Pre-operative Skin Preparation

- Goals of an ideal skin preparation agent:
  - significantly reduce micro-organisms on intact skin
  - non-irritative
  - broad spectrum
  - fast acting
  - long duration

- Single agents are aqueous based and include iodine (0.5 to 1 %) based – such as povidone iodine 5-10% - and chlorhexidine gluconate (CHG) 2-4%
  - Iodophors need not be removed as less irritative
  - Iodophors are solutions of iodine chemically bound to polyvinylpyrrolidone (or similar molecule)
  - CHG leaves a water soluble film ➔ resists saline & blood for a longer duration

- Dual agent preparations add in alcohol to iodophors or CHG for superior antimicrobial efficacy (NEJM 2010 and National Quality Forum)
  - Must be allowed to dry due to flammability.
  - Care to protect burning under a tourniquet.
  - Only on closed skin and cannot be used on mucous membranes
  - Usually 70% alcohol used for maximum effect
  - Ideally requires pre-wash with soap and proper drying + hair removal

<table>
<thead>
<tr>
<th>antiseptic</th>
<th>mechanism</th>
<th>coverage</th>
<th>kinetics</th>
<th>application</th>
</tr>
</thead>
<tbody>
<tr>
<td>single agent (aqueous-based)</td>
<td>iodophor</td>
<td>free iodine damages protein/DNA</td>
<td>gram +ve excellent gram -ve, fungi &amp; virus good</td>
<td>intermediate onset + 2hr duration</td>
</tr>
<tr>
<td></td>
<td>CHG</td>
<td>disrupts membranes</td>
<td>gram +ve excellent gram -ve &amp; virus good fungi fair</td>
<td>intermediate onset + 6hr duration</td>
</tr>
<tr>
<td>dual agent (alcohol-based)</td>
<td>iodophor</td>
<td>addition of alcohol denatures protein</td>
<td>improved vs. gram -ve &amp; mycoplasma</td>
<td>rapid onset + 48hr duration</td>
</tr>
<tr>
<td></td>
<td>CHG</td>
<td></td>
<td>improved vs. gram -ve, fungi &amp; mycoplasma</td>
<td></td>
</tr>
</tbody>
</table>

- Controversial comparison of efficacy between alcoholic iodophor vs. alcoholic CHG – general literature favours CHG (Dumville 2013, Cochrane Review), but 2 orthopaedic papers favour iodophor (Bosco 2010, Fletcher 2007 – JBJS-Am)