

# Surveillance System Setup in Oncology Pharmacy Compounding Cleanroom to Facilitate Checking of **Chemotherapy Preparation**





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# INTRODUCTION

The Oncology Pharmacy at National Cancer Centre Singapore prepares around 4500 chemotherapy preparations monthly in the cleanroom. Preparation of chemotherapy involves multiple processes; each carries potential risk for errors.

In May 2015, Failure Mode and Effects Analysis (FMEA) was carried out to identify potential failures in our chemotherapy preparation process.

FMEA has identified the following as potential critical failure modes:

- 1) Failure to check diluent, dose and drug volume on label before compounding
- 2) Wrong drug picked and used for compounding
- 3) Wrong drug volume used during compounding process

#### **Objectives:**

- To explore the feasibility of using photography, videography and a closed networkattached storage (NAS) system to set up a surveillance system to monitor the chemotherapy preparation process and to verify the compounded drugs.
- To employ this surveillance system to mitigate potential critical failure modes in chemotherapy preparation process
- To determine whether pharmacy waiting time (our key performance indicator (KPI) is below 60 minutes) is affected by the additional steps required in the chemotherapy preparation process using the surveillance system

# METHODOLOGY

### Chemotherapy preparation process using surveillance system:



Drug labels are sent

### 1) One Basket – One Preparation – One Batch Number

- One Photo:
- Lab Assistant places drug label and items for preparation in one basket
- Batch number (example: A83) is assigned
- Photo (shown on the left) is taken with smartphone

## 2) Closed NAS system:

- Photo is automatically transmitted from smartphone through a closed Wi-Fi network to the NAS system
- Photo is stored in the closed NAS system

### 3) Compounding:

- The basket is placed inside the Cytotoxic Drug Safety Cabinet
- Lab Operator displays the batch number before
- compounding A internet protocol camera captures the
- compounding process and stores the video in the same closed NAS system.

### 4) Packing:

Lab Assistant packs the final preparation All preparations are sent out from cleanroom through the pass-through hatch (shown on the left).

#### 5) Checking and Verification:

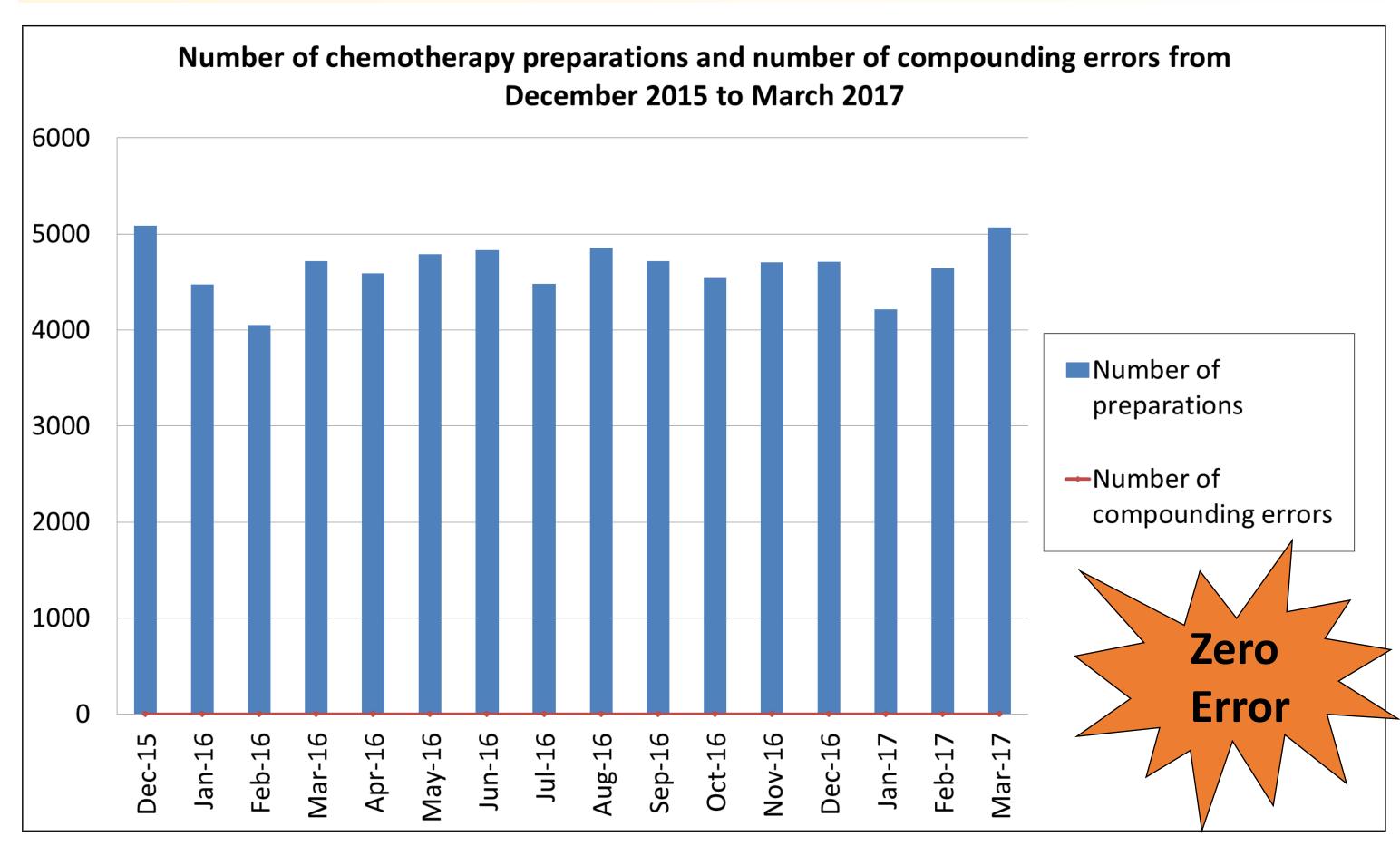
- The tablet automatically retrieves the photo (shown on the top left) and video (shown on the bottom left) from the closed NAS system through an app
- Pharmacy Staff outside the cleanroom will access the app
- Verification is done to ensure the right preparation is made

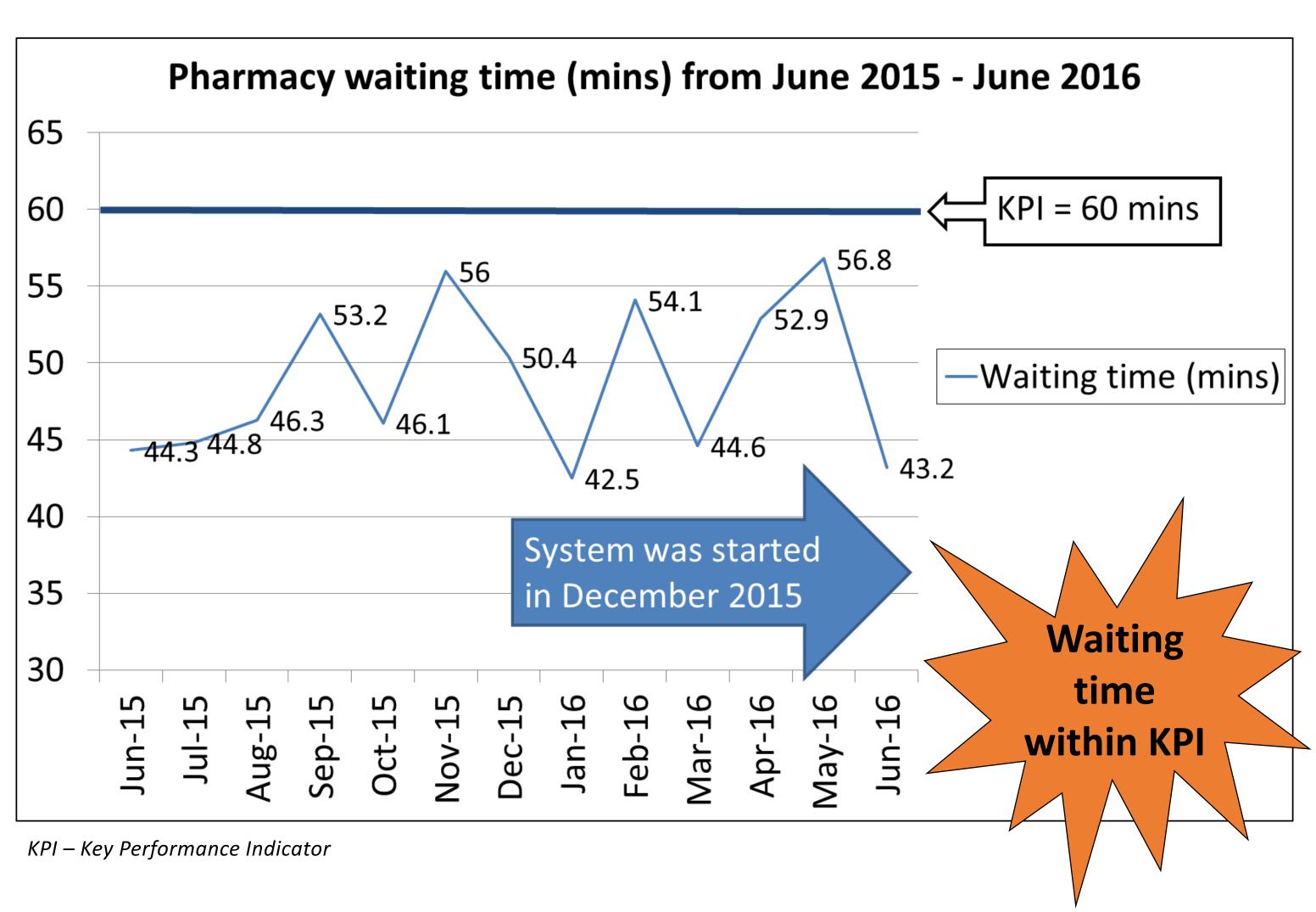
### Monitoring the impact of the surveillance system:

- Track number of incident reports related to compounding error of chemotherapy
- Track pharmacy waiting time 6 months before and after implementation of the surveillance system

# RESULTS

- The surveillance system utilising videography, photography and a closed NAS system was successfully implemented on 7 November 2015 and fully operational from 1 December 2015.
- A total of 74,512 preparations were verified from 1 December 2015 to 31 March 2017.

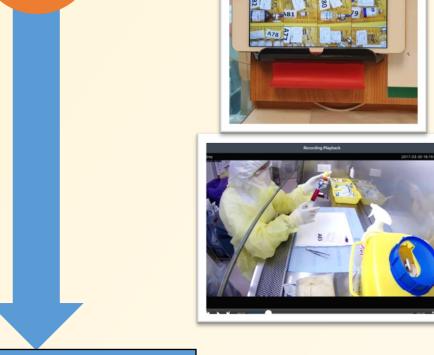




- The surveillance system is successfully implemented to help in the verification of chemotherapy preparation.
- This system provides quality assurance for the compounded drugs, and is useful in mitigating the risk of patients receiving wrong dose or wrong drug due to compounding error in the cleanroom.
- There is zero incident report related to compounding error of chemotherapy since the implementation of the system.
- Additional steps required to operate the surveillance system did not compromise pharmacy waiting time.

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Preparations are ready for dispensing