

# How AI Will Help Prevent Surgical Wound Infections

*I asked ChatGPT (4.0) to write an article on the benefits of AI to prevent surgical wound infections. By requesting several “regenerations” of the responses I was able to construct, from pieces of each version, a more informative article. This is the finished document.*

Surgical wound infections are a significant concern in healthcare facilities, with the potential to cause serious complications and increase healthcare costs. It is estimated that up to 5% of patients who undergo surgery develop a surgical site infection (SSI). According to the Centers for Disease Control and Prevention (CDC), SSIs are the most common type of healthcare-associated infection, accounting for approximately 31% of all such infections. SSIs can lead to prolonged hospital stays, increased healthcare costs, and in severe cases, even death. However, with advances in artificial intelligence (AI) technology, hospitals can take proactive measures to prevent SSIs and improve patient outcomes.

Preoperative planning is an essential aspect of preventing surgical wound infections. By analyzing electronic health records (EHRs) and medical imaging data, AI algorithms can identify patients who are at a higher risk of developing SWIs. For example, AI can identify patients with pre-existing medical conditions such as diabetes, which is known to increase the risk of SWIs. Furthermore, AI can also analyze patients' medical history, medications, and allergies to identify potential risk factors that can increase the likelihood of developing SWIs. By identifying high-risk patients before surgery, healthcare providers can take proactive measures to prevent SWIs, such as administering antibiotics and taking extra precautions during surgery.

## Assisting Surgeons

AI can help surgeons identify the most appropriate surgical technique for a specific patient, based on factors such as age, sex, and medical history. By analyzing surgical videos and data from surgical instruments, AI can identify patterns and provide insights that can improve surgical technique. In addition, AI can analyze data from previous surgeries and outcomes to provide surgeons with evidence-based recommendations for surgical



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Dr. Chaiken has over 25 years' experience in healthcare information technology, clinical transformation, and business intelligence. He provides thought leadership and strategic and analytics assessments in healthcare information technology, quality of care, clinical change management, and business development.

Chaiken has worked with the NIH, Tableau/Salesforce, Infor, McKesson, UK National Health Service, Boston University, and others.

## Navigating the Code

The healthcare industry, unlike many others, runs on time-tested ways to practice excellence in medicine. But does that mean adherence to practices and processes that are fifty, seventy, even a hundred years old?

Dr. Barry P. Chaiken thinks not. His 25+ years of experience as a physician and an informaticist, he believes information technology is healthcare's greatest problem-solving tool for resolving the greatest medical and business problems of the 21<sup>st</sup> century.

[Navigating the Code: How Revolutionary Transforms the Patient-Physician Journey](#)

techniques that are associated with lower rates of SSIs. This information can help surgeons make more informed decisions about the surgical approach and reduce the risk of infection.

Hospitals can use AI-powered decision support tools to recommend appropriate antibiotic prophylaxis regimens for patients based on their individual risk factors. These tools can also help ensure that antibiotics are administered at the appropriate time before surgery, which is a key factor in preventing SSIs. AI algorithms can also be used to monitor patients for signs of infection after surgery, allowing healthcare providers to intervene quickly and prevent the infection from worsening.

## Monitoring Patients

AI can assist in monitoring patients after surgery. By analyzing data from medical sensors and EHRs, AI algorithms can monitor patients' vital signs and detect early signs of infection. For example, AI can detect changes in patients' body temperature, heart rate, and blood pressure that can indicate the presence of an infection. Furthermore, AI can also monitor patients' medication adherence and detect any deviations from the prescribed regimen, which can be an early indicator of an infection. By detecting early signs of infection, healthcare providers can take proactive measures to prevent the infection from spreading and causing further harm to the patient.

AI can help prevent SSIs by optimizing surgical processes. AI algorithms can be used to analyze data from surgical procedures to identify areas where improvements can be made to reduce the risk of infection. For example, AI can be used to analyze data on the use of surgical equipment and instruments to identify potential sources of contamination. Hospitals can then take steps to improve the sterilization of equipment and reduce the risk of contamination during surgery.

AI can also be used to monitor the environment in surgical suites and identify potential sources of infection. For example, AI algorithms can be used to analyze data from environmental sensors to identify areas where the air quality may be poor or where there may be high levels of bacteria. Hospitals can then take steps to improve the ventilation in surgical suites and reduce the risk of contamination.

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Furthermore, AI can assist with infection control in the hospital setting. AI algorithms can analyze hospital data, including infection rates, antibiotic use, and environmental factors, to identify potential infection control issues. Healthcare providers can use this information to implement targeted interventions, such as improved hand hygiene practices, enhanced cleaning protocols, and appropriate antibiotic stewardship, to reduce the risk of SSIs and other healthcare-associated infections.

## Improving Quality

In addition to preventing SSIs, AI can also be used to improve the overall quality of care provided to surgical patients. AI algorithms can be used to analyze data from EHRs to identify patients who are at high risk of developing complications after surgery. Hospitals can then take steps to provide these patients with additional support and resources to improve their outcomes.

Additionally, AI can assist with patient education and communication. AI-powered chatbots can provide patients with information about the surgical procedure, postoperative care, and signs of infection. Patients can interact with the chatbot to ask questions, receive answers, and access resources related to their care. This type of communication can help patients feel more informed and engaged in their care, reducing the likelihood of complications and improving outcomes.

In conclusion, AI has the potential to revolutionize surgical care and prevent surgical wound infections in hospitals. By providing real-time feedback during surgery, facilitating postoperative monitoring, and assisting with preoperative planning, AI can help surgeons make more informed decisions, reduce the risk of complications, and improve outcomes. Additionally, AI can assist with patient education and communication, identify patients at high risk for SSIs, and facilitate infection control in the hospital setting. While AI is not a substitute for clinical judgment or human interaction, it has the potential to enhance surgical care and improve patient outcomes in the years to come.