TELEMEDICINE AND BURN INJURIES
A REVIEW OF THE LITERATURE AND A PRESTUDY OF UNAIDED BURN-TRIAGE
• 5.5 million inhabitants

• The National Burn Center in Copenhagen takes all severe burns in Denmark

• Around 12,000 burn injuries per year
<table>
<thead>
<tr>
<th></th>
<th>Danish Guidelines for referral</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Partial thickness burns exceeding 3 per cent estimated area burned (EAB)</td>
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<tr>
<td>2</td>
<td>Full thickness burn exceeding 1 per cent EAB</td>
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<td>3</td>
<td>Any suspicion of inhalation</td>
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<td>4</td>
<td>High-voltage burns</td>
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<td>5</td>
<td>Circular full-thickness burns</td>
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<td>6</td>
<td>Burn to the face</td>
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<td>7</td>
<td>Burn over the major joint</td>
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<td>8</td>
<td>Burn in the urogenital area</td>
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<tr>
<td>9</td>
<td>Suspicion of non-accidental injury</td>
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<tr>
<td>10</td>
<td>All cases of doubt</td>
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</tbody>
</table>
• Help by telephone from a burn specialist

• Store and forward pictures are not used
Methods

• Retrospective study

• All burn-patients transferred to RH-TC 3-months period

• Information collected from electronic patient files

• Additional information from referring hospital as needed
Methods

• 97 patients included

• Age, sex, etiology and type of burn, referring hospitals estimate and receiving hospitals estimate of burn etc.

• Estimated for relevance of referral, optimal mode of transport
Transferral of Burns in Denmark

- 30% overtriage
- Scalds Overtriaged – mostly children
## Age and EAB according to referral

<table>
<thead>
<tr>
<th></th>
<th>Age (years)</th>
<th>EAB (%)</th>
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<tbody>
<tr>
<td>Correct referral (n=68), median (5%-95% range)</td>
<td>24 (0.9-76)</td>
<td>5.0 (0.1-30)</td>
</tr>
<tr>
<td>Uncertain reason for referral (n=29), median (5%-95% range)</td>
<td>5.0 (0.5-69)</td>
<td>0.9 (0-3.0)</td>
</tr>
<tr>
<td>P</td>
<td>0.047</td>
<td>&lt; 0.001</td>
</tr>
</tbody>
</table>
Helicopter

16% of the patients were referred by helicopter

- Of these 75% were correctly referred according to the guidelines
- 56% correctly transported with helicopter
- 19% could have been transported by ground
- 25% could have been treated at the local emergency room
Burn injuries & Telemedicine

Can we...? Should we...?

- Beneficial for the patients?
- Safe?
- Beneficial for the healthcare system?
- Easily accessible
- Easy to use?
- Affordable?
Experience from around the world

• As face-to-face assessment
• Appropriate and cost-effective
• Improving the accuracy of triage

• Saffle et al. Telemedicine evaluation of acute burns is accurate and cost-effective. J Trauma 2009
• Turk E et al. Use of telemedicine and telephone consultation in decision-making and follow-up of burn patients: Initial experience from two burn units. Burns 2011
Risks versus Benefits

Misdiagnosis  Reliability
Time consumption  Improved triage
Training  Increased information
Cost  Costs saved
Dissatisfied users  Patient satisfaction

- Saffle et al. Telemedicine evaluation of acute burn is accurate and cost-effective. Jou Trauma 2009
Need for starting up a trial

• Improve the triage-process?
• Fewer unnecessary referrals?
• Fewer cases-of-doubt?
Take Home Messages

1. Thirty per cent of the transferred patients were unnecessarily referred to the National Burn Centre in Denmark in a three month period.

2. Store and forward picture evaluation by a burn surgeon seems to be as good as face-to-face assessment.

3. The use of image transferal of burn injuries in the referral decision has shown to improve the accuracy of triage.