

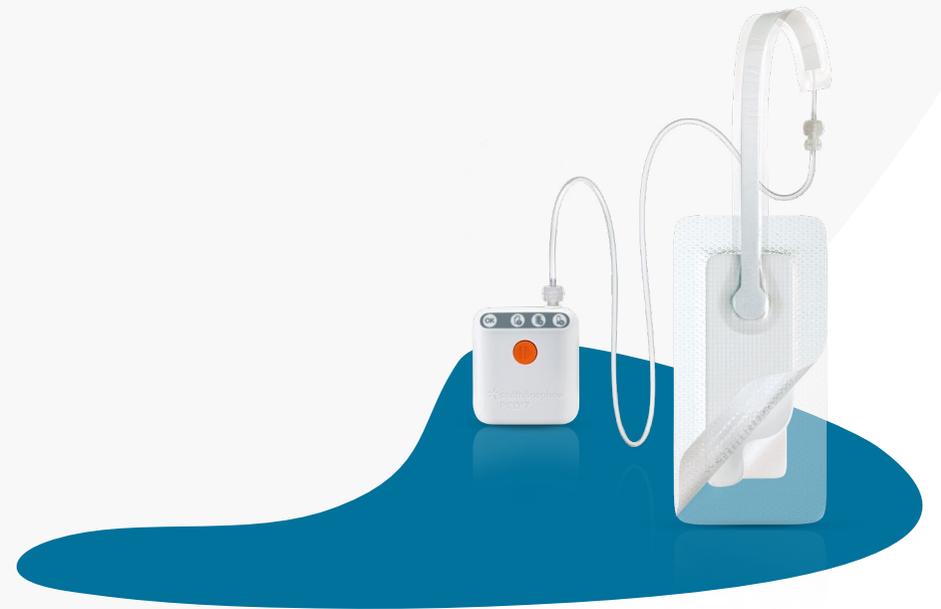
+ Evidence in focus

Application of International Panel insights to inclusion of PICO[◇] Single Use Negative Pressure Wound Therapy System in surgical care bundles

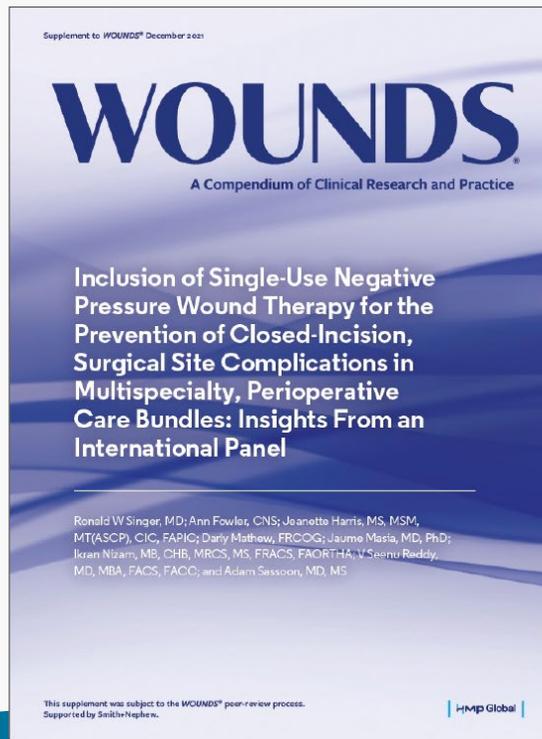
Smith+Nephew

PICO[◇]
Single Use Negative Pressure
Wound Therapy System





A consensus on single-use NPWT (sNPWT) for managing surgically closed incisions as part of surgical care bundles



Summarises the findings of a panel that:¹

- **Evaluated** how to incorporate prophylactic use of sNPWT into perioperative incision management protocols
- **Developed guidance** that utilises clinical evidence and experience, as well as including a proposal for establishing change

Guidance on use of sNPWT for surgically closed incisions

Background and aims

Despite increasing evidence supporting its use to help prevent surgical site complications (SSCs), there is no consensus on whether sNPWT should be part of a surgical care bundle and, if so, how best to employ this approach as part of managing surgically closed incisions.¹

A multinational panel from Australia, Spain, the UK and the USA was convened comprising:¹

- Three orthopaedic surgeons, a director of cardiac surgery, a consultant obstetrician and gynaecologist, one chief of plastic surgery, a clinical nurse specialist and an infection control specialist

The panel discussed ways to incorporate prophylactic use of sNPWT into perioperative incision management protocols and developed a proposal to action the findings¹

- PICO^o sNPWT was the reference product for discussions



The aim of this resource is to review the panel insights and recommendations and demonstrate how they can be applied to the use of PICO sNPWT as part of surgical care bundles

Assessing risk for use of sNPWT in surgical patients

How it applies to use of PICO^o sNPWT

Panel members highlighted a need for risk assessment when considering implementation of PICO sNPWT to help reduce the incidence of surgical site complications (SSCs):¹



Risk assessment

Is primarily the responsibility of the surgeon or surgical team

- Incision management can be planned prior to surgery
- A risk-based algorithm can be used to identify patients at high risk of SSCs prior to surgery



Risk factors

Risk factors for SSCs, which may be mitigated by PICO sNPWT, include:

- BMI >35kg/m²
- Poor nutrition
- Poor diabetic control
- Immunosuppression
- Chronic inflammatory disease
- Advanced age
- Nicotine use
- History of radiation therapy
- Anticoagulation or bleeding disorders

Other considerations for use of sNPWT in surgical patients

How it applies to use of PICO^o sNPWT

Panel members also highlighted economic discussions and communication priorities that may need to be considered when implementing PICO sNPWT in surgical patients¹



Economic considerations

Discussions with hospital administration about adoption of sNPWT are the role of the surgeon, supported by the multidisciplinary team (and clinical audit where required)

- The costs of using PICO sNPWT can be outweighed by potential cost savings from:
 - Reducing hospital length of stay
 - Reducing infections
 - Preventing emergency room visits
 - Preventing readmissions



Communication priorities

Communication between surgical and postoperative teams, patients, family and home care nurses about use of PICO sNPWT is important

- It should be communicated that dressings should be checked by the surgical and postoperative teams while patients are in hospital
 - Also that PICO sNPWT should be left undisturbed for up to 7 days subject to the surgical procedure and surgeon preference
- Patients and nurses should receive simple written or pictorial instructions for use during the post-operative period

Panel recommendations for use of sNPWT¹

All surgical specialties

Specific recommendations for certain surgical procedures where PICO[◇] sNPWT could be used:

-  **Orthopaedic surgery**
Use of sNPWT can **help expedite discharge** because it has been shown to reduce postsurgical complications in several orthopaedic procedures (including total knee and hip arthroplasty)
-  **Abdominal surgery**
Knowing the high prevalence of complications following abdominal surgery, sNPWT should be used to **prevent or reduce the complexities of healing**
-  **Obstetric and gynaecologic surgery**
Using sNPWT to **prevent infection or complications** after a caesarean section has the potential to impact the patient and newborn positively
-  **Cardiac surgery**
Using sNPWT in patients who have undergone cardiac surgery may help **prevent infection and keep the incision stable**
-  **Plastic surgery**
Patients requiring plastic surgery and who may have operative risk factors for SSCs could benefit from using sNPWT to **decrease infection, antibiotic use*, reoperation and hospital stay**

*Use of sNPWT is not intended to replace perioperative systemic antibiotics, but may help to avoid their use beyond the perioperative period.

Panel considerations and recommendations on use of sNPWT

Orthopaedic surgery



Considerations

- To help reduce the incidence of surgical site infections (SSIs), which can result in implant removal²
- To help reduce accumulation of post-operative fluid in soft tissues;³⁻⁷ this can affect range of motion and joint function, which may lead to early hospital discharge and speed up rehabilitation¹
- To help keep the incision covered and secured,⁸ which may reduce the incidence of SSCs for extremely thin patients or those with poor nutritional status¹
- To help reduce the risk of dehiscence and postoperative infection for obese patients¹



Recommendation

Use of sNPWT **can help expedite discharge** because it has been shown to reduce postsurgical complications in several orthopaedic procedures (including total knee and hip arthroscopy)¹

Panel considerations and recommendations on use of sNPWT

Abdominal surgery



Considerations

- To help reduce the complexities of healing as the incidence of SSCs is high in abdominal surgery^{1,4,8-10}
- For example, patients undergoing colorectal surgical procedures are perceived to be at increased risk of seroma, hematoma, and SSIs versus other procedures,⁸ due to the large surface area involved and the presence of interstitial fluid¹



Recommendation

Knowing the high prevalence of complications following abdominal surgery, sNPWT should be used to **prevent or reduce the complexities of healing**¹

Panel considerations and recommendations on use of sNPWT

Obstetric/gynaecologic surgery



Considerations

- To help reduce the risk of SSCs in women undergoing obstetric or gynaecologic surgery with pre-operative risk factors (eg, pre-pregnancy BMI >35kg/m², diabetes, nicotine use, presence of a large pannus, use of immunosuppressive medications, long preoperative stay and repeat caesarean sections)¹
- SSIs after caesarean section can be painful and traumatic for mothers, which can affect caring for their newborn¹¹
- Re-explorations of the abdomen, repeat caesarean sections and emergency cesareans increase the risk of SSCs^{1,12-14}



Recommendation

Using sNPWT to **prevent infection or complications** after a caesarean section has the potential to impact the patient and newborn positively¹

Panel considerations and recommendations on use of sNPWT

Cardiac surgery



Considerations

- To help reduce morbidity¹⁵ and the overall cost of care¹⁶ by helping to prevent mediastinal SSIs¹
- Patients considered to be at high risk of SSCs include those with diabetes, obesity, low albumin levels, poor tissue due to age or steroids, prior methicillin-resistant *Staphylococcus aureus* (MRSA) infection and previous procedures^{8,17}
- Sternotomies closed with additional hardware may benefit from using sNPWT to protect the incision from bacterial contamination and keep the incision stable (ie, reduce lateral tension)¹



Recommendation

Using sNPWT in patients who underwent cardiac surgery may help **prevent infection and keep the incision stable**¹

Panel considerations and recommendations on use of sNPWT

Plastic surgery



Considerations

- To help reduce the risk of infection and reoperation, antibiotic use* and length of hospital stay¹
- Pre-operative risk factors for SSCs in patients undergoing reconstructive breast surgery are similar to other types of surgery (ie, diabetes, obesity, nicotine use and cancer treatments)^{8,18}
- Plastic surgeons often assist other specialties with procedures, some of which could be contaminated after trauma or from abdominal contents¹



Recommendation

Patients requiring plastic surgery and who may have operative risk factors for SSC could benefit from using sNPWT to **decrease infection, antibiotic use*, reoperation and hospital stay**¹

Panel recommendations for a typical surgical care bundle¹

Where PICO^o sNPWT could be included

A surgical care bundle approach, which considers use of sNPWT, can be adopted by clinical groups and hospitals for perioperative management and/or to help predict post-operative SSCs

This approach uses:

- Pre-operative risk stratification
- Effective team communication

A sample care bundle for surgical procedures:

- Comprehensive pre-operative testing
- **SSC risk factor identification***
- Nasal decolonisation
- Blood glucose optimisation
- Use of chlorhexidine gluconate wipes (night before surgery)
- Clear liquids after midnight (not nil by mouth)
- Skin closure using sutures
- Appropriate use of perioperative antibiotics
- Maintenance of warm operating room temperature
- **Standardised incisional management using sNPWT***
- Early referral to wound care team for SSCs
- Education of care givers, patients and family

*Risk factors where use of sNPWT should be considered

Advanced age, diabetes, emergency procedure, immunosuppression, long perioperative hospital stay, nicotine use, obesity (BMI >35kg/m²), poor nutrition, presence of hardware and previous MRSA infection

How to embed use of PICO[◇] sNPWT in standard post-operative management to help prevent SSCs

Strong clinical and economic evidence supports the use of PICO sNPWT as part of surgical care bundles and local protocols to help reduce the incidence of SSCs^{19,20}

- The panel proposed three steps for incorporation of sNPWT into surgical care bundles and protocols,¹ which could be applied to PICO sNPWT as follows:

1**Define**

the at-risk population

Define risk factors for:

- Patients
- Procedures
- Perioperative period
- Intra-operative period

2**Establish**

a financial case for change

- Estimate the number of procedures
- Understand the expected SSC incidence
- Calculate expected costs for treating SSCs, including:
 - Length of stay (bed days)
 - Readmissions
 - Re-interventions
 - Out-patient follow-up care
 - Community follow-up care
- Compare expected costs of SSCs with the cost of using PICO sNPWT

3**Prove**

benefit by implementing a pathway

- Identify patients through pre-operative screening
- Apply PICO sNPWT as standard of care
- Embed practice change through regular communication and education

Role of the care team in delivering surgical care bundles that may include PICO^o sNPWT

The panel made specific recommendations on the role of care team members in ensuring the success of surgical care bundles and how to assess appropriate and effective use of sNPWT¹



Care team members

- All players on the health care team must **understand and accept their roles and the rationale for the interventions** that need to be put in place
- Care team members need to **ensure surgical patients are informed about and involved in their care** and monitored throughout the healing process
- Care team members need to **ensure the bundle is working** to achieve good outcomes



Use of sNPWT

- **Identifying patients at risk** for complications is paramount to demonstrating where sNPWT can be most effective
- A **canister-free sNPWT device** should be used as part of a surgical bundle
- Postoperative care should include **monitoring the extended use** of sNPWT

Overcoming challenges: clinical/administrative stakeholders¹

Application to use of PICO^o sNPWT

The panel suggested that addressing clinical and financial burdens of **additional inpatient days, readmissions, and/or surgical reintervention (ie, cost effectiveness)** can help facilitate a change in practice and standard of care using PICO sNPWT

- Upfront costs should be compared with estimated expenditure for treating SSCs (including infection) in a specific patient population
- Where its use may not be cost effective for all patients, it can be reserved for those at **highest risk of SSCs**
- Restrict use for **all high-consequence patients**, such as for joint replacement patients where deep infection could be catastrophic (ie, result in implant removal)
- **Preoperative identification** can ensure that a device and dressings are available in the operating room at time of surgery, avoiding indiscriminate use for patients who are at low risk of SSCs



Using PICO sNPWT can potentially **reduce postoperative expenses**, which can outweigh the initial outlay of funds

Summary of panel findings on use of sNPWT¹ applied to PICO[◇] sNPWT

PICO sNPWT can be **incorporated into a care bundle or standardised protocol** for patients undergoing surgery to help:

- Expedite discharge in **orthopaedic surgery**
- Reduce complexities of healing in **abdominal surgery**
- Reduce the incidence of infection or complications in **obstetric and gynaecologic surgery**
- Reduce the incidence of infection and keep the incision stable in **cardiac surgery**
- Reduce the incidence of infection, decrease antibiotic use*, reduce the risk of reoperation and shorten hospital stay in **plastic surgery**

Use of PICO sNPWT can be **embedded in standard post-operative management** by:

- Defining the at-risk population
- Establishing a financial case for change
- Proving benefit by implementing a pathway (with regular reviews)



Current informed opinion and research support incorporating PICO sNPWT into surgical care bundles

References

1. Singer RW, Fowler A, Harris J, et al. Inclusion of single-use negative pressure wound therapy for the prevention of closed-incision, surgical site complications in multispecialty, perioperative care bundles: insights from an international panel. *Wounds*. 2021;33(Suppl 12):S11–S23.
2. Kapadia BH, Berg RA, Daley JA, Fritz J, Bhave A, Mont MA. Periprosthetic joint infection. *Lancet*. 2016;387(10016):386–394.
3. Karlakki S, Brem M, Giannini S, Khanduja V, Stannard J, Martin R. Negative pressure wound therapy for management of the surgical incision in orthopaedic surgery: A review of evidence and mechanisms for an emerging indication. *Bone Joint Res*. 2013;2(12):276–284.
4. Fowler AL, Barry MK. Closed incision negative pressure therapy: results of recent trials and recommendations for clinical practice. *Surgeon*. 2020;18(4):241–250.
5. Birke-Sorensen H, Malmsjo M, Rome P, et al. Evidence-based recommendations for negative pressure wound therapy: treatment variables (pressure levels, wound filler and contact layer) – steps towards an international consensus. *J Plast Reconstr Aesthet Surg*. 2011;64:S1–16.
6. Scalise A, Calamita R, Tartaglione C, et al. Improving wound healing and preventing surgical site complications of closed surgical incisions: a possible role of incisional negative pressure wound therapy. A systematic review of the literature. *Int Wound J*. 2016;13(6):1260–1281.
7. Shim HS, Choi JS, Kim SW. A role for postoperative negative pressure wound therapy in multitissue hand injuries. *Biomed Res Int*. 2018:3629643.
8. World Union of Wound Healing Societies (WUWHS) Consensus Document. Closed surgical incision management: understanding the role of NPWT. *Wounds International*. 2016. Available at: <https://www.woundsme.com/resources/details/consensus-document-closed-surgical-incision-management-understanding-the-role-of-npwt-wme> Accessed November 2021.
9. Alkaaki A, Al-Radi O, Khoja A, et al. Surgical site infection following abdominal surgery: a prospective cohort study. *Can J Surg*. 2019;62(2):111–117.
10. European Centre for Disease Prevention and Control. Surveillance report. Healthcare-associated infections: surgical site infections. Annual epidemiological report for 2017. Available at: https://www.ecdc.europa.eu/sites/default/files/documents/AER_for_2017-SSI.pdf Accessed November 2021.
11. Pelko C. Reduction in Cesarean infections through education of patients and use of consistent practices by the health care team. *JOGNN*. 2019;48(Suppl 3S):S109.
12. Gomaa K, Abdelraheim AR, El Gelany S, Khalifa EM, Yousef AM, Hassan H. Incidence, risk factors and management of post cesarean section surgical site infection (SSI) in a tertiary hospital in Egypt: a five year retrospective study. *BMC Pregnancy and Childbirth*. 2021;21:634.
13. European Wound Management Association (2020). Birth-related wounds – risk, prevention and management of complications after vaginal and caesarean section birth. Available at: <https://ewma.org/what-we-do/projects/birth-related-wounds> Accessed November 2021.
14. Schneid-Kofman N, E Sheiner, A Levy, G Holcberg. Risk factors for wound infection following cesarean deliveries. *Int J Gynaecol Obstet*. 2005;90(1):10–15.
15. Perrault LP, Kirkwood KA, Chang HL, et al. A prospective multi-institutional cohort study of mediastinal infections after cardiac operations. *Ann Thorac Surg*. 2018;105(2):461–468.
16. Mehaffey JH, Hawkins RB, Byler M, Charles EJ, Fonner C, Kron I, et al. Cost of individual complications following coronary artery bypass grafting. *J Thorac Cardiovasc Surg*. 2018;155(3):875–882.
17. Phoon PHY, Hwang NC. Deep sternal wound infection: diagnosis, treatment and prevention. *J Cardiothorac Vasc Anesth*. 2020;34(6):1602–1613.
18. Masoomi H, Fairchild B, Marques ES. Frequency and predictors of 30-day surgical site complications in autologous breast reconstruction surgery. *World J Plast Surg*. 2019;8(2):200–207.
19. Saunders C, Nherera LM, Horner A, Trueman A. Single-use negative-pressure wound therapy versus conventional dressings for closed surgical incisions: systematic literature review and meta-analysis. *BJS Open*. 2021;5(1):zraa003. Nherera LM, Saunders C, Verma S, Trueman P, Fatoye F. Single-use negative pressure wound therapy reduces costs in closed surgical incisions: UK and US economic evaluation. *J Wound Care*. 2021;30(Sup5):S23–S31.
20. NICE Guidance. PICO negative pressure wound dressings for closed surgical incisions. Medical technologies guidance [MTG43]. May 2019. Available at: <https://www.nice.org.uk/guidance/MTG43> Accessed November 2021.

Developed by Evidence Communications,
Global Clinical & Medical Affairs

www.smith-nephew.com/education

For detailed product information,
including indications for use,
contraindications, precautions
and warnings, please consult the
product's applicable Instructions
for Use (IFU) prior to use.

Smith+Nephew

Advanced Wound Management
Smith & Nephew Medical Ltd
101 Hessle Road
Hull HU3 2BN, UK

◇ Trademark of Smith+Nephew
All Trademarks acknowledged
©February 2022 Smith+Nephew
AWM-AWD-33446 | GMC1531

www.smith-nephew.com

T +44 (0) 1482 225181
F +44 (0) 1482 328326