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ONDINE BIOMEDICAL INC.

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University of Sherbrooke Clinicians achieve Significant Reduction in Spine Surgery Infections in Quebec's First Deployment of Steriwave Nasal Photodisinfection

- Surgical site infections (SSIs) are a serious complication of spine surgery, leading to increased pain, greater mortality risk, longer recovery times, and higher healthcare costs.
- Results demonstrated that patients treated with Steriwave nasal photodisinfection (aPDT) experienced >78% fewer SSIs than untreated patients.
- Hospital length of stay also decreased by 30% in the Steriwave treated patients.

At the 25th Annual Scientific Conference of the Canadian Spine Society, researchers from the University of Sherbrooke presented findings from a year-long retrospective quality of care study confirming the safety and efficacy of Steriwave® nasal photodisinfection therapy (aPDT) in spine surgery patients. Data from the podium presentation demonstrated that patients who received presurgical Steriwave nasal photodisinfection had 78.8% fewer surgical site infections (SSIs) compared to the control group (p=0.021). This study follows the first implementation of a presurgical nasal photodisinfection protocol in Quebec.

Dr Bernard LaRue, MD, Orthopedical Spinal Surgeon and Director of Orthopedic Surgery at Université de Sherbrooke stated:
"*We are pleased to corroborate the previously published benefits of Steriwave in reducing surgical site infections in spinal surgery. Success in infection prevention is a team effort, and compliance is critical. Given its positive impact, we are keen to find ways to extend Steriwave's benefits to patients undergoing urgent surgeries, where consistent application can be more challenging. We will also be expanding its use to joint replacement surgery patients as part of our ongoing commitment to improving infection rates and patient outcomes.*"

The Université de Sherbrooke spinal surgery team including Drs Bernard LaRue, Jocelyn Blanchard, Newton Pimenta, Julien Goulet, Charles Touchette and Jérôme Couture is the first in Quebec to adopt nasal photodisinfection to address the persistent challenge of SSIs in spine surgeries. The research team which also includes Drs Louis Carrier, Yan Gabriel Morais Silva, Ms Ariane Paquette and Ms Sonia Bédard reported that spine SSIs, which occur in 1-12% of cases,[1] can each cost about 50,000.

Highlights from Study Data and Additional Analysis:

- **Lower SSI Rates:** Patients receiving aPDT nasal decolonization exhibited a significantly lower SSI rate of 1.29% (2, N=155) compared to 6.09% (14, N=230) in the non-aPDT group, a 78.8% difference in outcomes between the two groups (p=0.021).
- **Decreased Hospital Stay:** The aPDT group experienced a shorter average hospital stay of 4.9 days versus 7 days in the non-aPDT group (30% reduction, p=0.017), indicating enhanced patient recovery periods and optimizing healthcare resources.
- **Pharmacoeconomics:** Based on an estimated cost of 50,000 per SSI, return on the Steriwave investment was greater than 17 per 1 dollar spent on the technology deployment.
- **Differential benefit:** the study demonstrated that the key driver behind the reduction in SSI rate was nasal aPDT, especially in elective surgery where compliance rates were higher.

The Honorable Jean Charest, Former Premier of Quebec and Ondine's Chairman, commented:
"I commend the University of Sherbrooke team for their ambition to achieve zero infections and their commitment to studying and using Steriwave toward that goal. Their work reinforces that we should not accept infections as an unavoidable side effect of hospital care and adds to the growing body of evidence demonstrating the significant benefits of this innovative Canadian technology for both patients and healthcare systems."

The findings of the University of Sherbrooke researchers are consistent with previous research, notably a 14-year study involving over 13,000 patients at Vancouver General Hospital,[2] which reported a 66.5% decrease in spine surgery infection rates with the use of Steriwave nasal photodisinfection. The Vancouver study also highlighted substantial cost savings, averaging 2.49 million annually, equating to 2,578 per surgical patient.

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About Ondine Biomedical Inc.

Ondine Biomedical Inc. is a Canadian life sciences company and leader in light-activated antimicrobial therapies (also known as 'photodisinfection') to prevent and treat infections, including those caused by antibiotic-resistant bacteria. Ondine's patented light-activated antimicrobial technology offers a safe, rapid, and effective alternative to traditional antibiotics, tackling some of the most pressing healthcare challenges today.

About the Canadian Spine Society

The Canadian Spine Society is a professional organization dedicated to promoting excellence in spine care through research, education, and advocacy. Its annual conference convenes leading spine surgeons and researchers from across Canada to share knowledge and discuss the latest advancements in the field.

About Steriwave® Nasal Photodisinfection

Steriwave is an innovative antimicrobial treatment that rapidly eliminates a broad spectrum of pathogens, including bacteria, viruses, and fungi. Using a proprietary, light-activated antimicrobial agent, Steriwave works in a simple two-step process: the agent is first applied to the nostrils with a nasal swab, then activated by a specific wavelength of red light. This activation triggers an oxidative burst that destroys pathogens within a single five-minute treatment-providing offering a robust alternative to traditional antibiotics without the risk of developing resistance.
Nasal decolonization is recommended in the 2016 WHO Global guidelines for the prevention of surgical site infections,[3] and the Society for Healthcare Epidemiology of America (SHEA) guidelines, published in May 2023, recommend nasal decolonization for major surgical procedures.[4]

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[1] Zhang L, Li EN. Risk factors for surgical site infection following lumbar spinal surgery: a meta-analysis. Ther Clin Risk Manag. 2018 Oct 31;14:2161-2169. (link)

[2] Moskven E et al. Effectiveness of prophylactic intranasal photodynamic disinfection therapy and chlorhexidine gluconate body wipes for surgical site infection prophylaxis in adult spine surgery. Can J Surg. 2023 Nov;66(6), E550-E560. (link)

[3] Surgical Site Infection Prevention: Key facts on decolonization of nasal carriers of Staphylococcus aureus. World Health Organization. (link)

[4] Calderwood MS, Anderson DJ, Bratzler DW, et al. Strategies to prevent surgical site infections in acute-care hospitals: 2022 Update. Infect Control Hosp Epidemiol. 2023;44(5):695-720. (link)