated flushing on hot water returns, Environmental Services (EVS) personnel provided manpower for flushing at fixtures in patient areas based on low census and patient discharge. Validation testing confirmed the efficacy of the flushing program to reduce water age which in turn reduced Legionella growth.

**Results:** The flushing program was able to increase the average FRO level in the hot water systems < 0.05 ppm (2019) to >0.20 ppm (2021). The higher FRO levels contributed to the downward trend of 17% positive Legionella samples (2019) to 0% (2021) during Validation sampling.

**Conclusions:** Reducing water age by involving EVS in the WMT and implementing flushing procedures increased FRO levels system wide. Flushing was the simplest, safest, and most cost-effective solution compared to other solutions like supplemental disinfection while also reducing positive-detect Legionella samples.

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### Management of a Candida Auris Patient Across Two Healthcare Systems

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**Background:** Containing *Candida auris* (*C. auris*) has proven to be especially challenging during the COVID-19 pandemic given the enormous constraints on Infection Prevention (IP) departments. Knowledge of the organism, appropriate identification methods, and infection prevention strategies are key to reducing the risk of transmission. Many IP departments have been unable to develop or maintain comprehensive admission screening protocols and have limited best practices available for managing *C. auris* patients in the acute care setting. We describe the first case of *C. auris* in the acute care setting in the state of Minnesota and outline the infection prevention strategies used by the two systems that provided care to this patient.

**Methods:** Upon receipt of a preliminary positive *C. auris* result at Hospital One, the patient was placed into contact precautions. All patients that were identified as exposed were screened. A comprehensive infection prevention strategy was implemented in collaboration with the state health department and Hospital Two. The plan included transmission-based precautions, hand hygiene compliance, environmental cleaning and disinfection, and staff and patient education.

**Results:** A total of 48 patients were screened for *C. auris* at Hospital One and no additional positive results were identified. The patient was transferred to Hospital Two for progressive care needs and required an extensive hospital stay post-surgery. No additional screening was recommended by the state health department. Practical prevention strategies for high level disinfection and sterilization, environmental cleaning, patient transport and ambulation, and procedural protocols were developed. No additional *C. auris* colonization nor clinical isolates have been identified to date.

**Conclusions:** This case highlighted the importance of inter-facility communication and the need for an established screening protocol for *C. auris* to identify cases in a timely manner. The robust infection prevention strategies implemented by the two systems resulted in no known transmission to other patients or staff.

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### When Too Much of a Good Thing Becomes Harmful: A Cluster of Aspergillosis in Premature Extremely Low Birthweight Neonates

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**Background:** The movement of premature Extremely Low Birthweight (ELBW) neonates imposes risk for brain hemorrhage. In response to this concern, the babies in the Neonatal Intensive Care Unit (NICU) were enrolled in the newly adopted Intraventricular Hemorrhage (IVH) Prevention Bundle, where infants were immobilized in supine position for the first seventy-two hours of life. Four neonates from the NICU were diagnosed with Primary Cutaneous Aspergillus (PCA) infection after exposure to this life-saving protocol.

**Methods:** An internal multi-disciplinary team was convened to investigate these four cases. The case definition included infants who were enrolled in the IVH protocol starting in 2016. A review of the NICU's environment-of-care (EOC) elements was performed. This included retrospective air-quality culture surveillance data for molds