



## Barcode scanning, the missing link in patient safety



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## Who's talking ?

- Thomas De Rijdt, PharmD
- President of B.A.H.P.
  - *Belgian association of hospital pharmacists*
- Boardmember of V.Z.A.
  - *Flemish association of hospital pharmacists*
- Assistant-head of pharmacy UZ Leuven

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About what ? 

Not about barcoding ... 

... but about **patient safety** ! 

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When something happens ...

- Who's afraid to go to the hospital ? 
- Why are you afraid ?



Nothing can go wrong,  
we don't make mistakes ! 

**Until 1999**

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## To err is human ...

- Report Institute of Medicine: "To Err is Human" (1999)
  - 44.000 – 88.000 deaths/year by medical errors
  - Extrapolation for Belgium :
    - 1000 deaths / year (<150 medication errors)
    - €2.500.000 / year for 700 bed hospital
  - Avoidable ADE in 2 % of the admissions





**14 today**

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## Distribution of medication errors

Category	Percentage
CPOE	62%
Scanning	34%
Pharmacy	4%

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## From prescribing to C.P.O.E.

Overzicht Med. | Voorschrift Med. | Voorschrift Med. | Schema's Med. | Chemotherapie | Thuiszorg | 5. Antibiot voorschrift

1 Dagen | Ingedrukt | 4 | Dat = 2013-01-08 00:00 | A 0 GM ↔ GM 0 3 5 GM x 2 0 GM ↔ Voeding 1 Pijnscore 0

Medicatie	Toed.	Eenh.	za	zo	ma	di	wo	do	vr	za	zo
			05-00	04-00	05-00	06-00	07-00	08-00	09-00	10-00	
<b>NATROLON ORDE 0.8 % (PL INF 1.000 ML VAPLOC) - 1 infus</b> • LITICAN (AMP IN/50 MG/2 ML) - 4 amp • LANGACTIL (AMP IN/25 MG/2 ML) - 0 amp	% IV/bal	infus			1 infus	1 infus					
<b>NATROLON ORDE 0.8 % (PL INF 1.000 ML VAPLOC) - 1 infus</b> • LITICAN (AMP IN/50 MG/2 ML) - 5 amp • LANGACTIL (AMP IN/25 MG/2 ML) - 0 amp	% IV/bal	infus	1 infus	1 infus							
<b>NATROLON ORDE 0.8 % (PL INF 1.000 ML VAPLOC) - 1 infus</b> • LITICAN (AMP IN/50 MG/2 ML) - 6 amp • LANGACTIL (AMP IN/25 MG/2 ML) - 0 amp	% IV/bal	infus									
<b>SOMVEVOED: ENERGIER (P x 0.5)</b>	Maagpode	fls			1 fls	1 fls					
<b>SOMVEVOED: ENERGIER (P x 0.5)</b>	Maagpode	fls	2*1 fls	2*1 fls	2*1 fls	2*1 fls					
<b>SOMVEVOED: STANDAARD (P x 0.5)</b>	Maagpode	fls			1 fls	1 fls	1 fls	1 fls	1 fls	1 fls	1 fls
<b>FERO AD MONOSPIEL (PL 300 ML 0.12 %)</b>	OBSONIC	sol	2*15 ml	2*15 ml	2*15 ml	15 ml	2*15 ml	2*15 ml	2*15 ml	2*15 ml	
<b>PANTORID (TABL 40 MG)</b>	PO	tabl	1 tabl	1 tabl	1 tabl	1 tabl	1 tabl	1 tabl	1 tabl	1 tabl	1 tabl
<b>MOTILIN (TABL SMIET 10 MG)</b>	PO	zalg tabl									1 zalg tabl
<b>LITICAN (AMP IN/50 MG/2 ML)</b> # 20 rodd	% IV/bal	amp	3*1 amp	3*1 amp	3*1 amp						
<b>LITICAN (AMP IN/50 MG/2 ML)</b> # 20 rodd	% IV/bal	amp									1 amp
<b>MONOOL (CAL-IE NEUTRAL 13.70 G)</b> # 20 rodd	PO	poeder (zakje)	2*1 poeder (zakje)	2*1 poeder (zakje)	2*1 poeder (zakje)	2*1 poeder (zakje)	2*1 poeder (zakje)	2*1 poeder (zakje)	2*1 poeder (zakje)	2*1 poeder (zakje)	2*1 poeder (zakje)
<b>CLEXANE (SPUIT 40 MG/0.4 ML)</b>	SC	sput	1 sput	1 sput	1 sput	1 sput	1 sput	1 sput	1 sput	1 sput	1 sput
<b>DANTARIN (PL SPRAY 100 G)</b> # 20 rodd	LOC inh	toediening	1 toediening	1 toediening	1 toediening						
<b>EUSAPRIN (TRIME-TIL-SILFAM) (TABL PORT 100-000 MG)</b>	PO	tabl	2*1 tabl	2*1 tabl	2*1 tabl	2*1 tabl	2*1 tabl	4*1 tabl	4*1 tabl	4*1 tabl	4*1 tabl
<b>DRILUCAN (CAPS 200 MG)</b>	PO	caps	2 caps	2 caps	2 caps	2 caps	2 caps	2 caps	2 caps	2 caps	2 caps
<b>LORSAL (TABL 10 MG)</b>	PO	tabl	3*0.5 tabl	3*0.5 tabl	3*0.5 tabl	3*0.5 tabl	3*0.5 tabl	3*0.5 tabl	3*0.5 tabl	3*0.5 tabl	3*0.5 tabl
<b>CONTRAMAL (AMP IN/50 MG/2 ML)</b> # 20 rodd	% IV/bal	amp	4*0.5 amp	4*0.5 amp	0.5 amp (14)						
<b>DANALGAN (TABL 500 MG)</b>	PO	tabl								2*1 tabl	1 tabl
<b>DANALGAN (TABL PORTE 1 G)</b> # 20 rodd - max 3 per uur	PO	tabl					1 tab (1/1)	1 tab (1/1)	1 tab (1/1)	1 tab (1/1)	1 tab (1/1)
<b>DANALGAN (TABL PORTE BRUIS 1 G)</b>	PO	bruis tabl						1 bruis-tabl			1 bruis-tabl

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## Decision support for prescribers

Thuismed.

Form. Medicatie:  Vorm:

**Substitutie van medicatie BISOPROLOL EG TABL 10 MG**



Mogelijke substituties:

Form. Medicatie:  Vorm:

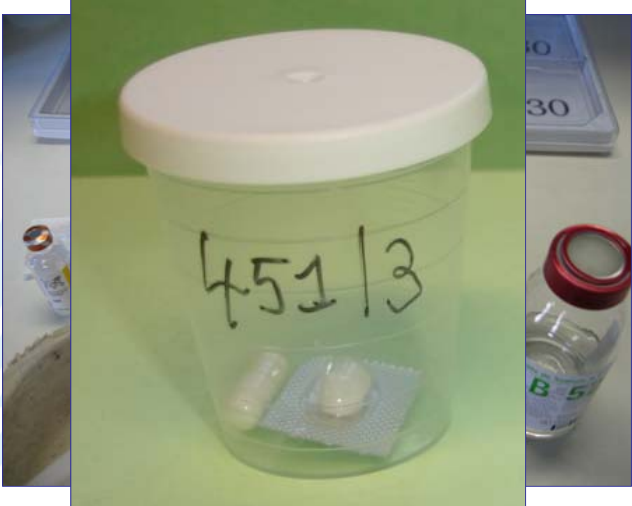
Disclaimer  
Deze databank werd met de grootste zorg samengesteld. Eventuele onjuistheden die aan de apotheek worden gesignaleerd, zullen zo snel mogelijk worden gecorrigeerd.



OK    Annuleer

A 0    GM ↔ GM 0 3 5    GM x 2 0  
7 10 7    GM ↔ Voeding 1    Pijnscore 0

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## You're not a number ...



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## Bedside scanning ...

- The final checkpoint !
- Requirements
  - Fully deployed CPOE
  - Hardware and software
  - Patient bracelets (*double identifier*)
  - Barcode on every single dose (*primary package*)
- UZ Leuven
  - 14.000.000 doses / year

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### Packaging ...



Mostly multi-dose blister packs

Solvay Pharma  
duphaston®  
dydrogesterone 10 mg

60 caps)  
date, no

capsule

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### Single dose, barcode ...



Lotus  
Original  
SPECULOOS



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## ... hard to get !

- How to get 14.000.000 doses ready ?
  - Repacking in the pharmacy
    - Legally seen as compounding
    - GMP in cleanroom
    - Time consuming
    - 4 blistering machines
  - Outsourcing
    - Legally possible
    - GMP in cleanroom
    - Expensive for small batches





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## With a little help ... ?

- Pharmaceutical industry
  - Delivery in single dose barcoded packages ?
  - Willingness but ...
    - Global management does not see the advantage
    - Blisteringlines are European or global
    - Different registration, different artwork
    - Need for a standard or legal obligation
    - Costs and difference between markets
- Policy makers
  - Provide a standard and a flexible framework for registration, artwork, information on primary package, ...




**BELGISCHE VERENIGING VAN ZIEKENHUISAPOTHEKERS**  
**ASSOCIATION BELGE DES PHARMACIENS HOSPITALIERS**

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**GS1**

**The global language of business**

**OVERALL BENEFIT: Improving efficiency & visibility in supply and demand chains**

**GS1 SOLUTIONS & SERVICES USING GS1 STANDARDS**  
 Solutions: POS / Inventory Management / Asset Management / Collaborative Planning / Traceability  
 Services: Global (GSMP, GEPIR, Global Registry, Training and Accreditation) & Local (e.g. Certification, Implementation, Training)

**GS1 System - Integrated system of standards**

 <b>GS1 BarCodes</b> Global standards for automatic identification Rapid and accurate, item, asset or location identification	 <b>GS1 eCom</b> Global standards for electronic business messaging Rapid, efficient & accurate business data exchange	 <b>GS1 GDSN</b> The environment for global data synchronisation Standardised, reliable data for effective business transactions	 <b>EPCglobal</b> <small>Powered by GS1</small> Global standards for RFID-based identification More accurate, immediate and cost-effective visibility of information
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**GS1 Identification Keys (e.g. GTIN, GLN, SSCC, GRAI, GIAI, GSRN, EPC) & Attribute Data (e.g. Best Before Date)**





## Why SD/BC by company ?

*(Single Dose / BarCode)*



- GMP production facility
- Optimal storage conditions *(primary)*
- Minimal cost *(just do it once, big batches)*
- Liability
- Protection against counterfeiting
- Supply chain management *(all packaging levels)*
- Added value in drug selection *(P&T committee, track and trace, ...)*

**QUALITY CONTROL**

**DO IT RIGHT THE FIRST TIME WE DON'T ALWAYS GET A SECOND CHANCE!**








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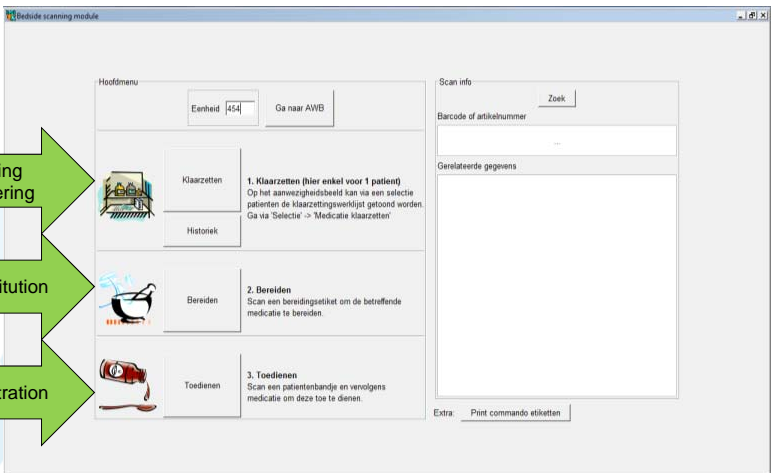
## Step by step

- Step 1: Identification
  - Unique identifier
    - Used in translation tables (1 on n relation)
    - Link to databases (measures, photo's, leaflets, ...)
- Step 2 : Traceability
  - Batch / serial
  - Expiration date



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## BSS in practice ...



Dispensing and ordering

Reconstitution

Administration

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## BSS in practice

- Module dispensing and ordering

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## BSS in practice

- Module pharmacy: Dispensing

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## BSS in practice

- Module reconstitution
  - Barcode verification of every ingredient
  - Reconstituted medication gets barcode

The screenshot shows a 'Confirmeer' dialog box with the following text:
   
Kies ...
   
Ja: Opslaan en markeren als voltooid.
   
Nee: Afsluiten ZONDER op te slaan (bereiding is niet afgewerkt).
   
Annuleren: Terug naar de bereidingsmodule.
   
The dialog box contains two QR code images, one on the left and one on the right, with buttons '< Ja' and 'Annuleren >' below them. At the bottom are buttons 'Ja', 'Nee', and 'Annuleren'.

Background information from the interface:
   
Klaargezet (02-05-2012 11:24)
   
Form Dosis
   
INF 50 ML 1 infuus
   
Datum
   
KWS-TESTPATIENT NUMME 14
   
ElikatNr: 4501
   
10-03-2012 12:00
   
AUGMENTIN (FL INJ 1 G-200 MG) 1 vial
   
NATR. CHLORIDE 0,9 % (FL INF 50 ML VIA

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## BSS in practice

- Module administration

The three screenshots show the 'Confirmeer' dialog box for different medication types:
   
1. **DOSIS afwijking: 20 mg\* (verwacht: 20 mg)**

- Ingevangende productie(n): LASIX (TABL 40 MG) - 8,5 tabl
- Gekoppelde voorschrift(en): LASIX (TABL 40 MG) Dosis: 20 mg
- Extradata: Toedieningsweg: PO, Gewicht: kg, Lengte: cm, Afs: jaar

2. **DOSIS afwijking: 200 mg (verwacht: 100 mg)**

- Ingevangende productie(n): DIFLUCAN (CAPS 200 MG) - 1 caps
- Gekoppelde voorschrift(en): DIFLUCAN (CAPS 200 MG) Dosis: 100 mg
- Extradata: Toedieningsweg: PO, Gewicht: kg, Lengte: cm, Afs: jaar

3. **VOORSCHRIFT: Geen voorschrift gekoppeld**

- Ingevangende productie(n): PARACETAMOL (FL FLU 1 G/100 ML) - 1 vial
- Gekoppelde voorschrift(en): Geen
- Extradata: Dosis: 1000 mg, Doel of delbet: Dose, Toedieningsweg: IV, Gewicht: kg, Lengte: cm, Afs: jaar

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## How does it work ?




SetID	FASET	Item ID	FA027532	XANAC TABEL 0,50MG	
Barcode inhoud	Van	Lengte	Barcode Type	Barcode gevalideerd?	Barcode validatie op
1 05415062100158	3	14 GS1 (2 en 16 cijfers)			15/05/12 16:26





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## Does it work ?

- **YES it works !**
  - Wrong patient
  - Wrong product
  - Wrong dose
  - Wrong time of administration
  - Wrong timeline cytotoxics
  - Double medication or dose
  - Contraindications and allergies for (standing) orders
  - Different patient incident reports (FONA)
  - Follow up use of decision support CPOE

*GET FOR YOURSELF*

