LET’S REDUCE SURGICAL SITE INFECTION TOGETHER
Applied Medical’s Commitment to Reducing Surgical Site Infection

Surgical site infections (SSIs) have contributed $3 billion to $10 billion annually to the cost of healthcare.\textsuperscript{1} With the constant threat to reimbursement and to patient safety, hospitals have aimed to combat SSI rates through systematic, defined processes.\textsuperscript{1,2,3}

To further our dedication to improving both hospital and patient outcomes, we are committed to being a part of the overall solution to reduce SSI through research, education and awareness. Our mission is to enhance patient outcomes by providing multiple platforms to discuss and implement clinically proven methods to reduce the incidence of SSI.
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SSI patients are 60% more likely to spend time in ICU.\(^3\)

SSI patients are 5X more likely to be readmitted to the hospital.\(^3\)

Over 8,000 deaths were associated with over 290,000 cases of SSI in one year.\(^5\)

SSI patients spend an additional 7 - 11 days in the hospital.\(^4\)

SSI patients have a 2 to 11 times higher risk of death than patients without an SSI.\(^4\)

SSI has added $3 \text{Billion} to $10 \text{Billion} to the cost of healthcare.\(^1\)

2% to 5% of patients undergoing inpatient surgery will develop an SSI.\(^4\)

SSIs generate an additional cost of $27,631 per infection.\(^6\)

The Impact of SSI on Hospitals

-$3$ BILLION
+$10$ BILLION

$3$ BILLION
$10$ BILLION

$2\%$ to $5\%$

$2\%$ to $5\%$

$60\%$

$2\%$ to $5\%$

$8,000$

$290,000$

$7 - 11$

$2\%$ to $5\%$

$60\%$

$2\%$ to $5\%$

$2\%$ to $5\%$

$3\%$)

$10\%$

$2\%$ to $5\%$

$2\%$ to $5\%$

$60\%$

$2\%$ to $5\%$

$2\%$ to $5\%$

$60\%$

$2\%$ to $5\%$

$2\%$ to $5\%$

$60\%$

$2\%$ to $5\%$

$2\%$ to $5\%$

$60\%$

$2\%$ to $5\%$

$2\%$ to $5\%$

$60\%$

$2\%$ to $5\%$

$2\%$ to $5\%$

$60\%$
The Impact of SSI on Hospitals

Guidelines for Preventing SSI

One of various bundle elements included in an SSI protocol, the use of a wound protector has been recommended by numerous health organizations as a means of preventing SSI.

“The use of a wound protector at the extraction site and the irrigation of port sites and extraction site incisions may reduce abdominal wall cancer recurrences.”
Society of American Gastrointestinal and Endoscopic Surgeons (SAGES)

“Use impervious plastic wound protectors for gastrointestinal and biliary tract surgery.”
The Society of Healthcare Epidemiology of America (SHEA)

“The use of an impervious plastic wound protector can prevent SSI in open abdominal surgery, and evidence is strongest for elective colorectal and biliary tract procedures (Guideline 2.8).”
American College of Surgeons and Surgical Infection Society (ACS)

“The panel suggests considering the use of wound protector devices in clean-contaminated, contaminated and dirty abdominal surgical procedures for the purpose of reducing the rate of SSI.”
World Health Organization (WHO)

Successful SSI Prevention Bundles

The following facilities have demonstrated a nearly 50% reduction in SSIs after implementing an SSI prevention bundle that included Alexis protectors.
Clinical Evidence

Rate of Superficial Incisional Surgical Site Infections – Alexis® Protectors vs Standard Retractors

<table>
<thead>
<tr>
<th>Study</th>
<th>Alexis Protectors</th>
<th>Standard Retractors</th>
<th>P Value</th>
<th>RRR*</th>
<th>RRR**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reid et al. 13</td>
<td>22.7% (15/66)</td>
<td>20% (6/30)</td>
<td>.004</td>
<td>79%</td>
<td></td>
</tr>
<tr>
<td>Cheng et al. 14</td>
<td>14.6% (7/48)</td>
<td>0% (0/34)</td>
<td>.006</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>Lee et al. 15</td>
<td></td>
<td></td>
<td>.02</td>
<td>89%</td>
<td></td>
</tr>
<tr>
<td>Horiuchi et al. 16</td>
<td>8.1% (9/110)</td>
<td>1.6% (1/61)</td>
<td>.0021</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>Hinkson et al. 17</td>
<td>8% (8/100)</td>
<td>0% (0/111)</td>
<td>.035</td>
<td>87%</td>
<td></td>
</tr>
</tbody>
</table>

*RRR (relative risk reduction) was defined as the proportion of the control group (standard retractors) experiencing a given outcome minus the proportion of the treatment group (Alexis protectors) experiencing the outcome, divided by the proportion of the control group (standard retractors) experiencing the outcome.
†The data reflects both superficial and deep incisional and organ space SSIs.

Colorectal

Wound protectors in reducing surgical site infections in lower gastrointestinal surgery: An updated meta-analysis.22

“Our meta-analysis found that dual-ring wound protectors reduce the odds of SSI in patients undergoing lower gastrointestinal surgery. . . .”

“. . . We demonstrated evidence of a subgroup difference where dual-ring wound protectors reduced SSIs while single-ring retractors did not, which provides greater insight in the choice of wound protection devices.”

Wound protectors reduce surgical site infection: A meta-analysis of randomized controlled trials.23

“Our study suggests that the use of wound protectors decreases the risk of SSI by 45%. Our number needed to treat suggests that only 10 patients would have to be treated intraoperatively with a wound protector to prevent 1 SSI.”
Barrier wound protection decreases surgical site infection in open elective colorectal surgery: A randomized clinical trial.13

“In this study the use of barrier wound protection in elective open colorectal resectional surgery resulted in a clinically significant reduction in incisional surgical site infections.”

“There was a significant reduction in the incidence of incisional surgical site infections when the wound protector was used: 3 of 64 (4.7%) vs 15 of 66 (22.7%); P = .004.”

ALEXIS O-Ring wound retractor vs conventional wound protection for the prevention of surgical site infections in colorectal resections.14

“Superficial incisional SSI was significantly diminished in the ALEXIS wound retractor group (P=0.006).”

Randomized, controlled investigation of the anti-infective properties of the Alexis retractor/protector of incision sites.16

Wound infection decreased by 100% in the With Alexis retractor group. (The wound infection rate was 0% for the With Alexis group, versus 8.1% for the Without Alexis group.)

Plastic wound retractors as bacteriological barriers in gastrointestinal surgery: A prospective multi-institutional trial.19

“(U)se of a plastic wound retractor may result in reduced enteric bacterial colonization of the surgical incision site during gastrointestinal surgery. Reduced colonization of the surgical incision site by enteric bacteria due to the use of a plastic wound retractor should result in a reduction in SSI following gastrointestinal surgery.”

General

Efficacy of a dual-ring wound protector for prevention of surgical site infections after pancreaticoduodenectomy in patients with intrabiliary stents: A randomized clinical trial.24

“Among adult patients with intrabiliary stents, the use of a dual-ring wound protector during pancreaticoduodenectomy significantly reduces the risk of incisional SSI.”
Use of wound-protection system and postoperative wound-infection rates in open appendectomy: A randomized prospective trial.\textsuperscript{15}

The study was terminated early, with 109 of 300 cases studied, after an interim analysis showed a significant reduction in infection (89\%) when the Alexis retractor was used. (The rate of infection was 1.6\% for the wound protection arm of the study, versus 14.6\% for the traditional retraction arm.)

\section*{C-Section}

Surgical site infection in cesarean sections with the use of a plastic sheath wound retractor compared to the traditional self-retaining metal retractor.\textsuperscript{17}

“[T]he use of plastic-sheath wound retractors such as the Alexis\textsuperscript{\textregistered} O C-Section Retractor compared to the traditional Collins self-retaining metal retractor in low risk women, having the first cesarean is associated with a significantly reduced risk of surgical site infection.

“There is significant reduction in the use of electric cautery for subcutaneous bleeding, bowel handling and postoperative pain. Operator satisfaction is improved and postoperative pain is less.”
ARE Alexis PRODUCTS PART OF YOUR STANDARD OF CARE?
The Alexis wound protector

... offers 360-degree protection:

• Reduces surgical site infection.\textsuperscript{13-17}
• Shields the incision site from bacterial invasion.\textsuperscript{18-19}
• Maintains moisture to promote healing.\textsuperscript{20}

... provides 360-degree atraumatic retraction:

• Allows for maximum exposure with a minimal incision size.
• Offers unparalleled exposure without the trauma and pain associated with prolonged point retraction.
• Provides retraction hands-free, reducing the strain, discomfort and fatigue associated with traditional hand-held retractors.\textsuperscript{21}
• Creates a tamponade effect to minimize blood loss.\textsuperscript{17}

... offers adaptability and versatility:

• Accommodates a wide range of specialties, patient sizes and incision sizes.
• Facilitates rapid and effortless setup.
Alexis O
Wound Protector-Retractor

Featuring a rigid retraction ring for maximum exposure
Alexis
Wound Protector-Retractor

Featuring a flexible retraction ring for anatomical conformity
Alexis O
C-Section Protector-Retractor

Featuring a rigid retraction ring for maximum uterine exposure
Alexis
Laparoscopic System

Featuring a laparoscopic cap to facilitate specimen extraction
Alexis
Orthopaedic Protector

Featuring a rigid retraction ring for maximum retraction and a flexible retraction ring for maximum versatility
Procedural Applications

**Colon and Rectal**

- Lap colectomy (S and M laparoscopic system)
- Open colectomy (L, XL, XXL, XXXL)

**Bariatric**

- Lap gastric bypass (XS, S)
- Open gastric bypass (L, XL)

**General**

- Inguinal hernia repair (XS, S)
- Thyroidectomy (XS, S)
- Appendectomy (S, M)
- Splenectomy (L, XL)
- Pancreatectomy (L, XL)
- Whipple (L, XL, XXL, XXXL)

**Cardiothoracic**

- Video-assisted thoracoscopic surgery (VATS) (XXS, XS, S)
- Mitral valve repair or replacement (S, M)
- Thoracotomy (S, M)
### OB/GYN
- Postpartum tubal ligation (XXS, XS)
- Bilateral salpingo-oophorectomy (XS, S)
- Lap hysterectomy (S and M laparoscopic system)
- Mini-laparotomy (S, M)
- Myomectomy (S, M)
- Total abdominal hysterectomy (S, M, L)
- Cesarean section (L, XL)

### Breast
- Lumpectomy (XS, S)
- Mastectomy (S, M)
- Sentinel lymph node biopsy (XXS, XS, S)

### Orthopaedic
- Total shoulder arthroplasty (XS/M, S/S, S/M)
- Total hip arthroplasty (S/M, M/L)
## Alexis O Wound Protector-Retractors
*Featuring a rigid retraction ring for maximum exposure*

<table>
<thead>
<tr>
<th>Reorder No.</th>
<th>Size</th>
<th>Sheath Length</th>
<th>Incision Range</th>
<th>Qty/Box</th>
</tr>
</thead>
<tbody>
<tr>
<td>C8401*</td>
<td>Small</td>
<td>18cm</td>
<td>2.5–6cm</td>
<td>5</td>
</tr>
<tr>
<td>C8402</td>
<td>Medium</td>
<td>18cm</td>
<td>5–9cm</td>
<td>5</td>
</tr>
<tr>
<td>C8403</td>
<td>Large</td>
<td>25cm</td>
<td>9–14cm</td>
<td>5</td>
</tr>
<tr>
<td>C8404</td>
<td>Extra Large</td>
<td>34cm</td>
<td>11–17cm</td>
<td>5</td>
</tr>
<tr>
<td>C8405</td>
<td>Extra Extra Large</td>
<td>36cm</td>
<td>17–25cm</td>
<td>5</td>
</tr>
<tr>
<td>C8406</td>
<td>Extra Extra Extra Large</td>
<td>39cm</td>
<td>25–32cm</td>
<td>3</td>
</tr>
</tbody>
</table>

*Models including a tether to facilitate device removal

## Alexis Wound Protector-Retractors
*Featuring a flexible retraction ring for anatomical conformity*

<table>
<thead>
<tr>
<th>Reorder No.</th>
<th>Size</th>
<th>Sheath Length</th>
<th>Incision Range</th>
<th>Qty/Box</th>
</tr>
</thead>
<tbody>
<tr>
<td>C8313*</td>
<td>Extra Extra Small</td>
<td>20cm</td>
<td>1–3cm</td>
<td>5</td>
</tr>
<tr>
<td>C8323*</td>
<td>Extra Extra Small, Short</td>
<td>11cm</td>
<td>1–3cm</td>
<td>5</td>
</tr>
<tr>
<td>C8312*</td>
<td>Extra Small</td>
<td>19cm</td>
<td>2–4cm</td>
<td>5</td>
</tr>
<tr>
<td>C8322*</td>
<td>Extra Small, Short</td>
<td>13cm</td>
<td>2–4cm</td>
<td>5</td>
</tr>
<tr>
<td>C8301*</td>
<td>Small</td>
<td>18cm</td>
<td>2.5–6cm</td>
<td>5</td>
</tr>
<tr>
<td>C8302</td>
<td>Medium</td>
<td>18cm</td>
<td>5–9cm</td>
<td>5</td>
</tr>
<tr>
<td>C8303</td>
<td>Large</td>
<td>25cm</td>
<td>9–14cm</td>
<td>5</td>
</tr>
<tr>
<td>C8304</td>
<td>Extra Large</td>
<td>34cm</td>
<td>11–17cm</td>
<td>5</td>
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</tbody>
</table>

## Alexis O C-Section Protector-Retractors
*Featuring a rigid retraction ring for maximum uterine exposure*

<table>
<thead>
<tr>
<th>Reorder No.</th>
<th>Size</th>
<th>Sheath Length</th>
<th>Incision Range</th>
<th>Qty/Box</th>
</tr>
</thead>
<tbody>
<tr>
<td>G6313</td>
<td>Large</td>
<td>25cm</td>
<td>9–14cm</td>
<td>5</td>
</tr>
<tr>
<td>G6314</td>
<td>Extra Large</td>
<td>34cm</td>
<td>11–17cm</td>
<td>5</td>
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</table>
**Alexis Laparoscopic Systems**  
*Featuring a laparoscopic cap to facilitate specimen extraction*

<table>
<thead>
<tr>
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<th>Qty/Box</th>
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</thead>
<tbody>
<tr>
<td>C8501*</td>
<td>Small</td>
<td>18cm</td>
<td>2.5–6cm</td>
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</tr>
<tr>
<td>C8502</td>
<td>Medium</td>
<td>18cm</td>
<td>5–9cm</td>
<td>6</td>
</tr>
</tbody>
</table>

**Alexis Orthopaedic Protectors**  
*Featuring a rigid retraction ring for maximum retraction and a flexible retraction ring for maximum versatility*

<table>
<thead>
<tr>
<th>Rigid Retraction Ring</th>
<th>Flexible Retraction Ring</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
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<th>Incision Range</th>
<th>Qty/Box</th>
</tr>
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<tbody>
<tr>
<td>HR000</td>
<td>Extra Small/Medium</td>
<td>14cm</td>
<td>2.5–7cm</td>
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</tr>
<tr>
<td>HR001</td>
<td>Small/Small</td>
<td>14cm</td>
<td>2.5–8cm</td>
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<tr>
<td>HR004</td>
<td>Small/Medium</td>
<td>14cm</td>
<td>2.5–8cm</td>
<td>5</td>
</tr>
<tr>
<td>HR005</td>
<td>Medium/Large</td>
<td>17cm</td>
<td>5–13cm</td>
<td>5</td>
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</table>

<table>
<thead>
<tr>
<th>Reorder No.</th>
<th>Size</th>
<th>Sheath Length</th>
<th>Incision Range</th>
<th>Qty/Box</th>
</tr>
</thead>
<tbody>
<tr>
<td>HR100</td>
<td>Extra Small/Medium</td>
<td>14cm</td>
<td>2.5–7cm</td>
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</tr>
<tr>
<td>HR101</td>
<td>Small/Small</td>
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<td>2.5–8cm</td>
<td>5</td>
</tr>
<tr>
<td>HR104</td>
<td>Small/Medium</td>
<td>14cm</td>
<td>2.5–8cm</td>
<td>5</td>
</tr>
<tr>
<td>HR105</td>
<td>Medium/Large</td>
<td>17cm</td>
<td>5–13cm</td>
<td>5</td>
</tr>
</tbody>
</table>

*Models including a tether to facilitate device removal*
References


7. Gorgun E. SSI bundles skin prep, oral antibx/bowel prep wound protector. Oral presentation at: Reducing SSI: Take action with evidence; May 2, 2014; Baltimore, MD.


9. Murthy R. Implementing a bundle to reduce colorectal surgical site infection. Oral presentation at: 34th Annual Meeting of the Surgical Infection Society; May 1-3, 2014; Baltimore, MD.


