Yes we scan! Minimizing medication administration errors through successful change management

Dr Pieter Helmons, hospital pharmacist, Chief Pharmacy Informatics Officer
St Jansdal Hospital, Harderwijk, the Netherlands

September 13, 2018
Welcome and thank you for attending!

• Welcome to our GS1 Healthcare September 2018 webinar.
  Thank you to our guest speaker Dr Pieter Helmons, hospital pharmacist at St Jansdal Hospital, Harderwijk, the Netherlands

• Some housekeeping for today:
  - All attendees will be on mute
  - If you have questions during the presentation, please type them into the questions area and these will be monitored then answered at the end of the call

• After the webinar:
  - Within a week, the recording will be posted to: http://www.gs1.org/healthcare/hpac_webinars
  - All previous webinars are also posted to this location, so please feel free to use this resource and share the link
The GS1 Healthcare Webinars

Focus is on thought leaders and adopters of GS1 Healthcare Standards from the global clinical provider environment. Their final goal is to improve patient safety, cost efficiency and staff productivity through implementation of GS1 standards.

- A forum for sharing and discussion
- Identification of projects and case studies
- A source of expertise and advice

- About the practical realities of implementation of GS1 Standards in the care giving environment in regards to the impact on clinical care and patient interaction
- That support the adoption of GS1 Standards in healthcare providers and retail pharmacies
- For publication, presentation and sharing
- To those involved in GS1 standards development, the wider Healthcare stakeholder community and senior executives/decision-makers to gain their buy-in and support for implementation of GS1 Standards
Some specific GS1 Healthcare Activities

<table>
<thead>
<tr>
<th>Webinars</th>
<th>Awards</th>
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</thead>
<tbody>
<tr>
<td>• Monthly webinars open to all stakeholders interested in learning about GS1 standards implementation in the care giving environment.</td>
<td>• Twice per year</td>
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<tr>
<td>• <a href="http://www.gs1.org/healthcare/hpac_webinars">http://www.gs1.org/healthcare/hpac_webinars</a></td>
<td>• Provider Best Case Study Award</td>
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<td>• Provider Recognition Award</td>
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<td>• The prize is travel / accommodation to attend the next GS1 Healthcare conference</td>
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<tr>
<td></td>
<td>• <a href="http://www.gs1.org/healthcare/hpac">http://www.gs1.org/healthcare/hpac</a></td>
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GS1 Healthcare also holds two global conferences per year. The next conference will be in Bangkok, Thailand from October 30 – November 1st, 2018. We expect significant Healthcare Provider participation on the agenda.
Presenting today

Dr Pieter Helmons, Pharm.D, PhD, MAS

- Hospital Pharmacist
- Chief Pharmacy Informatics Officer (CPIO)
- Responsible for
  - Inventory management
  - Optimizing medication processes using the electronic health record
  - Barcoded medication administration (BCMA)
My background

2003 - 2007

2007 -

2011

Go live 2016

2011 -

2016

Go live

Medication safety through information technology: a focus on medication prescribing and administering

Pieter Helmons

Since November 2017: HIMSS EMRAM stage 7

Welcome to the HIMSS Europe website, where we transform healthcare through information and technology, together.

Stage 7 Hospitals

Netherlands
Radboudumc, Nijmegen, Netherlands
Ziekenhuis St Jansdal - Harderwijk

Portugal
Hospital de Cascais – Cascais

Turkey
Izmir Tire Devlet Hastanesi - Izmir

http://www.himss.eu/communities/himss-emram-stage-6-7-community
UC San Diego Medical Center versus St Jansdal Hospital: surprisingly similar

Intensive Care St Jansdal 2018

Intensive Care UCSD 2010
“Limited staff, unlimited potential”

"If someone offers you an amazing opportunity and you're not sure you can do it, say yes - then learn how to do it later."

- Richard Branson
Optimal medication safety
The core business of the hospital pharmacy

1. Prescribing
2. Verifying
3. Dispensing
4. Distribution
5. Administering
6. Monitoring

Multidisciplinary
Core pharmacy
Central Medication Error Registration (CMR, 2014)

Things go wrong!

Med. errors(%)
Today’s focus
Barcode medication administration (BCMA)

1. Prescribing
2. Verifying
3. Dispensing
4. Distribution
5. Administering
6. Monitoring

Multidisciplinary
Core pharmacy
Barcode scanning of medication: important?

How many errors are made on a daily basis when administering medication in the hospital?

A 8 errors per 10,000 administrations
B 8 errors per 1,000 administrations
C 8 errors per 100 administrations
D 8 errors per 10 administrations

Barcode-scanning of medication: Important?

How many medication errors are made annually in our hospital (340 beds)?

A 64
B 640
C 6400
D 64000
Why is that? Human versus machine
We see things that are not there

Courtesy from M. Duijvendak, hospital pharmacist, Antonius Hospital, Sneek
Human vs. machine:
We read things that are not there

An itvgnoieation of an Elsginh Urinvetsiy dosecverid taht it
dseon’t mtetar in wcihh oedrr
tthe Iteetrts are wteitrn in a wrodr.
The olny itcnorapme is taht the
fsrit and the Isat Iteetr are
sdntniag at the rhgit Itcoioan.

The lrttees bteewen the fsrit and
the Isat Iteter in a wrodr may be
lectoad at rdonam. Bscueae we
dno’t raed ecah Itteer at a tmie,
we raed the wrodr has a wlohe.

Courtesy from M. Duijvendak, hospital pharmacist,
Antonius Hospital, Sneek
Daily reality: look-alikes
We only see the tip of the iceberg

The facts:

• 8 observed medication errors are made per 100 administrations
• BCMA decreases medication errors by 50%

2014:

• 800,000 med administrations annually
• 64,000 estimated med. errors per year at St Jansdal
• 52 reported medication administration errors at St Jansdal
• 5294 reported medication administration errors nationally
BCMA in practice
**The basics:**

**Primary and secondary barcode...**

**Secondary:** All outer packages, some GS1, all in national drug database (G-Standard)

**Primary:** about 80% of inventory, some GS1, some in national drug database (submission possible since March 2018)
BCMA dashboard at go-live
Yes, we scan!

Other Epic hospitals
The life of the hospital pharmacist…
4 types of medication

1. Medication in unit dose with primary barcode

2. Medication in unit dose without a primary barcode

3. Medication not in unit dose

4. Medication without a primary barcode used in compounding iv mixtures
1. Medication in unit dose with primary barcode
2. Medication in unit dose without primary barcode
3. Medication not in unit dose
4. Medication without a primary barcode used in compounding iv mixtures

https://docplayer.net/11581567-Bd-cato-medication-workflow-solutions.html
The secret of our success (I)
Routing items based on flag in Inventory System

Herbevoorradingslocatie: HAR ZIEKENHUISAPOTHEEK MAGAZIJN (vervolg)

<table>
<thead>
<tr>
<th>Voorraaditem</th>
<th>Locatie</th>
<th>Aantal ontvangen</th>
<th>ZI</th>
<th>Verpakkingen</th>
<th>Beschikbare hoeveelheid na ontvangst</th>
<th>Opmerkingen</th>
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</thead>
<tbody>
<tr>
<td>DEXAMETHASON TABLET 4MG, 1 stuk</td>
<td>3H-34</td>
<td>5</td>
<td>DEXAMETHASON TEVA TABLET 4MG (14896257) (3 x 10 stuk)</td>
<td>190 stuk</td>
<td>LABELLEN</td>
<td></td>
</tr>
<tr>
<td>TOCILIZUMAB INFOPL CONC 20MG/ML FL*, 4 ml</td>
<td>4K-54</td>
<td>3</td>
<td>ROACTEMRA INFYLST CONC 20MG/ML FLACON 4ML (15459373) (4 ml)</td>
<td>12 ml</td>
<td>LABELLEN</td>
<td></td>
</tr>
<tr>
<td>PROPafenon TABLET OMHULD 150MG, 1 stuk</td>
<td>9B-76</td>
<td>1</td>
<td>RYTMONORM TABLET OMHULD 150MG (16156900) (10 x 10 stuk)</td>
<td>150 stuk</td>
<td>QUARANTAINE - OMPAKKEN *</td>
<td></td>
</tr>
</tbody>
</table>

Ompakken = repackaging
The secret of our success (2)
Primary barcode check when receiving stock

Items to be barcoded

I am Wim!

Barcoded items

THE mobile plug-and-play barcoding solution

COW to check “scannability”
The secret of our success (3)

Our plug-and-play mobile barcode solution
The secret of our success (3)

Create custom QR codes based on secondary barcode
The secret of our success (4)
Unit dosis repackaging (labor intensive!)

Includes QR code with barcode data of secondary package
The secret of our success (4)

Unit dosis repackaging including QR coding (GMP-z activity)
The secret of our success (5)
Scanning policy incorporated in the Medication Administration Record (MAR)

- Institution wide scanning policy
- “Low risk products” may be scanned but scanning is not required

This product does not have to be scanned before administration
Implementing scanning is one thing, really wanting to scan is another…

Journal of the American Medical Informatics Association, 0(0), 2017, 1–8
doi: 10.1093/jamia/ocx077
Research and Applications

Research and Applications

Association between workarounds and medication administration errors in bar-code-assisted medication administration

CONCLUSION

In hospitals using barcode-assisted medication administration, workarounds occurred in two-thirds of medication administrations and were associated with a large number of medication administration errors. These data suggest that BCMA needs more post-implementation evaluation if it is to achieve its intended benefits for medication safety.
BCMA post-live
Continuous focus on improvement

- Making it easy to do it right
  - Standardisation of products
  - Address barriers (CapsLock)
- Safety first!

- Scanning compliance dashboard for nurse management
- Weekly check of non-scanning items
- Analysis of warning overrides

- Project plan: “from excellent to unbelievable”
- Optimization strategy

- Project execution
- Communication of the goal: improved medication safety
A barcode ≠ a barcode
A barcode ≠ a barcode (2)
BCMA nurse leadership dashboard (1)
| BCMA nurse leadership dashboard (2) |

<table>
<thead>
<tr>
<th>Rijlabels</th>
<th>Barcode onleesbaar</th>
<th>Scanner niet beschikbaar</th>
<th>Niet ingevuld</th>
<th>Scanner kapot</th>
<th>Spoed</th>
<th>Bolus vanuit zak</th>
<th>Medicatie in eigen beheer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nurse 1</td>
<td>19</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nurse 2</td>
<td>12</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nurse 3</td>
<td>9</td>
<td>2</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nurse 4</td>
<td>6</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Nurse 5</td>
<td>1</td>
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<td></td>
</tr>
<tr>
<td>Nurse 6</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nurse 7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nurse 8</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nurse 9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nurse 10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eindtotaal</td>
<td>52</td>
<td>7</td>
<td>7</td>
<td>4</td>
<td>11</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

Current BCMA statistics: 1,5 yeast post go-live

<table>
<thead>
<tr>
<th></th>
<th>mei</th>
<th>jun</th>
<th>jul</th>
<th>aug</th>
<th>scp</th>
<th>okt</th>
<th>MTNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>BCMA-patiëntscannen</td>
<td>95%</td>
<td>93%</td>
<td>95%</td>
<td>94%</td>
<td>95%</td>
<td>95%</td>
<td>95%</td>
</tr>
<tr>
<td>BCMA-medicatiescannen</td>
<td>95%</td>
<td>94%</td>
<td>95%</td>
<td>95%</td>
<td>95%</td>
<td>96%</td>
<td>96%</td>
</tr>
<tr>
<td>Bloedscannen</td>
<td>97%</td>
<td>91%</td>
<td>89%</td>
<td>94%</td>
<td>95%</td>
<td>96%</td>
<td>94%</td>
</tr>
</tbody>
</table>
Warning overridden?
Provide direct feedback to nurse

Metoprolol extended release (ZOC) order

Metoprolol standard release tablet scanned

System records all failed barcode scans 5 min prior to admin
And:
- **250** cases of preventable harm
- **10,000** additional days in the hospital
- Total savings: **€21,4 million** euro
- Current number of Dutch hospitals with BCMA or other computerized check: about 10 (11%)

[https://www.rijksoverheid.nl/documenten/kamerstukken/2017/01/31/kamerbrief-over-barcodering-primaire-verpakking-geneesmiddelen](https://www.rijksoverheid.nl/documenten/kamerstukken/2017/01/31/kamerbrief-over-barcodering-primaire-verpakking-geneesmiddelen) (Dutch)
To conclude:
We can start preventing harm and saving lives today!

Manufacturers: help us improve medication safety

- Adhere to the Dutch Society Hospital Pharmacist position paper on Single Unit Packages (EAG): info: secretariaat@nvza.nl (or https://nvza.nl/nvza/nvza-standpunten/)
- Assure a standardized barcode on EVERY primary (unit dosed) package
- Use the primary barcode standard (GS1-GTIN)
- Submit primary barcode data to the Dutch G-Standard

Hospitals: no more excuses!

- Implement a computerized check of accurate medication administration
- 80% of stock already contains a primary barcode
- Use efficient ways to barcode the rest
- Monitor compliance but praise your nurses!
- AND use the KISS principle: “Keep It Simple Stupid”
Thank you for your attention

Thank you!

Our nurses!
Hospital Pharmacy team
Stepic (EHR support) team
C-Suite (Raad van Bestuur and management)
Michiel Duyvendak, hospital pharmacist, Antonius Hospital, Sneek.

Questions?
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Questions and contact details

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