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## SELECTION OF OPPORTUNITIES FOR IMPROVEMENT

Chest X-ray (CXR) examinations in the Emergency Department (ED) of Hospital Baling, Kedah, currently take **over two hours**, leading to numerous complaints and negatively impacting patient care. Since the ED accounts for 70% of total X-ray services and CXR examinations comprise 60% of this volume, urgent improvement is needed to reduce CXR turnaround times.

## KEY MEASUREMENT FOR IMPROVEMENT

National guidelines highlight the importance of timely radiological exams but do not specify duration. Literature reports a mean of 38 minutes with filmless imaging. We aim to reduce the **mean turnaround time (TAT) for completing CXR examinations in the ED to 90 minutes, from request to completion.**



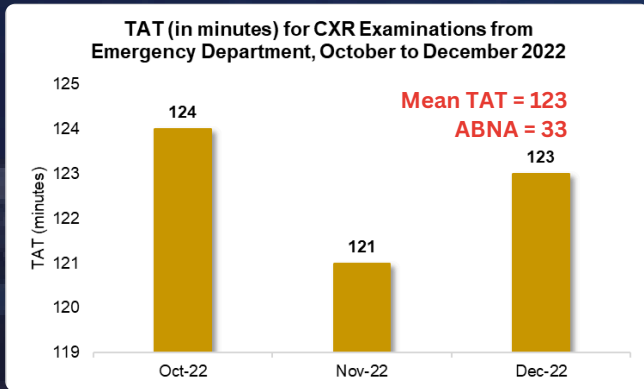
## PROCESS OF GATHERING INFORMATION

This quality improvement study, conducted from October 2022 to December 2023, included verification, strategy implementation, and post-intervention phases. Data on TAT and cost implications were collected from departmental records. Workflow inefficiencies were identified through meetings, observations, interviews, and documentary research, while a survey assessed the perceived impact of interventions among users.



## ANALYSIS AND INTERPRETATION

Pre-intervention (October to December 2022), the mean TAT for CXR was **123 minutes (ABNA = 33 minutes)**, with seven bottlenecks due to **manual processes** and the absence of a Picture Archiving and Communication System (PACS), straining both human resources and budget.



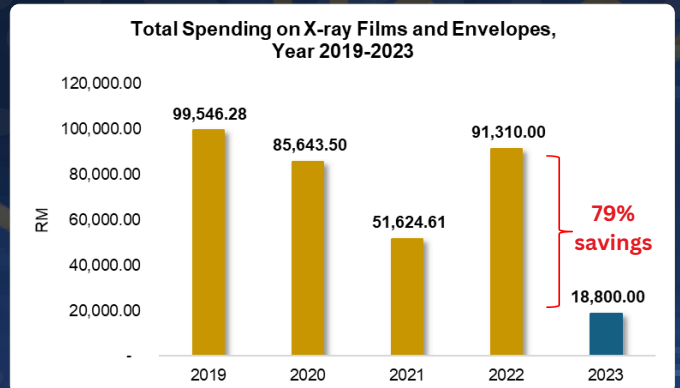
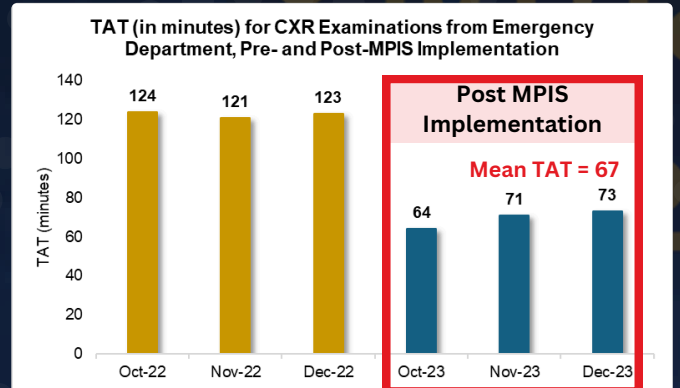
## STRATEGIES FOR CHANGE

**Digitalization** through the **cost-efficient** implementation of the **Medical Programme Information System (MPIS)** replaced manual processes, eliminating bottlenecks.



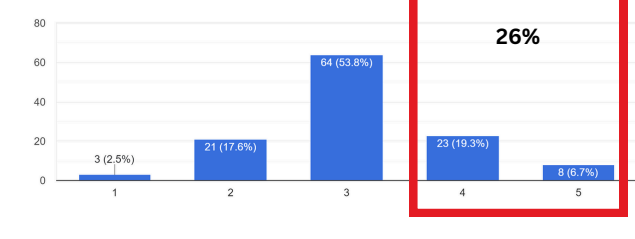
## EFFECT OF CHANGE

Post-intervention, the mean TAT from October to December 2023 improved to **67 minutes**, with 99.34% of examinations (n=2568) completed within 90 minutes, resulting in **79% cost savings**.

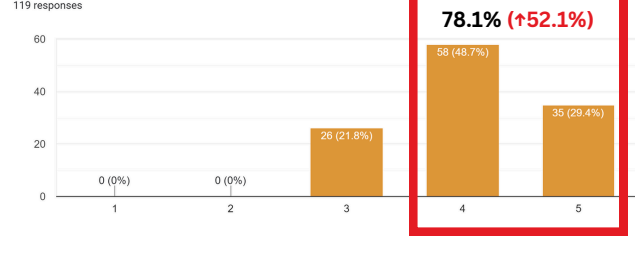


Survey results showed that **73.9%** of respondents agreed that MPIS improved workflow efficiency, **73.2%** were confident using the system, **69.8%** reported a positive impact on patient care, and **70.6%** recommended its continued use.

1. Sebelum pelaksanaan MPIS, saya berpuas hati dengan kelajuan mengakses imej radiografi. Before MPIS, I was satisfied with the speed of accessing radiography images.



1. MPIS telah meningkatkan kecekapan mengakses pengimejan pesakit. MPIS has improved efficiency in accessing patient imaging.



Efficiency in accessing patient imaging **improved by 52.1%** with MPIS compared to using manual film.

## THE NEXT STEP

The next step is to expand this initiative to include cases from health clinics, as Hospital Baling is the sole provider of radiology services in the Baling District.

## ACKNOWLEDGMENT

We would like to extend our sincere gratitude to the staff at Hospital Baling for their invaluable support, the hospital administration for their guidance and to all those who contributed their time and expertise to make this project a success. Special thanks to the Medical Development Division, Ministry of Health (MOH), particularly Dr. Mohamad Anas Putra Bin Mohamed Ismail, Dr. Basyir Bin Kamaruzaman, Dr. Hanis Binti Hasri, Dr. Naadira Faa'iza Binti Mazlan, and their team, as the owners of the MPIS.