A Pre-Post Implementation Evaluation of a Robotic Inventory and Dispensing System in a Tertiary Hospital

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Background:

Although well established in Europe, the UK and USA, robotic pharmacy systems in Australian hospitals are just starting to be implemented with promises of improved stock management, more efficient dispensing processes and increased medication safety.

Aims:

To compare work flow, medication safety and financial indicators before and after implementing a pharmacy robotic inventory and dispensing system (PRIDS).
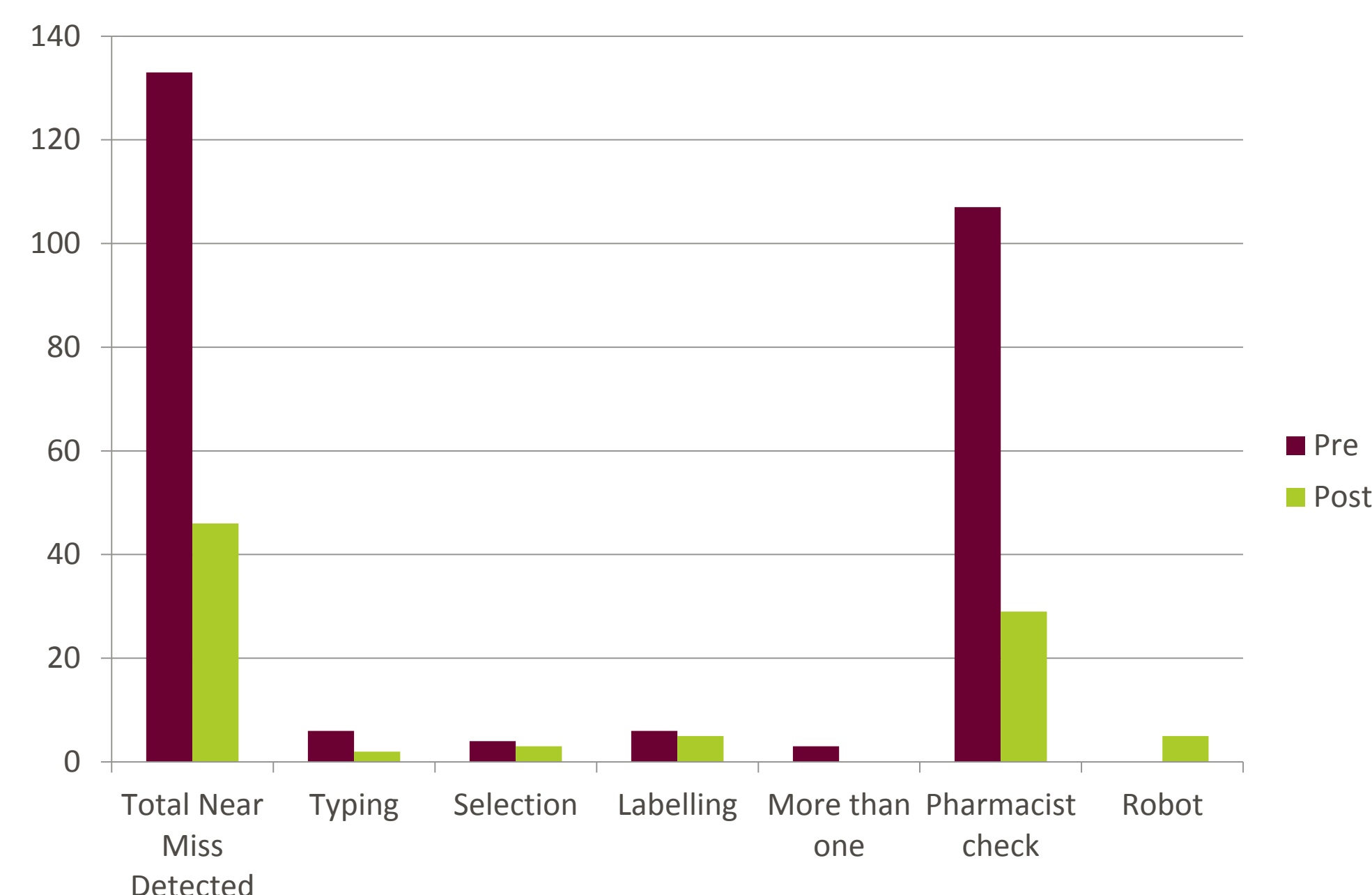
Method:

A pharmacy technician observer collected data over two 12 day periods, five months prior to the robot installation (December 13) and seven months post the robot implementation (December 14). Time and motion data were recorded in the outpatient pharmacy and pharmacy store. Workload and financial data was extracted from pharmacy and financial systems.
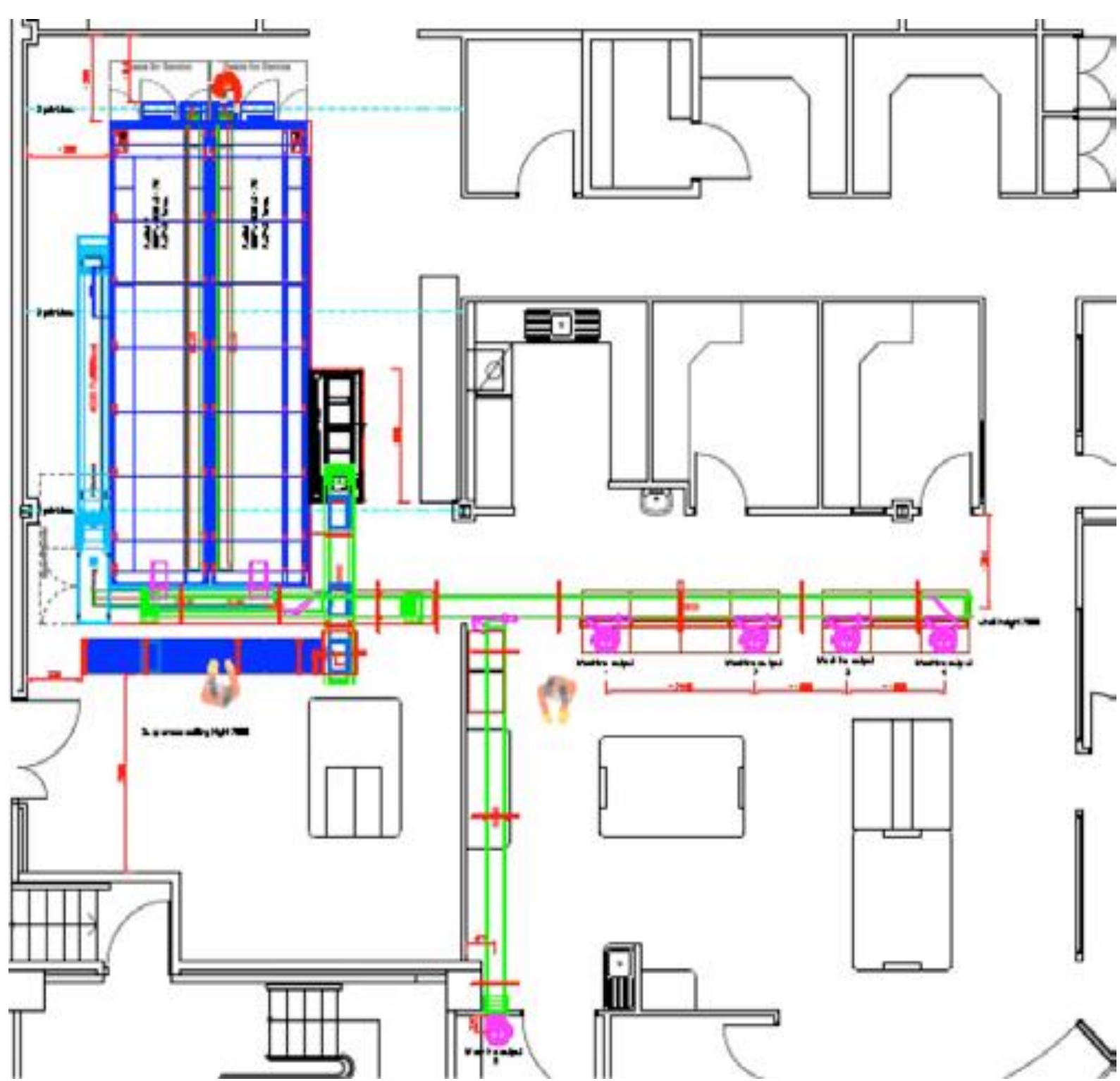
Robot store , conveyors and chute locations

Remote pharmacist after hours stock release

Results:

A significant reduction in near miss 12 day pre- post events detected in the dispensing process (p<0.01) occurred.

Staff satisfaction

"The dispensary is much more organised, less hectic movements …"

"It works hard every shift, and the best bit, it doesn't complain. Faster than a speeding pharmacist"

"Reduced boring packing and top up tasks"

"Reduced brand selection errors "

"Most of store stocktake is now automated"

"Dispensing in the 21st Century"

Dispensary stock management

Based on 37 daily dispensary orders an average of 30 minutes scanning and 69 minutes put away time per order was achieved.

Post robot there was a significant reduction outpatient dispensing stock collection time (MD 16.93 min, p = 0.03) and outpatient prescription processing time (MD 26.6 min p = 0.00).

Financial performance against business plan

Stocktake value of the store, outpatient and discharge area while falling in 2015 did not reduce by the forecast $250,000.

30th June 2013 $1.333 million
30th June 2014 $1.366 million ← Robot May 14
30th Jan 2015 $1.652 million
30th June 2015 $1.296 million

Based on seven months data remote pharmacist recalls would save $ 13,200 pa against a forecast $20,000 pa.

Store unpacking put away saved 5 minutes per order.

Forecast pharmacy expired stock reductions did not achieve a reduction of $17,000 but increased by $6000.

Discussion:

PRIDS has improved supply chain processing by introducing efficiencies in dispensing and store processing. Near miss dispensing events have decreased significantly. Reductions in combined outpatient, discharge, and pharmacy stock holdings did not reduce after 12 months. It is likely savings in this area were affected by the increased hospital activity over the period. Savings in pharmacist recall expenditure were achieved but were below the budget forecast. Manual entry of bottles into the robot slowed 'put away' times per order. Implementing automated 3 month expired stock forecasts should improve future expired stock management. The robot was well accepted by staff.

Conclusion:

PRIDS delivered medication safety, system efficiencies and savings but some measures fell short of the business plan.