Continuous Environmental Disinfection in the OR

A Case Study

Background

Surgical Site Infections (SSIs) represent 33% of the total cost of all healthcare acquired infections (HAIs). While the patient’s skin flora is typically thought to be the major source of pathogens associated with surgical site infections, recent studies have shown that the environment in the operating room (OR) is frequently contaminated with pathogens which can also be a source. Additional studies have shown that improved environmental hygiene can reduce the acquisition of pathogens and subsequent surgical site infections.

Goal

To reduce the number of SSIs with the addition of the VLD system.

Methods

A visible light disinfection system was installed into one orthopedic OR and its effect upon bacteria levels throughout the room was measured using Baird Parker Agar (BPA) contact media for a period of 30 days. During this time, each room was cleaned using the facility’s standard work process. Infection rates were compared one year before and after the visual light disinfection (VLD) system installation.

Results

The results from the test room show a continuous, average bacterial reduction of between 56%-88% from the sampled surfaces as compared to those in the two weeks before and after the VLD system installation. Infections were tracked for 12 months and showed a 73% reduction in the test room as compared to the baseline period.

Conclusion

These results combined with previous studies related to improved environmental hygiene in the OR demonstrate that continuous environmental disinfection plays a role in reducing surgical site infections.

- SSI prevention requires multiple activities throughout the entire perioperative and postoperative time.
- We have to keep asking “What more can we do?”
- VLD provides another means of protection for our patients by continuously reducing bacteria in the OR environment.
- Lights may provide greater benefit in outcomes when paired with a robust SSI prevention program.

Contact

Lynnelle Murrell, BSN, RN, CIC
Director, Infection Prevention
Maury Regional Medical Center
1224 Trotwood Ave. Columbia, TN 38401
931.381.1111 x2414
lymurrell@mauryregional.com

Endnotes:
Continuous Environmental Disinfection in the OR

A Case Study

Background

Surgical Site Infections (SSIs) represent 33% of the total cost of all healthcare-acquired infections (HAIs)1. While the patient’s skin flora is typically thought to be the major source of pathogens associated with surgical site infections, recent studies have shown that the environment in the operating room (OR) is frequently contaminated with pathogens which can also be a source2. Additional studies have shown that improved environmental hygiene can reduce the acquisition of pathogens and subsequent surgical site infections3.

Methods

A visible light disinfection system was installed into one orthopedic OR, and its effect upon bacteria levels throughout the room was measured using Baird Parker Agar (BPA) contact media for a period of 30 days. During this time, each room was cleaned using the facility’s standard work process. Infection rates were compared one year before and after the visual light disinfection (VLD) system implementation.

Goal

To reduce the number of SSIs with the addition of the VLD system.

Results

The results from the test room show a continuous, average bacterial reduction of between 56%-88% from the sampled surfaces as compared to those in the two weeks before and after the VLD system installation. Infections were tracked for 12 months and showed a 73% reduction in the test room as compared to the baseline period.

<table>
<thead>
<tr>
<th>Room</th>
<th># of Cases</th>
<th># of SSIs</th>
<th>% Change</th>
<th>Reduction</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>OR-1 (Adjacent Control)</td>
<td>662</td>
<td>8</td>
<td>2</td>
<td>&gt;= 75%</td>
<td>0.009</td>
</tr>
<tr>
<td>OR-2 (With VLD)</td>
<td>788</td>
<td>11</td>
<td>3</td>
<td>&gt;= 73%</td>
<td>0.011</td>
</tr>
<tr>
<td>OR-3 (Control)</td>
<td>751</td>
<td>6</td>
<td>7</td>
<td>&lt;= 17%</td>
<td>Not Measured</td>
</tr>
<tr>
<td>Total</td>
<td>2281</td>
<td>23</td>
<td></td>
<td></td>
<td>Not Measured</td>
</tr>
</tbody>
</table>

Contact

Lynnelle Murrell, BSN, RN, CIC
Director, Infection Prevention
Maury Regional Medical Center
1224 Trotwood Ave. Columbia, TN 38401
931.381.1111 x2414
lymurrell@mauryregional.com

Conclusion

These results combined with previous studies related to improved environmental hygiene in the OR demonstrate that continuous environmental disinfection plays a role in reducing surgical site infections.

-SSI prevention requires multiple activities throughout the entire perioperative and postoperative time.
-We have to keep asking “What more can we do?”
-VLD provides another means of protection for our patients by continuously reducing bacteria in the OR environment.
-Lights may provide greater benefit in outcomes when paired with a robust SSI prevention program.

References:


Total Colony Count

Or1 (W/O VLD) Or2 (With VLD)

Before (VLD Off) After (VLD On)

<table>
<thead>
<tr>
<th>Room</th>
<th>Total CFU Per Sampling Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>OR-1 (Adjacent Control)</td>
<td>1000</td>
</tr>
<tr>
<td>OR-2 (With VLD)</td>
<td>500</td>
</tr>
<tr>
<td>Total</td>
<td>1500</td>
</tr>
</tbody>
</table>

Cumulative Culture Results

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>OR-1 (Adjacent Control)</td>
<td>2000</td>
<td></td>
</tr>
<tr>
<td>OR-2 (With VLD)</td>
<td>1500</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>3500</td>
<td></td>
</tr>
</tbody>
</table>

Daily Culture Results

<table>
<thead>
<tr>
<th>Room</th>
<th>Total CFU Per Sampling Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>OR1</td>
<td>800</td>
</tr>
<tr>
<td>OR2</td>
<td>500</td>
</tr>
<tr>
<td>Linear (OR1)</td>
<td>600</td>
</tr>
<tr>
<td>Linear (OR2)</td>
<td>400</td>
</tr>
</tbody>
</table>

10/15: Lights Installed

10/15: Lights Installed
Continuous Environmental Disinfection in the OR

A Case Study

Background

Surgical Site Infections (SSIs) represent 33% of the total cost of all healthcare-acquired infections (HAIs). While the patient’s skin flora is typically thought to be the major source of pathogens associated with surgical site infections, recent studies have shown that the environment in the operating room (OR) is frequently contaminated with pathogens which can also be a source. Additional studies have shown that improved environmental hygiene can reduce the acquisition of pathogens and subsequent surgical site infections.

Methods

A visible light disinfection system was installed into one orthopedic OR and its effect upon bacteria levels throughout the room was measured using Baird Parker Agar (BPA) contact media for a period of 30 days. During this time, each room was cleaned using the facility’s standard work process. Infection rates were compared one year before and after the visual light disinfection (VLD) system implementation.

Results

The results from the test room show a continuous, average bacterial reduction of between 56%-88% from the sampled surfaces as compared to those in the two weeks before and after the VLD system installation. Infections were tracked for 12 months and showed a 73% reduction in the test room as compared to the baseline period.

Contact

Lynnette Murrell, BSN, RN, CIC
Director, Infection Prevention
Maury Regional Medical Center
1224 Trotwood Ave. Columbia, TN 38401
931.381.1111 x2414
lymurrell@mauryregional.com

Goal

To reduce the number of SSIs with the addition of the VLD system.

Conclusion

These results combined with previous studies related to improved environmental hygiene in the OR demonstrate that continuous environmental disinfection plays a role in reducing surgical site infections.

- SSI prevention requires multiple activities throughout the entire perioperative and postoperative time.
- We have to keep asking “What more can we do?”
- VLD provides another means of protection for our patients by continuously reducing bacteria in the OR environment.
- Lights may provide greater benefit in outcomes when paired with a robust SSI prevention program.

References