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Sharps injuries among radiographers: Dangers associated with opening bottles of contrast agent

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Faculty of Health, Medical Science and Social Care

GE Healthcare

University of Cumbria
Research Objectives:

- To understand and examine the extent to which bottle related injuries occur within radiology departments
- Measure the frequency and number of bottle related injuries
- Evaluate the extent and seriousness of the injuries that occur
- Assess perceptions of how serious the threat of bottle related injuries are and the level of concern
- Understand the extent to which bottle related injuries are reported
- To identify the extent to which the issue of injuries should be considered for further development of alternatives to glass
Research Methodology & Sample:

- Telephone survey in 6 European countries
  - 10 minutes in length
  - In the native language of respondent
- Inclusion criteria:
  - work in the radiology department
  - have been working in their current position for a minimum of 3 months and a maximum of 30 years
  - be regular users of glass bottle packaging
## Summary:

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average number of opening injuries per month per radiographer</td>
<td>2.03 injuries</td>
</tr>
<tr>
<td>Average number of breakage injuries per year per radiographer</td>
<td>1.9 injuries</td>
</tr>
<tr>
<td>Average number of breakage injuries per month per radiographer</td>
<td>0.16 injuries</td>
</tr>
<tr>
<td>Total average number of injuries per month per radiographer</td>
<td>2.19 injuries</td>
</tr>
<tr>
<td>Percentage of injuries that draw blood</td>
<td>47%</td>
</tr>
<tr>
<td>Average time spent dealing with one injury</td>
<td>4.04 minutes</td>
</tr>
<tr>
<td>Average time spent dealing with injuries per month</td>
<td>8.84 minutes</td>
</tr>
<tr>
<td>Number of radiographers per department</td>
<td>24.4</td>
</tr>
<tr>
<td>Time lost dealing with injuries per department per month</td>
<td>3.59 hours</td>
</tr>
</tbody>
</table>

Base: 125 respondents who admit to injuries occurring within their department whilst handling contrast agents
Magnetic Resonance Scan:
3 D Computed Tomography Reconstruction:
Study Sample:

<table>
<thead>
<tr>
<th>Country</th>
<th>Radiographers</th>
<th>Radiology Department Managers</th>
</tr>
</thead>
<tbody>
<tr>
<td>France</td>
<td>24</td>
<td>6</td>
</tr>
<tr>
<td>Italy</td>
<td>20</td>
<td>5</td>
</tr>
<tr>
<td>Germany</td>
<td>20</td>
<td>5</td>
</tr>
<tr>
<td>Spain</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Sweden</td>
<td>13</td>
<td>2</td>
</tr>
<tr>
<td>UK</td>
<td>20</td>
<td>6</td>
</tr>
</tbody>
</table>

Total: 125
Glass bottles dominate all markets except Sweden:

Proportion of products packed in glass bottles

Q2 Thinking of the different individual contrast agents products that you stock in your lab, what proportion are packaged in glass bottles?

Base: All (n=125)
Glass bottle of contrast agents / polymer bottles:
Opening is only slightly more problematic than storing, unpacking and disposal:

<table>
<thead>
<tr>
<th></th>
<th>Ease of unpacking and storage</th>
<th>Ease of opening</th>
<th>Ease of disposal</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Means</td>
<td>% 6 &amp; 7</td>
<td>Means</td>
</tr>
<tr>
<td><strong>France (30)</strong></td>
<td>5.4</td>
<td>53%</td>
<td>4.5</td>
</tr>
<tr>
<td><strong>Germany (25)</strong></td>
<td>5.6</td>
<td>52%</td>
<td>3.4</td>
</tr>
<tr>
<td><strong>Italy (25)</strong></td>
<td>5.8</td>
<td>72%</td>
<td>4.9</td>
</tr>
<tr>
<td><strong>Spain (4)</strong></td>
<td>5.3</td>
<td>75%</td>
<td>5.5</td>
</tr>
<tr>
<td><strong>Sweden (15)</strong></td>
<td>4.8</td>
<td>34%</td>
<td>3.5</td>
</tr>
<tr>
<td><strong>UK (26)</strong></td>
<td>5.0</td>
<td>46%</td>
<td>3.6</td>
</tr>
<tr>
<td><strong>Total (125)</strong></td>
<td>5.4</td>
<td>53%</td>
<td>4.1</td>
</tr>
</tbody>
</table>

Base: All (n=125)

Q3  How easy are glass bottles to unpack and store? Using a scale of 1 to 7, where 1 is not at all easy and 7 is extremely easy
Q4  How easy are glass bottles to open? Using a scale of 1 to 7, where 1 is not at all easy and 7 is extremely easy
Q5  How easy are glass to dispose of? Using a scale of 1 to 7, where 1 is not at all easy and 7 is extremely easy

*Small Base
Wide variability in cause of injury across countries:

Base: All respondents who report injuries in their department as a result of opening glass bottles (n=118)

Q8. Please can you allocate 100% between the following options indicating what opening injuries most commonly occur in your department?

- Ring pull snaps off, user injured as a result of opening using other methods
- Ring pull snaps off, user cut on sharp edge
- Bottle opened correctly, user cut on sharp edge

% injury type

UK (26)

38.6
42.2
19.2

France (29)

30.0
54.5
15.5

Germany (25)

66.4
29.6
4.0

Italy (20)

39.7
33.7
26.7

Spain (4)*

46.3
3.0
50.8

Sweden (14)

28.6
42.5
28.9

Total (118)

53.1
25.0
d
38.6

*Small Base

Base: All respondents who report injuries in their department as a result of opening glass bottles (n=118)
Rarity of injury and minimal risk reduce concern regarding opening injuries:

**Reasons for high concern:**
- Risk of infection 11%
- Alternative methods to open are dangerous 3%
- Concerned – glass bottles cause accidents/ Afraid of injuries (single mentions)

**Reasons for low concern:**
- Minor risk/not serious 18%
- Injuries are a rare occurrence 16%
- Careful handling 10%
- No contact with patient 5%
- Injuries not a problem 3%

Base: All respondents who report injuries in their department as a result of opening glass bottles (n=118)
Q11b Why did you give this rating?
Almost 4 working hours are lost per month per department dealing with injuries:

- Total (125) - 3.6 hours
- France (30) - 2.6 hours
- Germany (25) - 0.9 hours
- Italy (25) - 6.6 hours
- Spain (4)* - 2.4 hours
- Sweden (15) - 4.4 hours
- UK (26) - 6.5 hours

Base: All (n=125)

Q1 Firstly, please could you tell me how many radiographers and/or technologists work in your department?

Q6 In an average month how often do you injure yourself (however minor) when opening a glass bottle? Q9a, Q9b, Q9c, Q18.

Q16 In an average year how often do you injure yourself (however minor) on broken glass?
Minor injuries are not usually reported:

<table>
<thead>
<tr>
<th>Method of reporting</th>
<th>Total (125)</th>
<th>France (30)</th>
<th>Germany (25)</th>
<th>Italy (25)</th>
<th>Spain (4)*</th>
<th>Sweden (15)</th>
<th>UK (26)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not reported</td>
<td>68%</td>
<td>60%</td>
<td>92%</td>
<td>48%</td>
<td>75%</td>
<td>80%</td>
<td>65%</td>
</tr>
<tr>
<td>Within the department – verbal report</td>
<td>18%</td>
<td>33%</td>
<td>4%</td>
<td>36%</td>
<td>-</td>
<td>7%</td>
<td>8%</td>
</tr>
<tr>
<td>Within the department – written report / log</td>
<td>7%</td>
<td>7%</td>
<td>4%</td>
<td>8%</td>
<td>-</td>
<td>13%</td>
<td>8%</td>
</tr>
<tr>
<td>External – verbal report</td>
<td>2%</td>
<td>-</td>
<td>-</td>
<td>4%</td>
<td>-</td>
<td>-</td>
<td>4%</td>
</tr>
<tr>
<td>External – written report / log</td>
<td>2%</td>
<td>-</td>
<td>-</td>
<td>4%</td>
<td>25%</td>
<td>-</td>
<td>4%</td>
</tr>
<tr>
<td>Within the department and externally – written report / log</td>
<td>2%</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>12%</td>
</tr>
<tr>
<td>Within the department and externally – verbal report</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Base: All (n=125)
Q22 How are minor bottle related injuries reported? (eg. Minor cuts that may or may not require a plaster

*Small Base
Majority of serious injuries are reported except in Germany where serious injuries rarely occur:

<table>
<thead>
<tr>
<th>Method of reporting</th>
<th>Total (125)</th>
<th>France (30)</th>
<th>Germany (25)</th>
<th>Italy (25)</th>
<th>Spain (4)*</th>
<th>Sweden (15)</th>
<th>UK (26)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Within the department and externally – written report / log</td>
<td>34%</td>
<td>40%</td>
<td>4%</td>
<td>20%</td>
<td>-</td>
<td>27%</td>
<td>81%</td>
</tr>
<tr>
<td>Not reported</td>
<td>32%</td>
<td>47%</td>
<td>88%</td>
<td>12%</td>
<td>25%</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Within the department – written report / log</td>
<td>15%</td>
<td>-</td>
<td>4%</td>
<td>24%</td>
<td>-</td>
<td>60%</td>
<td>12%</td>
</tr>
<tr>
<td>External – written report / log</td>
<td>12%</td>
<td>-</td>
<td>-</td>
<td>32%</td>
<td>75%</td>
<td>13%</td>
<td>8%</td>
</tr>
<tr>
<td>Within the department – verbal report</td>
<td>4%</td>
<td>10%</td>
<td>4%</td>
<td>4%</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Within the department and externally – verbal report</td>
<td>2%</td>
<td>3%</td>
<td>-</td>
<td>4%</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>External – verbal report</td>
<td>1%</td>
<td>-</td>
<td>-</td>
<td>4%</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Base: All (n=125)
Q23 How are more serious bottle related injuries reported? (eg. Deeper cuts that require stitches)
Conclusions:

- A radiographer can expect to be injured either through opening a glass bottle or through glass bottle breakages 2.2 times per month.

- Most injuries are minor (no requirement for a plaster).

- 48% of injuries however draw blood and require further treatment.

- Opening injuries are predominately caused by sharp edges or the ring pull snapping off.

- On average, injuries caused by opening are more frequent (24.4 per year) per respondent than injuries caused by broken glass (1.9 per year).
Conclusions:

- Approximately 3 and a half hours are lost per month per department. This varies within countries, based on their estimation of time taken.

- The vast majority of respondents are not too concerned with the risk of injuries when either unpacking, opening and disposing of glass bottles.

- Generally, minor injuries are not reported at all (55%), however, the more serious injuries are usually reported (59%).

- Respondents indicate that injuries are more of a nuisance rather than a serious concern.

- Any improvements to reduce the risk of injuries and time lost would be efficacious.
References: