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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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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BHQ isolation cart management at a Bangkok Hospital

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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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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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