

response findings underscore the need for ongoing assessment, education, and collaboration among all healthcare settings.

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Poster Presentation

Opening Doors in the Operating Rooms: An Intervention and Outcome Study

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Background: Surgical site infections (SSIs) are a major cause of morbidity and mortality with an estimated cost of \$3–10 billion annually in the United States. Laminar air flow in the operating room (OR) is 1 factor in reducing SSIs. Opening the OR door results in interruption of laminar air flow. As a part of annual infection prevention evaluation of our facility, we observed cases in the OR in which we identified excessive unnecessary door openings during surgical cases. We report an intervention in door openings in the OR and the effect on infection rate after surgery. **Methods:** We conducted an observational analytical study using prospective audit and feedback. Door-opening counters were placed on 4 OR doors. Each day, they were reset and the number was logged for each case by the circulating nurse. A baseline number of door openings was established between April 18, 2019, and May 2, 2019. Subsequently, daily feedback sheets were provided to all persons involved in the previous day's procedures detailing the rationale to limit unnecessary door openings and the number of door openings that had occurred during the case(s) in which they were specifically involved from May 3, 2019, to June 4, 2019. Analyses of postoperative infection rates compared with historical controls were conducted. Using Stata version 15 statistical software, independent sample *t* tests were performed to see the difference between control and intervention groups. A CI 95% was set for significance. **Results:** There were no differences between control and intervention groups with the number of procedures (71 vs 80), OR, duration of procedure, or type of case. Outliers due to vibration of doors triggering the counters were removed, and door stabilizations were performed throughout the study. After removing outliers, there were no differences in control groups and interventions groups (39 vs 43). An independent sample *t* test showed a significant difference in the mean number of door openings between the control and intervention groups: 32.13 versus 24.84 ($P < .05$ and $P = .0072$). There have been no postoperative infections in any of the cases in the study to date compared to an overall annual rate of 1.5% in 2018 at our facility. **Conclusions:** Prospective audit and feedback to OR staff can reduce the number of unnecessary door openings during operating procedures. The baseline number of door openings from this study was 25 per case. No postoperative infections occurred in the patients receiving surgery in this study.

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Operating Room Nurses' Knowledge of Surgical Site Infection Prevention Measures

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Background: Surgical site infection (SSI) stands out among healthcare-related infections as one of the most important globally due to

its associated morbidity and mortality. However, it is well known that the transoperative period is recognized as one of the most critical moments for the prevention of SSI. **Objective:** We evaluated the knowledge of the operating room (OR) nurse coordinators regarding SSI prevention measures. **Methods:** We conducted a cross-sectional study in 30 large hospitals in the state of Minas Gerais, Brazil, from February 2018 to April 2019. Data were collected through interviews with OR nurse coordinators. **Results:** Administration time of prophylactic antibiotic administered between 30 and 60 minutes prior to surgery was reported by 84% of the professionals and the suspension of this agent in the first 24 hours was reported by 47.8%. Preoperative hair removal within the operating room was mentioned by 60% of respondents and 36.7% mentioned using a razor. The Safe Surgery program of the WHO was unknown to 6.7% of nurses. Among those who knew about it, 20.8% stated that there was no surgical site demarcation. Presentation of the surgical team occurred before the beginning of the procedure in only 53.3% of the institutions. Patient surveillance for SSI was reported by 93.3% of respondents, but the criteria adopted for the diagnosis of SSI were unknown, even though SSI rates were given for 90% of services, predominantly via meetings (53.5%). **Conclusions:** The knowledge of nurses related to the prevention of SSI was not satisfactory, pointing to the need for immediate efforts in education and awareness programs. Such programs may facilitate changes in practice through the recognition of surgical patient risk by these professionals, thus leading to better planning and practice during the trans-operative period.

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Optimizing Sentinel Surveillance to Target Containment of Emerging Multidrug-Resistant Organisms in Regional Networks

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Background: Successful containment of regional outbreaks of emerging multidrug-resistant organisms (MDROs) relies on early outbreak detection. However, deploying regional containment is resource intensive; understanding the distribution of different types of outbreaks might aid in further classifying types of responses. **Objective:** We used a stochastic model of disease transmission in a region where healthcare facilities are linked by patient sharing to explore optimal strategies for early outbreak detection. **Methods:** We simulated the introduction and spread of *Candida auris* in a region using a lumped-parameter stochastic adaptation of a previously described deterministic model (*Clin Infect Dis* 2019 Mar 28. doi:[10.1093/cid/ciz248](https://doi.org/10.1093/cid/ciz248)). Stochasticity was incorporated to capture early-stage behavior of outbreaks with greater accuracy than was possible with a deterministic model. The model includes the real patient sharing network among healthcare facilities in an exemplary US state, using hospital claims data and the minimum data set from the CMS for 2015. Disease progression rates for *C. auris* were estimated from surveillance data and the literature. Each simulated outbreak was initiated with an importation to a

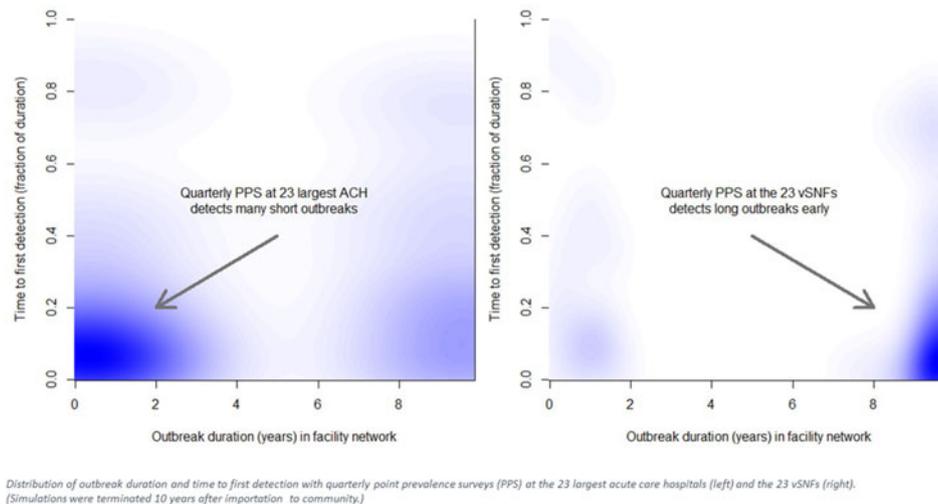


Fig. 1.

Dartmouth Atlas of Health Care hospital referral region. To estimate the potential burden, we quantified the “facility-time” period during which infectious patients presented a risk of subsequent transmission within each healthcare facility. **Results:** Of the 28,000 simulated outbreaks initiated with an importation to the community, 2,534 resulted in patients entering the healthcare facility network. Among those, 2,480 (98%) initiated a short outbreak that died out or quickly attenuated within 2 years without additional intervention. In the simulations, if containment responses were initiated for each of those short outbreaks, facility time at risk decreased by only 3%. If containment responses were initiated for the 54 (2%) outbreaks lasting 2 years or longer, facility time at risk decreased by 79%. Sentinel surveillance through point-prevalence surveys (PPS) at the 23 skilled-nursing facilities caring for ventilated patients (vSNF) in the network detected 50 (93%) of the 54 longer outbreaks (median, 235 days to detection). Quarterly PPSs at the 23 largest acute-care hospitals (ie, most discharges) detected 48 longer outbreaks (89%), but the time to detection was longer (median, 716 days to detection). Quarterly PPSs also identified 76 short-term outbreaks (in comparison to only 14 via vSNF PPS) that self-terminated without intervention. **Conclusions:** A vSNF-based sentinel surveillance system likely provides better information for guiding regional intervention for the containment of emerging MDROs than a similarly sized acute-care hospital-based system.

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Outbreak of *Burkholderia cepacia* Complex Due to Multiple Brands of Contaminated Aqueous Chlorhexidine in Hong Kong
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Background: Contaminated chlorhexidine produced by a single company has been implicated in the outbreak or pseudo-outbreak of *Burkholderia cepacia* complex (BCC). However, simultaneous occurrence of multiple brands of contaminated chlorhexidine

supplied by different manufacturers resulting in a persistent outbreak for >1 year has not been well described. **Objective:** We report an outbreak of BCC with epidemiological investigation and using whole-genome sequencing (WGS) analysis of patient and environmental isolates in Hong Kong. **Methods:** Upon the investigation of a cohort of renal patients undergoing peritoneal dialysis colonized or infected with BCC in their exit sites, different brands of 0.05% aqueous chlorhexidine (aqCHX) used for exit site dressing, supplied from hospital or purchased from community pharmacies by patients, were cultured. A risk factor analysis for exit-site acquisition of BCC was performed. A site visit to a local manufacturer was conducted to investigate the process of production and to collect environmental samples for culture, which were further analyzed by WGS along with the BCC isolates cultured from patients and aqCHX purchased from community pharmacies. **Results:** Four patients undergoing peritoneal dialysis had cultures positive for BCC in the exit site swab in September 2019. A snapshot screening revealed 88 (32.0%) of 275 renal dialysis patients colonized with BCC. Of these patients, 47 (17.1%) were newly diagnosed and 41 (14.9%) were known to be colonized or infected with BCC according to retrospective data retrieval from January 1, 2018. A significantly greater proportion of patients with newly diagnosed BCC (cases) had used contaminated aqCHX for exit-site dressing than those with culture negative for BCC (controls): 38 of 47 (80.9%) versus 54 of 187 (28.9%) ($P < .001$). Of 161 aqCHX samples, 10 brands from 4 manufacturers (purchased from community pharmacies), 125 (77.6%) were culture positive for BCC, whereas all 77 aqCHX samples supplied by the hospital, which are different brands and are produced by different manufacturers, were proven to be sterile. Of the 28 environmental samples taken from a local manufacturer during the site visit, 19 samples (67.9%, 3 collected from the instrument for production of aqCHX and all 16 newly produced aqCHX samples) were culture positive for BCC. WGS revealed 3 major clusters characterized by *B. cenocepacia* genomovar IIIA ST1547 and 2 novel MLST clusters from 52 patients and 26 environmental isolates selected. **Conclusions:** This outbreak was terminated by product recall, and the government has decided to take regulatory actions to ensure the sterility of antiseptics, including aqCHX.

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