

Singapore's National University Hospital (NUH)

How global standards for barcodes in product identification combined with IT reduce preventable errors & enable full product traceability, keys to patient safety

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The Challenge

Medication Use System Failure

	Ref 1	Ref 2
- Prescribing	39%	49%
- Transcription	12%	11%
- Dispensing	11%	14%
- Administration	38%	26%

1 Leape et al, JAMA 1995, 274: 29-43
2 Bates, D, J Qual. Clin Practice (1999), 19:13-17

49%

- wrong dose 38%
- wrong choice 19%
- known allergy 12%
- wrong frequency 6%
- drug/drug interaction 5%
- others 20%

The solution

Use of information technology based on globally standardised barcodes for medication together with transformative work redesign and staff training

Globally standardised barcodes for medications

Help with

- Matching medication orders and drug products to be dispensed
- Verifying medications dispensed / administered
- Identifying the correct patient

Know what is dispensed or administered

- the dose, to whom, by whom and when this is done

Specifically

- Ensuring that the right drug is being received, picked, packed & distributed to patient care areas or dispensed to patients
- Preventing knowledge-based errors (lack of knowledge) - for example, giving penicillin, without having established whether the patient is allergic
- Minimising action based errors (called slip-up's) by creating conditions in which they are unlikely

Solutions enabled at NUH

Closed loop medication management system (CLMMS)

Objectives

- Enhanced medication safety process

Right Patient ✓ Right Drug ✓

Right Dose ✓ Right Time ✓

- Improve efficiency of ward processes
- Reduced turn around time for providing medication to wards
- Reduced time required to administer medications to patients



Outpatient pharmacy automation system (OPAS)

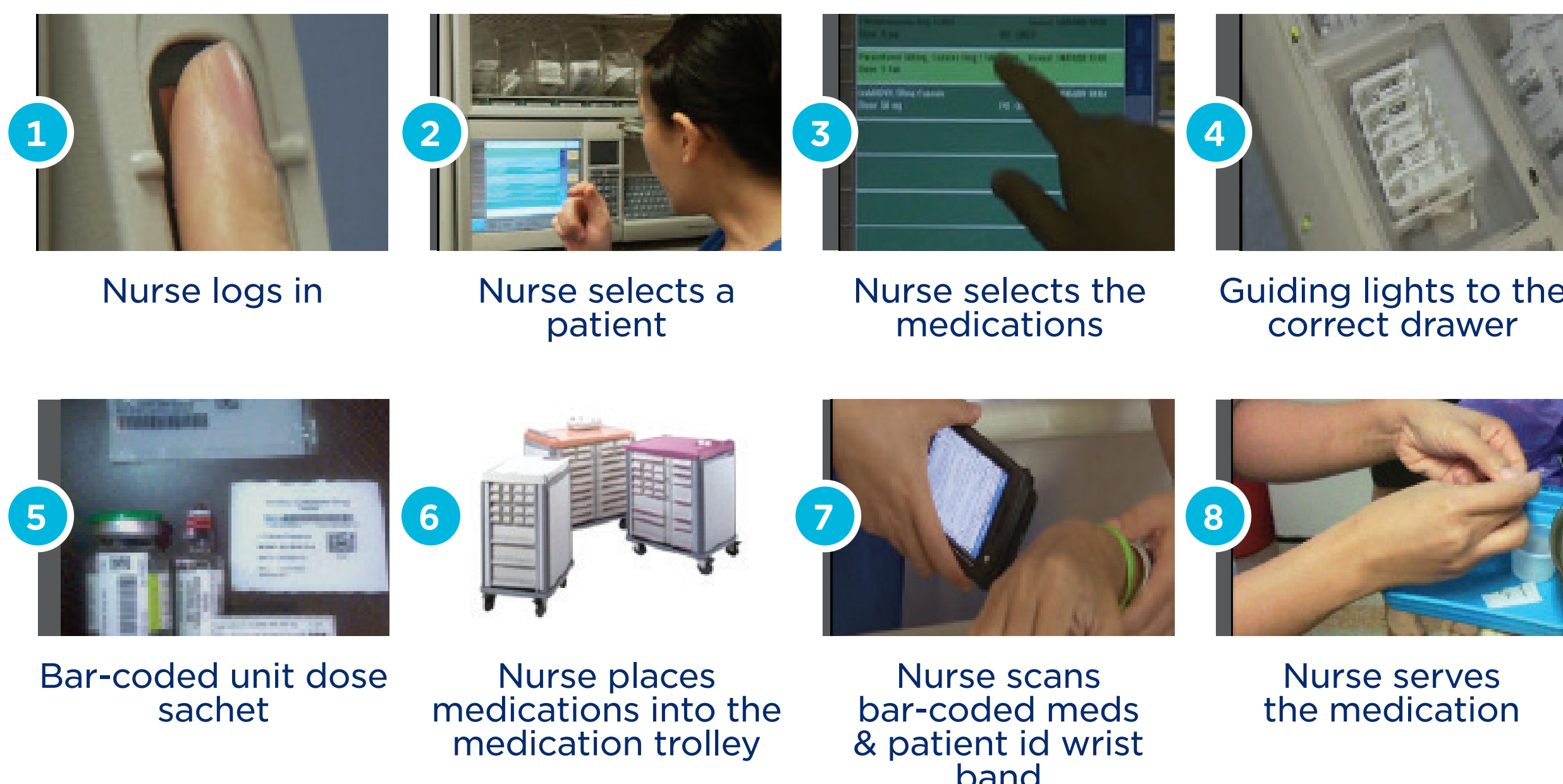
3 components

- Robotics to pick & pack (ROWA & Parata)
- Workflow engine to drive automation and processes (Rxpress)
- Job redesign for Pharmacy Assistants, Pharmacy Technicians and Pharmacists

Benefits

- Improve waiting time for patients
- Improve safety of medication dispensing through:
 - machine picking of pre-packed medication
 - barcode and drug image verification
- Allow pharmacy staff to do more value added work

Electronic medication administration system (eMARS)



- Nurse logs in
- Nurse selects a patient
- Nurse selects the medications
- Guiding lights to the correct drawer
- Bar-coded unit dose sachet
- Nurse places medications into the medication trolley
- Nurse scans bar-coded meds & patient id wrist band
- Nurse serves the medication

Medication and patient tracking using Rxpress and mobile technology

Benefits of using Rxpress & mobile technology

- Repackaging/Redressing of medication
- Topping up
- Picking
- Dispensing
- Patient medication administration alert
- Drug Information
- Inventory tracking : Tracks amount of medication remaining and facilitates refilling of prescription as required



Results

- ➔ 97% of patients identified by wristband barcode scanning
- ➔ 90% of medications scanned at patient bedside
- ➔ 65% reduction in preventable incidents