Support surfaces for pressure ulcer prevention: a network meta-analysis

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Support surfaces

and so on…
Support surfaces

• Q1: What are the relative effects of each two support surfaces in preventing pressure ulcers?
• Q2: Which support surface could be the most effective one among all support surfaces?
Support surfaces

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- Q2: Which support surface could be the **most effective** one among all support surfaces?
Support surfaces for pressure ulcer prevention (Review)

McInnes E, Jammall-Blasi A, Bell-Syer SEM, Dunville JC, Middleton V, Cullum N

Support surfaces for pressure ulcer prevention.
DOI: 10.1002/14651858.CD001735.pub3.

www.cochranelibrary.com
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• Network meta-analysis
  – method for Q1 about relative effects;
• Ranking – SUCRA for the probability of each surface being the best one
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Main results

For this fourth update six new trials were included, bringing the total of included trials to 59.

Foam alternatives to standard hospital foam mattresses reduce the incidence of pressure ulcers in people at risk (RR 0.40 95% CI 0.21 to 0.74). The relative merits of alternating- and constant low-pressure devices are unclear. One high-quality trial suggested that alternating-pressure mattresses may be more cost effective than alternating-pressure overlays in a UK context.

Pressure-relieving overlays on the operating table reduce postoperative pressure ulcer incidence, although two trials indicated that foam overlays caused adverse skin changes. Meta-analysis of three trials suggest that Australian standard medical sheepskins prevent pressure ulcers (RR 0.56 95% CI 0.32 to 0.97).

Authors’ conclusions

People at high risk of developing pressure ulcers should use higher-specification foam mattresses rather than standard hospital foam mattresses. The relative merits of higher-specification constant low-pressure and alternating-pressure support surfaces for preventing pressure ulcers are unclear, but alternating-pressure mattresses may be more cost effective than alternating-pressure overlays in a UK context. Medical grade sheepskins are associated with a decrease in pressure ulcer development. Organisations might consider the use of some forms of pressure relief for high risk patients in the operating theatre.
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65 RCTs
New NPUAP Support Surface Standards Initiative (S3I) system — 14 groups
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91 network contrasts
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New NPUAP Support Surface Standards Initiative (S3I) system — 14 groups

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High-quality RCTs are required!
Relative effects – Q1

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<table>
<thead>
<tr>
<th>Powered/ non-powered reactive low-air-loss surfaces</th>
<th>Powered reactive airfluidised surfaces</th>
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<th>Powered hybrid low-air-loss surfaces</th>
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</tr>
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<tbody>
<tr>
<td>1.36 (0.35)</td>
<td>3.15 (0.35)</td>
<td>1.00 (0.16)</td>
<td>6.16 (0.16)</td>
<td>2.67 (0.18)</td>
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<tr>
<td>3.62 (0.47)</td>
<td>27.59 (0.47)</td>
<td>2.00 (0.16)</td>
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<td>1.02 (0.16)</td>
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<td>1.33 (0.16)</td>
</tr>
<tr>
<td>1.93 (0.51)</td>
<td>7.29 (0.51)</td>
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<td>12.75 (0.42)</td>
<td>0.53 (0.11)</td>
<td>2.53 (0.11)</td>
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<tr>
<td>2.5 (6.11)</td>
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<td>0.35 (0.03)</td>
<td>3.79 (0.03)</td>
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<td>0.72 (2.45)</td>
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<td>4.52 (0.17)</td>
<td>0.20 (0.02)</td>
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<td>0.37 (0.02)</td>
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<td>0.99 (2.26)</td>
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<td>0.77 (1.90)</td>
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<td>4.25 (0.24)</td>
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<tr>
<td>1.58 (5.95)</td>
<td>1.17 (0.42)</td>
<td>1.17 (0.41)</td>
<td>1.17 (0.41)</td>
<td>0.44 (0.05)</td>
<td>4.04 (0.05)</td>
<td>0.82 (0.05)</td>
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<tr>
<td>0.63 (1.42)</td>
<td>0.45 (0.28)</td>
<td>0.46 (0.24)</td>
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<td>0.89 (2.42)</td>
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Certainty of evidence
- Red = very low-certainty evidence
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Relative effects – Q1

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Standard hospital surfaces (as reference)

= 10 people
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  - 95% CI 15 to 145

- Powered hybrid air surfaces:
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  - = 10 people
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- Powered active air surfaces: 92 (RR 0.42 (95% CI 0.29 to 0.63), 95% CI 64 to 138)

= 10 people
### Number of people per 1,000 will develop new ulcers in future

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Rankings – Q2

SUCRA – probability of each surface being the best one
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SUCRA – probability of each surface being the best one

- Powered hybrid low-air-loss surfaces: 87.4
- Powered hybrid air surfaces: 76.8
- Non-powered reactive gel surfaces: 69.4
- Non-powered reactive air surfaces: 66.3
- Powered reactive airfluidised surfaces: 59.5
- Powered reactive low-air-loss surfaces: 58.4
- Powered active low-air-loss surfaces: 56.8
- Powered active air surfaces: 48
- Powered reactive fibre surfaces: 47.9
- Non-powered reactive sheepskin surfaces: 41.3
- Non-powered reactive foam surfaces: 33.4
- Non-powered reactive foam surfaces: 31.2
- Standard hospital surfaces: 20.1
- Powered active air surface plus non-powered reactive surfaces: 3.3

SUCRA
Rankings – Q2

SUCRA – probability of each surface being the best one

GRADED evidence for all 14 surfaces as very low-certainty
Conclusion
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• The first network meta-analysis in pressure ulcer prevention;

• GRADEd the certainty of evidence
  — Relative effects: powered hybrid air and active air surfaces;
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• High-quality RCTs are required.
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