Impact of a checklist on reliability of final check at patient bedside: illustration with anticancer chemotherapies

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Human reliability

Efficacy of human-performed controls

- Introduction of errors during unit dose dispensing
- Detection ability:
  - Pharmacists: 87.7%
  - Nurses: 82.1%

Facchinetti NJ, Med Care 1999;37:39-43

Efficacy $\approx$ 85%
(known value in the industry)

Do not be too confident with the double-checks!
## Chemotherapies

- High-risk drugs
- Final check is complex: **10 control points**

<table>
<thead>
<tr>
<th>Sources</th>
<th>Patient</th>
<th>Protocol</th>
<th>Product</th>
<th>Calendar</th>
<th>Conservation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient ID</td>
<td>●</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Product ID</td>
<td></td>
<td>●</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dose</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Route</td>
<td></td>
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<tr>
<td>Day</td>
<td></td>
<td>●</td>
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<td></td>
<td>●</td>
</tr>
<tr>
<td>Expiration</td>
<td></td>
<td></td>
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<td>●</td>
<td></td>
</tr>
<tr>
<td>Conservation</td>
<td></td>
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<td></td>
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<td>●</td>
</tr>
</tbody>
</table>
Objective

• Can a checklist improve the reliability of final check of chemotherapies at patient bedside?
Methods

- Experimental randomized controlled study
- 62 volunteers
  - 34 nurses and 28 technicians/pharmacists
  - Specialised or not in anticancer chemotherapy
- Inspection of protocols with introduced errors
  - Determination of conformities
  - Without and with a checklist
- Logistic regression to identify the factors influencing inspection reliability
Protsocols

- 20 treatments
- 200 control points
- Non-conformities randomly introduced

<table>
<thead>
<tr>
<th>Non-conformities</th>
<th>Without checklist</th>
<th>With checklist</th>
</tr>
</thead>
<tbody>
<tr>
<td>2%</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>16%</td>
<td>5</td>
<td>5</td>
</tr>
</tbody>
</table>
Without checklist
With checklist

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PROTOCOLE

Patient : Nom : M. Willy
Prénom : Jean
Date de naissance : 02/12/1955
Sexe : M
Lieu : 6-FL

Chimiothérapie à répéter toutes les 4 semaines

<table>
<thead>
<tr>
<th>Jour</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>01/06/06</td>
</tr>
</tbody>
</table>

DOXORUBICINE LIPOSOMALE (caelyx®) 20 mg/m² IV G5% 250ml en 1h.

Soit 45 mg dose totale

PATIENT

Bracelet : Nom : M. Willy
Prénom : Jean
Date de naissance : 02/12/1955
Sexe : M
Lieu : 6-FL

Voie : IV

PREPARATION

BL: WILLY Jean 02.12.1955
DOXORUBICINE (caelyx®) 40 mg INTRA-VEINEUX

Prise Glucose 5% adr 276 ml
Conservation: Au congédo
Remarque : 

CONFORMITE

conforme : ☐
non conforme : ☐

Nature de la (des) non-conformité(s) :

CONSEIL

On est le 01 août 2006.
HEURE
Il est 16h30.

CONSERVATION

A température ambiante.
## Results

### Logistic regression

<table>
<thead>
<tr>
<th>Variable</th>
<th>Risk factors</th>
<th>p</th>
<th>CI   95%</th>
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</thead>
<tbody>
<tr>
<td>n=62</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Profession</td>
<td>1.5</td>
<td>0.194</td>
<td>0.8-2.9</td>
</tr>
<tr>
<td>Specialisation</td>
<td>2.2</td>
<td>0.007</td>
<td>1.2-3.8</td>
</tr>
<tr>
<td>Checklist</td>
<td>13.0</td>
<td>0.000</td>
<td>5.7-29.4</td>
</tr>
<tr>
<td>Control point</td>
<td>1.0</td>
<td>0.089</td>
<td>1.0-1.2</td>
</tr>
<tr>
<td>Introduced error rate</td>
<td>1.0</td>
<td>0.174</td>
<td>1.0-1.1</td>
</tr>
<tr>
<td>Individuals</td>
<td>1.0</td>
<td>0.599</td>
<td>1.0-1.0</td>
</tr>
</tbody>
</table>
Results

Checklist

<table>
<thead>
<tr>
<th></th>
<th>No help</th>
<th>Checklist</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>86.4%</td>
<td>98.6%</td>
</tr>
<tr>
<td>[CI 95%]</td>
<td>[83.3 – 89.1]</td>
<td>[97.2 – 99.4]</td>
</tr>
<tr>
<td>n</td>
<td>62</td>
<td></td>
</tr>
</tbody>
</table>

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Pharmacie
Hôpitaux Universitaires de Genève
Results
Specialisation

<table>
<thead>
<tr>
<th>Specialisation</th>
<th>Mean [CI 95%]</th>
<th>n=62</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not specialised</td>
<td>83.5%</td>
<td></td>
</tr>
<tr>
<td>Specialised</td>
<td>90.1%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>97.5%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>100%</td>
<td></td>
</tr>
</tbody>
</table>

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Discussion

• Inspection reliability without checklist was similar to the rate known in other areas

• A major impact of the checklist was observed

• The efficacy in the real life might be slightly lower (compliance, distraction)

• Owing to the **low cost**, it is strongly recommended to implement it for high-risk products like anticancer chemotherapies
Perspective
Electronic scanning at bedside

Caregiver ID (RFID)

Drug ID (RFID)

CYTOS-TRACE (database)

Patient ID (RFID)

(项目正在进行中)

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Conflict of interest

Nothing to disclose

This presentation can be downloaded:

www.hcuge.ch/Pharmacie/ens/conferences.htm