ICU, ZeBox achieved a consistent >90% reduction across several months. Some of the airborne pathogens that ZeBox eliminated in the hospital ICU were multidrug resistant. **Conclusions:** ZeBox is an effective preventive technology against the spread of airborne pathogens and potentially associated infections. ZeBox could be used to reduce healthcare-associated infections in clinics and hospitals, as well as in burns units and immunocompromised patients. Zebox has the potential to be a significant prophylactic device in the global war on antimicrobial resistance.

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**Subject Category:** Sterilization and Disinfection
**Abstract Number:** SG-APSIC1047
**Patient instrument tracking system**
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**Background:** In the post–COVID-19 era, competency of healthcare workers is very important, and new technology is imperative. The central sterile supply department (CSSD) staff must also improve their response when a patient infection is reported. The sterilization process is more important than ever. **Objectives:** We sought to simplify surveillance to act faster, to reduce the time to obtain patient data, and to eliminate nonvalue stream mapping in the workflow process in order to prevent patient harm and strengthen our infection prevention and control efforts. **Methods:** The CSSD staff met with an IT developer to determine requirements for an electronic surveillance program. Before this intervention, we scanned hard copies of patient records and stored them in a folder on a computer on a daily basis. These data were difficult to search, monitor, and display, and this method wasted time in locating patient data. The IT developer designed a program to track patients and instruments. The program collected data regarding the patient's surgery, instruments used, and monitoring information. With the help of the IT developer, the CSSD staff tested and tweaked the new platform until accuracy and usability were achieved. Staff were trained on the use of the new system before it was implemented. **Results:** This project yielded simplified surveillance that improved the infection prevention process, reduced potential patient harm, and strengthened the ability of the IPC team to analyze and act on data. **Conclusions:** A simple surveillance system for tracking patients and instruments used assists both CSSD and IPC teams. This system assures the performance of sterilization procedures. When adverse events occur, patients who used these devices are tracked, and an analysis is performed to identify and implement improvements.

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**Subject Category:** Sterilization and Disinfection
**Abstract Number:** SG-APSIC1175
**Reusing of single-use devices management**
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**Objectives:** Single-use devices are supposed to be used only once, but under some conditions those devices need to be reused. Therefore, we conducted the "Reuse of Single-Use Devices Management" project in our hospital. We evaluated single-use devices that are reused for the following factors: (1) reuse of the single-use device with the same patient; (2) a manufacturer stop production order; (3) lack of devices in inventory; and (4) device value >5,000 Thai baht (US $150). Every unit in the hospital is able to handle and monitor the reuse of single-use devices systematically for patient safety. We performed a quality surveillance project to monitor and prevent patient infection and injury from worn-out reused single-use devices, and we collected data related to the cost of reusing single-use devices. **Methods:** In a working group that studied single-use devices, responsibilities and roles were assigned and the purposes and scope of work were established. We reviewed the reuse of single-use devices policy. We created a request form for the reuse of single-use devices and a quality record form for use in units that reused single-use devices. We analyzed outcomes, monitored data, and audited the completion of these forms on these units. We assured the completion of single-use device registration. We measured the rate of reuse of single-use devices. We monitored the incidence of surgical wound infections related to reuse of a single-use device. **Results:** Both of these forms were implemented at 100%, and the number of surgical wound infections was zero. **Conclusions:** The project focused on single-use device registration and the rate of devices ready to use. The uptake of new procedures was 100%, and the expected number of surgical wound infections in patients was zero.

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**Subject Category:** Sterilization and Disinfection
**Abstract Number:** SG-APSIC1127
**Digital transformation of the central sterile supply department: Justify by tracking system**
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**Background:** Avoidable infections in healthcare (healthcare-associated infections or HAIs) occur globally. The causes of HAI are influenced by a complex combination of gaps in policies, infrastructure, organization, knowledge, healthcare worker behavior, and patient-related factors. Through knowledge, best practices, and infrastructure improvement, the infection prevention and control (IPC) team aims to prevent harm to patients and healthcare workers due to HAIs. The most common HAIs are surgical site infections (SSIs) caused by harmful device-reuse practices, inadequate sterilization, and/or inadequate decontamination procedures. Disinfection and sterilization of instruments and medical devices play very important roles in HAI and SSI prevention. World Health Organization (WHO) Collaborating Centre in Quality Improvement Program certification, the first pilot project in Thailand, included the Central Sterilizing Services Association of Thailand and 15 hospital central sterile supply departments (CSSDs). This quality improvement program for sterilization reprocessing aimed to prevent harm to patients and healthcare workers due to HAIs. **Objectives:** We sought to reduce damage to instruments caused by inadequate reprocessing sterilization to zero incidents. We sought to reduce inadequate packing to ≤3 events per month. We sought to reduce the need to resterilize instruments by >80%. **Methods:** A root-cause analysis meeting was held by CSSD staff, and an IT vendor was consulted about developing an electronic alert system. The following changes were implemented: Staff packed instruments using a list of pictures for each set. Sticker labels were applied showing the proper number of pieces in the set. Identification O-rings were added to instruments with inventory dates, serial numbers, and instructions for use. Stickers were added to indicate the method of sterilization, such as ethylene oxide gas only or hydrogen peroxide only. **Results:** Reports of damage due to the sterilization process decreased to zero. No events related to the packing process were reported, and resterilization of instruments decreased by 98.94%. **Conclusions:** In this project, we implemented a quality improvement process and tracking system, reduced defects, and increased healthcare worker competency to improve patient safety.

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**Subject Category:** Sterilization and Disinfection
**Abstract Number:** SG-APSIC1181
**Design of a temperature and humidity alert system**
Nanthipha Sirijindadirat, President, Central Sterilizing Services Association, Bankok, Thailand

**Objectives:** The central sterile supply department (CSSD) is responsible for sterilization processes, and instruments are then stored in a clean room until use. Environmental controls, such as temperature, and relative

humidity, are important in preventing the spread of infection during the sterilization process and during storage of medical devices. Data regarding temperature and relative humidity readings in the operating room, and whether instruments remain covered for the duration of the operation, are difficult to obtain. For easy access to relative temperature and humidity data covering all operational intervals, a rapid and convenient notification system was designed using a software application to send temperature and humidity information to the ThingSpeak website. We identified abnormal values for temperature and relative humidity and submitted revisions for all operating periods to facilitate monitoring of the refrigeration system. **Methods:** We implemented 3 programs: (1) DHT11 humidity and temperature sensor; (2) NodeMCU ESP8266; and (3) Program Arduino IDE. **Results:** The ESP8266 board connected using WIFI SUTH Mobile, and the DHT11 displayed temperature and humidity. The temperature and humidity data were sent to the website every 10 minutes. When an alarm occurred, it triggered immediate notification via the software application. **Conclusions:** We designed a temperature and humidity alert system using DHT11. Environmental control was possible using ESP8266, and alerts were triggered in the software application when an anomaly occurred. Data were uploaded to ThingSpeak every 10 minutes. The triple system actually sends alerts through the application and records data every 10 minutes. This system can measure environmental conditions in real time.

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**Subject Category:** Sterilization and Disinfection
**Abstract Number:** SG-APSIC1174
**High-value instrument management: Rigid endoscopes**
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**Background:** After 3 years, we discovered that a high-value instrument, rigid endoscopes, needed to be used and cleaned properly. If those instruments are damaged from inappropriate handling or reprocessing, they can pose infection risks to patients. Furthermore, the hospital incurs additional repair costs. **Objectives:** We sought to ensure that specialized instruments are handled and used appropriately in accordance with the manufacturers' recommendations and that all related units handle and use instruments appropriately. **Methods:** A meeting was convened to establish the purposes and scope of the work, and related data were collected. As a result, we created registration forms for high-risk instruments as well as a survey list for rigid endoscopes. These forms were distributed to appropriate units. We analyzed outcomes, monitored the indicators, and audited work processes. The operating room registered high-value instruments on a form that included instructions for use. A dealer demonstrated how to handle the rigid endoscopes. The CSSD team visited the operating room to emphasize the importance of handling and reprocessing to ensure compliance. The BEM team inspected all endoscopes after use. We created group communication within the software. Using T-DOC, we analyzed and monitored outcomes. We measured the rate of high-risk instrument registration as well as the completeness of registration. We also measured the rate of damage to rigid endoscopes. **Results:** We collected data related to rigid endoscopes and educated the staff to handle and reprocess the instruments appropriately, including instructions for use. High-risk instrument registration forms and surveys were created to record information in the T-DOC system. The staff was invited to educational workshops. The rates of registration, registration completeness, and readiness were measured using the plan–do–check–act (PDCA) method. The results of every indicator reached the expected rates of 100%. **Conclusions:** We achieved our goal of 100% compliance with the new program. All high-value instruments should be registered, and all related staff should be trained to use them appropriately.

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**Subject Category:** Sterilization and Disinfection
**Abstract Number:** SG-APSIC1132
**BHQ isolation cart management at a Bangkok Hospital**
Rome Chomrak, Bangkok Hospital, Bankok, Thailand

**Objectives:** We aimed to provide sufficient equipment to effectively and efficiently track all equipment. Advanced management procedures are available for the treatment of any patients with infections or immunodeficiency as well as those who need special treatment or isolation from others. This management plan can be beneficial for the hospital by promoting process improvement and achieving cost effectiveness. **Methods:** The instruments used were surveyed in all departments of Bangkok Hospital and these data were analyzed. We used a plan–do–check–act (PDCA) strategy to improve the management by moving from a manual system to a collaborative innovation project that used 4 technological systems: (1) storage identification and identification codes for equipment; (2) request, return, and delivery using the Nsmart system; (3) transportation, receiving, and delivery; and (4) an HIS system for tracing and NSterile version 4.0 software for reporting. **Results:** The BHQ isolation cart management system helped the hospital control inventory and prevent infection and helped standardize patient services to improve quality at the hospital. **Conclusions:** This report confirms earlier findings that sufficient equipment can be made available to patients with no extra cost to management. Our findings can contribute to efforts to prevent the virus from spreading within the hospital.

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**Subject Category:** Sterilization and Disinfection
**Abstract Number:** SG-APSIC1043
**Creating an urgent operating room alert using Kaizen automation**
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**Objectives:** We sought to reduce waiting time for instruments in the operating room, to develop technology for communication between zones, to record data in real time for planning instrument management, and to increase trust and satisfaction of customers. **Methods:** The central sterile supply department (CSSD) provides sterilization of instruments and medical devices, mostly to the following departments: operating room, dental unit, outpatient otolaryngology, and obstetrics and gynecology. The CSSD processes 557,588 units per month, among which 30.05% are for the operating room. In the normal process when the operating room send instruments for decontamination, the operating room staff places stickers on the item or uses a form to document the request. The normal turnaround time was 3 hours and 9 minutes and urgent turnaround time was 2 hours and 14 minutes. For color control, we used white color for normal requests and pink for urgent requests. We redesigned our record keeping using Google forms and sent data on dashboards with real-time alerts in the CSSD application to notify staff of an urgent request. **Results:** Staff in the dirty zone placed an urgent tag on the instrument baskets of the auto-washer. After the door was opened in the clean zone, staff noted the urgent tag and marked a validation sheet, then placed a red unilock on the rigid constrainer. Peel pouches were marked "urgent," advising sterile storage zone staff to separate the basket from normal baskets and to apply the "urgent" paper form and labelling. **Conclusions:** Turnaround time improved by 15 minutes for urgent instruments. Lead time to export data for analysis increased from 80% to 95.49%. Because of facility design, it was difficult to ensure communication between separate dirty, clean, and sterile storage zones. We redesigned our process using new technology to improve turnaround times, reduce waste, improve communication, and increase productivity.

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