Trends of Medical Glove Usage in Europe

Australia 2008

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Natural rubber latex allergy
Hevea brasiliensis
Urticaria
Why is this called urticaria?
Urtica dioica = Stinging nettle
Prevalence in the „General Population“

- 1987: 0.8%
- 1990/93: 0.8 - 1.1%
- 1995 - 999: 3.5%
- 1999 AB: 6.1%
- 1999 AB: 1.4%
- 2000: 18.6%
- 2001: 20%
Prevalence in „Health Care Workers“

- 14.1% in 1997 AB
- 14% in 1998
- 15% in 1999
- 16% in 1997
- 7.4% in 1987
- 11.6% in 1996
- 16.7% in 1999
- 20.6% in 2000 AB
- 9.2% in 2000
Lung function of a nurse with type-I allergy
Incidence of suspected OA cases per 1000 insured HCWs

Acute care hospitals

Inzidenz der BK-Verdachtsfälle je 1.000 Versicherte

4301 Latex
4301 Gesamt
Dentists' offices

Incidence of suspected OA cases per 1000 insured HCWs

- 4301 Latex
- 4301 Gesamt

Physicians‘ offices without surgery

Incidence of suspected OA cases per 1000 insured HCWs

- 4301 Latex
- 4301 Gesamt

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<tr>
<td>Latex</td>
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<td>Gesamt</td>
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Suspected Dermatitis

Incidence per 1,000 insured HCWs

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<tr>
<td>all HCWs</td>
<td>0.30</td>
<td>0.30</td>
<td>0.20</td>
<td>0.20</td>
<td>0.20</td>
<td>0.20</td>
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<tr>
<td>HCWs in acute care hospitals</td>
<td>0.60</td>
<td>0.60</td>
<td>0.40</td>
<td>0.40</td>
<td>0.40</td>
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B.K. 5101 Latex
Suspected Occupational Asthma

Acute care hospitals
Dentists' offices
All HCW's
NRL-Allergy Time to Symptoms

Start of work between:

- 86/87
- 88/89
- 90/91
- 92/93

First symptoms
Occupational asthma

Measurements

Sampler
Identifying the Cause

- Measurement of NLR in the air
- Evaluation of NRL sensitization in Health Care Workers
- Result: We found only sensitizations in rooms with detectable NRL allergens!!!
Implementing Secondary Prevention

- St. Franziskus Hospital in Münster
- Evaluation of NRL sensitization in Health Care Workers
- Switch to powderfree NRL or non-NRL gloves
- Measurement of allergens in the air and antibodies in affected HCWs.
Subject: Concentration of NRL-spec. IgE-antibodies

- September 96
- April 97
- September 97

The graph shows the concentration of NRL-specific IgE-antibodies for different subjects (F, C, E, H, A, G, B) across the months of September 96, April 97, and September 97. The x-axis represents the subjects, and the y-axis represents the concentration of NRL-specific IgE-antibodies.
Prevention

• Primary (population approach):
  – Use only powder-free gloves and other materials.

• Secondary (high risk approach):
  – Latex-free materials for sensitized/allergic HCWs
  – Use only powder-free gloves and other materials.
Keep in mind:
The powder is only the carrier and not the allergen.
NRL-Allergy Time to Symptoms

Start of work between:
- 86/87
- 88/89
- 90/91
- 92/93

Duration to symptoms [months]
- 132
- 120
- 108
- 96
- 84
- 72
- 60
- 48
- 36
- 24
- 12
- 0

First symptoms
Occupational asthma

Reasons

- High demand lower quality
- No transport denaturation during shipment because new plants close to plantations
- Defense proteins
Worst case scenario assumption:

Release per glove = 98.7 mg powder
Worst case scenario assumption:
Release per glove = 98.7 mg powder

1,025 %
79.7 %
<table>
<thead>
<tr>
<th>Destination /GloveType</th>
<th>EU</th>
<th>USA</th>
<th>Japan</th>
<th>Rest of the world</th>
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<tbody>
<tr>
<td>Powder-free</td>
<td>46.2%</td>
<td>47.7%</td>
<td>15.2%</td>
<td>17.2%</td>
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<tr>
<td>Powdered</td>
<td>53.8%</td>
<td>52.3%</td>
<td>84.8%</td>
<td>82.8%</td>
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<tr>
<td>Total</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>
Quantity of purchased NRL-examination glove [x 1000]

- Powdered gloves
- Powder-free gloves
- Occupational asthma
- Contact urticaria

Incidence of suspected NRL-allergy cases per 1,000 HCWs

Prevention

• Primary (population approach):
  – Use only powder-free NRL gloves and other materials.

• Secondary (high risk approach):
  – Latex-free materials for sensitized/allergic HCWs
  – Use only powder-free NRL gloves and other materials.
Newly suspected cases in acute care hospitals in Germany

- Skin allergy 1998 – 2005: 89 % reduction
- Occupational asthma 1997 - 2005: 95 % reduction
Reason for the decrease?

- Is it the powder/inhalation route?
- or reduction of allergen content?
- Is the „powder free approach“ just a proxy?
- Sensitisation via skin contact?
Our answer:

The NRL allergy epidemic is over and the success was reached by using this approach:
Before exposure

$\text{FEV}_1: 2.9 \text{ L} = 100\%$

$sR_t: .77 \text{ kPa}^*\text{s} = 100\%$
Control: Cornstarch ADP 30 min.

\[ \text{FEV}_1 : 2.9 \text{ L} = 100\% \]
\[ \text{sR}_t : .88 \text{ kPa}^*\text{s} = 115\% \]
30 min 10 pair powderfree NRL-gloves

FEV\textsubscript{1} \( \text{L} = 2.9 \text{ L} = 100\% \\
\text{sR}_t \text{ } \text{ kPa*s} = .9 \text{ kPa*s} = 116 \% \)
20 min 1 pair powdered NRL-gloves

$FEV_1 : 2.3 \text{ L} = 79\%$

$sR_t : 1.5 \text{ kPa}\cdot\text{s} = 196\%$
Powder-free made her smile
Outlook

The natural rubber latex allergy epidemic is over in Germany

But from an occupational medicine point of view it is always important to know when to use the right material for the job
Any questions?