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Using POWER BI for Monitoring Operating Room Utilization Efficiency

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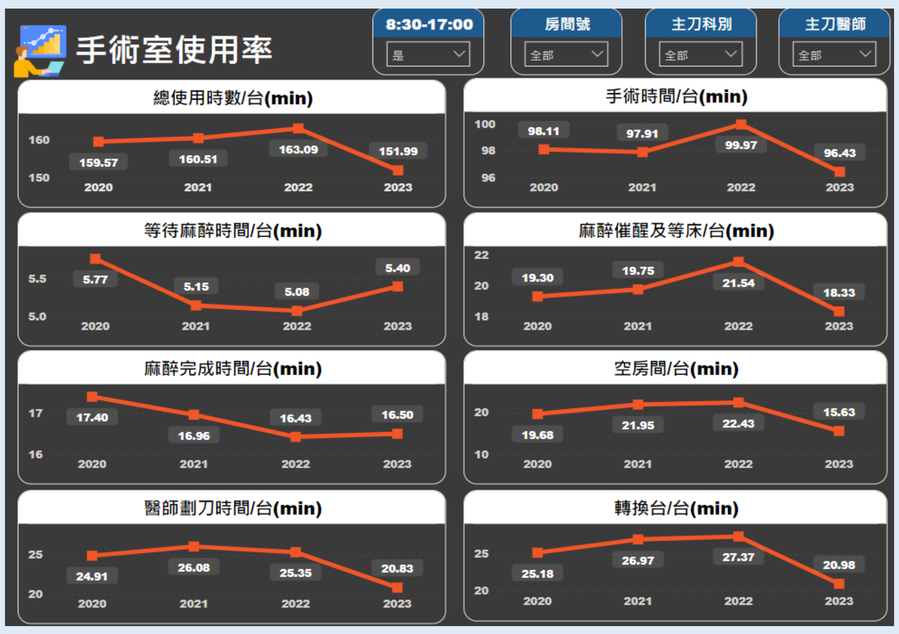
Objective

The operation of an operating room is intricately linked to its workflow processes. Streamlining these processes is crucial to minimizing unnecessary delays and maximizing operational efficiency, necessitating prompt access to clinical information. The deployment of business intelligence (BI) visualization tools for efficiency monitoring in operating rooms plays a important role in this context. This approach enables effective time management across various procedural stages, thereby enhancing the overall utilization efficiency of operating rooms.

Methods

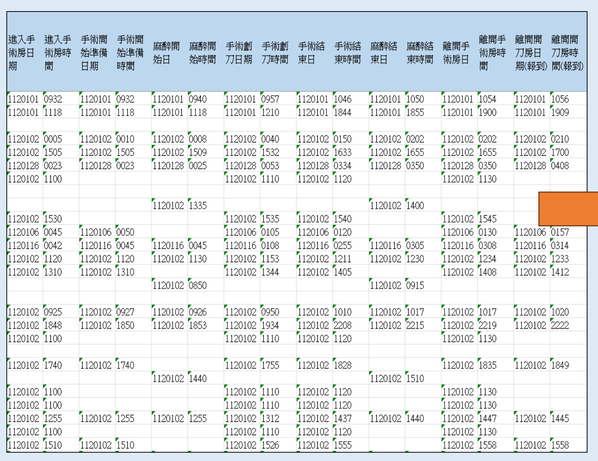
Monitoring was conducted based on patient flow, covering various time points in the operating room usage cycle: time of entry into the operating room, start time of anesthesia, end time of anesthesia induction, time of first surgical incision, surgery end time, time of leaving the operating room, time the previous patient left the operating room, time the next patient entered the operating room, start time of anesthesia for the next patient, and time of first surgical incision for the next patient. Ten specific factors were tracked. Seven critical monitoring parameters were identified, encompassing anesthesia waiting and completion time, surgeon’ s first incision, surgery duration, anesthesia recovery, room vacancy, and turnover periods. To automate data collection by defining the required fields, collaborative weekly sessions with the hospital’ s Artificial Intelligence Medical Innovation Development Center were initiated in January 2022. Historical data were compared with recent automated data to ensure accuracy and consistency. Through use of SQL, data were migrated to an internal data warehouse, making Power BI accessible via the internal website for real-time queries by clinical units.

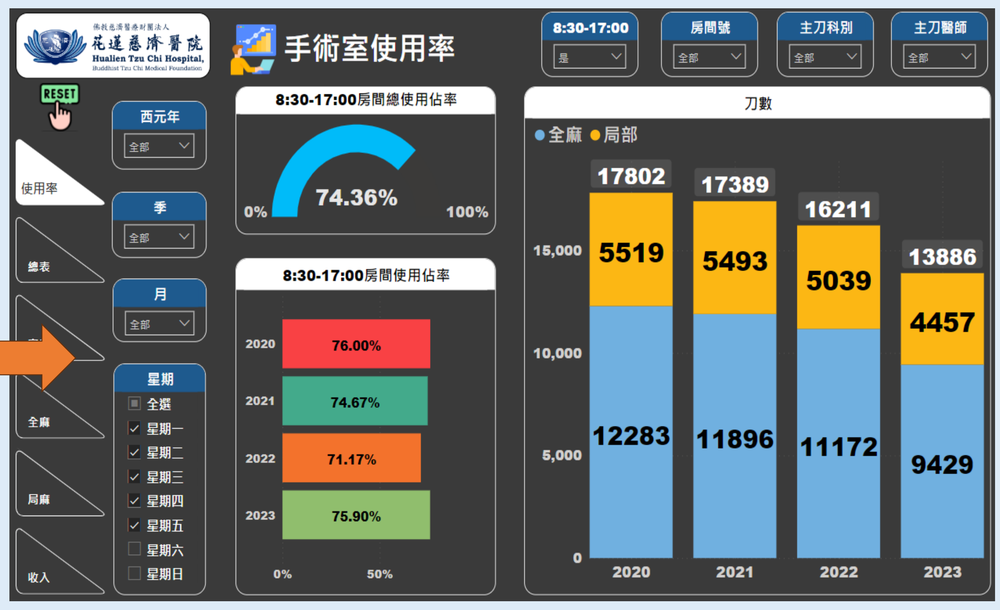
The period from 2022 to 2023 was analyzed to assess the impact of visualization management on operating room efficiency. To reduce unnecessary waiting and enhance operating room utilization, monthly reviews of each monitoring parameter and quarterly improvement reports to the committee were conducted, aiming to enhance room utilization and surgical team efficiency.



Results

Previously, the administrative workflow from data retrieval to presentation completion had averaged 90 minutes. With POWER BI, this process was streamlined to approximately 10 minutes, saving about 80 minutes.





Conclusion

POWER BI facilitates real-time, detailed analysis down to specific departments and physicians, effectively enhancing operating room efficiency monitoring. Future integration of historical data with AI predictive models is intended to establish an intelligent surgical scheduling system, further improving operating room utilization.