GS1 Healthcare Provider Advisory Council Webinar

**Patient and Logistic Safety using Barcodes on primary package**

M. Duyvendak, PharmD, Phd, Antonius Hospital Sneek, The Netherlands
09-02-2017
Welcome and thank you for attending!

- Welcome to our February 2017 webinar. Thank you to our guest speaker – dr. Michiel Duyvendak, Hospital Pharmacist of the Antonius Ziekenhuis (Hospital) in Sneek, 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 Provider Advisory Council (HPAC)

Thought leaders and early 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
HPAC Activities

**Webinars**

- Monthly webinars open to all stakeholders interested in learning about GS1 standards implementation in the care giving environment.
- [http://www.gs1.org/healthcare/hpac_webinars](http://www.gs1.org/healthcare/hpac_webinars)

**Awards**

- Twice per year
- Provider Best Case Study Award
- Provider Recognition Award
- The prize is travel / accommodation to attend the next GS1 Healthcare conference
- [http://www.gs1.org/healthcare/hpac](http://www.gs1.org/healthcare/hpac)

**GS1 Healthcare also holds two global conferences per year. The next conference will be in Berlin from April 4-6, 2017, with significant Healthcare Provider participation on the agenda.**
Dr. Michiel Duyvendak

Who am I

- Hospital Pharmacist
- PhD using decision support technology, 2010
- Working at Antonius Ziekenhuis (hospital), Sneek / Emmeloord, the Netherlands
- Interest in direct patient care and medication safety
- Since 2011 project-leader of the Medication Closed Loop project implementing pharmacy-based and bed-side barcode-verification technology as one of the new features
- Chairman pathway committee NVZA (Dutch Association Hospital Pharmacists)
EU-directive

1. Legislative proposals:
   - to tackle the growing issues of counterfeiting and illegal distribution of medicines (see Memo)
   - to enable citizens to have access to high-quality information on prescription-only medicines (see Memo).
   - to improve patient protection by strengthening the EU system for the safety monitoring (‘pharmacovigilance’) of medicines (see Memo).

These proposals will now be transmitted to the European Parliament and the Council.

2. A political communication:
   - to discuss with Member States ways to improve market access by making pricing/reimbursement decisions more transparent;
   - to develop initiatives to boost EU pharmaceutical research.
   - to intensify cooperation with major partners (US, Japan, Canada) to improve medicines’ safety worldwide;
   - to strengthen cooperation with emerging partners (Russia, India, China).

More... 
http://ec.europa.eu/enterprise/pharmaceuticals/index_en.htm
The Essence of Health Care

- Effective
- Efficient
- Quality
- Patient Centred
- Safe
- Timely

**FIVE RIGHTS**
- Right Patient
- Right Drug
- Right Dose
- Right Route
- Right Time

**RECAP**
- EXP: EXPIRED!
- MEDICINE EXPIRATION DATES

The Global Language of Business

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Optical Failure
EMR Adoption Model

<table>
<thead>
<tr>
<th>Stage</th>
<th>Cumulative Capabilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage 7</td>
<td>Complete EMR; CCD transactions to share data; Data warehousing; Data continuity with ED, ambulatory, OP</td>
</tr>
</tbody>
</table>

Closed Loop Medication Administration

<table>
<thead>
<tr>
<th>Stage</th>
<th>Capabilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage 4</td>
<td>CPOE, Clinical Decision Support (clinical protocols)</td>
</tr>
<tr>
<td>Stage 3</td>
<td>Nursing/clinical documentation (flow sheets), CDSS (error checking), PACS available outside Radiology</td>
</tr>
<tr>
<td>Stage 2</td>
<td>CDR, Controlled Medical Vocabulary, CDS, may have Document Imaging; HIE capable</td>
</tr>
<tr>
<td>Stage 1</td>
<td>Ancillaries – Lab, Rad, Pharmacy - All Installed</td>
</tr>
<tr>
<td>Stage 0</td>
<td>All Three Ancillaries Not Installed</td>
</tr>
</tbody>
</table>
Typical Process

Typical EPMA process

www.jac-pharmacy.co.uk
Commercial in confidence. Copyright © 21 January 2008 of JAC Computer Services Ltd.
JAC Computer Services Ltd is a wholly owned subsidiary of Mediware Inc.
Results of BCMA

- Ordering errors, 39% of all serious medication errors
  - With CPOE, 55% reduction

- Transcription errors, 12% of all serious medication errors
  - With eMAR, 100% reduction

- Dispensing errors, 11% of all serious medication errors
  - With pharmacy bar-code scanning

Administration errors, 38% of all serious medication errors
- With bar-code eMAR, 51% reduction

*Figure 1. Effect of Health Information Technology at Key Stages in the Process of Medication Use.*

Table 2  Number of observations, and error rates before and after BCMA implementation

<table>
<thead>
<tr>
<th>Study</th>
<th>Ward type</th>
<th>No of observations</th>
<th>Frequency of errors including time errors</th>
<th>Change from baseline</th>
<th>p Value</th>
<th>Frequency of errors excluding time errors</th>
<th>Change from baseline</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paoletti et al</td>
<td>Cardiac telemetry</td>
<td>308</td>
<td>25.3%</td>
<td>19.2%</td>
<td>24.1%</td>
<td>1.6%*</td>
<td>1.6%*</td>
<td>0.0%</td>
</tr>
<tr>
<td>Poon et al</td>
<td>Medical</td>
<td>2008</td>
<td>ND</td>
<td>ND</td>
<td>ND</td>
<td>5.3%†</td>
<td>3.8%†</td>
<td>28.5%</td>
</tr>
<tr>
<td>Paoletti et al</td>
<td>Medical-surgical</td>
<td>320</td>
<td>15.6%</td>
<td>10.0%</td>
<td>35.9%</td>
<td>6.3%*</td>
<td>2.9%*</td>
<td>53.5%</td>
</tr>
<tr>
<td>Franklin et al</td>
<td>Surgical</td>
<td>1473</td>
<td>7.0%</td>
<td>4.3%</td>
<td>38.6%</td>
<td>ND</td>
<td>ND</td>
<td>ND</td>
</tr>
<tr>
<td>Helmons et al</td>
<td>Medical-surgical</td>
<td>888</td>
<td>10.7%</td>
<td>8.2%</td>
<td>23.6%</td>
<td>8.0%</td>
<td>3.4%</td>
<td>56.9%</td>
</tr>
<tr>
<td>Poon et al</td>
<td>Surgical</td>
<td>3528</td>
<td>ND</td>
<td>ND</td>
<td>ND</td>
<td>9.8%†</td>
<td>5.4%†</td>
<td>45.1%</td>
</tr>
<tr>
<td>De Young et al</td>
<td>ICU</td>
<td>775</td>
<td>19.7%</td>
<td>8.7%</td>
<td>56.0%</td>
<td>3.6%†</td>
<td>4.2%</td>
<td>−16.3%</td>
</tr>
<tr>
<td>Helmons et al</td>
<td>ICU</td>
<td>374</td>
<td>12.6%</td>
<td>13.5%</td>
<td>−7.0%</td>
<td>11.0%</td>
<td>9.9%</td>
<td>9.7%</td>
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<tr>
<td>Poon et al</td>
<td>NICU</td>
<td>1187</td>
<td>ND</td>
<td>ND</td>
<td>ND</td>
<td>27.3%†</td>
<td>16.5%†</td>
<td>39.5%</td>
</tr>
<tr>
<td>Morris et al</td>
<td>NICU</td>
<td>46090</td>
<td>6.7%</td>
<td>8.0%</td>
<td>−14.7%†</td>
<td>ND</td>
<td>ND</td>
<td>ND</td>
</tr>
<tr>
<td>Ros et al</td>
<td>Neurology</td>
<td>3814</td>
<td>5.8%</td>
<td>7.0%</td>
<td>−20.4%</td>
<td>1.7%</td>
<td>0.8%</td>
<td>48.5%</td>
</tr>
<tr>
<td>Poon et al</td>
<td>Overall</td>
<td>6723</td>
<td>16.7%§</td>
<td>12.2%§</td>
<td>27.3%</td>
<td>11.5%</td>
<td>6.8%</td>
<td>41.4%</td>
</tr>
</tbody>
</table>

*Excluding time and technique errors.
†Frequency calculated based on numbers presented in original publication (number of errors per ward type/number of observed doses per ward type ×100%).
‡Reduction calculated based on numbers presented in original publication.
§Only time errors.

BCMA, bar code-assisted medication administration; ND, not determined.

Effects of bar code-assisted medication administration (BCMA) on frequency, type and severity of medication administration errors: a review of the literature
Jeroen Hassink, 1 Mark Jansen, 1 Pieter Helmons 2  European Journal of Hospital Pharmacy 2012;19: 489–494
Medication Errors

KNMP/NVZA: Central Registration on Medication incidents 2013
Implementatie >95% UDP BCMA is Slow
YES WE SCAN
Scanning on the Ward
Issues

High Risk

Unusable/Erronomous Barcode
(gemfibrozil TEVA 600mg scans 900mg!)

Protect from light/moist no single unit of use
Issues

Suppositories, Slippery Surface

Opioids

Ampuls, Small

Small strips
## Workarounds and Errors

<table>
<thead>
<tr>
<th></th>
<th>MAE</th>
<th>No MAE</th>
<th>Total</th>
<th>OR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>WA</td>
<td>271 (4.7%)</td>
<td>3362 (58.0%)</td>
<td>3633 (62.7%)</td>
<td></td>
</tr>
<tr>
<td>No WA</td>
<td>16 (0.3%)</td>
<td>2144 (37.0%)</td>
<td>2160 (37.3%)</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>287 (5.0%)</td>
<td>5506 (95.0%)</td>
<td>5793 (100%)</td>
<td>10.8 (6.51-17.94)</td>
</tr>
</tbody>
</table>

Including time-window medication administration errors (470) the OR was 34.3 (95% CI 20.85-56.51)
Patient Errors
Recent Errors
Sound alike
Good Manufacturing Practice
Antonius Sneek

Stock Keeping Units (SKU): 2012
SKUs dispensed/year 3,522,500

Production
SKU: 63 (3.1%)
SKUs dispensed/year 13,112 (0.4%)

Solid oral (tab/caps)
SKU: 854 (42.5%)
SKUs dispensed/year 2,760,274 (78.4%)

Other
SKU: 1,095 (54.4%)
SKUs dispensed/year 749,114 (21.2%)

Overall Barcode
SKU: 1,164 (57.9%)
SKUs dispensed/year 2,870,483 (81.5%)

Overall No-Barcode
SKU: 848 (42.1%)
SKUs dispensed/year 652,017 (18.5%)
How to overcome these obstacles?

Repackaging

Standardization of Medication suppliers
How do they do it?

- Responsive Hospital Board
- Active role in Safety Committee of the hospital
- Active role in Hospital IT project
- Local and National Network
IMPROVING LIFE AT WORK
## Toedieningsregistratie

### Geboren 20-04-1927

#### Oraal

<table>
<thead>
<tr>
<th>Medicijn</th>
<th>Startdatum</th>
<th>Stopdatum</th>
<th>Dosering</th>
<th>Tijd</th>
<th>Bericht</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diclofenac-Natrium Tablet Msr 50mg</td>
<td>2013-10-31</td>
<td>2013-10-31</td>
<td>3 x per dag (1 x 1 tab)</td>
<td>08:00</td>
<td>ZN 1STUK</td>
</tr>
<tr>
<td>Naproxen Tablet 500mg</td>
<td>2013-10-31</td>
<td>2013-10-31</td>
<td>1 x per dag</td>
<td>08:00</td>
<td>ZN 1STUK</td>
</tr>
<tr>
<td>Paracetamol Tablet 500mg</td>
<td>2013-10-31</td>
<td>2013-10-31</td>
<td>1 x per dag</td>
<td>08:00</td>
<td>ZN 1STUK</td>
</tr>
</tbody>
</table>
| Cutaan
| Ketocnaol Creme 20% | 2013-10-31 | 2013-10-31 | 1 x per dag | 08:00 | ZN 1STUK |
| IV
| Amoxicillin/Clavulaniczuur/Bipdr | 2013-10-31 | 2013-10-31 | 3 x per dag | 08:00 | ZN 1STUK |
| Vancomycin Pdr V Infvst 500mg Fl | 2013-10-31 | 2013-10-31 | 1 x 240mg | 08:00 | ZN 1STUK |
## Direct Feedback

### Toedieningsregistratie

<table>
<thead>
<tr>
<th>Datum</th>
<th>Uur</th>
<th>Oraal</th>
<th>Medicijn</th>
<th>Totaal</th>
<th>Startdatum</th>
<th>Stoppdatum</th>
<th>Stukken</th>
</tr>
</thead>
<tbody>
<tr>
<td>14 okt</td>
<td>06:00</td>
<td>3x per dag</td>
<td>Diclofenac-Natrium Tablet 50mg</td>
<td>12</td>
<td>14-10-2013</td>
<td>-</td>
<td>14 STUK</td>
</tr>
<tr>
<td></td>
<td>12:00</td>
<td>06:00</td>
<td>Baxter</td>
<td></td>
<td>14-10-2013</td>
<td>-</td>
<td>14 STUK</td>
</tr>
<tr>
<td></td>
<td>18:00</td>
<td>06:00</td>
<td></td>
<td></td>
<td>14-10-2013</td>
<td>-</td>
<td>14 STUK</td>
</tr>
<tr>
<td></td>
<td>15 okt</td>
<td>08:00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
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<td></td>
<td>18:00</td>
<td>08:00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>16:52</td>
<td>16:52</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>2400mg</td>
<td>2400mg</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

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**Geboren 20-04-1922**
Success factors

- IT infrastructure usable for Patient data management
- Digital ordering and decision support software provide pharmacy time for barcoding.
- Barcodes can be used for logistic safety
- Scanning can improve ward-stocking
Medication IT in the Netherlands

The Netherlands is leading in Medication IT

Opportunity for Dutch Pharma

<table>
<thead>
<tr>
<th></th>
<th>Germany</th>
<th>Italy</th>
<th>Spain</th>
<th>Netherlands</th>
<th>Poland</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pharmacy in Hospital</td>
<td>89.3%</td>
<td>100.0%</td>
<td>99.2%</td>
<td>100%</td>
<td>96.0%</td>
</tr>
<tr>
<td>Pharmacy IS</td>
<td>50.9%</td>
<td>75.1%</td>
<td>95.9%</td>
<td>99.7%</td>
<td>74.4%</td>
</tr>
<tr>
<td>ePrescribing</td>
<td>34.8%</td>
<td>35.1%</td>
<td>54.3%</td>
<td>94.7%</td>
<td>7.6%</td>
</tr>
<tr>
<td>eMAR, of which</td>
<td>37.6%</td>
<td>31.8%</td>
<td>88.3%</td>
<td>77.3%</td>
<td>7.6%</td>
</tr>
<tr>
<td>Available at bedside</td>
<td>14.0%</td>
<td>73.7%</td>
<td>75.3%</td>
<td>96.7%</td>
<td>0.0%</td>
</tr>
<tr>
<td>ADM Unit-Dose</td>
<td>3.6%</td>
<td>5.9%</td>
<td>35.1%</td>
<td>40.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Bar code / RFID, of which</td>
<td>79.5%</td>
<td>92.3%</td>
<td>77.4%</td>
<td>93.1%</td>
<td>64.6%</td>
</tr>
<tr>
<td>for Medication</td>
<td>40.3%</td>
<td>26.3%</td>
<td>31.1%</td>
<td>65.7%</td>
<td>4.2%</td>
</tr>
<tr>
<td>CLMA (self-perception)</td>
<td>3.5%</td>
<td>10.5%</td>
<td>34.0%</td>
<td>41.1%</td>
<td>0.0%</td>
</tr>
</tbody>
</table>

Source: HIMSS Analytics Europe, eHospital Census, 2012
BAR CODING TO THE SINGLE UNIT OF MEDICINE ADMINISTERED IN HOSPITALS
The patient safety case for bar coding to the single unit

America takes action!

- In 2001 the **Federation of American Hospitals (FAH)** called for bar coding to the single unit.
- The National Coordinating Council for Medication Error Reporting and the American Society for Health System Pharmacists supported the call.
- **2006 – campaign success!** The US FDA made it mandatory for medicines supplied to hospitals to be bar coded to the single unit.
Site Specific vs Industry
NVZA position paper

• All medication used in hospitals should be available in Single Unit of Use Packages
  • Single unit administration

• All Single Unit of Use Packages should contain the correct barcode
  • record the administration of medication electronically
  • significantly contributes to greater medication safety
Our needs

EAG of all single unit packages eg.
- Solid oral (tablets, capsules, ..)
- Solid/Liquid parenteral (ampoules, syringes, vials)
- Liquids (minims, morfine solution ampoules, etc)
- Ointments etc (not available in NL)

- label should contain:
  - Nonproprietary and proprietary names.
  - Dosage form.
  - Strength
  - Expiration date
  - Control number (lot number)
  - Barcode GTIN
The outcomes

- Medication safety at point of care
- Possibility of recalls at single dose level
- Registration batch number biologicals
- Solutions along the continuum of care
Medication Dispensing (Nursing)Home
Road Map

- Covenant of all stakeholders
  - Manufacturers, Gov’t, Regulators, Health Care Professionals
- Prioritising High Risk medication
- Identification all single use medication
- Batch number, expiry date

Barcodering op de primaire verpakking van geneesmiddelen in ziekenhuizen

Een kosten-baten analyse

In opdracht van het Ministerie van VWS, Directie Geneesmiddelen en Medische Technologie
Het rapport is tot stand gekomen in samenwerking met de werkgroep Barcodering Geneesmiddelen

Ref.: 16.0246
7 november 2016
Yes You Can

Success

NEXT EXIT
HPAC Questions and contact details

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