Closing the loop of medication management in hospitals to improve patient safety with barcoding technology on unit dose packaging

Maryanne Molenaar

1 Healesville Hospital

Healesville Hospital offers surgery, acute medical services, palliative care, geriatric medicine, antenatal care, specialist outpatient clinics and midwifery home care.

Yarra Valley Health

Yarra Valley Health offers a GP clinic, counselling, allied health, Aboriginal health, health promotion, district nursing and wellness programs across the Yarra Ranges.

2 Yarra Ranges Health

Yarra Ranges Health offers a variety of day surgery procedures, oncology and chemotherapy services, and a range of specialist clinical, rehabilitation and outreach services.

3 Box Hill Hospital

Box Hill Hospital offers emergency care, general and specialty medicine, intensive care services, surgery, maternity, paediatrics, specialist outpatient clinics, mental healthcare, allied health services, teaching and research.

4 Peter James Centre

Peter James Centre offers rehabilitation, geriatric medicine, aged person's mental health services, aged care assessment services, aged psychiatry assessment, haemodialysis, residential care and transition care.

5 Wantirna Health

Wantirna Health offers palliative care, rehabilitation, geriatric medicine and specialist clinics. It is also home to a large education precinct which opened in 2014.

6 Maroondah Hospital

Maroondah Hospital offers emergency care, general and specialty medicine, intensive care services, general and specialist surgery, paediatrics, specialist outpatient clinics, allied health services and adult mental healthcare.

7 Angliss Hospital

Angliss Hospital offers emergency care, general medicine, surgery, maternity, paediatrics and rehabilitation.

8 Statewide Services

Statewide Services include Spectrum, which provides treatment for people with borderline personality disorders, and Turning Point, which provides treatment, research and education in the fields of alcohol, other drugs and gambling.

Map labels:
Glenburn, Buxton, Woods Point, Kinglake, Marysville, Cambarville, Matlock, Steel Creek, Narbethong, Chum Creek, Healesville Hospital and Yarra Valley Health, Yarra Glen, Reefton, Kangaroo Ground, Eltham, Warrandyte, Templestowe, Yarra Ranges Health, Warburton, Toorongo, Box Hill Hospital, Wandin, Woori Yallock, Kew, Peter James Centre, Maroondah Hospital, Glen Iris, Wantirna Health, Olinda, Hoddles Creek, Powelltown, Anglis Hospital, Emerald, Mulgrave, Rowville, Lysterfield, Gembrook, Upper Beaconsfield

Statewide Services (Richmond) Spectrum, Turning Point

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POSITION STATEMENT

Introduction

The medication safety benefits for patients of hospitals using electronic medication management systems are well documented as is also that most of these benefits are in the reduced number of errors of administration if closed loop medication management is incorporated into the electronic medication management system. To this end, a small number of Australian hospitals have endeavoured to implement closed loop medication management by adding barcodes to the unit dose of the medication to be administered; however, this is not sustainable for most Australian hospitals. This position statement addresses the issues faced by Australian hospitals in the absence of a standard for barcoding medications at the unit dose level and makes recommendations for such a standard.

Society of Hospital Pharmacists of Australia (SHPA)

5,200 members – pharmacists, pharmacist interns, students, technicians and associates

Any member may join an *Interest Group*.

Members with demonstrated expertise may join a *Practice Group.*

10 to 12 members from the Practice Group are elected to the *Leadership Committee* for 3 years.

Closed Loop Electronic Medication Management

The use of technology in the medication management process, from ordering through to administration.

Aims to minimise manual selection, inputs and transcription, to reduce human effort and some risks of human error.

Why is CLEMM important?

Closed Loop Electronic Medication Management

How we are achieving CLEMM in Australia

- Royal Children's Hospital, Melbourne, VIC
  - In-house barcodes

- Princess Alexandra Hospital, Brisbane, QLD
  - GTINs

- Alfred Health, Melbourne, VIC
  - GTINs

- St Stephen's Uniting Care, Hervey Bay, QLD
  - Unit Dose Packaging

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With increased medication use in Australia, there is a proportional increase in medication-related errors, many of which are avoidable. Medication errors contribute to 250,000 hospital admissions per annum at a cost of $1.4 billion each year to the Australian health system[6]. However, errors in medication supply and administration can be reduced with the use of electronic medication management systems with a closed loop medication management system.

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In a study of the incidence of medication errors at various stages of the medication management process, 34% of errors occurred at the medications administration phase which is where unit dose packing with barcodes may lessen the rate of error. Transcription errors (6%) and dispensing errors (4%) were less common[8]. Errors were much more likely to be picked

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reduction in medication administration errors[1]. However, health services that opt to repackage medications from commercial preparations to enable unit dose packing and barcoding and scanning at administration do so at significant cost. This involves machinery costs, equipment and packaging costs and staff resources that are not a nationally scalable solution.

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The Australian Digital Health Agency's National Product Catalogue (NPC) is already built with the GTIN as the primary unambiguous identifier for all products. In addition to providing those required for supply chain purposes, it has the capacity within the data fields for the GTIN and relevant data to be provided for the unit level in addition to the secondary pack. Having a manufacturer uniquely identify their products to the level of the unit dose using the GTIN and provide the accurate data related to the product ensures the most comprehensive, consistent and cost-effective action to enable barcode scanning at the bedside as a part of a closed loop medication management system.

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> Barcode scanning of medications at the unit dose level would most probably start with unambiguous identification of the product using the Global Trade Item Number (GTIN) allocated to identify this level of the product contained within the GS1 DataMatrix. In future, the barcodes may also include data related to the batch number and expiry date, which will assist in the management of medication alerts and recalls due to improved tracking and tracing of doses within hospitals. The introduction of identification and barcoding including batch

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Conclusion

The introduction of unit dose packaging unambiguous identification and barcoding scanning technology in the hospital medication management process represents a significant safety and quality improvement initiative that will reduce medication-related errors in hospitals through incorrect administration; errors that are potentially fatal.

Without a nationally supported change to mandate that barcodes are available at the medicinal product unit of use there is no feasible way to systematically enable this safety and quality improvement. Barcodes on the unit dose of medications enabling barcoding and scanning technology at administration, ensure that patients benefit from an 'additional check' via systems that are always alert even when busy clinicians and nurses may be tired and distracted.

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Recommendations

- All medications distributed in Australia have barcodes containing the GTIN on the smallest unit of dose to enable the product to be unambiguously identified when scanned

- Data needed to support the scanning process, including unit dose or primary package, should be provided and managed by the manufacturer / sponsor of the medication within the Australian marketplace

- Over time, the barcodes on all unit doses of medications should also contain the expiry date and batch number
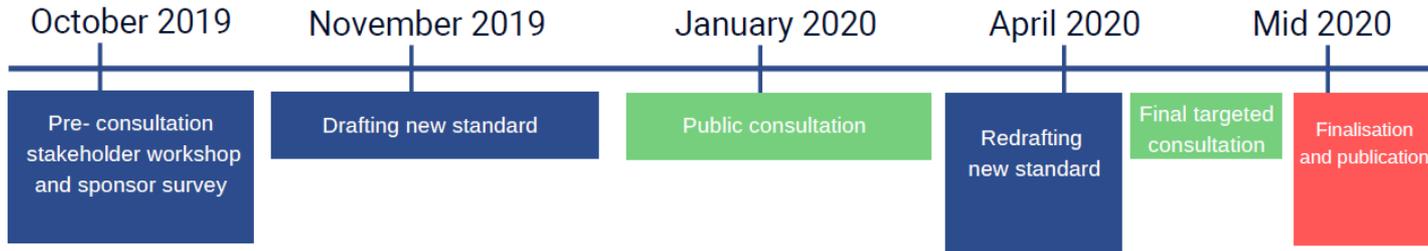
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Therapeutic Goods Administration

- Workshop with stakeholders held 21 October
- Survey sent to manufacturers to assess capability to implement 2D Datamatrix barcodes
- Draft of TGA Standard to be prepared November
- Draft circulated for public consultation in January

Target date for the new standard to be signed into effect by mid 2020

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Therapeutic Goods Administration

TIMELINE FOR THE DEVELOPMENT OF
A NEW STANDARD FOR 2D DATAMATRIX CODES

October 2019	November 2019	January 2020	April 2020	Mid 2020
Pre- consultation stakeholder workshop and sponsor survey	Drafting new standard	Public consultation	Redrafting new standard	Final targeted consultation / Finalisation and publication

Further Information

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https://www.shpa.org.au/sites/default/files/uploaded-content/website-content/Fact-sheets-position-statements/position_statement_-_unit_dose_packaging.pdf