Bedside Assortment Picking
Decreasing the number of dispensing errors by implementing CPOE and barcode assisted dispensing

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Gelre Hospitals, Apeldoorn, The Netherlands
Gelre hospitals 1875 - 1925
Apeldoorn  Zutphen

Het Ziekenhuis

Algemeen ziekenhuis

St. Liduina

St. Walburgis
Artist impression
Gelre Hospitals, Apeldoorn
Some facts of Gelre Hospitals (2006)

<table>
<thead>
<tr>
<th>Metric</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of beds</td>
<td>985</td>
</tr>
<tr>
<td>Number of daycare treatments</td>
<td>21.712</td>
</tr>
<tr>
<td>Number of clinical admissions</td>
<td>29.359</td>
</tr>
<tr>
<td>Adherence</td>
<td>281.261</td>
</tr>
<tr>
<td>Number of physicians</td>
<td>190</td>
</tr>
<tr>
<td>Number of employees</td>
<td>circa 3300</td>
</tr>
</tbody>
</table>
Agenda: focus on BAP

- Defining the problem of dispensing errors
- The survey
- Results
- Conclusion
- Need for barcodes
Defining the problem

- Poor quality of handwritten prescriptions
- High medication turnaround time: logistics follow prescriptions
- Dispensing secured insufficiently: need for a second nurse to bring into action?
The survey
A survey is like a sports team..

- With physicians, nurses on the ward, pharmacy personnel
Goals of the survey

To improve medication safety in two steps:

Step 1:
• Implement a CPOE-system
• Introduce computer assisted dispensing

Step 2:
• Introduce barcode-assisted dispensing
• Introduce the BAP-trolley

CPOE = Computerized Prescriber Order Entry
BAP = Bedside Assortment Picking
Timeframe: 3 measurements were carried out using the disguised observation method

- **Pre-CPOE**: Sept 2003
  - **Physician**: Handwritten prescriptions
  - **Pharmacy**: Patient-specific distribution of drugs in trolleys
  - **Nurse**: Dispensing assisted by a printed medication

- **Intervention 1**: Post-CPOE
  - **Physician**: CPOE
  - **Pharmacy**: Patient-specific distribution of drugs in trolleys
  - **Nurse**: Computer assisted dispensing

- **Intervention 2**: BAP-phase
  - **Physician**: CPOE
  - **Pharmacy**: Stock medication in BAP trolley
  - **Nurse**: Computer and barcode assisted dispensing

- **Dec 2005**
Primary endpoint

- The number of dispensing errors
Definition of a dispensing error

Every difference between what was prescribed by the physician and what is actually administered to the patient
Classification of dispensing errors

- Category I  No prescription from a physician
- Category II  Extra dose
- Category III  Wrong dose
- Category IV  Dose not administered
- Category V  Time error
- Category VI  Wrong route of administration
- Category VII  Wrong formulation
- Category VIII  Wrong technique of administration

Bron: Bermt vd, Pharmaceutisch Weekblad 2002
RESULTS
Intervention 1 (CPOE)

Step 1:
- Implement a CPOE-system
- Introduce computer assisted dispensing

Advantages
- No handwriting, no transcription
- Complete and legible prescriptions
- A real-time and on-line overview of the current medication is always available
Results step 1:

47% decline in dispensing errors

<table>
<thead>
<tr>
<th>Category</th>
<th>Pre-CPOE (n=4457)</th>
<th>Post-CPOE (n=3814)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>II Extra dose</td>
<td>9</td>
<td>1</td>
<td>&lt;0.05</td>
</tr>
<tr>
<td>IV Dose not administered</td>
<td>57</td>
<td>23</td>
<td>0.001&lt;p&lt;0.01</td>
</tr>
<tr>
<td>VI Wrong route of administration</td>
<td>11</td>
<td>1</td>
<td>&lt;0.05</td>
</tr>
<tr>
<td>VII Wrong technique</td>
<td>27</td>
<td>9</td>
<td>&lt;0.05</td>
</tr>
<tr>
<td>Total</td>
<td>319</td>
<td>222</td>
<td>0.01&lt;p&lt;0.02</td>
</tr>
<tr>
<td>Total (excl. Category V)</td>
<td>138</td>
<td>63</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>
Intervention 2 (BAP)

Step 2:
- Introduce barcode-assisted dispensing
- Introduce the BAP-trolley

Advantages
- Dispensing to the right patient secured by the use of barcodes
- Dispensing of the right drugs secured by the use of barcodes
Process

1. **Physician**: CPOE
   **Pharmacy**: Check on interactions / overdoses, etc. and distribute the drugs

2. **Nurse**: Scanning the barcode of the patient

3. Scanning the medication

4. Scanning the barcode of the patient
Prototype of the BAP-trolley

- Content trolley is determined by the specific turnover of the ward
- Wireless laptop + scanner
- Stock medication
- Patient-specific medication
Stock control

- By double bin principle
- Yellow drawer: high throughput
- Red drawer: fast runners with a lower throughput
- Distribution: twice a week