

## ABSTRACT PROCEEDINGS – 11th International Conference of Asia Pacific Society of Infection Control (APSIC) 2024

### Trends in prevalence and antibiotic susceptibility of multidrug-resistant Carbapenem-Resistant *Acinetobacter baumannii* (CRAb) and carbapenem-resistant *Pseudomonas aeruginosa* (CRPa) in blood culture

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**Background:** Carbapenem-resistant *Acinetobacter baumannii* (CRAb) and carbapenem-resistant *Pseudomonas aeruginosa* (CRPa) are critical priority MDROs. They can develop resistance to last-line antibiotics, complicating infection treatment, leading to longer hospital stays, higher costs, and mortality. **Objectives:** To describe trends in CRAb and CRPa prevalence and antibiotic susceptibility in the access, watch, and reserve groups of positive blood cultures. **Methods:** This was a descriptive observational study using data from positive blood cultures at Dr Sardjito General Hospital from 2020–2023. Bacterial identification and antibiotic susceptibility testing were performed using the Vitec-2 Compact system. Patient demographics and clinical data were obtained from the microbiology LIS and electronic medical records. **Results:** A total of 3603 positive blood cultures were obtained. CRAb rates were 85%, 62%, 68%, 78%, while CRPa were 26%, 21%, 12%, 25% respectively. CRAb antibiotic susceptibility in access group: 2%, 8%, 5%, 3%, in watch group: 27%, 28%, 27%, 22% and in reserve group: 33%, 58%, 37%, 30%. CRPa susceptibility was reduced in all groups: 13%, 30%, 13%, 6% in access, 0%, 4%, 0%, 19% in watch, and 13%, 7%, 13%, 14% in reserve group. CRPa was more susceptible in the access group, while CRAb was more susceptible in the watch and reserve groups suggesting that CRPa infections were more difficult to treat. The highest prevalence was in 2020, possibly due to failure to control antibiotic use during the early Covid-19 pandemic. A decrease in both MDR pathogens in 2021 was associated with intense ASP activities in the second year of the pandemic. Increasing prevalence in the following years may be due to a lack of stewardship following a change in the internal antimicrobial stewardship team structure. **Conclusions:** These data indicate that consistent ASP had important role in controlling CRAb and CRPa. Changing the structure of antimicrobial stewardship team should be well prepared to ensure a good adaptation.

**Keywords:** CRAb; CRPa; MDRO; antibiotic susceptibility; difficult to treat

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### Harnessing the capabilities of an electronic health record system to enhance surveillance for middle east respiratory syndrome in an acute hospital

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**Objectives:** The recent experience of the COVID-19 pandemic emphasized the critical need for a surveillance system to alert healthcare facilities about the admission of patients with emerging infectious diseases (EID), thereby preventing nosocomial transmissions. **Methods:** Tan Tock Seng Hospital, an 1800-bed acute tertiary-care hospital in Singapore, transitioned to a new-generation electronic medical record system, Epic, in

August 2022. Leveraging the system's capabilities, we developed an algorithm to generate the line-list of suspected Middle East Respiratory Syndrome (MERS) patients, in alignment with the screening guidelines provided by Singapore's Ministry of Health. The algorithm first identifies patients who presented within 14 days (maximum incubation period) of their travel to Arabic peninsular countries. This information is documented by the emergency department's triage nurses. Additionally, patients with suspected MERS indicated in the problem list or diagnosis by attending clinicians, particularly emergency-medicine physicians or infectious-disease physicians, are included. Furthermore, patients who are ordered for a MERS- Coronavirus polymerase chain reaction test, are identified. The algorithm can also be further modified as and when the case definition of the EID changes. **Results:** The surveillance report constructed with Epic algorithm can be scheduled for daily generation or generated on demand within a few minutes. This newer approach is more time- and resource-efficient compared to the manual surveillance process, which necessitates at least three staff members to engage in a series of prolonged manual processes. The report, by extracting information directly from Epic in near real-time, also minimizes the likelihood of errors that may occur during the manual process. Subsequently, the team of epidemiologists identifies the suspected MERS patients from the generated report and efficiently follow up them until a diagnosis of MERS is excluded. **Conclusions:** Harnessing Epic's capabilities, we constructed an algorithm to efficiently and swiftly identify suspected MERS patients, enabling the timely implementation of infection prevention strategies to prevent nosocomial transmission.

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### Digitalisation of staff health record system in MT Alvernia Hospital Calis Lim

**Background/Aim:** The manual compilation of employees' health information and record-keeping can be an arduous and distressing task. Therefore, it is essential to invest time and effort in finding a solution to collect, store, and retrieve data in real-time when required. **Method:** To address this challenge, the Infection Control Team collaborated with the IT department and relevant HODs to develop an integrated and digitalized record system known as the "Staff Health System." This system can be easily accessed by all employees, supervisors, and the infection control team. The Infection Control (IC) team is responsible for updating and maintaining vaccination records, while HR takes charge of documenting the health records of new employees and monitoring staff health/vaccination in compliance with MOH requirements. **Result:** The implementation of the Staff Health System offers several benefits as: (1) Empowerment of staff: The system grants employees the autonomy to schedule and reschedule vaccination and mask fitting sessions at their convenience; (2) Enhanced accessibility: Staff and other stakeholders can readily access vaccination and mask fitting records, as well as pre-employment lab results through the system; (3) Real-time data: The system can generate up-to-date data that are relevant to stakeholders and management, improving decision-making processes; (4) Resource efficiency: The digitalized system reduces the consumption of resources such as paper, toner, and manpower required for

collating, updating, storing, and retrieving data; (5) Data accuracy: With the Staff Health System, data accuracy is ensured, reducing the risk of errors and discrepancies in records. **Conclusion:** Overall, the implementation of this digitalized solution has elevated Mt Alvernia Hospital's service standards by enhancing efficiency and compliance in record-keeping and updating processes.

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### Reprocessing of single-use energy devices: efficacy cleaning aspect

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**Objectives:** Energy devices (EDs), such as Harmonic, Ligasure, Thunderbeat and Trocar are widely used in Minimally Invasive Surgeries. They are expensive and designed for single use. However, due to the limitation of resources, they have been reused in some cases. Therefore, we aimed to assess the efficacy of EDs reprocessing by Adenosine Triphosphate (ATP) method. **Methods:** This was a cross-sectional description study. After first clinical using, EDs were taken to cleaning. Every ED was cleaned three times. Efficacy cleaning was assessed after each cleaning procedure by ATP method. ATP <200 RLUs (Relative Light Units) was benchmark as efficient cleaning process. **Results:** A total of 611 EDs were studied, including 269 of Harmonic, Ligasure, Thunderbeat, 298 of Trocar, and 44 other types. Detachable devices accounted for about 32.7%. Overall, after three consecutive cleanings, the median ATP values were decreased dramatically (957 RLUs, 160 RLUs, and 62 RLUs, respectively). This was a significant reduction in ATP levels between three stages ( $p < 0.05$ ). There were 63.5%, 84.3%, and 92.8% EDs that had ATP < 200 RLUs after first, second, third cleaning respectively. Approximately 90% of EDs were still functional after three cleaning times. Nondetachable items were to be more difficult to clean than detachable ones ( $p = 0.0003$ , OR 1.3 [1.1 – 1.5]). **Conclusions:** Our data suggest that monitoring efficacy cleaning of surgical instruments in general and single-use energy devices in particular with ATP can identify a number of different influence factors, like the instrument condition, reprocessing procedure, or especially their structure. ATP measurement seems to be a valid technique that allows an immediate repeat of the manual cleaning if the results exceed the established cutoff of 200 RLUs.

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### Effectiveness of visual inspection, practices observation and aerobic colony count to monitor hospital cleanliness

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**Background:** Enhancing environmental hygiene resulted in a reduction of multidrug-resistant microorganisms colonization and healthcare-associated infections. There has been less studies to compare the effects of practice observation with other methods. This study aimed to compare correlations between visual inspection, practice observation and aerobic colony count (ACC) and verify the effectiveness. **Methods:** A prospective study was conducted in a medical intensive care unit from May 2021 to

November 2022. High-touch surfaces were assessed by visual inspection (clean or not clean) and practice observation (compliant or not compliant) to compare the correlations by using ACC with the cut-off point of 2.5 CFU/cm<sup>2</sup> as a golden standard. **Results:** Among 569 samples, the pass rate by ACC was 90.5%, the clean rate by visual inspection was 73.3%, and the compliant rate by practice observation was 47.1%. The concordance was 245 surfaces (43.1%) of the three methods. There was no correlation between visual inspection and ACC ( $p < 0.001$ ,  $\phi = 0.184$ ). The correlations were weak positive between visual inspection and practice observation and between practice observation and ACC ( $p < 0.001$ ,  $\phi = 0.212$ , 0.233). The median aerobic colony count of “compliant” group (0.00 CFU/cm<sup>2</sup>) was significantly lower than “not compliant” (0.40 CFU/cm<sup>2</sup>) ( $p < 0.001$ ). The median aerobic colony count of “clean” groups (0.08 CFU/cm<sup>2</sup>) was also significantly lower than “not clean” groups (0.20 CFU/cm<sup>2</sup>) ( $p < 0.001$ ). **Conclusion:** Practice observation is more reliable than visual inspection. Therefore, visual inspection can be used for low risk area to maintain visibly clean. In high risk area, an integrated program is critical to combine practice observation with other methods to monitor cleanliness.

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### Effectiveness and implementation outcomes of the multimodal strategy in IPC for pediatric ventilator-associated events at a provincial hospital in Vietnam: a hybrid II implementation design

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**Background:** Vietnam has the national guidelines for infection control in hospitals and it also recommends the application of WHO's IPCAF framework to do self-evaluation of infection prevention and control (IPC) activities and plan to improve them in hospitals. **Objective:** Our study aimed to implement the multimodal strategy for IPC, in which our expected outcome was the practices of doctors and nurses for pediatric ventilator-associated events (Ped-VAE). **Design:** We used the implementation research approach with the hybrid design of quasi-experimental pre-post comparison without control group. All 16 doctors and 32 nurses at the Department of PICU were observed 3 times that practicing the IPC packages for PedVAE guided by MOH. The implementation strategies used included Plan, Restructure, Train, and Quality Management. **Results:** Four over six steps practised by doctors and 5/10 steps practised by nurses for PedVAE were well practised after the intervention with significantly higher proportion of right practices ( $p < 0.001$ ). The practices of doctors had insignificant changes between pre-post intervention, including hand hygiene (85.4% and 83.3% of right practice at pre-post intervention, respectively) and daily assessment of weaning from mechanical ventilation (54.2%-68.7%). Most unchanged practices among nurses were steps of ensuring humidification and heating of inhaled gas for in patients with artificial airway. All practice scores of the whole steps among doctors and nurses had statistically significant increase after intervention. Our implementation strategies were highly assessed by providers (doctors and nurses) and hospital managers in terms of the its acceptability, feasibility and sustainability. **Conclusion:** The implementation of multimodal strategy in IPC for pediatric ventilator-associated events is effective and acceptable and feasible for hospitals at city/province level in Vietnam. In addition with improving practices of healthcare staffs, hospitals should regularly assess and upgrade ventilators machines to ensure the effectiveness of IPC.

**Key words:** infection prevention and control; infection prevention and control assessment framework (IPCAF); pediatric ventilator-associated events (Ped-VAE); multimodal strategy

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