Implementation of a livestream closed-looped video system to improve medication safety in the aseptic manufacturing.

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Background:

Accurate dosing of chemotherapy requires precise measurements during the manufacturing process and errors can occur which could result in adverse outcomes for patients as well as increased waste and costs[1].

It is critical to assess the accuracy in each step independently and although compounders are trained and validated to comply with good manufacturing practices, there are still instances whereby errors or near-misses may occur.

Our organisational practice is for a pharmacist to check vials, diluents and syringes used post compounding.
Human errors such as incorrect drug or diluent , incorrect volume and inadequate dissolution mixed with infusion bag may occur in the absence of duo-checking during the manufacturing process.

Aims & Objectives:

To improve medication safety processes by utilising a live camera system for the verification of product volume, and confirmation of right-drug and right-diluent during the manufacturing process.

Method:

Fig. 1 Implementation method of manufacturing process

Software & Hardware selection:

Livestream platform (ZOOM™) & web camera (video capture resolution: 720p)

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Training provided to compounder including positioning and utilizing the web camera inside the laminar flow cabinet.

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Batch sheet were given to compounder and checking pharmacist for manufacturing and checking process.

Evaluation:

A total of 28 infusions were prepared and one 'measuring error' was observed and prevented under the video system monitoring during a two week trial.

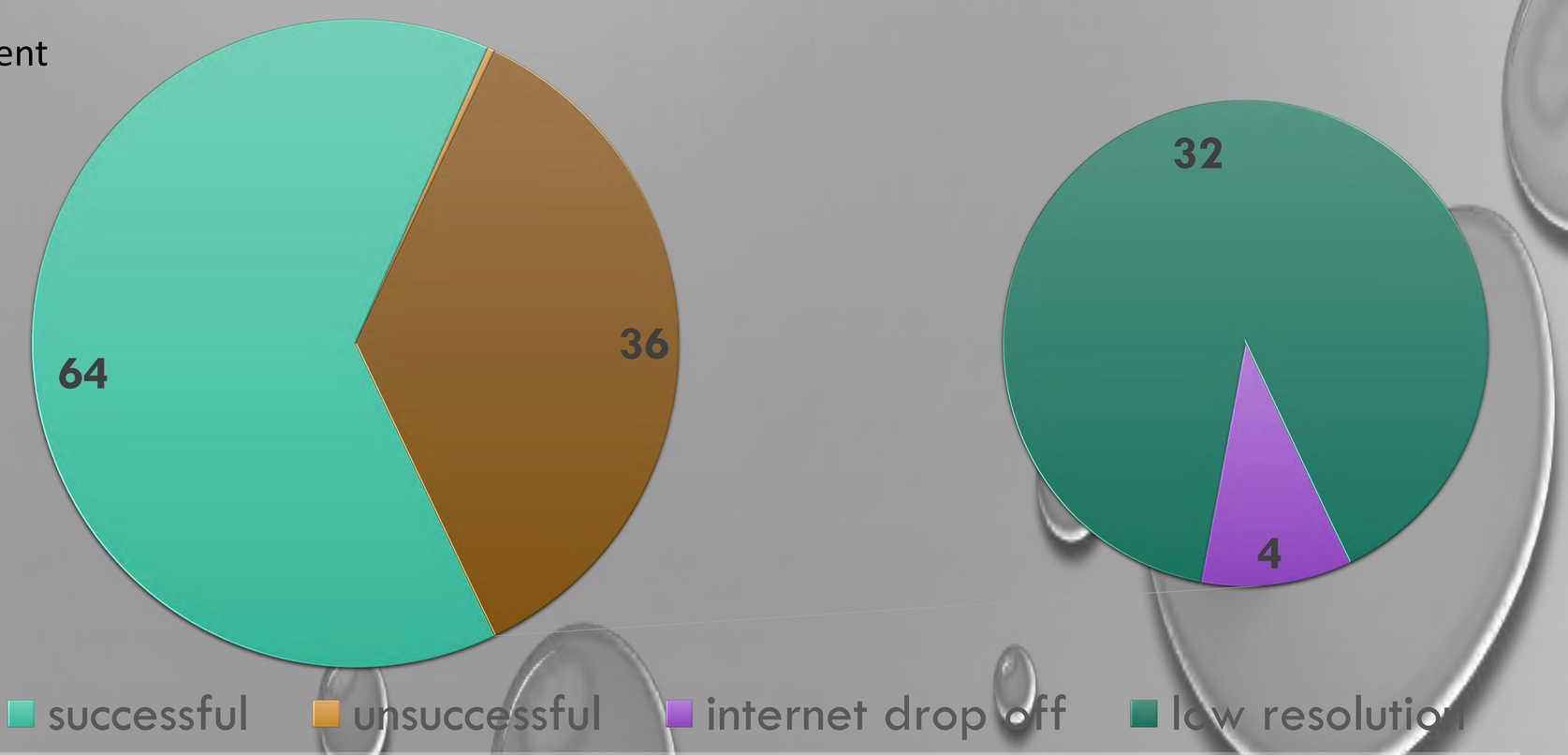
By utilizing the livestream closed-looped video system, the pharmacist was able to overcome the physical barrier to enable duo-checking during the manufacturing process to improve medication safety.

The exposure risk of hazardous substances for the pharmacist checking the products was also minimized by reducing the handling of used vials and syringes.

Some technical issues identified during the monitoring process included:

- Time restrictions by ZOOM™ application.
- Low camera resolution resulting in failure of volume verification of syringes with small graduation marks.
- Internet connection issues.

Fig. 2 Success rate and reason for lack of success for camera observations



Discussion:

This implementation demonstrated that a duo-checking mechanism via livestream closed-looped video system has the potential to reduce human errors in aseptic drug preparation. One error was identified by the checking pharmacist hence contributed towards improved patient safety. Further work is needed to standardise and streamline this process to maximise benefits. Methods need to be identified to overcome technical barriers in utilisation of the live camera system prior re-implementation.

References:
1. Cousins DH, Sabatier B, Begue D, Schmitt C, Hoppe-Tichy T. Medication errors in intravenous drug preparation and administration: a multicentre audit in the UK, Germany and France. Qual Saf Health Care. 2005 Jun;14(3):190-5. doi: 10.1136/qshc.2003.006676. PMID: 15933316; PMCID: PMC1744040.

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