Preoperative Skin Antiseptics for Preventing Surgical Site Infections: A Systematic Review

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April 16, 2012
CADTH Rapid Response

- Time-limited assessment
- Focused literature search
- Critical appraisal
- Potential policy implications
- Limitations
Research Questions

1. What is the comparative effectiveness of antiseptics for preventing SSIs?

2. What is the comparative effectiveness techniques used to apply antiseptics for preventing SSIs?
Systematic Review Methods

- Literature search
- Evidence selection and synthesis
- Quality assessment
## Results: Skin Antiseptics

<table>
<thead>
<tr>
<th>Intervention/Comparison</th>
<th>Included Studies (n=18)</th>
<th>Effectiveness</th>
<th>Strengths and Limitations</th>
</tr>
</thead>
</table>
| Antiseptic showering    | • 2 RCTs • 4 cohort     | ✔ Reduces skin flora | Clear study characteristics  
                          |                         | ✔ Reduces SSIs          | Poor external validity     |
| Antiseptic versus hygiene | • 2 RCTs          | ✔ Reduces SSIs     | Clear study characteristics  
                          |                         | ✔ PI ≅ soap/saline       | Poor external validity     |
| Antiseptic versus antiseptic | • 5 RCTs • 2 cohort • 1 case-control | ✔ Reduces SSIs     | Clear study characteristics  
                          |                         | - No antiseptic > effective | Possible selection bias     |
| Incise drapes           | • 2 RCTs • 1 cohort    | ✔ Iodophor drapes reduce SSIs | Blinded assessors  
                          |                         |                           | Poor external validity     |

PI: povidone iodine; RCT: randomized controlled trial; SSI: surgical site infection
## Results: Antiseptic Application Techniques

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Included Studies (n=4)</th>
<th>Effectiveness</th>
<th>Strengths and Limitations</th>
</tr>
</thead>
<tbody>
<tr>
<td>PI scrub and paint versus paint</td>
<td>• 3 RCTs</td>
<td>NSD in SSIs by technique</td>
<td>Blinded assessors (n=1) Randomization method (n=1) Withdrawals or LFU NR (n=4), poor internal validity</td>
</tr>
<tr>
<td></td>
<td>• 1 cohort</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

LFU: loss to follow-up; NR: not reported; NSD: no significant difference; PI: povidone iodine; RCT: randomized controlled trial; SSI: surgical site infection
## Results: Guidelines & Recommendations

<table>
<thead>
<tr>
<th>CPG</th>
<th>Recommendations and Levels of Evidence</th>
<th>Strengths and Limitations</th>
</tr>
</thead>
<tbody>
<tr>
<td>NICE</td>
<td>1. Shower/bathe with soap day before/day of surgery. [EL 1+] 1 SR, 6 RCTs</td>
<td>Research question and target users were clearly defined</td>
</tr>
<tr>
<td></td>
<td>2. Use PI or chlorhexidine in aqueous or alcohol base just before incision. [EL 1+] 1 SR, 4 RCTs</td>
<td>Population for use was unclear; not pilot tested</td>
</tr>
<tr>
<td></td>
<td>3. Do not use non-iodophor-impregnated drapes routinely. [EL 1+] 1 SR, 1 RCT</td>
<td>Recommendations directly linked to evidence based on a SR</td>
</tr>
<tr>
<td></td>
<td>4. Use an iodophor drape if a drape is required. [EL 1+] 1 SR, 1 RCT</td>
<td>Organizational barriers were NR; editorial independence unclear</td>
</tr>
</tbody>
</table>

**CPG:** clinical practice guideline; **EL:** evidence level; **NICE:** National Institute for Clinical Excellence; **NR:** not reported; **PI:** povidone iodine; **RCT:** randomized controlled trial; **SSI:** surgical site infection
Summary of Findings

Clinical Effectiveness of Antiseptics & Application Techniques for Reducing SSIs

- 12 RCTs + 9 Observational + 1 CPG

- Preoperative showers effective + reduce skin flora
  - PI antisepsis is as effective as soap/saline
  - No single antiseptic most effective

- Iodophor drapes effective
  - Application method NSD
Conclusions

• Preoperative showers reduce skin flora
• Application technique is inconsequential
• Most effective antiseptic remains unclear
Limitations: Included Studies

- Shower regimens and compliance varied; optimal number and timing is unclear.
- NSD in SSIs by technique; different surgical types may hold different risks
- Disinfectants are mixed in alcohol or aqueous base that may influence effectiveness.
Limitations: More Evidence Needed

RCTs to provide unequivocal evidence regarding the:

• optimal solution, strength, number and timing of preoperative showers

• comparative effectiveness of antiseptics
For more information

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Evidence to Policy

THE LATEST RESEARCH SHOWS THAT WE REALLY SHOULD DO SOMETHING WITH ALL THIS RESEARCH