Cliniweave®
Class leading, built-in anti-bacterial solutions
On average, a patient who contracts MRSA spends 3 times as long in hospital (14.3 vs. 4.5 days) and costs 3 times as much.\(^\text{1}\)

Figure 1. Hospital stays with methicillin-resistant Staphylococcus aureus (MRSA) infections, 1993–2005

Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 1993-2005

Figure 3. Rates of hospitalization with MRSA infection per 100,000 population, by age group and expected payer, 2004

Source: AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 2004

\(^{\text{1}}\)Significantly different from 18-44 year olds. \(^{\text{2}}\)Significantly higher than privately insured.
Cliniweave technology is an effective new component to support infection control programmes:

- Demonstrated to provide the most effective bactericidal action of currently available products
- Bactericidal activity delivers a dual effect:
  - Eliminating potential reservoirs of infectious organisms
  - Breaking the contact transmission chain
- Can be utilised in a variety of materials within the healthcare environment
- Affordable – does not carry the large cost burden of silver ion technology
For a person to be infected whilst they are in hospital, an essentially simple process has to operate. There has to be a source or reservoir of the bacteria, virus or other organism that can cause the infection and there has to be a vector or means of transmission. Cliniweave aims to eliminate the reservoir and break the chain of transmission.

“Bed linen, patient gowns and overbed tables were the most common sources with over 40% of these sites contaminated.”

*Dr Stephanie Dancer, The Lancet, October 2007*
Cliniweave – Mode of Action

- Cliniweave dramatically lowers the levels of ATP – energy – in the bacteria, causing it to shut down and die.
- Cliniweave does this by affecting the transport of key cell requirements through the cell wall.
- There is no evidence of bacterial resistance developing to this type of bactericidal action.
Cliniweave employs 3 functional mechanisms to attack bacterial cells.

- **Membrane coupling enzyme**
- **Respiratory enzyme**
- **To disrupt Solute transport function**

The triple attack using physical interactions, makes it very unlikely for resistance to develop.

**Cell membrane**

**Cytoplasm Leak**

**Microbial cell**
Cliniweave – Patient Safety

- The mechanism of action by which Cliniweave operates gives it no means of interacting with, or affecting, a person.
- Cliniweave complies with EU Biocide Directive and is undergoing US EPA approval.
Cliniweave – Efficacy Testing

- Cliniweave has undergone a comprehensive, independent testing programme
- Tests were conducted by Professor Mark Enright at Imperial College, University of London
- The tests measured the ability of Cliniweave treated fabrics to kill and inhibit the growth of HAI bacteria
- Efficacy was tested against the most common strains of organisms associated with Hospital Acquired Infections
Efficacy Testing vs Control

- Fabric samples soaked with a solution containing the test organism were blotted onto agar plates at regular intervals.
- Untreated fabric allowed viable organisms to survive throughout the test period.
- Cliniweave treated fabrics transferred no viable organisms after 2 hours.
Cliniweave Comparative Testing

• Cliniweave was tested against the current competition to determine which is the most effective at killing and inhibiting HAIs. This included
  – nano-silver based fabrics
    • Skopos Biocote
    • Trevira Bioactive
    • Toray See It Safe
    • Cliniweave
  – Alkoxysilane quaternary ammonium
    • AEGIS microbe shield
• The same testing technique was used as before, using 2 strains of MRSA bacteria with a control and 5 treated fabric samples
Cliniweave vs silver
Test Plates at Time 0 Hour

Biocote    Bioactive    See It Safe    Cliniweave    Control

Top row:  MRSA NCT6571       Bottom row: EMRSA 15
Cliniweave vs silver
Test Plates at Time 2 Hours

Biocote       Bioactive       See It Safe       Cliniweave       Control

Top row:  MRSA NCT6571       Bottom row:  EMRSA 15
Cliniweave vs silver
Test Plates at Time 4 Hours

<table>
<thead>
<tr>
<th>Biocote</th>
<th>Bioactive</th>
<th>See It Safe</th>
<th>Cliniweave</th>
<th>Control</th>
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</thead>
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Top row: MRSA NCT6571

Bottom row: EMRSA 15
Cliniweave vs silver
Test Plates at Time 6 Hours

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Top row: MRSA NCT6571
Bottom row: EMRSA 15
Cliniweave vs Aegis Shield at 6 hours

AEGIS Shield

Cliniweave

Tested against EMRSA 15
## Cliniweave vs Competition Summary

<table>
<thead>
<tr>
<th></th>
<th>Cliniweave</th>
<th>Aegis</th>
<th>Silver</th>
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<tbody>
<tr>
<td>Meets highest Japanese antibacterial medical standard *</td>
<td>✓</td>
<td>✗</td>
<td>✗</td>
</tr>
<tr>
<td>Kills MRSA in minutes ***</td>
<td>✓</td>
<td>✗</td>
<td>✗</td>
</tr>
<tr>
<td>Proven to inhibit the growth of MRSA</td>
<td>✓</td>
<td>✗</td>
<td>✓</td>
</tr>
<tr>
<td>Proven bacteria killing action</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Environmentally safe as a fabric</td>
<td>✓</td>
<td>✗</td>
<td>✗</td>
</tr>
<tr>
<td>Meets Japanese antibacterial medical standard washing test **</td>
<td>✓</td>
<td>✗</td>
<td>✗</td>
</tr>
<tr>
<td>Doesn’t promote further resistance</td>
<td>✓</td>
<td>✓</td>
<td>✗</td>
</tr>
</tbody>
</table>

* Japanese Industrial standard JIS 1902 - 2002  
** Japanese Industrial Standard JIS 1902 - 1998  
*** Hanlon, SJ; Enright, ME; A novel bactericidal fabric coating with potent *in vitro* activity against meticillin-resistant *Staphylococcus aureus* (MRSA), Journal of Antimicrobial Agents
Cliniweave – the most effective bactericidal textile available today

• Cliniweave treated products:
  – Kill a wide variety of organisms associated with HAI’s
  – Prevent the proliferation of organisms in susceptible environments
  – Prevent the onward contact transmission of infectious organisms
  – Are practical and durable to industrial washing temperatures and procedures
Cliniweave Applications

Cliniweave treated products:
• Kill a wide variety of organisms associated with HCAI’s
• Prevent the proliferation of organisms in susceptible environments
• Prevent the onward contact transmission of infectious organisms
• Are practical and durable to industrial washing temperatures and procedures

“We aim to provide guidance on how to ‘design out’ infection, for example by reducing potential reservoirs for infection”

Clean Safe Care, Department of Health, January 2008
References


5. Simon J. O’Hanlon and Mark C. Enright, A novel bacteriocidal fabric coating with potent in vitro activity against Staphylococcus aureus,