PICO◊ sNPWT clinical cases

Smith+Nephew

PICO◊
Single Use Negative Pressure
Wound Therapy System

Helping you get **CLOSER TO ZERO◊** delay in wound healing.[1-3]

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ZERO ZERO
ZERO VENOUS
PRESSURE ULCER
ULCER RECURRENCE
INCIDENCE ZERO
ZERO WASTE OF
HEALTHCARE
DELAYS RESOURCES
IN WOUND ZERO
HEALING DIABETIC
ZERO AMPUTATIONS
SURGICAL SITE ZERO
COMPLICATIONS
ZERO DELAYS
PRESSURE IN WOUND
ULCER HEALING
INCIDENCE
ZERO ZERO

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Wound deeper than 2cm

Symbol indicates wound is deeper than 2cm

Click on the case to go to section

Using PICO◊ sNPWT on **closed surgical incisions** to help prevent surgical site complications

Preventive use of PICO◊ sNPWT after Achilles tendon surgery

Dr Daniel Herrero (Assistant Specialist) - *Department of Trauma and Orthopaedic Surgery, De Liria Hospital (Valencia - Spain)*

Patient

A 41-year-old man with no medical history of interest or background treatment. The previous year he underwent a first surgery for Achilles tendon rupture sustained while playing football. At three weeks, the staples and part of the plaster were removed. After removing all the staples and placing the splint, the team noticed clinical signs of infection. The wound showed poor healing at one month. The depth of the deficit had increased, allowing visualization of the tendon.

Treatment

The patient received treatment with NPWT for two weeks, after which the dressing was removed due to persistent clinical signs of infection. He underwent another surgery in March 2017 to clean up the infection and debride some of the necrotic tissue. It was decided to use the PICO single use NPWT system for one week in order to avid the complications seen after the first surgery.

Follow-up/results

The PICO single use NPWT device was removed 7 days after the procedure. Since there was no exudate, no dressing change was required before this time and the surgical wound appeared to be healing well. It was decided to apply a conventional post-surgical dressing until the stitches were removed.

Conclusions

The preventive use of the PICO single use NPWT device proved very satisfactory in this case. It contributed to the prevention of complications (dehiscence and infection) seen after the first surgery. Such complications directly affect not only the patient, but also the healthcare team and the health system.

Day 0
Start of PICO sNPWT

Application of PICO sNPWT

Day 5
Follow-up at 5 days

Day 7
Follow-up at 7 days
End of PICO treatment

Preventive use of PICO◊ sNPWT in a Caesarean section

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Introduction

Gynaecology departments do not widely use negative pressure wound therapy (NPWT), due to the low prevalence of wounds in their field NPWT is currently used as an adjunct to treatment for the prevention of surgical site complications. A wider range of applications is opening up in this department.

We present a case report in which PICO sNPWT was used on a caesarean section.

Patient

A 17 year-old woman of Afro-Caribbean descent who had had a previous caesarean section. At the start of pregnancy, she had a body mass index (BMI) of 27 and she had since gained 6kg in weight. She smoked one cigarette/day. She had no other relevant medical history.

Treatment

Due to the patient's previous caesarean section, there was a risk of surgical site complications.

Caesarean delivery was performed. The newborn infant weighed 4.105kg.

Staple skin closure was performed. A single use negative pressure wound therapy device (PICO sNPWT) was applied for prevention of SSC after the intervention while the patient was still in the operating theatre.

In this case, the purpose of using the PICO System was to:

- Decrease tension on the suture line[1]
- Manage fluid and promote healing[2]
- Stimulate the micro-circulation[3]
- Protect the incision from external aggressors (the dressing acts as physical and antimicrobial barrier,[4] and allows minor wound manipulation)[5]
- Minimise trauma to the incision during application and removal of the dressing[6]

Follow-up/results

The wound appeared to be healing well at day 8.

The dressing had to be changed at 24 hours due to wound exudate. At this time, the wound showed good clinical progress, with clean edges and a favourable appearance.

No further dressing changes were needed after the first 24 hours.

The dressing was removed one week later. The surgical site was in good clinical condition, with no maceration and good wound shrinkage. The staples were removed at this time.

Conclusions

The patient had no difficulty understanding the portable system, no problems with the device, and was able to have a normal life.

For health care professionals, this experience with the single use NPWT device (PICO) was a positive one. The use of the device requires minimal training for health care professionals or patients.

Clinically, the risk of seroma decreases, and with it the risk of complications such as dehiscence or hypertrophic scars.

The use of negative pressure wound therapy for prevention of SSC has already been described in multiple studies in the literature. Depending on the patient's risk factors, caesarean section wounds may be eligible for sNPWT.

Day 1
Star of streamer

Day 1
Application of PICO sNPWT in the operatin theatre

Day 8
PICO Dressing change after 1 week

Appearence of the surgical wound after removal the PICO Dressing

Appearence of the surgical wound upon stample removal

Note: The PICO sNPWT pump shown is no longer commercially available and has been superseded with PICO 7 sNPWT and PICO 14 sNPWT System.

1. Wilkes RP, Kilpad DV, Zhao Y, Kazala R, McNulty A. Closed incision management with negative pressure wound therapy (CIM): biomechanics. *Surg Innov*. 2012 Mar;19(1):67-75. Epub 2011 Aug 25. **2.** Stannard JP, Robinson JT, Anderson ER, McGwin G Jr, Volgas DA, Alonso JE. Negative pressure wound therapy to treat hematomas and surgical incisions following high-energy trauma. *J Trauma*. 2006 Jun;60(6):1301-6. **3.** Atkins BZ, Tetterton JK, Petersen RP, Hurley K, Wolfe WG. Laser Doppler flowmetry assessment of peristernal perfusion after cardiac surgery: beneficial effect of NPWT. *Int Wound J* 2010; dol: 10.11 11/j.1742-481X.2010.00743.x. **4.** Smith & Nephew February 2011.Bacterial Barrier Testing (wet-wet) of PICO dressing with a 7 day test duration against S. marcescens. Internal Report. 1102010. **5.** Gommoll AH, *et al*. Incisional vacuum-assisted closure therapy. *J Orthop Trauma* 2006;20:705-709. **6.** Payne C, Edwards D. Application of the Single Use Negative Pressure Wound Therapy Device (PICO) on a Heterogeneous Group of Surgical and Traumatic Wounds. *ePlasty*. 2014:152-166.

Preventive use of PICO◊ sNPWT in Caesarean sections case

Dr Antonio de la Torre (Gynaecologist), Dr Elena Marín (Gynaecologist), Ms Concepción Navarro (Nursing Supervisor) - *Reina Sofía University Hospital (Córdoba - Spain)*

Introduction

Healthcare-associated infections are a leading cause of patient mortality and morbidity, with surgical site infections (SSI) among the most common. Patients who develop a SSI are more likely to be admitted to an intensive care unit, to be readmitted to the hospital and to die.[1] In addition, the development of a SSI prolongs hospital stays, considerably increases healthcare costs and carries a significant emotional cost for patients and for their relatives.[1] We present a case in which the PICO single use negative pressure wound therapy (sNPWT) system was used to prevent surgical site complications in a patient who underwent an elective caesarean section.

Patient 1

The patient was a 33 year-old woman with a number of risk factors, including uncontrolled diabetes, smoking (about 10 cigarettes/day during pregnancy) and a slightly elevated BMI (weight not specified, but some abdominal overhang after caesarean section). A caesarean section was scheduled (baby in the breach position).

Patient 2

The patient was a 38 year-old woman with no underlying diseases and not currently on any medication who underwent an elective caesarean section.

Treatment

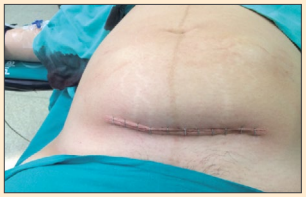
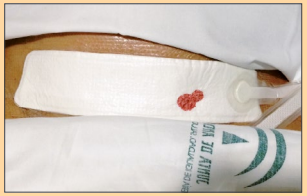
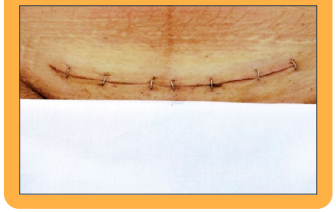
The PICO device was applied in the operating theatre immediately after closing the incision. The PICO System has a wear time of up to seven days. The dressing used to manage the exudate is inspected for saturation at 24 and 48 hours in case it needs changing. A replacement dressing is included. As can be seen in the picture, the dressing was not saturated, so that there was no need to change it. The patient was discharged from hospital 72 hours after the surgery. Before then, the team decided to examine the incision that motivated the change of PICO dressing.

Follow-up/results

The patient was asked to visit the hospital 7 days post-intervention for removal of the PICO sNPWT system and assessment of wound healing. As can be seen from the pictures, the wound healed very well with no visible haematoma, seroma or clinical signs of infection. The staples were removed and a conventional dressing applied. The patient returned for follow-up 15 days later, showing no signs of involution.

Conclusions

The satisfactory results obtained in this case suggest that the PICO System may constitute a new tool to improve clinical results in gynaecology. As illustrated in this case, PICO sNPWT helps improve the post-operative management of this type of intervention, especially in patients with risk factors.

Patient 1	Patient 2
Day 0 *Application of the PICO System in the operative theatre* 	**Day 0** *Application of the PICO System in the operative theatre*
Day 3 *Exudate management at 72 hours* 	**Day 3** *Exudate management at 72 hours* 
Day 3 *Follow-up at 72 hours* 	**Day 3** *Follow-up at 72 hours*
Day 7 *Removal of the PICO System. Follow-up at 7 days* 	**Day 7** *Removal of the PICO System. Follow-up at 7 days* 

Note: The PICO sNPWT pump shown is no longer commercially available and has been superseded with PICO 7 sNPWT and PICO 14 sNPWT System.

1. Sugrue M, *et al.* World Union of Wound Healing Societies (WUWHS) Consensus Document. Closed surgical incision management: understanding the role of NPWT. *Wounds International*, 2016.

Preventive use of PICO◊ sNPWT in a patient who underwent a triple coronary bypass

Dr Ángela Irabien Ortiz (Resident), Dr Álvaro Pedraz Prieto (Resident), Dr Hugo Rodríguez-Abella González (Assistant) - *Cardiac Surgery, Gregorio Marañón University Hospital (Madrid - Spain)*

Introduction

Surgical site infections (SSI) are the most common cause of nosocomial infection in post-operative patients.[1] The incidence of SSI after sternotomy in cardiac surgery patients ranges between 4-7% for superficial infections and 1-4% for deep infections.[1] This is associated with increased post-operative morbidity and mortality, and increased healthcare costs per procedure.[2]

Patient

A 71-year-old woman with a history of hypertension, type 2 diabetes, dyslipidaemia and ischaemic cardiopathy. The patient was scheduled to undergo revascularisation surgery with a triple coronary bypass using a saphenous vein graft.

Treatment

The patient underwent a triple coronary bypass and it was decided to use the PICO single use NPWT system prophylactically as a dressing for the sternotomy incision, with 1-2 dressings per week depending on the exudate managed by the PICO System.

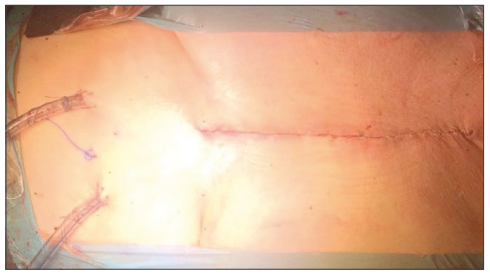
Follow-up/results

As can be seen in the pictures, the PICO device was placed on the sternotomy wound in the operating theatre. No dressing change was required for 7 days. The surgical wound healed completely without any complications. In contrast, the saphenectomy wound did not heal well, showing complications including infection and dehiscence. Systemic antibiotics were required, as well as local treatment with the PICO System.

Conclusions

This case potentially shows the substantial differences in the healing of surgical wounds treated with vs. without PICO sNPWT. Given the success obtained, the cardiac surgeons considered using the PICO System on a consistent basis in order to help prevent surgical site complications in cardiac surgery patients with risk factors.

Closure of the sternotomy wound



Application of the PICO sNPWT System in the operating theatre

End of PICO sNPWT treatment
Follow-up at 7 days

Wound NOT treated with PICO sNPWT
Follow-up of saphenectomy at 7 days

Note: The PICO sNPWT pump shown is no longer commercially available and has been superseded with PICO 7 sNPWT and PICO 14 sNPWT System.

1. Witt-Majchrzak A, Żelazny P, Snarska J. Preliminary outcome of treatment of postoperative primarily closed sternotomy wounds treated using negative pressure wound therapy. *Przeglad Chirugiczny*. 2014;86(10):456-465. **2.** Sugrue M, *et al.* World Union of Wound Healing Societies (WUWHS) Consensus Document. Closed surgical incision management: understanding the role of NPWT. *Wounds International*, 2016.

Use of PICO◊ sNPWT on an incision made during full surgical revision of ulnar osteosynthesis

Dr Adrien Jacquot - *Clinique Louis Pasteur [Louis Pasteur Hospital], (Essey les Nancy - France)*

Patient

A 45-year-old male patient living independently.

The patient underwent full revision of left ulnar osteosynthesis due to inadequate fracture reduction. Six weeks earlier, the patient was in a road accident and sustained a complex open fracture of the ulna with transolecranon dislocation, for which he underwent osteosynthesis with two plates. During treatment with PICO sNPWT, the patient was on antibiotics (Cefazoline™).

PICO sNPWT treatment methodology

It was decided to apply the PICO System in the operating theatre. The PICO dressing size selected for the left elbow of the patient was 10 x 40cm. The incision line measured 24cm L x 1cm W, staples present.

The surgeon decided to leave the PICO System in place for 6 days.

Course of PICO sNPWT

The patient was hospitalised for 6 days before being transferred to post-acute care and rehabilitation. Since the surgery, the patient's elbow has been continuously immobilised in a splint and he has been subject to increased monitoring by the nursing team.

Treatment outcome

Negative pressure wound therapy was discontinued at D6. There was no sign of inflammation or dehiscence and the PICO System was replaced with a OPSITE◊ POST-OP VISIBLE Waterproof, Bacteria-proof Dressing with See-through Absorbent Pad.

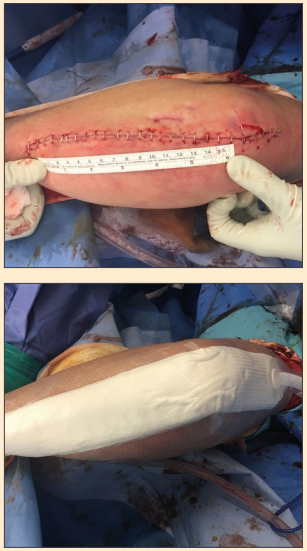
The total duration of treatment was 6 days.

The patient attended a follow-up visit at D22, after removal of the staples. He remained in post-acute and rehabilitation care. Note that antibiotic therapy was discontinued and the splint removed on that day. The patient could move his elbow again, while receiving care from a physiotherapist.

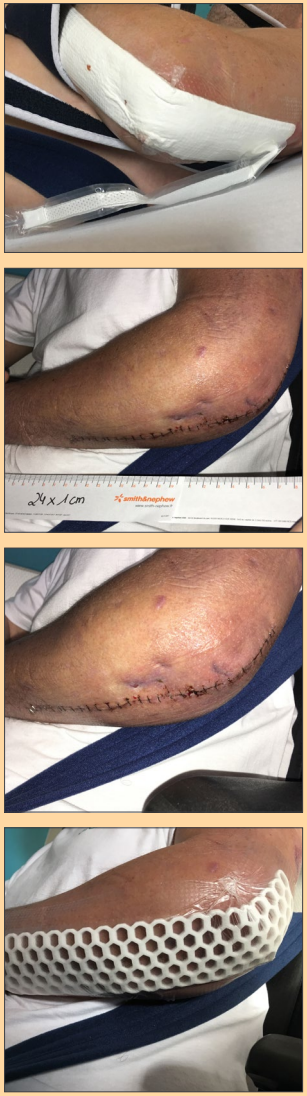
By D54, the wound was fully healed without any complications.

This was the first time that the surgeon had used the PICO device and he was satisfied with its ease of use, its efficacy and the rapid treatment time.

Day 0



Day 6



Day 22

Day 54

PICO◊ sNPWT on a surgical incision line after treatment of pseudarthrosis

Dr Frank Wein - *Clinique Louis Pasteur, Essey les Nancy (France)*

Patient

A 59 year-old male.

Independent patient living with his spouse.

- Cardiac history
- Class 1 obesity
- Fragile skin

Wound history

The patient underwent surgical treatment for left leg pseudarthrosis, the second in 4 months. The patient had a household accident that resulted in an open fracture of the tibia. The wound healing process was complicated by an infection. The patient was prescribed antibiotic therapy (Cefazoline™).

PICO sNPWT treatment methodology

- One day after the surgery, the surgeon decided to apply two PICO dressings
- The incision lines were cleaned with iodine antiseptic four times. The PICO dressing selected for the knee wound was 15 x 20cm
- At this time, the incision line was 6cm L x 1cm W. The PICO dressing applied on the tibia was 15 x 30cm in size, and the incision line 21cm L x 1cm W, with staples on both incision lines
- The surgeon decided to leave the PICO dressing on the knee in place for 7 days and to change the PICO dressing on the tibia at D2 for monitoring purposes

Course of PICO sNPWT

The patient remained hospitalised for 7 days before being discharged home.

Since the surgery, the leg has been immobilised in a boot and weight-bearing was not permitted.

At D2, the PICO dressing applied on the tibia showed 50% saturation and was removed. Under the dressing, the incision line showed no sign of inflammation.

The PICO dressing applied on the knee was only slightly stained and was left in place.

Treatment outcome

Negative pressure wound therapy was discontinued at D7. Both PICO dressings were removed. The one on the knee was slightly stained while the one below showed 30% saturation. There was no sign of inflammation or dehiscence. PICO sNPWT preserved the peri-wound skin and no pain was reported upon removal. Wound care was continued with hydrocellular dressings.

The total duration of treatment was 7 days.

The patient was pleased with the outcome and the use of the device, which allowed him to retain his independence. He had two pumps with him.

At D16, the staples remained in place, but every second staple was removed that day. Antibiotic treatment was also discontinued, as laboratory tests found no sign of infection.

The walking boot was removed and replaced by a splint. However, weight-bearing was still forbidden.

Full, complication-free healing was achieved at D57. Weight-bearing was permitted from then on. The surgeon was pleased with the use of the PICO System.

Note: The PICO sNPWT pump shown is no longer commercially available and has been superseded with PICO 7 sNPWT and PICO 14 sNPWT System.

Preventive use of PICO◊ sNPWT on laparotomy wounds in living-donor kidney transplant

Sonia Almansa Saura (RN), Inmaculada Romero Sánchez (RN), Mónica Rodríguez Valiente (RN), Patricio Alcaraz Lorente (Specialist Physician), Teresa Soria Cogollos (Specialist Physician), Gregorio Castellanos Escrig (Head of Department) - *Wound and Diabetic Foot Unit Department of General Surgery and Gastroenterology, V. Arrixaca Clinical University Hospital (Murcia - Spain)*

Introduction

In Spain and neighbouring countries, an estimated 6-14% of patients admitted to an acute care hospital develop a nosocomial (healthcare-associated) infection (NI).* In the field of NIs, multifactorial surgical wound or surgical site infections occur at variable rates, causing complications, discomfort for the patient and consuming resources (increased average length of stay and hospital costs).*

Patient

A 56-year-old woman with hypertension, dyslipidaemia, stage 4 chronic kidney disease secondary to glomerulopathy and a BMI of 24kg/m².

Treatment

She received a living-donor kidney transplant in the right iliac fossa (29/11/2016) with anastomosis of the laterolateral external iliac artery and the lateroterminal iliac vein. Ureteral re-implant surgery was performed using the Lich-Gregoir technique with the placement of a double J catheter. The skin was closed with staples, disinfected with chlorhexidine and the suture line covered with a 15x30 cm PICO single use NPWT dressing in the operating theatre (Figure 1).

Follow-up/results

The surgical wound and dressing were inspected on 06/12/2016 (day 7 post surgery). The dressing was divided into a grid to get a rough estimate of the amount of exudate absorbed (Figure 2).

The findings were as follows:

- Dressing: Wound exudate (Figure 3) estimated at 15ml by square, making up a total of approximately 45ml in this case
- Wound: No local signs of inflammation (heat, pain, redness swelling, fluctuation, oedema), seroma and/or local infection were observed (Figure 3)

Conclusions

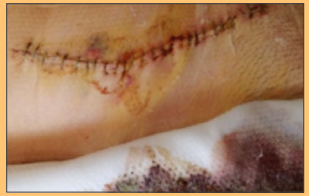
The preventive use of the PICO single use (sNPWT) system in this recipient was associated with the absence of surgical site complications.

Day 0 (Figure 1)
Application of the PICO sNPWT system in the operating theatre

Figure 2
PICO sNPWT dressing divided into areas

¡¡NO TOCAR!! means *DO NOT TOUCH!!!*

Day 7 (Figure 3)
Inspection of the wound/PICO sNPWT dressing at 7 days post-surgery



Procedure	Dressing changes	Heal time
Current treatment with PICO sNPWT (80 mm Hg)	▪ Weekly dressing changes ▪ No uncovering of the wound or wound management until the PICO sNPWT dressing needs changing (7 days) ▪ Alternate suture removal after 10 days	One wound care session when the dressing is removed after 7 days

Note: The PICO sNPWT pump shown is no longer commercially available and has been superseded with PICO 7 sNPWT and PICO 14 sNPWT System.

*Authors' information not validated by Smith+Nephew.

Preventive use of PICO◊ sNPWT in colorectal surgery

Dr Pedro Abadía Barnó, Dr Juan Diego Pina, Dr Javier Die Trill (General Surgeons) - *Colorectal Unit, Ramón y Cajal Hospital (Madrid - Spain)*

Introduction

At about 20%, the SSI rate after colorectal surgery is among the highest of all elective surgeries.[1] While the increased use of laparoscopic surgery has contributed to underestimate the incidence of SSIs, strategies to promote recovery after surgery and speed up hospital discharge have led to an increase in the diagnosis of SSIs after discharge. According to the literature, the average time-to-diagnosis of SSIs is seven days in the hospital and 14 days after discharge.* Unsurprisingly, due to the high amounts of bacteria present, rates of SSI after colorectal surgery are higher than in other fields. Emergency interventions for the management of purulent peritonitis or intestinal perforations are associated with a very high risk of SSI.*

Patient

A 78 year-old man, ASA III with a body mass index (BMI) of 27 kg/m^2 and a history of type 2 diabetes, chronic renal failure, atrial fibrillation treated with Sintrom™, and gastric ulcer perforation 20 years ago, treated by midline laparotomy. The patient had midline herniation and left colon cancer.

Treatment

Elective surgery by midline laparotomy consisted of left hemicolectomy with mechanical anastomosis and eventroplasty with Polypropylene Mesh, intra-abdominal drainage and placement of two subcutaneous drainages.

As can be seen in the photograph, the surgical wound had a length of 25cm and, given the patient's personal history described above, it was decided to use the PICO single use NPWT system to help reduce the risk of surgical site complications (oedema, seroma, infection, dehiscence).[2] As shown in the picture, the PICO sNPWT device was applied in the operating theatre immediately after closure of the surgical wound and with the vacuum pump tube directed cranially so as to avoid problems during hospitalisation.

Follow-up/results

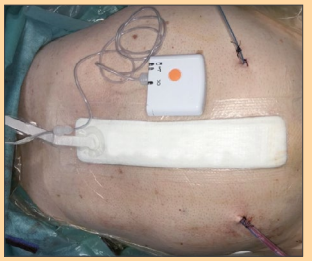
The PICO dressing was inspected at 24 and 48 hours after surgery, but did not need changing, so that the surgical wound was uncovered on day 6 with no evidence of complications, as shown in picture Day 7. After discharge home and at the one-month follow-up visit, the incision was fully healed without complications.

Conclusions

The preventive use of the PICO sNPWT system in this case achieved a very satisfactory outcome. Despite the patient's risk factors and the surgery itself, the wound looked good, with no evidence of complications and satisfactory healing in the first month after surgery.

Day 0
Surgical wound closure

Drain removal from the surgical wound



Day 0
Application of the PICO sNPWT system in the operating theatre

Day 7
End of PICO sNPWT application

Note: The PICO sNPWT pump shown is no longer commercially available and has been superseded with PICO 7 sNPWT and PICO 14 sNPWT System.

*Authors' information not validated by Smith+Nephew.

1. Hübner M, Diana M, Zanetti G, Eisenring MC, Demartines N, Troillet N. Surgical Site Infections in Colon Surgery: The Patient, the Procedure, the Hospital, and the Surgeon. *Arch Surg.* 2011;146(11):1240-1245. doi:10.1001/archsurg.2011.17. **2.** Saunders C, Buzza K, Nherera L. 2019. A single use negative pressure system reduces surgical site complications compared with conventional dressings in closed surgical incisions: a systematic literature review with meta-analysis. Poster presented at the European Wound Management Association annual meeting, June 5-7, 2019, Gothenburg, Sweden.

PICO◊ sNPWT after mastectomy with no skin suture

Dr Antonio Rodríguez Oliver, Dr Aida González Paredes, Dr Mª Teresa Aguilar Romero, Dr José Mª Puerta Sanabria - *Virgen de las Nieves University Hospital (Granada - Spain)*

Introduction

Single use negative pressure wound therapy (sNPWT) after mastectomy with no skin suture.

Patient

A 68 year-old woman with a personal history of diabetes, hypertension and hyperlipidaemia.

Diagnosed with invasive lobular carcinoma (ILC) of the left breast via the Breast Cancer Early Detection Programme in June 2017 and referred to Virgen de las Nieves Hospital (Granada) for further investigation and treatment.

Magnetic resonance imaging (MRI) was performed, according to which the wound measured 5 x 3.5 x 2.7cm.

The Gynaecological Oncology Tumour Committee decided to perform a total mastectomy of the left breast and selective sentinel lymph node biopsy.

Treatment

The scheduled surgery was performed in September 2017 with no notable incidents, with subcutaneous drain placement and closing of the wound with subcutaneous sutures and intermittent stitches, but no cutaneous suture, as it was decided to place a PICO dressing on the incision.

Follow-up/results

The patient was discharged 4 days later after good pain control was achieved and the drainage tube was removed due to low flow.

A follow-up appointment was scheduled 7 days after the intervention for removal of the PICO dressing and assessment of the wound.

Given the good condition of the wound, the patient was discharged pending the final histological results.

Important: PICO sNPWT is contraindicated in patients with malignancy in the wound bed or margins of the wound (except in palliative care to enhance quality of life)

The figure shows a subcutaneous mastectomy incision with drain insertion at the distal end

PICO Dressing placed over the mastectomy incision, distally to the dressing placed on the drain exit

PICO Dressing 24 hours after placement. The drain had 100cc of serosanguineous fluid

Surgical site after removal of the PICO Dressing 7 days after surgery

Note: The PICO sNPWT pump shown is no longer commercially available and has been superseded with PICO 7 sNPWT and PICO 14 sNPWT System.

Preventive use of PICO◊ sNPWT in a patient who underwent periareolar mastopexy

Dr Joaquín Navarro Cecilia (Cosmetic and Plastic Surgeon) - *Private practice (Jaén - Spain)*

Introduction

Surgical wound complications such as infection or haematoma are associated with an increase in morbidity, mortality and length of hospital stays, which is not only a health problem for patients, but also poses a huge economic burden for the healthcare system as a whole.[1] An in-depth knowledge of the financial costs of SSIs is especially useful when investing resources in monitoring and prevention programs.

Patient

A 44-year-old woman with no relevant medical history and not receiving any kind of background medication. The patient had a periareolar mastopexy in November 2015.

Treatment

She was then scheduled for hypertrophic scar removal, areolar reduction and a new round block periareolar suture. In order to prevent post-operative complications such as bruising and to achieve more aesthetic healing than with the first surgery performed in 2015, the team decided to apply the PICO single use negative pressure wound therapy device. The PICO System is sterile, which facilitates its application in the operating theatre immediately after closure of the surgical incision. The PICO dressing is changed once or twice per week depending on saturation.

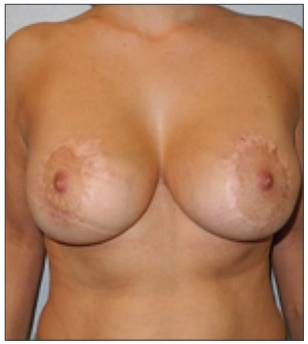
Follow-up/results

After application in the operating theatre, the PICO single use NPWT system was inspected only 24 hours post-surgery. It was found to be working well, and neither of the two dressings was saturated. It was checked again at 48 hours, with no further inspections until 7 days after the intervention, when the PICO single use NPWT system was removed. As can be seen in the pictures, after suture and sNPWT removal, the incision was completely healed, with no perilesional bruising or other surgical site complications.

Conclusions

Both the clinical team and the patient were very happy with the outcome of the surgery. The hypertrophic scars were replaced by aesthetic scars. There were no complications that might have negatively affected the patient, the healthcare team or the health system. The patient said that she felt very comfortable and confident while performing activities of daily living with the PICO single use NPWT system.

Before surgery

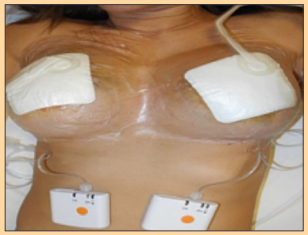


After surgery

Right breast

Left breast

Application of PICO dressing



Note: The PICO sNPWT pump shown is no longer commercially available and has been superseded with PICO 7 sNPWT and PICO 14 sNPWT System.

1. Sugrue M, *et al*. World Union of Wound Healing Societies (WUWHS) Consensus Document. Closed surgical incision management: understanding the role of NPWT. *Wounds International*, 2016.

PICO◊ sNPWT on a surgical incision line after a primary total knee arthroplasty

Dr Frank Wein - *Clinique Louis Pasteur, Essey les Nancy (France)*

Patient

A 76 year-old female.

Patient living independently at home, alone.

- Hypertension
- Class 2 obesity
- Treated for leukaemia

Wound history

The patient was hospitalised for a right total knee arthroplasty. She remained on anticoagulation therapy until one week before the procedure. She was also prescribed antibiotics (Cefazoline™).

PICO sNPWT treatment methodology

- In view of the patient's history, the surgeon decided to apply a PICO dressing. At the surgeon's request, the dressing was applied two days after the intervention
- The incision line was cleaned four times with iodine antiseptic. The chosen PICO dressing size was 10 x 30 cm
- At the time, the incision line measured 15.5 cm L x 1 cm W and staples were present
- The surgeon decided to leave the PICO System in place for 7 days

Course of PICO sNPWT

The patient remained hospitalised for 7 days due to lack of beds in the post-acute care and rehabilitation ward.

The patient's leg was not immobilised and she was able to wear her compression stocking, which was compatible with the PICO device.*

At D1, 25% saturation of the dressing was observed. She has been subject to increased monitoring by the nursing team.

Treatment outcome

PICO sNPWT was discontinued at D7. At the time of removal, the PICO dressing showed ~50% saturation, with no sign of inflammation or dehiscence underneath.

The patient was transferred to post-acute care and rehabilitation at D7. Note that the patient received physiotherapy throughout treatment with PICO sNPWT.

The total duration of treatment was 7 days. PICO sNPWT was then replaced with a OPSITE◊ POST-OP Visible dressing.

The patient was was re-examined at D22, after removal of the staples. The incision line was slightly crusted.

Antibiotic therapy was also discontinued.

By D55, the wound was fully healed without any complications.

The patient was pleased with the outcome and the use of the device, which allowed her to retain her daily independence.

The surgeon was ALSO pleased with the device.

Note: The PICO sNPWT pump shown is no longer commercially available and has been superseded with PICO 7 sNPWT and PICO 14 sNPWT System.

*PICO sNPWT can be used in conjunction with adjuvant Pressure Garment Therapy (PGT) following surgery.

Preventive use of PICO◊ sNPWT in a patient undergoing radical nephrectomy

Dr Fernando Vázquez - *Department of Urology, Virgen de las Nieves Hospital (Granada - Spain)*

Introduction

Radical nephrectomy is a surgical treatment for suspected cancer option. Open radical nephrectomy, which requires subcostal laparotomy via the anterior approach, is the treatment of choice for vena cava thrombosis in renal cancer. The procedure has a long recovery time, with a risk of post-surgical pain or complications.*

Patient

The patient was a 71-year-old woman referred from another hospital with a large tumour occupying the entire right kidney and renal vein thrombosis ascending into the vena cava to the supra-hepatic veins, all diagnosed because of blood in the urine.

Treatment

She underwent right radical nephrectomy + vena cava thrombectomy + retroperitoneal lymphadenectomy via the anterior approach with a bilateral Chevron incision. To reduce the risk of surgical site complications, PICO single use negative pressure therapy was applied in the operating theatre after closure of the surgical incision. The PICO sNPWT dressing was to be left on for one week.

Follow-up/results

At the time of removal after 7 days,the dressing was slightly stained with serosanguinous fluid (Figure 1) and changed for a conventional dressing. The wound appeared to be healing well (Figure 2) and the patient was discharged 10 days after the procedure.

Follow-up 9 weeks after surgery found the wound to be healing well (Figures 3, 4).

Conclusions

This case report marks a before and after in the management of surgical wounds in patients with risk factors or after high-risk surgery. The preventive use of the PICO sNPWT led to rapid and complication-free wound healing, with the potential to reduce nursing time.

Figure 1
PICO dressing at 7 days

Figure 2
Follow-up at 7 days

Figure 3
Follow-up at 9 weeks

Figure 4
Follow-up at 9 weeks

*Authors' information not validated by Smith+Nephew.

PICO◊ sNPWT on a surgical incision line after revision total knee arthroplasty

Dr Thomas Goetzmann - *Clinique Louis Pasteur, Essey les Nancy (France)*

Patient

A 73 year-old female, the patient was unable to walk unaided.

Class 1 obesity.

History of total knee replacement (TKR) revision surgery due to infection; the patient had already received two TKRs.

- The patient was hospitalised for left total knee arthroplasty revision and put on antibiotics (Vancomycin™)

PICO sNPWT treatment methodology

- It was decided to apply the PICO sNPWT system in the operating theatre. The chosen PICO dressing size was 10cm x 40cm and the incision line measured 21cm L x 1cm W, with sutures present
- The surgeon decided to leave the PICO System in place for 6 days

Course of PICO sNPWT

The patient was hospitalised for 6 days before transfer to post-acute care and rehabilitation.

The patient's leg was not immobilised and she was able to wear her compression stocking, which is compatible with the PICO System. She was monitored regularly by the nursing team.

At D6, ~20% saturation of the dressing was observed. There was no sign of inflammation under the dressing. After a team discussion, a new PICO dressing (15cm x 30cm) was applied in order to avoid any risk of dehiscence in areas where the peri-wound skin was more fragile, which was distinguishable by a whitish discolouration. The surgeon decided to leave the PICO System in place for another 6 days.

Treatment outcome

The patient was seen again at D12. The PICO dressing showed 45% saturation, and the sutures at the ends of the incision line were removed. There was no sign of inflammation or dehiscence. The surgeon decided to continue PICO sNPWT for another 7 days, with the same dressing size (15cm x 30 cm).

PICO sNPWT was discontinued at D19. The dressing showed two stains, and all remaining sutures were removed. Antibiotic therapy was discontinued on the same day.

Note that the patient was able to receive physiotherapy throughout treatment with PICO sNPWT in order to regain the ability to walk unaided.

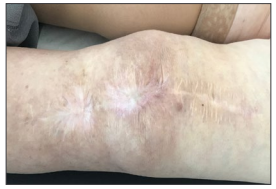
The total duration of treatment was 19 days. PICO sNPWT was then replaced by a hydrocellular dressing.

After completing the procedure and physiotherapy the patient was able to walk again.

The patient was pleased with the outcome and with the device, which helped prevent further complications and allowed her to resume physiotherapy sessions in order to regain mobility.

The surgeon was also pleased with the device.

Before surgery

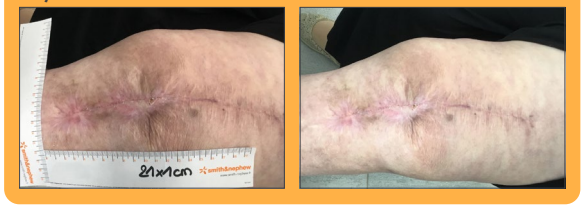


Day 6

Day 19

Day 12

Day 47



Note: The PICO sNPWT pump shown is no longer commercially available and has been superseded with PICO 7 sNPWT and PICO 14 sNPWT System.

Preventive use of PICO◊ sNPWT in amputation

Dr Mireia Sanz (Vascular Surgery), Dr Diego Sisa (Vascular Surgery), Mercè Centelles (Wound Care Nurse) - *Sant Joan de Martorell Hospital* (Barcelona - Spain)

Patient

- 58 year-old male patient
- Morbidly obese and diabetic with heart failure and renal insufficiency
- Sensorimotor polyneuropathy
- Long history of ulcers in both feet with superinfection

Treatment

- After several interventions involving attempts to dilate the posterior tibial artery and amputation of several toes, and given the worsening condition and poor prognosis, supracondylar amputation of the left leg was performed
- The stump was very thick and very swollen
- There were concerns that the surgical wound might open due to suture line tension

Follow-up/results

Two 10 x 30cm PICO dressings were used for 2 weeks, consolidating the suture perfectly without any complications.

Picture at application day

Picture at 7 days

Picture at 3 weeks

Using PICO◊ sNPWT on **open wounds** to help achieve wound healing or kick start stalled wounds

Resolution of abdominal dehiscence with PICO◊ sNPWT

Ms Emilia Mateo Marín (Nurse) - *Vall d'Hebron University Hospital (Barcelona - Spain)*

Introduction

Despite advances in preoperative care, surgical wound dehiscence remains one of the most serious complications faced by health professionals. There is a close relationship between patient risk factors and the likelihood of dehiscence, hence the importance of identifying patients with a high risk of surgical wound dehiscence in order to be able to provide treatment and avoid complications. These preventable surgical complications represent a huge emotional and financial cost for patients, health professionals and for the healthcare system.[1]

Patient

A 59-year-old woman who received surgery for an endometrial neoplasm 17 days earlier was referred by a gynaecological oncology outpatient clinic for review of abdominal suture dehiscence.

Treatment

Examination revealed suture dehiscence in the lower third of the abdominal surgical wound, with involvement of the subcutaneous tissue but not the fascia. There were no obvious signs of infection; it was therefore decided to use the single use NPWT system after cleaning the wound with biguanide/polyhexanide solution.

Follow-up/results

The dressing was changed twice in one week. During the first dressing change, it was necessary to reinforce the lower portion of the dressing, as it was positioned in a fold of the lower abdomen where moisture built up and caused it to detach. A strip of hydrocolloid adhesive was applied which proved effective, as evidenced at the next dressing change. After one week of NPWT, the wound was level with the skin so that the PICO dressing was replaced with a foam and silicone dressing for 15 more days, by the end of which the wound had healed completely.

Conclusions

In this case of surgical wound dehiscence, the use of the PICO sNPWT system allowed us to:

- Demonstrate the benefit of sNPWT in achieving rapid growth of granulation tissue
- It has the potential to:
  - Reduce the number of dressing changes
  - Reduce the length of hospital stay
  - Improve the patient's quality of life and their expectations
  - Demonstrate the cost-effectiveness of the combination of sNPWT and moist wound healing

Day 0
Start of PICO sNPWT treatment

Day 4
PICO dressing at 4 days of follow-up

Day 7
End of PICO sNPWT treatment

1. World Union of Wound Healing Societies (WUWHS) Consensus Document. Surgical wound dehiscence: improving prevention and outcomes. *Wounds International*, 2018.

Use of PICO◊ sNPWT in incisional hernia with infection

Dr Radu Scurtu - *CH Montbéliard [Montbeliard Hospital], (France)*

Wound deeper than 2cm

Patient

72-year-old male, the patient underwent left hemicolectomy by midline laparotomy with restoration of intestinal continuity, due to diverticulitis with abscess formation.

Treated for infection of the surgical wound after incisional hernia with musculoaponeurotic placement of a non-absorbable plate.

- Removal of the staples opposite the infected area was followed by dehiscence of the entire midline incision
- Treatment was initiated with the placement of a traditional negative pressure wound therapy system

PICO sNPWT treatment methodology and treatment outcome

- Placement of a traditional NPWT system. Highly exuding wound, about 300ml per day. Dressing changes every 72 hours
- 14 days later, the volume of wound exudate had fallen to 100ml per day, and the PICO dressing size was switched to 25 x 25cm
- The cavity was packed with foam, with dressing changes every 48 hours for the first week and then every 72 hours at the surgeon's request
- At D2, sutures were placed at both ends of the cavity.
- At D4, the wound was clean and granulating, with no sign of infection
- The size of the PICO dressing was changed to 15 x 30cm
- At D14, while the wound continued to produce exudate, the course of healing was favourable. PICO sNPWT was continued, but without packing the cavity
- PICO sNPWT was discontinued at D37 and switched to a dry dressing
- The patient maintained his independence throughout treatment and was very happy with the PICO device

tNPWT treatment

Day 0

(After 2 weeks, tNPWT changed to PICO sNPWT)

25 x 25cm dressing size

Day 2

Day 4

Day 14

Day 37

Note: The PICO sNPWT pump shown is no longer commercially available and has been superseded with PICO 7 sNPWT and PICO 14 sNPWT System.

PICO◊ dressing applied on right transmetatarsal amputation

Dr Olivier Szymoniak - Vascular and Thoracic Surgery, Polyclinique de Cholet - *Cholet Polyclinic (Cholet, France)*

Patient

A 68 year-old female.

Patient admitted to the hospital for right transmetatarsal amputation.

The patient had untreatable proximal interphalangeal joint osteoarthritis, for which all treatment options had been exhausted.

- Cirrhosis secondary to past chronic alcoholism
- Peripheral artery disease of the lower extremities
- Type 1 diabetes

PICO sNPWT treatment methodology

The post-operative course was rather satisfactory.

However, removal of the skin sutures to limit the risk of necrosis led to dehiscence of the surgical wound.

It was therefore decided to apply a PICO System with a 10 x 30cm dressing.

At the time, the wound measured 7cm L x 3cm W x 1.5cm D, with an approximate surface area of 21 cm².

Course of PICO sNPWT

Given the large amount of exudate on day 7 and the impossibility to apply a larger PICO dressing due to the location of the wound, it was decided to switch to a RENASYS◊ NPWT gauze dressing.

At this time, granulation was in progress and the wound was clean and healthy.

The NPWT dressing was changed every 72 hours after cleaning the wound with saline. Granulation tissue was gradually filling the wound cavity, which produced little wound exudate.

At D29 and after 3 weeks of RENASYS NPWT, it was decided to continue this healing process with the PICO System.

The PICO dressing was changed twice per week.

The PICO dressing managed the volume of exudate and preserved the peri-wound skin.

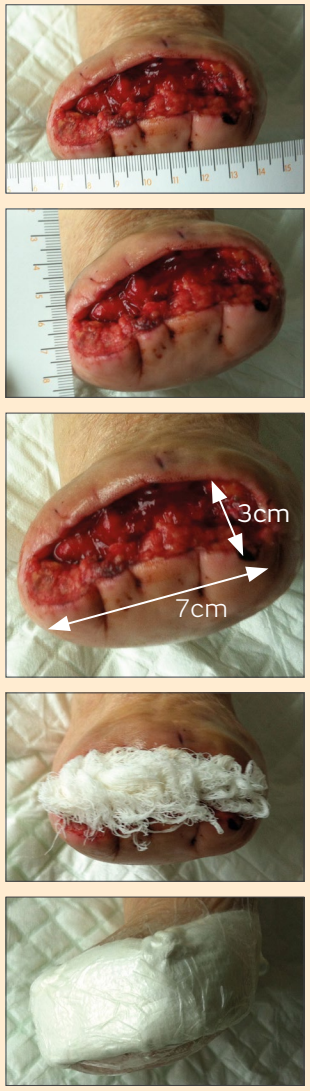
The healing process was found to be continuous, with complete filling of the cavity by D42.

Treatment outcome

Progress was fast, with the cavity filled and the wound fully healed by D52.

The placement and size of the PICO dressing allowed optimal compliance by a patient who regained her independence very quickly.

Day 0 with PICO sNPWT
Day 29 after intervention



Day 7 with PICO sNPWT

Day 14

Day 19

Day 24

Resolution of trauma surgery wound dehiscence with PICO◊ sNPWT

Dr Ricardo Rodríguez Arozena (Head of Department), Dr Javier Martínez Mesa (Trauma and Orthopaedic Surgery Assistant), Juan de Dios Belizón Sánchez (Nurse) -
Department of Traumatology, Torrelodones University Hospital (Madrid - Spain)

Patient

A 60 year-old woman with no remarkable medical history and not receiving any background medication. The patient had surgery for left ankle fracture.

Treatment

She developed a surgical site infection which required her to be readmitted twice. Due to the need to achieve rapid growth of granulation tissue to cover the exposed plate and the deficit it was decided to use the PICO single use NPWT system with weekly dressing changes.

Follow-up/results

As can be seen in the pictures, the wound healed quickly and well, so that the objectives set with the PICO sNPWT system were achieved in a timely manner. This treatment regimen was maintained for a total of 3 months with the same frequency of dressing changes, eventually finishing with conventional moist wound healing (MWH).

Conclusions

Surgical site complications remain a challenge for clinicians due to both the loss of patient quality of life and the cost in terms of human and economic resources. In this case, the single use NPWT system led to resolution of a tricky situation in which wound healing was complicated by dehiscence, which would have likely resulted in a second surgery, at the very least.

Day 0
Start of PICO sNPWT

Application of the PICO dressing

Follow-up at 45 days

Follow-up at three months of treatment with PICO sNPWT

Use of the PICO◊ sNPWT on a slow-healing arterial ulcer

Dr Cristina Feijoo Cano (Assistant) - *Vascular Surgery, Miguel Servet Hospital (Zaragoza - Spain)*

Introduction

The therapeutic approach thought to be the most effective in the management of lower limb ulcers is one that targets their cause and resolves it, either temporarily or definitively.

Patient

A patient with a history of childhood polio (at the age of 2 years), hypertension and receiving new generation anticoagulants. Due to the severe pain reported, the patient required daily intake of analgesics (magnesium metamizole) and used a transdermal analgesic patch which proved rather ineffective, making sleep very difficult. The patient had an ischaemic ulcer which had appeared over one year earlier after a traumatic injury.

Treatment

He also had two small ulcers in the anterior middle area of the left leg. Both ulcers showed 100% devitalized tissue in the wound bed and oedema at the wound edge. The perilesional skin was spared and there were no clinical signs of infection. Due to the pain, it was decided to perform mild mechanical debridement by abrasion before applying the PICO single use negative pressure wound therapy system (sNPWT) to help kick-start healing. Dressing changes were to be performed weekly.

Follow-up/results

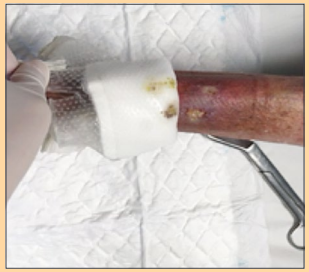
As seen in the pictures, very favourable wound healing was observed over the weeks that followed. The wound beds were free from devitalized tissue, with low exudate, no clinical signs of infection and uninvolved perilesional skin. Three weeks after starting PICO sNPWT and once treatment goals were met, it was decided to discontinue NPWT and switch to MWH until complete healing two weeks later.

Conclusions

This case report illustrates the importance of setting treatment goals with the PICO single use NPWT system to ensure appropriate and more cost-effective use. The patient said that the device felt very comfortable, which allowed him to carry out activities of daily living.

Day 0
Start of PICO sNPWT

Day 8
Follow-up at 7 days



Day 15
Follow-up at 2 weeks

Day 22
End of PICO sNPWT

PICO◊ sNPWT used on femoral dehiscence post by-pass surgery

Dr Arnaud Corbineau (Nurse and technical advisor) - *Cholet (49) Hospital at Home service (France)*

Patient

A 79-year-old male.

- Type 1 diabetes
- Hypertension
- Arteriopathy

Femoral popliteal bypass surgery.

Dehiscence 10 days after surgery.

PICO sNPWT treatment methodology

- Low exuding wound. 2cm cavity
- Decision to use the PICO sNPWT system

Course of PICO sNPWT

- Reduced cavity depth (0.5cm).
- Decision to discontinue PICO sNPWT and to carry on with an interface + CICAPLAIE◊ Dressing

Day 0

Day 7

Day 14

Use of PICO◊ system on an autologus micrograft

Dr Elena Conde Montero (Dermatology Specialist), Ms Soledad Guisado Muñoz - *Vicente Soldevilla Wound Clinic (Madrid - Spain)*

Patient

A 58 year-old man who had a motorbike accident 30 years ago. Shattered tibial condyle in the left leg with exposed bone and loss of muscle mass (gastrocnemius, tibialis anterior and soleus muscles). The patient reported sensory hypoaesthesia in the distal third.

The first examination found a circular wound measuring 2 x 2cm, with clean edges and exposed muscle in the wound bed, located in the distal area of the left Achilles tendon and which had appeared 8 months earlier.

Treatment

The wound was inspected at the first visit and covered with autologous micrografts mounted on a patch. PICO single use negative wound therapy was initiated for 1 week.

Follow-up

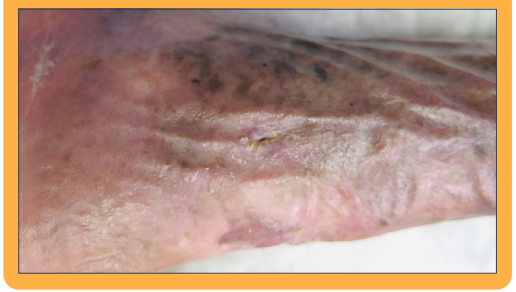
Follow-up one week after autologous micrografting in combination with negative pressure wound therapy (PICO).

No time point given by reporting clinician

No time point given by reporting clinician

One week follow-up

Follow-up 2 months after micrografting



Note: The PICO sNPWT pump shown is no longer commercially available and has been superseded with PICO 7 sNPWT and PICO 14 sNPWT System.

Use of PICO◊ sNPWT on complex soft tissue injuries

Sonia Almansa Saura (RN), Inmaculada Romero Sánchez (RN), Mónica Rodríguez Valiente (RN), Patricio Alcaraz Lorente (Specialist Physician), Teresa Soria Cogollos (Specialist Physician), Gregorio Castellanos Escrig (Head of Department) - *Diabetic Foot and Wound Healing Unit; Department of General and Surgery and Gastroenterology. Virgen Arrixaca Clinical University Hospital (Murcia - Spain)*

Patient

A 51-year-old man with no relevant medical history who suffered a traffic accident resulting in left ankle fracture and an open traumatic heel wound.

Treatment

He underwent an emergency trauma procedure with fracture repair by open reduction and internal fixation with osteosynthesis and percutaneous K-wire fixation of the distal phalanx. The heel wound was sutured and the foot placed in a plaster cast for immobilisation (Figure 1). After 15 days, the cast was removed, revealing extensive dry necrosis of the skin on the entire postero-lateral side of the ankle/heel with a small amount of exudate (Figure 2). The patient was referred to his local Health Centre for moist wound healing with collagenase.

Due to slow wound healing, on Day 39 he visited the Wound and Diabetic Foot Unit of Virgen de la Arrixaca Clinical University Hospital. Inspection of the wound revealed significant soft tissue loss with signs of local inflammatory, oedema, exudate, sloughing and dermal necrosis (Figure 3). The wound exudate was cultured, resulting in the isolation of Klebsiella oxytoca and Enterobacter cloacae, both of which were sensitive to ciprofloxacin which was prescribed at a dose of 600mg every 12 hours (Table 1). Extensive exeresis and debridement of the devitalized tissues was performed (Figure 4) with collagenase wound dressings every 48 hours.

After one week, granulation tissue had developed in the wound (Figure 5) and the wound bed was covered with ACTICOAT◊ FLEX 3 Antimicrobial Barrier Dressing (Figure 6).* To achieve granulation of the wound bed, a PICO single use NPWT device (-80 mm Hg) was used with a 15 x 30cm dressing sealed on all sides (Figure 7).

To allow the patient to walk while relieving pressure on the affected area, the patient was fitted with an open-heel Optima walking boot (Figure 8).

Results

Granulation tissue formation and wound contraction observed after 14 days of use of the PICO System (Figure 9, Graphic 1).

At 21 days, complete granulation of the soft tissue deficit was observed, so that the single use NPWT system was removed. The wound was then epithelialised using cell therapy, by weekly placement of an amniotic membrane (AM) in contact with the granulated wound bed for 14 weeks (Figure 10) until complete epithelisation was achieved (Figures 11-12).

The patient attended ankle rehabilitation sessions throughout the wound healing process and recovered full function.

Conclusions

The use of the PICO single use NPWT system in our department allowed to achieve full granulation of this complex soft tissue wound. It also prepared the wound bed for epithelisation using cell therapy.

Table 1

	Day 4	Day 11	Day 46	Day 56
Klebsiella oxytoca (Ampicillin resistant)	■	■	■	■
Enterobacter cloacae complex: (treatment with 3rd generation cephalosporins - resistant to beta-lactam antibiotics)			■	■
Enterococcus faecalis (Cefuroxime-resistant)	■	■	■	■

*The ACTICOAT FLEX range may be used in combination with PICO sNPWT for up to 3 days.

Figure 1
Post surgery
Start

Figure 2
15 days post surgery

Figure 3
39 days post surgery

Figure 4

Figure 5
Day 0 PICO therapy

Figure 6

Figure 7

Figure 8

Figure 9
Day 14 PICO therapy

Figure 10
Week 14 post surgery

Figure 11
Week 25 post surgery

Figure 12

PICO◊ sNPWT applied on a dehiscence post-hernia

Ms Gaillard (Pharmacist), Ms Raphanel (Lead RN for wound care and healing), Mr. N'Tirandekura (Gastrointestinal Surgeon) - *Pôle de santé du Villeneuvois, [Villeneuve Regional Hospital] (France)*

Wound deeper than 2cm

Patient

A 92 year-old male hospitalised on 3 July 2017 due to wound dehiscence post hernia repair.

Blindness, the patient was not undernourished and was keen to go home as soon as possible, where he lives with his wife.

The patient was admitted to the Pôle de Santé du Villeneuvois for surgical wound dehiscence repair by Mr N'Tirandekura.

- Subcutaneous puncture performed once a week post-intervention
- One-centimetre incision made near the surgical wound for drainage of subcutaneous fluid collection after surgery with placement of a PICO Multisite 20 x 25cm sNPWT
- Cavity packed with packing gauze

PICO sNPWT treatment methodology

- The post-operative follow-up was rather satisfactory considering the age of the patient. However, due to wound exudate, it was decided to apply a 25 x 25cm PICO dressing on 7 July 2017
- At the time, the wound was 5.7cm L x 2cm W x 4.7cm D, with a tunnel measuring 0.3cm in diameter and 6.1 cm deep
- This represents an approximate area of 11.4cm² and 53.58cm³

Course of treatment

- Cleansing of wound edges with soap and water
- Cleansing of the wound with saline
- Wound cavity packed with Kerlix packing gauze

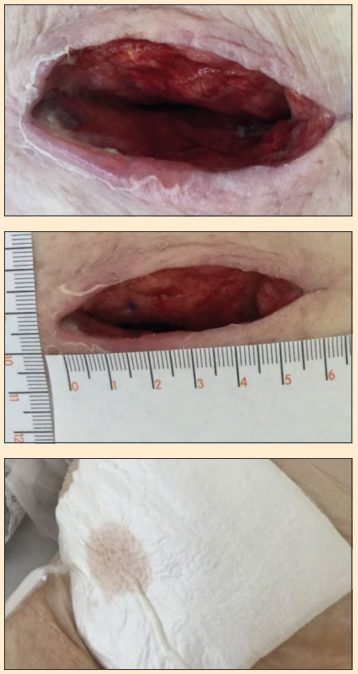
Course of treatment outcome with the PICO System

At D0, the wound showed no sign of infection and no fibrin, and the patient was not in any pain.

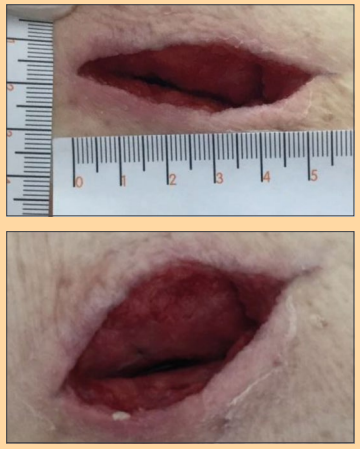
It was decided to change the PICO dressing on Fridays and Tuesdays, i.e. twice per week in order to comply with the instructions for proper use. Granulation of the moderately exuding wound continued throughout treatment, gradually and rapidly filling the cavity despite the patient's elderly age.

This patient was followed-up for a study for COMEDIMS [Commission for Medicines and Sterile Medical Devices] in order to determine whether the PICO System should be added to the hospital formulary; therefore, all the data were presented in table.

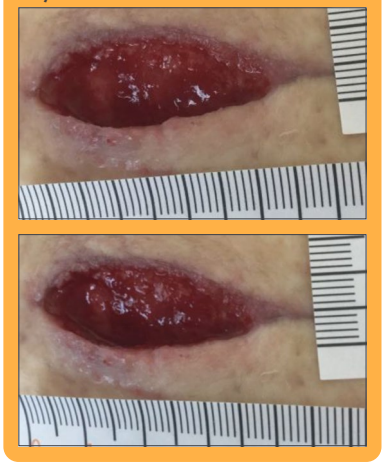
Day 0



Day 5



Day 18



Day 10

Day 25

Table. Evolution of wound

	Lenght (cm)	Width (cm)	Depth of the cavity (cm)	Wound surface area (cm²)	Wound cavity volume (cm³)
Day 0	5.7	2.0	4.7	11.4	53.58
Day 10	4.5	1.5	3.0	6.75	20.25
Day 18	3.7	1.0	1.3	3.70	4.44
Day 25	3.0	0.5	0.5	1.50	0.75
Day 28	2.5	0.5	Epidermisation phase, PICO sNPWT therefore discontinued	1.25	Not mesurable
Difference in 28 days	**3.2**	**1.5**	**4.7**	**10.15**	**53.58**

- Wound that progressed toward healing very favourably with PICO System
- A 4.7cm deep cavitary wound which progressed to the epidermisatipon phase in 28 days
- The patient experienced no pain during the healing process and wound care took 10-20 minutes twice a week

PICO◊ sNPWT used on a wound burrowing into scarpa's fascia secondary to dehiscence of post-thromboembolectomy sutures

Dr Amer Hamadé - *Mulhouse and South Alsace Hospital Group - (HAD Mulhouse) (France)*

Wound deeper than 2cm

Patient

The patient is 81 years old female and lives independently at home, alone.

She had undergone thromboembolectomy one month earlier via the right common femoral artery for acute ischaemia of the right lower limb due to an embolism secondary to atrial fibrillation. Complication of the surgical wound initially took the shape of local cellulitis near the stitches, which was treated with antibiotics (Augmentin™ and Ofloxacin™ for two weeks: CRP 25mg/l vs. 150mg/l).

- Hypertension
- Moderate obesity
- Type 2 diabetes mellitus

PICO sNPWT treatment methodology

In light of the complex and cavitary wound secondary to femoral access, the physician decided to apply a PICO System for controlled wound healing coupled with good wound debridement.

The wound was cleaned with saline, with debridement of fibrinous areas at each dressing change. At the physician's request, the wound cavity was packed with calcium alginate.

A 25 x 25cm PICO dressing was selected for its high absorption capacity, to be changed twice per week. Treatment was started in the hospital and continued as at-home hospital care.

At the time, the wound measured 7cm L x 3cm W x 4cm D.

Course of treatment

By D7, the wound had improved both in terms of its appearance, which was less fibrinous, and in terms of its size, now measuring 7cm L x 2cm W x 3cm D. The PICO dressing perfectly controlled the volume of exudate.

It was painless and preserved the peri-wound skin.

At D21, the wound was less exudative and the dressing was replaced by a 15 x 20cm PICO MultiSite Dressing. The wound was healing well, now measuring 6cm L x 1cm W x 1.2cm D. Packing of the wound cavity was no longer required.

Treatment outcome

The healing process was found to be continuous, with complete filling of the cavity by D35. Wound measuring: 4cm L x 0.5cm W.

PICO sNPWT was then replaced by a hydrocellular dressing. The patient had been very anxious and fatigued since her surgery one month earlier. The wound was highly exudative, requiring twice daily visits from a nurse and regular changes of clothing. The PICO dressing, which was leak proof and changed only twice per week, proved reassuring. The use of the PICO System has shown the potential for medical and economic benefits compared to traditional wound care: fewer health professionals needed and fewer changes required than for conventional dressings.

Day 0

Day 2

Day 7

Day 21

Day 35

Note: The PICO sNPWT pump shown is no longer commercially available and has been superseded with PICO 7 sNPWT and PICO 14 sNPWT System.

PICO◊ sNPWT kick start on a diabetic foot ulceration

Sue Meyrick (Clinical Specialist Podiatrist) - *Congleton War Memorial Hospital, UK - 2016*

Introduction

The patient injured his right 5th metatarsal by standing on a nail, the wound failed to heal resulting in amputation of the fifth toe.

Two months after the amputation, the patient was referred to a Specialist Wound Care Podiatrist as the amputation site was not healing and needed daily dressing changes due to heavy exudate levels and malodour. Previous management included alternative anti-microbial dressing where he attended the medical centre three times a week for dressing changes. Often the dressings would require to be changed in between appointments due to the strong odour and leakage of exudate.

The patient had been pre-warned that if the wound did not respond he would need further amputation, as a result he became quite depressed with the lack of progress. His social life suffered as he felt unable to go out due to the malodour and pain when mobilising his foot.

After a joint assessment with the Podiatrist and Tissue Viability Nurse it was decided to use PICO on the wound in an attempt to help kick-start the healing process.

Patient

A 60-year-old gentleman suffering with insulin dependent diabetes; a high BMI of 39.9; peripheral vascular disease and stage 4 chronic kidney disease.

Treatment

The patient was very detached, frustrated and non-communicative as he was in disbelief that anything would help his wound to heal.

Initial wound assessment: 4x1.5cm; wound bed – 100% adherent slough; wound edges – uneven and macerated; exudate levels – heavy and malodorous; condition of peri-ulcer skin – macerated, inflamed, dry and flaky which extended to the dorsum of the foot.

The patient found PICO sNPWT comfortable whilst in situ and was delighted to see an improvement in the wound at the first dressing change.

Wound measurements reduced to 3.2x0.9cm; Exudate remained purulent and the wound bed sloughy, so it was decided to use ACTICOAT◊ FLEX 3 dressing beneath the PICO dressing to reduce the bacterial burden and manage the odour.

Follow-up/results

After seven days of using PICO sNPWT (including three days of using ACTICOAT FLEX 3 Antimicrobial Barrier Dressings),* the wound was less odorous and the exudate level reduced.

- The wound now measured 2.5x0.6cm
- The patient was noticeably brighter and optimistic

The wound bed was now 100% granulation tissue, with some epithelialisation. Surrounding skin was less inflamed and exudate levels continued to reduce. PICO sNPWT and ACTICOAT FLEX 3 Dressings re-applied.

- Wound measurements of 2.4 x 0.2cm with a depth of 0.3cm
- There was no exudate and no odour

The patient was happy, positive and engaging in conversation in comparison to day one where he would not verbally engage or make eye contact with the podiatrist whilst the wound was treated.

Figure 1, day 0
Wound prior PICO sNPWT application

Figure 2, day 4
First dressing change

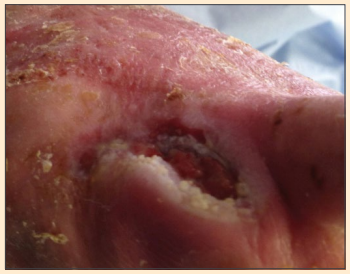


Figure 4, day 11
Third dressing change

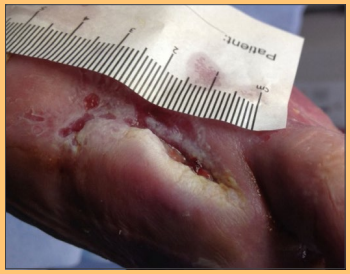


Figure 6
Healed at 18 weeks

Figure 3, day 7
Second dressing change and device change

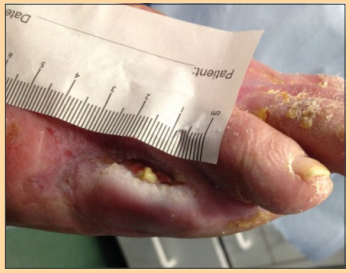
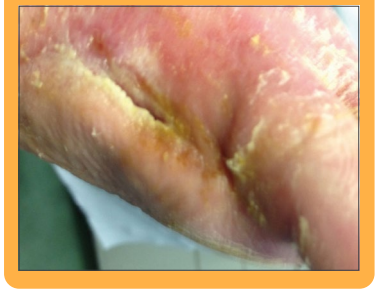


Figure 5
PICO sNPWT discontinued after 18 days of therapy



*The ACTICOAT FLEX range may be used in combination with PICO sNPWT for up to 3 days.

Use of PICO◊ sNPWT on a diabetic foot ulceration

Andrew Sharpe (Advanced podiatrist in wound care) - *Southport and Ormskirk NHS Trust UK*

Introduction

Six weeks after presentation, due to the chronicity of ulceration, The patient's history of amputation, increasing volumes of exudate and failure of previous interventions to progess the wound to healing, it was decided to use the PICO System to kick-start the healing process and move the wound from its current chronic state to a dynamic healing state.

Patient

The patient was 58 years old with a history of type 2 diabetes and known peripheral arterial disease (PAD). His right first toe had been amputated in 2012.

He presented on 4 February 2015 at the author's clinic with a diabetic foot ulcer that he had been self-managing for three weeks. At this stage, the ulcer was 3x2.2cm (6.6cm^2) and approximately 0.4cm deep (with no known osteomyelitis).

Following debridement, it comprised 30% granulation and 70% sloughy tissue. A high-moderate volume of exudate was present (Figure 1).

Previous treatments included antimicrobial and absorbent dressings to manage the exudate, which were changed three times a week (once by the podiatry service at his weekly visit and twice at home by his wife, who was a qualified nurse, due to the exudate volume and smell). The wound was significantly impacting on the patient's lifestyle, due to the volume of exudate and odour, and the fact that he was unable to wear normal footwear.

Treatment

While there was a problem in securing the seal at the start of PICO therapy, this was quickly overcome with the extra tape provided in the pack. After further discussion about how the system can sometimes buzz during normal use, the patient's initial apprehensions were allayed and he was confident with the system. He was happier that the dressing was less bulky and he could wear his own shoes, enabling him to go out and socialise.

Follow-up/results

At the first dressing change after using PICO sNPWT for four days (Figure 2), the wound had reduced in size to 3x1.7cm (5.1cm^2) - a reduction of 5mm within four days. A further redution was seen at day seven (Figure 3), with the wound measuring 2.7 x 1.7cm (4.59cm^2). Although at the next dressing change (10 days after starting treatment), the wound's dimensions remained the same, there was an improvement in the tissue types present in the wound bed - 70% granulation and 30% sloughy tissue. By day 21, epithelialisation was occurring at the wound edge and the sloughy tissue was lighter and easier to clear away (Figure 4).

Throughout the four-week treatment period, the wound consistently improved and measured 2 x 1.7cm (3.4cm^2) at day 28 (Figure 5).

After just four weeks of treatment with PICO sNPWT, the ulcer site and wound bed improved and, indeed, continued to do so thereafter (Figure 6).

Figure 1, day 0
Wound prior PICO sNPWT application
Wound measured 3x2.2cm

Figure 2, day 4
First dressing change

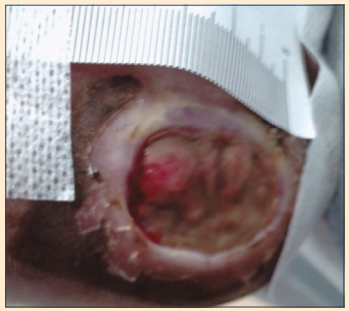


Figure 3, day 7
Wound measured 2.7x1.7cm

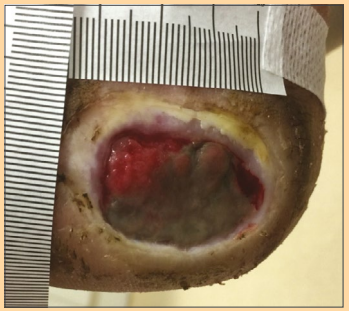


Figure 4, day 21
Wound measured 2.4x2cm

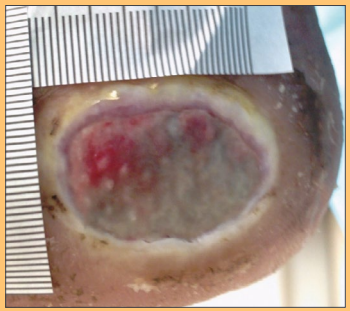


Figure 5, day 28
Wound measured 2x1.7cm

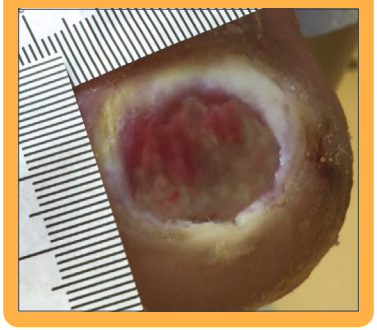
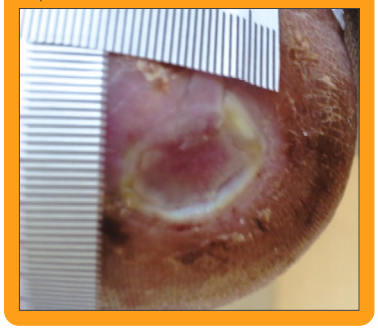


Figure 6, day 56
Improvement still seen



PICO◊ sNPWT following surgical debridement of a diabetic foot ulcer

Samantha Haycocks (Advanced Podiatrist), Heather Schofield (Advanced Podiatrist), Paul Chadwick (Principal Podiatrist) - *Salford Royal Foundation Trust, Podiatry and Foot Health, Salford Royal Hospital, Stott Lane, Salford UK*

Introduction

A diabetic (Type 1) male in his late forties sustained an injury when a horse stood on his foot. There were a number of fractures and a large area of necrosis on the dorsum of the foot. Initially the wound was managed conservatively with dressings.

Following discharge the patient's foot became infected and debridement surgery was performed.

Patient

Diabetic (Type 1) male in his late forties.

Treatment

8 days post operatively, PICO sNPWT was applied to assist in granulating the wound bed and managing the moderate exudate from the wound. Over the next 12 days the wound decreased in size and granulation tissue was noted to be flush with the surrounding skin.

Follow-up/results

Advanced wound healing dressings were then used until wound closure was achieved.

The patient found the dressing comfortable and the system easy to operate. The clinicians involved also found the PICO System simple to use and easy to apply.

Figure 1
Wound post-surgical debridement

Figure 2
Day 0
Wound at commencement of PICO sNPWT

Figure 3
*PICO Dressing in-situ post-application.**

Figure 4
Day 2
PICO Dressing prior to dressing change after 2 days

Figure 5
Day 5
Wound following 5 days of PICO therapy

Figure 6
Day 12
Wound following 12 days of PICO therapy

Figure 7
Day 21
Wound continuing to progress towards healing

Figure 8
Week 12
Wound completely healed

Note: The PICO sNPWT pump shown is no longer commercially available and has been superseded with PICO 7 sNPWT and PICO 14 sNPWT System.

*This case study was done with PICO hard port. This product is no longer available in the UK. This product was replaced by PICO soft port.

Use of PICO◊ 7 sNPWT in the community – A hospital in the home patient

Jennifer Garrett - *Wound Care Clinical Nurse (Australia)*

Introduction

NPWT has not been utilised as much in the community for 'Hospital in the Home (HITH)' patients as it has been in the acute setting. An increasing number of patients have been identified who do not need acute care, but may be suitable for sNPWT. A simpler, more convenient device was required, which was easy to use for the community staff who were undertaking the dressing changes. PICO 7 sNPWT was utilised in this instance.

Patient

- An 83-year-old male with left sided hemiplegia for approximately 20 years sustained a large laceration to his left forearm following a fall whilst in his home

Wound history and previous treatment

- Wound washed out and sutured at a regional hospital with the doctor noting considerable dead space in the forearm and a large haematoma. The arm was placed in a pressure dressing. 2 days after admission patient's haemaglobin dropped to 88 g/l so transfusion of 1 unit of packed red blood cells was administered
- Patient's haemaglobin rose to 101 g/l. 20ml of altered blood aspirated from the wound and patients arm placed in a pressure dressing and discharged home
- Patient admitted to hospital for possible left forearm wound infection and wound care. Oral antibiotics Cephalexin 500mg commenced 6 hourly. Wound swabbing indicated heavy growth of Pseudomonas aeruginosa and a light growth of Peptostreptococcus species. Since arrival at hospital wound dressing included an application of gauze soaked with PHMB surfactant wound irrigation solution for 10-15min, application of PHMB wound gel and simple non-adhesive dressings for exudate management
- BACTIGRAS◊ (chlorhexidine-impregnated paraffin gauze) added to treatment regime, and patient referred to Wound Specialist Service
- A substantial amount of sanguineous exudate was flowing from the wound – this was a devolving haematoma. The flap had become necrotic so conservative sharp wound debridement was conducted. Following debridement, blood clots and further necrotic tissue underneath the flap was revealed. The wound extended in all directions for approximately 3cm of undermining. Bone could not be felt within the wound bed
- A plastic surgeon review was arranged following wound debridement. Gauze dressings soaked with PHMB irrigation wound solution were applied daily to help facilitate cleaning of the clots, necrotic tissue and try to further reduce the bioburden
- The plastic surgeon reviewed patient and requested twice-daily PHMB soaked gauze dressings to further clean up the wound and comprehensive work up for a possible skin graft. Patient was also commenced on Ciprofloxacin 500mg BD. An incidental finding of a false aneurysm was noted on his brachial artery of approximately 21mm x 13mm and review by a Vascular Surgeon conducted. Along with the brachial artery false aneurysm there was a possible further haematoma of 14cm x 1.4cm x 5.9cm in the soft tissue of his left upper medial arm
- During review it was noted significant wound healing had occurred. It was determined NPWT could be a treatment option should the wound not be suitable for grafting
- The decision was taken to cancel the surgery due to the false aneurysm. As per the plastic surgeons orders twice daily PHMB wound irrigation solution soaked gauze dressings continued until next review

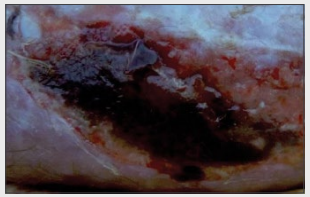
PICO 7 sNPWT treatment

- Patients wound was approximately 1cm at the deepest point with no significant undermining. Decision taken to use NPWT however due to his left sided deficiency the patient required a portable, lightweight, easily managed device. As there was also no acute reason for patient to remain in hospital, PICO 7 sNPWT was chosen as this would enable him to be transferred to a respite centre closer to his home and twice-weekly dressing changes undertaken in the community
- Patient transferred to the respite centre under the 'Hospital in the Home' program and the dressing change completed with respite centre staff in attendance to train them in PICO dressing application
- PICO 7 sNPWT removed and a silicone wound dressing placed on the wound. Patient attended the wound specialist service and presented with a healed wound
- In total four PICO 7 systems were used which included 8 dressings

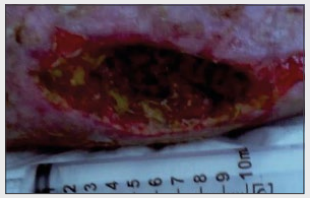
Treatment outcome and results

- From a necrotic flap with significant dissolved haematoma, complete repethelisiation occurred in 2 months, with the use of a PICO 7 sNPWT for 4 weeks.
- The wound area reduced from 5.25cm² to 1.86cm², wound depth by 1.5cm and undermining from approximately 3cm to no undermining over the 4 weeks with the use of PICO 7 sNPWT
- Decision to use PICO 7 sNPWT supported the patient's earlier discharge from the acute care setting to a respite centre under the Hospital in the Home program, with dressing changes completed twice weekly in the centre
- PICO 7 sNPWT did not impede his activity of daily living and he undertook a day's leave from the centre on Christmas day to be with his family

14 days after accident



19 days after accident



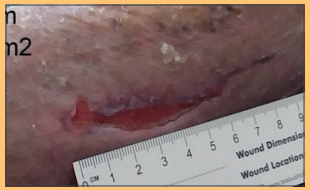
24 days after accident

Day 1 with PICO sNPWT

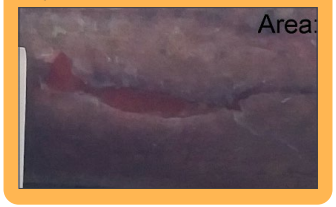
Day 4 with PICO sNPWT

Day 8 with PICO sNPWT

Day 11 with PICO sNPWT

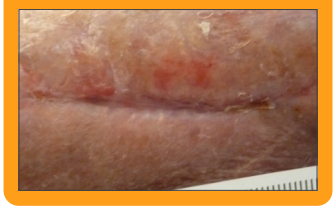


Day 15 with PICO sNPWT



Day 26 with PICO sNPWT

Healed wound



Use of PICO◊ sNPWT on a hard to heal ulcer

María José Cros Carulla (Nurse) - *Vascular Surgery, Santa Creu i Sant Pau Hospital (Barcelona - Spain)*

Patient

A 71-year-old woman with the following underlying diseases: Diabetes, hypertension and ischaemic cardiopathy. She was admitted to A&E for a necrotic ulcer on the outer side of the left heel caused by a nail puncture wound sustained 6 days earlier.

Treatment

Examination revealed significant perilesional cellulitis with lower extremity oedema with a VAS pain score of 8/10 and bad odour in the context of stage 4 peripheral artery disease of the left lower extremity; the femoral pulse was palpable, but the popliteal and distal pulses were not. Left superficial femoral angioplasty was performed along with cleaning of the left heel wound.

The following organisms were isolated from wound culture:

1. *Staphylococci coagulase-negative*
2. *Escherichia coli*
3. *Enterobacter*
4. Bacteroides

It was therefore decided to start IV antibiotic therapy followed by oral antibiotics after discharge. Treatment with the PICO single use NPWT system was initiated with once weekly dressing changes.

Follow-up/results

As can be seen in the images, the deficit was gradually filled by granulation tissue, helping to achieve a flat ulcer. The team decided to switch to moist wound healing (MWH) until wound healing was complete, with twice-weekly dressing changes.

Conclusions

The use of the PICO single use NPWT system on ulcers expected to be persistent allowed healing to be achieved in a timely manner. The design of the device allows outpatient treatment and has the potential to reduce costs.

Start of PICO sNPWT

PICO dressing with foam filler

Follow-up at 40 days

End of PICO sNPWT

PICO◊ sNPWT on an infant with an extravasion injury

Gemma Pérez (Nurse) - *Sant Joan de Déu Hospital (Barcelona - Spain)*

Introduction

Extravasation injuries (EXINJ) are defined as tissue damage due to perivascular efflux of a vesicant solution which can progress to necrosis. In paediatrics, the incidence of EXINJ unrelated to chemotherapy ranges from 11% to 58%. Nursing care of EXINJ is aimed at optimising early resolution,1 reducing complications and improving the quality of life of patients. The severity of necrosis depends on the duration of extravasation and on the volume and type of vesicant solution. This is due to the vesicant exerts toxic effects on the tissues exposed whilst the solution is active. Advanced care of EXINJ with negative pressure wound therapy (NPWT) and moist wound healing (MWH) products is an option that allows to optimise treatment, shorten the clinical course and decrease the potential for complications or sequelae compared to traditional wound dressings.*

Patient

A three-month old baby girl with oesophageal atresia admitted to a paediatric intensive care unit (PICU) due to respiratory difficulties, requiring NPO, ventilatory support and fluid replacement therapy administered via a peripheral vein. After 12 hours of fluid therapy, the right upper extremity was found to be very swollen, hard and pale. The line was checked for leaks, and after confirming that there were none, the infusion was stopped and the catheter removed. The back of the hand showed necrosis the depth of which could not yet be determined.

Treatment

As an initial treatment option, it was decided to reduce the swelling with compresses of Burow's solution and elevation of the limb. Daily enzymatic debridement of the necrotic area was then initiated in combination with sharp debridement in subsequent sessions, and using a polymer foam as a secondary dressing. On the third day, it was decided to consult a traumatologist to rule out the possibility of tendon involvement. Once tendon necrosis was ruled out and during ongoing debridement of the wound, it was decided to start treatment with PICO sNPWT to stimulate mechanical debridement, the formation of granulation tissue, wound shrinkage and scarring.

Follow-up/results

As can be seen in the picture sequence, satisfactory wound healing was achieved in 42 days, after 13 dressing treatments (2 PICO and 11 ALLEVYN◊ Dressing).

Conclusions

The treatment regime used allowed to optimize nursing care with a fully satisfactory outcome in a situation that could had been a long evolution with the need for complex treatments with the use of accessible wound healing therapies.

In this pediatric lactating patient PICO sNPWT was well tolerated and was an effective choice for advanced wound bed preparation.

Extravasation injury

Start of PICO sNPWT

Application of PICO sNPWT

Follow-up after 2 weeks with PICO sNPWT

Switch to MWH (moist wound healing)

Follow-up after 2 weeks of MWH (moist wound healing)

Healing and end of treatment

Products	Time needed for wound healing	Average dressing wear time
Initial treatment: PICO sNPWT	14 days, 2 dressings	7 days
Current treatment: ALLEVYN GENTLE BORDER	28 days, 11 deressings	3 days

*Authors' information not validated by Smith+Nephew.

PICO◊ System applied on a laparotomy dehiscence

Dr Radu Scurtu - *CH Montbéliard - Montbeliard Hospital, (Montbeliard, France)*

Patient

A 70 year-old female.

History: pneumoperitoneum secondary to perforation of a tumour at the rectosigmoid junction; laparostomy and stoma present after surgery. Impaired general condition with weight loss of 10kg in less than 6 months and dehydration.

- Treatment started with traditional negative pressure wound therapy for 57 days to better suction off the wound contents and facilitate healing
- Slow but favourable course. The patient was on antibiotics due to multiple episodes of septic shock during hospitalisation
- PICO sNPWT 15 x 30cm applied after skin graft, shallow wound with dehiscence but little exudate
- The wound cavity was covered with an interface

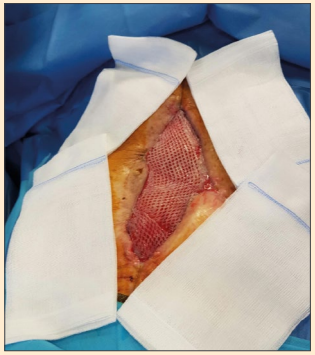
PICO sNPWT methodology and treatment outcome

- Treatment was initiated with traditional NPWT
- A 15 x 30cm PICO Dressing was applied after the skin graft to support graft acceptance, with the interface in the wound bed. The dressing was changed every 72 hours
- PICO sNPWT was discontinued at D6. There was no sign of infection, and PICO sNPWT was replaced by a traditional dressing
- The patient was then transferred to post acute care and rehabilitation. She reported having found the device comfortable and convenient to wear on a daily basis, as well as discreet

Before PICO sNPWT

Day 0

Skin graft



15 x 30cm dressing size

Interface and gel patch

Day 3

Day 6

PICO sNPWT stops

Note: The PICO sNPWT pump shown is no longer commercially available and has been superseded with PICO 7 sNPWT and PICO 14 sNPWT System.

PICO◊ sNPWT use after peritonitis

Dr Madih - *Clinique de la MIOTTE [La Miotte Hospital], (Belfort, France)*

Wound deeper than 2cm

Patient

A 19 year-old female.

Peritonitis after a road accident

The patient was treated for abdominal surgical wound dehiscence secondary to an infection of the incision.

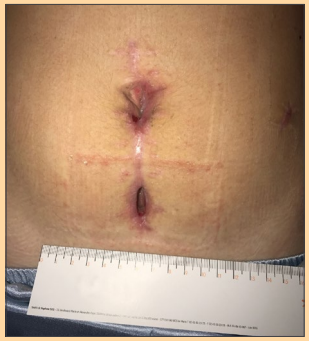
- Healing was slow and difficult, so that it was decided to apply a PICO System
- Connected tunnelling wounds, one 7cm in length and 1cm deep, and the one below measuring 2cm wide x 1cm long

PICO sNPWT methodology and treatment outcome

- A 15 x 30cm PICO dressing was applied at D0, with dressing changes every 48 hours for the first week and every 72 hours thereafter, at the request of the surgeon
- Wicking of the wound cavity using filling gauze
- Hospital at Home care
- The device was chosen due to its ability to provide negative pressure
- At D5, little saturation of the PICO Dressing, placement of a smaller PICO (15 x 20cm)
- By D32, the wounds were no longer connected and the upper one had closed*
- PICO sNPWT was discontinued at D42. The remaining wound was 0.4cm deep and measured 1cm in diameter. Wound care was continued with a calcium alginate and an ALLEVYN◊ GENTLE BORDER Dressing
- 14 days after discontinuation of PICO sNPWT, the wound was fully healed

Day 0

Day 8



Day 42

Day 56

Note: The PICO sNPWT pump shown is no longer commercially available and has been superseded with PICO 7 sNPWT and PICO 14 sNPWT System.

*PICO sNPWT is contraindicated for non-enteric and unexplored fistulas.

PICO◊ sNPWT applied on malleolar ulcer

Dr Eric Placidi - *Polyclinique Les Fleurs Ollioules (France)*

Patient

A 86 year-old female.

Patient living in a nursing home and receiving hospital- at-home treatment for a stage IV left external malleolar ulcer with tendinous (necrosis) and osseous involvement (splinter).

- Hypertension
- Bladder cancer
- Stroke with right hemiparesis
- Hyperlipidaemia
- Hydrocephalus

Wound history

Wound caused by the patient's footwear 3 weeks earlier and maintained by leftward malposition of the lower limbs.

Patient seen in consultation with Dr Placidi, who performed wider debridement of necrotic tissue and decided to apply a PICO System in order to optimise debridement and stimulate the wound healing process.

PICO sNPWT treatment methodology

- Cleansing of the wound with saline
- The wound measured 4.5cm W x 5cm L x 0.5cm D
- The chosen PICO dressing size was 15 x 30cm due to the volume of exudate present. A wound contact layer type interface was used to protect the bone and tendon from the negative pressure. The dressing was changed every 3 days

Course of treatment

The chosen size of the PICO dressing allowed effective management of the volume of exudate; the dressing was changed twice per week.

The patient's footwear was replaced by a sock, and no weight-bearing on the malleolus allowed the PICO System to accelerate the wound healing process.

Treatment outcome

The patient responded very well to negative pressure wound therapy, and granulation tissue rapidly filled the wound cavity, covering both bone and tendon.

It took only 3 weeks to reach the epidermisation stage. PICO System was then replaced by a hydrocellular dressing.

Note: The PICO sNPWT pump shown is no longer commercially available and has been superseded with PICO 7 sNPWT and PICO 14 sNPWT System.

Use of PICO◊ sNPWT in a patient with a mangled limb

Mr Francesc Zamora Carmona (Trauma and Orthopaedic Nurse, Outpatient Department), Ms Helena Costa Ventura (Head of Outpatient Department), Dr Mònica Salomó Domènech (Trauma and Orthopaedic Assistant Physician) - *Outpatient Department, Trauma and Orthopaedic Surgery Outpatient, Sabadell Clinic Hospital (Sabadell - Spain)*

Introduction

Traffic accidents involve a substantial social and emotional impact as well as elevated financial costs.

Patient

A 56-year-old motorcyclist with a history of hypertension and prostate cancer.

Motorbike-lorry crash; mangled right lower leg (grade IIIC open fracture of the tibia and fibula).

Treatment

Due to the complexity of the fracture and complications, he underwent five surgeries over a period of 1 year and 4 months.

External fixator (EF) placement, anterior tibial artery to dorsalis pedis artery bypass, pretibial escharotomy, necrotic bone removal, cement spacer placement, left anterolateral thigh flap, new flap with free skin graft.

Dressing changes were performed both during hospitalisation and in trauma and orthopaedic outpatient clinics.

Follow-up/results

Patient with EF and substantial skin deficit. It was decided to treat the wound (Cuticerin gauze dressing and foam) with the RENASYS◊ NPWT system, and later the PICO sNPWT system; due to the difficulty in maintaining an airtight dressing seal, a malleable resin bar was used in the area of the EF pins.

Growth of granulation tissue and substantial epithelisation.

Removal of the cement spacer, osteotomy of the proximal tibia to lengthen and minimize shortening (transport). The patient had skin deficits and ulcers which were dressed with moist wound dressings. The patient received education about transport and psychological support throughout the process.

Conclusions

Complete epithelisation of the skin.

Sequelae due to ankle fixation in the equinus position with reduced mobility. The patient had to wear a platform orthopaedic shoe and walk with a cane. He was unable to work and continued to require counselling.

RENASYS◊

PICO

Note: Application under HCP instructions. Please refer to IFU

Use of PICO◊ sNPWT in a post-op mastectomy

Dr Francine Achatz Hestin - *GHR Mulhose [Mulhose Regional Hospital], (Mulhose, France)*

Patient

A 50-year-old female who had a right mastectomy and axillary dissection

12cm right breast tumour shrunk to 5cm as a result of chemotherapy.

- Subcutaneous puncture performed once a week post-intervention
- One-centimetre incision made near the surgical wound for drainage of subcutaneous fluid collection after surgery with placement of a PICO large Multisite 20 x 25cm sNPWT System
- Cavity packed with packing gauze

PICO sNPWT methodology and treatment outcome

- PICO Multisite Dressing 20 x 25cm placed at D0; gauze placed in the cavity, dressing changes every 72 hours
- Hospital at Home care
- The device was chosen due to its ability to provide negative pressure
- At D7, the size of the PICO dressing was reduced to 15 x 30cm following a decrease in the fluid collection
- At D11, the wound was healing nicely, with substantially less saturation of the PICO dressing
- At D21, the wound was barely producing exudate, and the size of the PICO dressing was reduced to 10 x 20cm. Though still present, the cavity was shallower and the wound showed no sign of infection
- PICO sNPWT was discontinued at D38. The wound was no longer tunnelled and no longer produced exudate. Hydrocellular dressing applied
- One week after discontinuation of PICO sNPWT, the wound was fully healed, no longer exudative and was left uncovered
- The patient found the PICO device both comfortable and very easy to use. Radiation therapy was resumed at the end of treatment

Day 0

Day 1

Day 21

15 x 30cm dressing size

Day 38

PICO sNPWT discontinued

Day 46

Note: The PICO sNPWT pump shown is no longer commercially available and has been superseded with PICO 7 sNPWT and PICO 14 sNPWT System.

Important: PICO sNPWT is contraindicated in patients with malignancy in the wound bed or margins of the wound (except in palliative care to enhance quality of life).

Use of PICO◊ sNPWT case on mastectomy with axillary curettage

Dr. Francine Achatz Hestin - *GHR Mulhouse [Mulhouse Regional Hospital] (France)*

Patient

A 60-year-old female who had a right mastectomy with axillary curettage.

The patient was admitted at D16 with a wide, gaping surgical incision.

- An orifice was present next to the wound cavity
- Wound measuring 9 L x 4 W x 1cm D, with dehiscence of the margins
- Cavity packed with packing gauze

PICO sNPWT methodology and treatment outcome

- A 15 x 30cm PICO dressing was applied at D0 with placement of a gauze. The dressings were changed every 72 hours
- The device was chosen due to its ability to provide continuous fluid management
- By D14, the orifice on the side of the cavity had healed and there was no more dehiscence of the lower margins. There was no sign of infection.
- The wound measured 7.5 L x 3 W x 0.7cm D
- The PICO dressing showed little saturation at D51
- Wound measuring 5 L x 1.5 W x 0.4cm D
- The gauze was removed from the wound cavity
- Placement of a 15 x 20cm PICO dressing
- PICO sNPWT was discontinued at D60, as the wound had shrunk to 4 L x 1.2cm W and was now level with the margins
- An ALLEVYN◊ GENTLE BORDER Multisite Dressing was applied

Day 0

Orifice with cavity

Day 14

Day 60

Note: The PICO sNPWT pump shown is no longer commercially available and has been superseded with PICO 7 sNPWT and PICO 14 sNPWT System.

Use of PICO◊ sNPWT on hard to heal wounds with skin graft

Dr Francisco Najarro (Traumatologist), Ms Ana Carmona (Treatment Room Nurse), Ms Belén Camacho (Wound Care Nurse) - *Santa Ángela de la Cruz Hospital (Seville - Spain)*

Introduction

Despite the range of available treatments, certain wound types are commonly associated with healing problems. Wound management can be challenging for clinicians who aim to achieve the best possible results with minimum complications.

Patient

A 38 year-old woman with no underlying diseases and not receiving any background medication. The patient underwent a surgical procedure for the the placement of a right-ankle prosthesis on 12 May 2017. Three days post-surgery, the surgical incision showed lesional and perilesional erythema. Over the 10 days that followed, the wound worsened with the development of perilesional necrotic plaque.

Pre-treatment

After 10 days the incision had healed. Two necrotic islands located medially to the incision and near its lower portion could be seen in the left perilesional area. A wound management protocol was initiated according to the principles of wound bed preparation for the debridement of both necrotic plaques. The wounds were cleaned every 24 hours, by irrigation with saline and a combination of sharp, enzymatic and autolytic debridement. We started by removing alternate staples; all remaining staples were removed at 48 hours.

Treatment and follow-up/results

We used the wound bed preparation approach to accelerate wound healing and decrease the likelihood of complications. To this end, we made use of advanced technology such as the PICO single use negative pressure wound therapy (sNPWT) system. Wound management with the PICO sNPWT system was started with the aim to rapidly increase granulation tissue and then perform a skin graft to achieve wound healing. Treatment was initiated with two dressings in the first week. In the weeks that followed, the PICO dressing was changed once weekly. As can be seen in the pictures, the wound healed in a timely manner. One month after the start of treatment, the wound bed showed 95% granulation tissue with a low to moderate amount of exudate. The perilesional area was preserved and there were no clinical signs of infection. The team therefore decided to discontinue PICO sNPWT after a total of 7 single use dressings. Conventional moist wound healing (MWH) was then initiated at a rate of two dressings per week until complete wound healing.

Picture at 10 days follow-up

Day 0
Start of PICO sNPWT

Day 7
One week of follow-up

Day 21
Three weeks of follow-up

Day 42
End of PICO sNPWT

Day 63
Follow -up of MWH

Day 93
End of treatment

Use of PICO◊ sNPWT case in pilonidal cyst

Dr Jordi Bombardó (Colorectal Surgeon), Ms Marta Fernández (Nurse), Ms Eva Ángeles Sánchez (Nurse) - *Parc Taulí University Hospital (Sabadell - Spain)*

Wound deeper than 2cm

Patient

A 30 year-old man with no remarkable medical history and a pilonidal cyst that began to develop three years earlier.

Treatment

Surgery.

A cyst measuring 5cm in size, with no active fistula and distal granuloma draining serous fluid.

Equipment

- PICO sNPWT
- No-Sting Skin-Prep spray
- Adhesive Gel patch
- Foam filler

The dressing was applied in the operating theatre, but due to the risk of bleeding, it was decided to check it at 24 hours.

Follow-up

2 weeks.

2 dressings per week.

Recommendation

Apply the lower adhesive strips with the patient standing up in order to improve comfort during movement.

Conclusions

The wound took approx. one and a half months to close.

Healing time was reduced by an estimated 50% (3 months) compared to the treatment duration with the standard dressing regimen.

PICO sNPWT has been shown to deliver greater healing rates vs SoC.[1]*

The PICO dressing was used for approximately 2 weeks during the most exudative phase. The wound showed substantial reduction in size; the patient was then switched to moist wound healing with absorbent dressings.

Exudate control with the PICO dressing prevents leakage, improving the quality of life of patients with pilonidal cysts, who tend to be young with an active lifestyle.

Note: The PICO sNPWT pump shown is no longer commercially available and has been superseded with PICO 7 sNPWT and PICO 14 sNPWT System.

*p=0.001; 52 wounds.

1. Dowsett C, Hampton J, Myers D, Styche T. Use of PICO to improve clinical and economic outcomes in hard-to-heal wounds. *Wounds International*. 2017;8, p53–58.

PICO◊ 14 sNPWT evaluation – post renal transplant wound

Thomas Leong CNC (Skin Integrity & Wound Management) - *RPAH Sydney (Australia)*

Introduction

Renal Transplant patients have numerous co-morbidities and therefore have foreseeable complications post-transplant surgery. Dehiscence is a regular occurrence, which often requires NPWT for a lengthy period of time.

Patient

- 61 year-old female with history of Diabetes Mellitus, Hypertension, End stage renal disease received a transplant
- Four weeks post-transplant returned to hospital with fevers, Candiduria, anaemia requiring iron and 1unit RBC infusion, AKI, hyperK+, glycaemic . Subcutaneous collection at the RTx surgical wound (65ml on admission vs 44ml)
- Ongoing Anaemia

Wound history and previous treatment

- 4 weeks post-surgery – Wound drained and traditional negative pressure wound therapy (tNPWT) with foam filler applied. After a course of antimicrobials during her admission patient was discharged
- Followed up in the Renal Transplant Clinic on Mondays and Thursdays.
- 6 weeks post-surgery – Initial review by clinical nurse consultant
- tNPWT was utilised for 46 days prior to the commencement of PICO 14 sNPWT.
- Initially there was a large amount of exudate of up to 300mls/ per dressing change. During tNPWT treatment exudate decreased to approx. 100mls per dressing change and the opening of the wound also reduced, however the length of the tunnelling had not receded

Wound challenges and management objectives

- The main challenge for this wound was, as with all renal transplant patients, immunosuppression leading to delayed wound healing and specifically in this patient, it was not the size of the opening but rather the depth of the tunneling
- The level of exudate was not excessive with only a small collection of fluid draining with each dressing change. The need to close this wound without leaving a sinus was still the goal
- The use of the larger NPWT device was beginning to cause some shoulder pain
- Dressing changes were carried out 2 x per week necessitating returns to hospital despite no longer requiring medical follow-up post-transplant
- As tNPWT had been utilised for over 6 weeks with little change in the depth of the tunneling, the goal was to retract the wound from the bottom to the surface before it closed over.
- Treatment period was difficult to ascertain due to the immunosuppression however, it was targeted to achieve this within 3-4 weeks

PICO sNPWT treatment

- Day 0 – PICO 14 sNPWT applied with black foam dressing. Wound opening measured at 1cm² however remained deep
- Twice weekly dressing changes conducted so foam wound dressing would not adhere inside the tunnel and level of exudate would not overwhelm the dressing, and thus avoiding maceration of the peri-wound skin
- Day 10 – 10 Days after the commencement of PICO 14 sNPWT wound was 60% smaller (0.33cm²) and 3.5cm deep
- Day 14 – Wound was 0.27cm² and only 1cm deep
- Day 17 – PICO 14 sNPWT removed and dressing changed to a more conservative dressing of hydrofibre and silicone foam changed weekly
- Day 31 – Wound completely closed with no further treatment required

Treatment outcome and results

- The end result was positive with complete wound closure achieved within the targeted 4 week period
- Wound closure was achieved with a measurable reduction in the wound depth and thereby eliminating the risk of sinus formation under closed epithelium
- Patient was much happier with the size and weight of the pump which made it easier for her to be very compliant with her treatment
- As this was an initial evaluation of the PICO 14 system, our dressing changes may have been more frequent than necessary in the first week. This may have affected the economic savings however with the elimination of a tNPWT rental savings were already significant
- For this case PICO 14 sNPWT was effective at reducing the wound depth, managing the exudate, maintaining patient comfort and potentially reducing the overall cost. All of this was achieved along with the ultimate goal of closing the wound in a very reasonable time frame

Opening/wound at the medial end of the suture-line, tracked 8cm posterior-laterally along the suture-line and opening was 2.69cm² measured with Tissue Analytics App.

Day 0
Opening measured at 1cm² however remained 8cm deep. Dressing changed twice a week so foam would not adhere to the wound bed and was shortened with each dressing change.

Commenced on the PICO 14 sNPWT with Black foam dressing

Day 3

Day 10
10 Days after the commencement of PICO 14 sNPWT (wound was 60% smaller (0.33cm²) and 3.5cm deep.

Day 14
Wound was 0.27cm² and only 1cm deep.

Day 31
Wound was completely closed with nil further treatment required.

PICO◊ sNPWT applied on stump with prosthetic restoration

Dr Patrick Brunel - *Functional rehabilitation, Les Capucins, Angers (France)*

Patient

A 77 year-old male.

Hospitalised at the CRF d'Angers [Angers Rehabilitation Centre] for rehabilitation & prosthetic restoration after left transtibial amputation performed two weeks earlier.

The amputation was related to peripheral artery disease of the lower extremities.

- Chronic obstructive pulmonary disease (COPD)
- Lung cancer with left lobectomy in 1989
- Peripheral artery bypass surgery in the left leg in October 2010
- Left transmetatarsal amputation in December 2010
- Smoker, 120 pack-years, weaned off one year ago

Wound history

- Unhealed, exuding stump wound requiring twice daily dressing changes by the department nursing team using the Hydrofibre/Hydrocellular dressing protocol
- Rehabilitation pending due to impossibility to put on footwear due to ongoing pain and saturation of the dressings with abundant exudate
- Dr. Brunel decided to apply a PICO sNPWT system in order to help accelerate the healing process and allow the patient to wear prosthetics at the same time in order to resume rehabilitation as soon as possible
- Approximate wound surface: approx. 16.25cm²

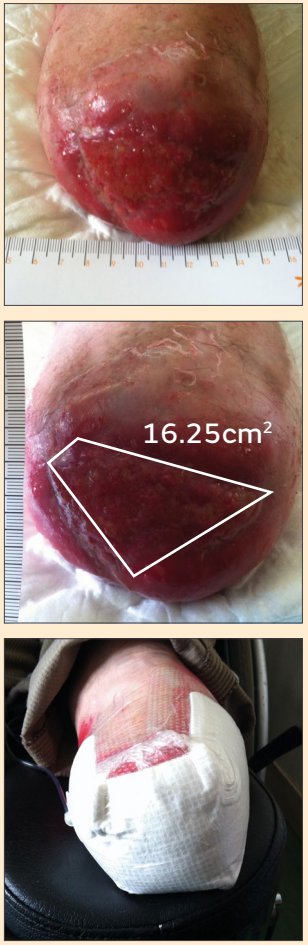
PICO sNPWT treatment methodology

- Wound cleansed with soap and water and rinsed with saline solution
- The chosen PICO dressing size was 15 x 30cm
- The PICO dressing was changed every 3 days

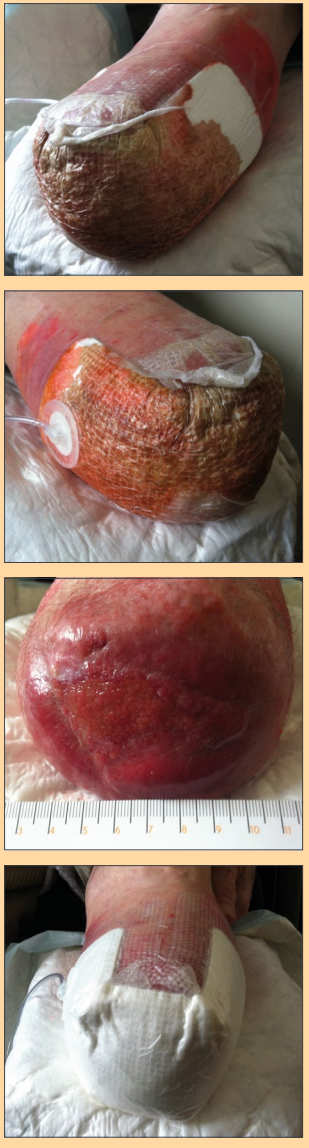
Treatment results

- The patient was delighted with the wound healing time.
- Near-complete healing was achieved after 19 days of treatment.
- Wound surface area at the start of treatment: 16.25cm²
- Wound surface area at the end of treatment: 3.5cm², i.e. a reduction in the wound surface area of nearly 80%

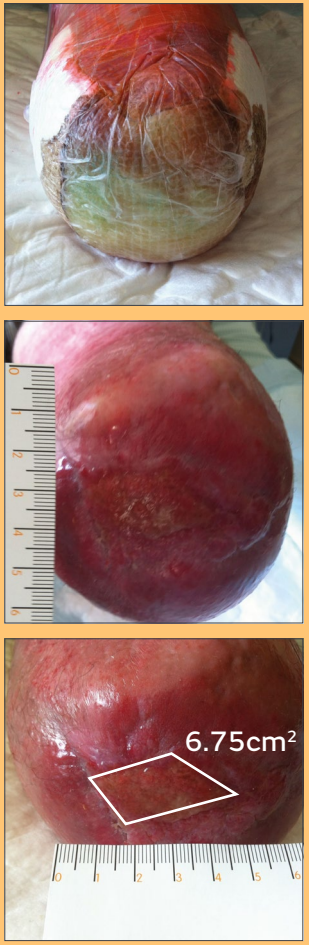
Day 0



Day 2



Day 12



Day 19

Photo with the prothesis on

Note: The PICO sNPWT pump shown is no longer commercially available and has been superseded with PICO 7 sNPWT and PICO 14 sNPWT System.

PICO◊ sNPWT used on a sacro coccygeal cyst

Dr Arnaud Fotso Kamdem - *Besancon Hospital (France)*

Wound deeper than 2cm

Patient

A 17 year-old male treated for a pilonidal cyst.

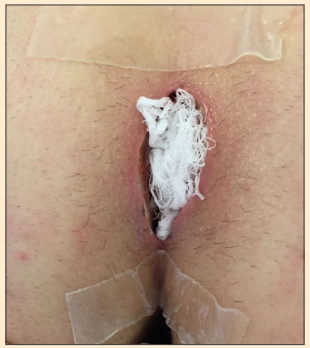
Wound characteristic

- Start of treatment with the placement of a calcium alginate wick and an ALLEVYN◊ Dressing
- Switch to 15 x 30cm PICO Dressing at D5 post-intervention for a wound measuring 3 x 2 x 4cm (L x W x D)

PICO sNPWT methodology and treatment outcome

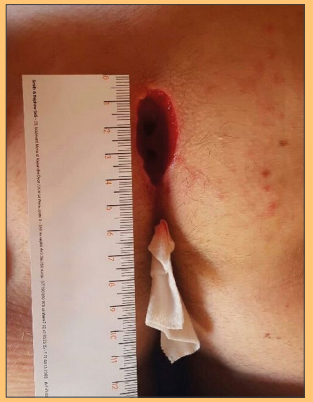
- Treatment with the PICO dressing started at D0, with dressing changes every 48 hours
- Wound cavity packed with ribbon dressing and dressing sealed with gel patch
- Hospital at Home care
- At D5, the wound measured 3 x 1.7 x 4cm and it was decided to attempt to increase the interval between dressing changes to 72 hours
- At each dressing change (2 to 3 times a week), the wound was clean
- At D13, the wound measured 3 x 1 x 3cm
- At D28, the loss of substance was almost filled
- The PICO dressing was applied without packing gauze
- PICO sNPWT was discontinued at D35
- The patient was able to continue to go to school throughout treatment

Day 0



Day 3

Day 13



Day 35

Note: The PICO sNPWT pump shown is no longer commercially available and has been superseded with PICO 7 sNPWT and PICO 14 sNPWT System.

PICO◊ 14 sNPWT evaluation – skin tear

Thomas Leong CNC (Skin Integrity & Wound Management) - *RPAH Sydney (Australia)*

Introduction

Elderly patients, even without numerous co-morbidities, not only have an increased risk of injury, but also have a decreased ability to heal due to the changes to skin as a result of ageing (Thinner, drier, loss of elasticity, with less subcutaneous tissue). Wound healing rates can be up to 4 times slower. Our goals are therefore to use the best means possible to achieve faster wound closure to avoid co-morbidities in this vulnerable group.*

Patient

- 87 year-old female with history of bronchiectasis, diverticulitis, helicobacter pylori
- Self-presents with worsening infection to left shin skin tear (category 3) 1 week prior

Wound history and previous treatment

- Initially looked after by GP however the wound was worsening with more pain and increased necrotic tissue present. Leg very oedematous and inflamed compared to the uninjured leg
- Four days of oral Antibiotics prescribed by GP with nil effect
- Treated with 3 days IV Cephazolin, stepped down to cephalexin QID PO on discharge
- An initial consultation took place but patient was then discharged the next day so unable to follow up
- Patient returned to emergency department same week as GP unable to be remove dressing
- Days later patient admitted to Hospital in the home service (HITH) and PICO 14 sNPWT applied in this setting
- Followed up continued in HITH twice weekly
- Day 38 of PICO sNPWT treatment – PICO 14 sNPWT ceased and treatment changed back to DURAFIBER◊ Ag Dressings and a silicone foam dressing

Wound challenges and management objetives

- The main challenge for this wound was, as with all elderly patients, slow wound healing and specifically for this patient recurrent cellulitis and local wound infection leading to pain, swelling and a build-up of devitalized tissue. Fortunately, this was brought under control with oral antibiotics and cleaning with a super oxidized solution. The main goal was to close this wound as quickly as possible to minimize infections
- Dressing changes carried out 2 x per week necessitating returns to hospital
- Goal was to reduce the wound as much as possible within 4 weeks so that it would not be an encumbrance for the patient's activity of daily living (ADL's)g

PICO 7 sNPWT treatment

- 1 week before PICO treatment – Wound size 30.29cm^2 surface area as measured with Tissue Analytics App. Initial dressing plan was to use a hydrofibre and a silicone foam dressing to help remove the necrotic burden as well as be gentle for dressing changes
- Day 0 – There was a significant increase in wound size (43.74cm^2) prior to commencement of PICO 14 sNPWT treatment
- Day 1 – PICO 14 sNPWT commenced
- Day 3 – 1st review and dressing changed. The short turn around was deliberate to assess the level of exudate as well as to accommodate for the weekend and minimise risk of dressing failure
- Dressings were then changed 2 x per week. Initially there was slough build up and cellulitis remained despite oral A/B's
- Cleaning consisted of the use of super oxidised Solution and mechanical debridement with gauze and a scalpel blade occasionally
- After 2 Weeks of treatment with the PICO 14. Wound size was reduced to 33.26cm^2 as measured with Tissue Analytics
- Day 17 – As no PICO sNPWT system was available for continuation of NPWT the wound was dressed with DURAFIBER◊ Ag Dressings and a silicone foam
- Day 21 – PICO 14 sNPWT recommenced to help speed up granulation and epithelialisation
- Over the next two weeks the wound continued to improve however the patient experienced some moisture associated skin damage (MASD) due to leakage of fluid (from small breaks in the skin) under the silicone border and film strips. These were treated with a skin barrier film and Aquacel™ Extra which managed the issue
- Day 38 – PICO 14 sNPWT changed to a more conservative dressing of DURAFIBER Ag Dressings and a silicone foam, changed weekly

Treatment outcome and results

- Positive end result with an overall 81% reduction in wound size - slightly over the aimed 4 week period
- This amount of wound closure was achieved despite initial ongoing infection
- Patient was happy with the size and weight of the pump which made it easier for her to be very compliant with her treatment
- For this case PICO 14 NPWT was effective at reducing the wound size and managing the exudate whilst also maintaining patient comfort
- Overall, the PICO 14 system is a useful addition to one's disposable NPWT quiver. The 14 days provided is enough time to ensure that a wound is progressing in the right direction

*Authors' information not validated by Smith+Nephew.

Wound images during treatment in next page

PICO◊ 14 sNPWT evaluation – skin tear (cont)

Thomas Leong CNC (Skin Integrity & Wound Management) - *RPAH Sydney (Australia)*

1 week before PICO sNPWT

Day 0
There was an actual significant wound size increase when the PICO 14 sNPWT was commenced. (43.74cm²)

Day 3
Dressing appearance on the first change. Obvious tissue death/slough buildup related to ongoing infection.

After 2 Weeks of treatment with the PICO 14 sNPWT. Wound size was reduced to 33.26cm² as measured with Tissue Analytics.

Upon dressing removal

Post wound cleansing and debridement

Day 14

Dressed with DURAFIBER◊ Ag on Day 17 and PICO sNPWT was recommenced on Day 21.

Day 21 *(19.18cm²)*

Day 28 *(11.53cm²)*

Day 31 *(10.46cm²)*

Day 35 *(6.78cm²)*

Day 38 *(5.75cm²)*

Evaluation of PICO◊ 14 sNPWT in outpatient setting – split thickness skin grafts

Harriet Apted (Registered Nurse, Practice Nurse for Dr Dan Rowe, Brisbane Hand and Plastic Surgery) - *(Australia)*

Introduction

This case series followed the progress of three patients who underwent a split thickness skin grafts (STSG) following excision of a skin cancer, aided in healing by the application of NPWT in the form of the PICO 14 system.

The PICO 14 System was applied to the skin graft at the time of repair with all procedures completed as day surgeries at the participating hospital. Patients were then followed through in the surgeon's private rooms by the surgeon and practice nurse until the wound was deemed as healed. In this context, 'healed' is taken to mean that the skin graft is well taken enough to tolerate cessation of compression bandaging and no longer requires wound care dressings.

Patients

All skin grafts were implemented as a result of excisions of skin cancers, where the absence of sufficient skin to facilitate direct closure or a flap dictated that a skin graft was to be applied to the defect for healing via primary intention. All patients had sufficient mobility and support at home, avoiding the need for an inpatient stay, benefiting both the patient personally and the hospital financially.

- **Patient A** – 79 year old female, nil relevant co-morbidities; mobilising in wheelchair for three weeks due to location of wound; split skin graft to right achilles measuring approx. 5cm x 5cm
- **Patient B** – 84 year old male, history of bowel cancer (ileostomy); independent mobilisation; split skin graft to left lower anterior leg measuring approx. 4cm x 4cm
- **Patient C** – 72 year old male, nil relevant co-morbidities; independent mobilisation; split skin graft to left pretibial measuring approx. 5cm x 5cm

Wound challenges and management objectives

Skin grafts require a unique set of circumstances to heal, in that they require external suppression of the inflammatory response of the body following injury in the form of compression as well as minimal mobilisation. There tends to be little to no clinical impact of the wound on the body systemically but this can also play into the psychosocial aspects of the wound; as the patient is otherwise feeling 'well', the need to maintain what is essentially bed rest at home can be challenging for the patient. This can lead to social isolation and loss of muscle tone leading to impaired mobility and falls. Previously, with patients undergoing split skin graft with PICO 7 sNPWT +/- an inpatient stay, from data collated by the authors following 9 patients, showed healing averaged at 5.88 weeks.

The objective of this evaluation is to ascertain if extended NPWT with PICO 14 sNPWT expedites the wound healing process, lessening burdens on patients, hospitals, community nurses, and specialist practitioners.

Treatment

The method used in split skin grafting as performed by Dr Dan Rowe involves an upper lateral thigh donor site (usually on the same side of the body as the graft is being performed) to repair the defect created by excising a skin cancer with adequate margins. The skin is then perforated and secured to the defect with a synthetic absorbable copolymer suture (Vicryl Rapide™, Johnson & Johnson).

Due to the mandated bed rest and leg elevation to ensure angiogenesis and tissue proliferation between the defect and the skin graft, if the patient has limited support at home, poor peripheral vascularity or a challenging graft location (i.e. heel or foot), they may require an inpatient stay with RENASYS◊ NPWT for 5-10 days prior to discharge with PICO sNPWT. This was not required for any of three patients in this case series.

With both PICO 7 and PICO 14 sNPWT, a dressing change is conducted at approximately halfway through the pumps duration. ACTICOAT◊ FLEX Dressing is applied as the primary interface dressing;* this has been noted by the authors to generally improve outcomes for lower limb skin grafts.

Following cessation of NPWT at around day 14, decisions are made with regards to the ongoing wound care but would usually entail daily dressing changes with BACTIGRAS◊ Medicated Tulle Gras as primary interface, an absorbent dressing (either MELOLIN◊ Cushioned Dressing Pads or Mesorb™ depending exudate level) and two Tensocrepe™ hospital heavy weight bandages in a figure eight technique from toe to knee.

The patient is seen in the specialists rooms by the practice nurse one week after the commencement of daily dressings and then fortnightly thereafter until deemed healed by practice nurse and Dr Rowe. As mentioned, the authors would usually estimate a healing trajectory of six weeks when using either PICO 7 sNPWT or 'conventional' dressings.

Complicating factors in graft healing include most often a non-compliance of the patient with rest and elevation, resulting in graft loss and thus an extended healing trajectory whilst the partially healed grafts continue to heal by secondary intention (epithelialisation from the wound edges). Venous insufficiency is an additional factor leading to the same outcomes.

Treatment outcome and results

All patients had adequate support at home to undergo their graft as day surgery and then mobilising at home independently (patient A with a wheelchair), eradicating any costs for the hospital and private health fund relating to an inpatient stay

Patient A – 5cm x 5cm graft

- PICO dressing changed one week post-op. Good revascularisation progress and adherence to the wound bed (Image 1)
- 2 weeks post-op wound showing excellent progress towards healing – often not seen until week 3 or 4 (Image 2). PICO 14 sNPWT treatment discontinued and BACTIGRAS Dressings, MELOLIN Dressings and compression applied.
- Wound progress check at 3 weeks postoperatively (Image 3).
- At the time of consultation, the patient reported no exudate from the wound for 1 week previously, implying minimal need for wound care dressings and expected actual time to healing of 4 weeks.
- Final check at 5.5 weeks post-op (image 4) with complete wound healing. Significant maturation of the graft is noted. At no point was there any concerns regarding graft loss for this particular patient

Patient A

Image 1

Image 3

Image 2

Image 4

* The ACTICOAT FLEX range may be used in combination with PICO sNPWT for up to 3 days.

Continue in next page

Evaluation of PICO◊ 14 sNPWT in outpatient setting – split thickness skin grafts (cont)

Harriet Apted (Registered Nurse, Practice Nurse for Dr Dan Rowe, Brisbane Hand and Plastic Surgery) *(Australia)*

Patient B – 4cm x 4cm graft

- PICO dressing changed 1 week post-op (image 5). Some moderate congestion noted which can lead to graft loss at times but it could be said another week of NPWT may have abated this.
- At 2 weeks post op PICO 14 sNPWT discontinued with wound showing a vast improvement in vascularisation (image 6). However due to observed moderate-severe haemoserous exudate throughout therapy, BACTIGRAS was implemented as the primary interface dressing, with Mesorb™ , a highly absorbent cellulose dressing and commencement of daily dressing changes.. This was due to a lymphatic vessel at the 4 o'clock aspect of the wound and was done in an effort to avoid maceration and maintain the integrity of the donor skin.
- Progress check at 3 weeks post-op showed some minor purulent discharge and increased oedema to the wound edges (Image 7). The occurrence of a minor infection may have been due to the slightly more moist nature of the wound bed thereby encouraging colonisation of bacteria. Antibiotics prescribed with good result.
- Final check at 4 weeks (image 8 provided by patient) - graft healed and overall an outstanding result.

Patient C – 5x5cm graft

- PICO dressing changed 1 week post-op. Good revascularisation and adherence to the wound bed (Inage 9). Some moderate mottled congestion noted at one week which receded by week 2.
- Week 2 some superficial exfoliation of the graft is also noted indicating cell proliferation in the deeper levels. PICO 14 sNPWT cessation with excellent progress towards healing – often not seen until week 3 or 4 (Image 10)
- BACTIGRAS and MELOLIN◊ dressings and compression bandages utilised following cessation of PICO 14 sNPWT.
- Week 3 progress check (image 11)
- Final check at 4 weeks post-op showing a healed graft no longer requiring wound care dressings (Image 12). This graft was perhaps not as mature as the other patients grafts in this series were, this may be due to poor vasculature of the recipient.

Discussion and conclusions

- All patients reported great satisfaction with being able to remain at home for post-op treatment and the simplicity of care for the period PICO 14 sNPWT was *in situ*
- Implementation of PICO 14 sNPWT showed expedited healing and reduced burden on the hospital, community nurses and the patients. From a financial perspective, hospitals, private health funds and patients all benefited by avoiding an inpatient stay, and having to provide or undergo fewer post op dressings, but maintain excellent outcomes
- The benefits of the implementation of the PICO 14 sNPWT used in partnership with other wound care dressings throughout the healing process are many and varied but the group that sees the most benefit are our most important clients – the patients – who see improved outcomes in healing, decreased financial burden

Patient B

Image 5

Image 7

Image 6

Image 8

Patient C

Image 9

Image 11

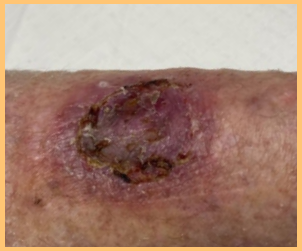
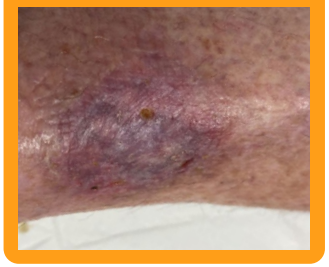


Image 10

Image 12



PICO◊ Dressing applied on sternotomy dehiscence wound

Dr Thomas Senage - *Cardiothoracic Surgery, Nantes University Hospital (Nantes - France)*

Patient

A 47 year-old female.

- Mild hypertension
- Mild obesity
- Diabetic
- Active smoker, 35 pack-years
- Dyslipidaemia

The patient underwent emergency quadruple coronary artery bypass surgery due to left cardiac decompensation indicative of severe ischaemic heart disease.

One month post-op, the patient presented with sternal dehiscence complicated by Staphylococcus aureus colonisation revealed by bacteriological sample collection, requiring surgical revision.

Sternotomy was performed on the lower half with mechanical debridement and abundant flushing.

- Negative Pressure Wound Therapy was initiated postoperatively.

NPWT methodology

A traditional NPWT system with RENASYS◊ Foam was placed on the highly exudative wound in the hospital.

The volume of wound exudate decreased rapidly and a PICO System was then applied. The patient was discharged home with the PICO System in place, and subsequently managed by the regional at-home hospital service. The private nurses assigned by the service took over dressing changing duties.

The wound was cleaned with saline and fibrinous tissues debrided at each dressing change.

The PICO dressing size was initially 15 x 30cm, subsequently adjusted to the wound size. By the end of treatment, the PICO dressing size used was 10 x 20cm.

Course of PICO sNPWT

The use of the PICO dressing allowed optimal compliance in a patient fatigued by a long hospital stay. The PICO System is quick and intuitive to use, making it easy for private nurses to learn.

The dressings were changed twice per week.

The PICO System controlled the volume of exudate and preserved the peri-wound skin.

Results

The patient was delighted with the PICO System, which was much more discreet than the traditional system, with less pain on removal and shorter treatment times. Private RNs liked the conformability of the PICO dressing and how easily the system is applied.

Day 0

Day 24

Day 31

Day 48

Use of PICO◊ sNPWT on a complex trans-metatarsal amputation

Dr. Buisson Stéphane Andrew Sharpe - *CH Lanmary (France)*

Introduction

Past history of type 2 diabetes for 14 years, arterial hypertension and diabetic neuropathy associated with non-compliance of his treatment for 6 months.

Patient

56-year-old male.

Trans-metatarsal amputations with necrotic fasciitis and cellulitis.

Treatment

- The wound was washed, cleaned and a PICO System was applied, the dressing was changed twice a week
- Postural adaption was provided through a therapeutic shoe
- The PICO sNPWT treatment was discontinued at day 60, the wound continued to heal and a calcium alginate dressing was applied

Follow-up/results

The patient retained full mobility.

Day 0
Initial wound

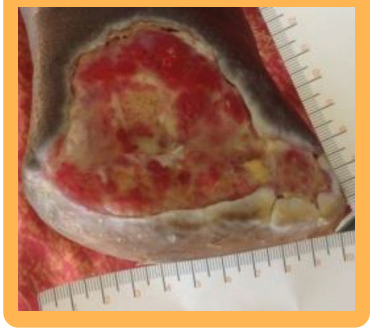
PICO sNPWT begins

Day 2

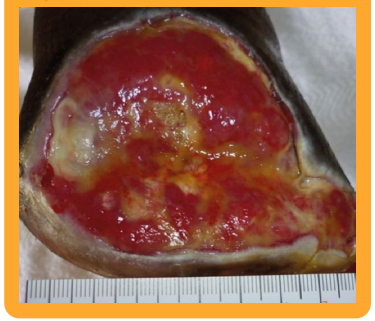
Day 4

Day 6

Day 9



Day 14



Day 42
After PICO System treatment

Note: The PICO sNPWT pump shown is no longer commercially available and has been superseded with PICO 7 sNPWT and PICO 14 sNPWT System.

PICO◊ dressing applied on traumatic right hand wound

Dr Poichotte - *Orthopaedic Surgery, Challans Hospital (France)*

Patient

A 49 year-old male.

- Diabetic
- Scheduled to undergo a triple coronary bypass

Lorry driver, right-handed, awaiting coronary bypass surgery, with a complex wound secondary to trauma inflicted by lawn mower blade.

- Wound: first metacarpal open fracture with sectioned extensor digitorum longus and abductor pollicis muscles, and an oblique skin flap. No vascular or nerve injury
- Operative decision: Wound dressing, tendon repair suture, metacarpal screw osteosynthesis and flap repositioning

PICO sNPWT treatment methodology

Three weeks post-surgery, the wound was still oozing, with flap necrosis significantly delaying heart surgery.

It was decided to apply a PICO System to speed up the healing process.

The size of the PICO dressing used was 10 x 30cm.

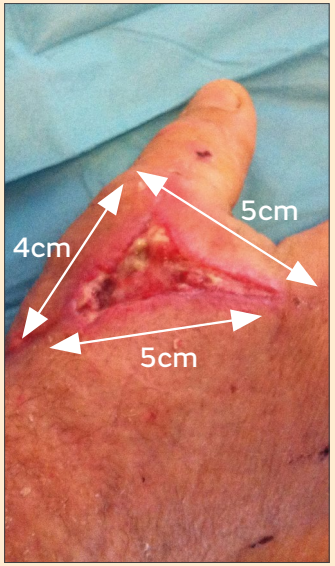
Course of treatment with the PICO sNPWT

- Debridement of necrotic and fibrinous tissue at each dressing change
- Wound cleansing with saline
- Twice weekly dressing changes by the private nurses appointed by the Hospital-at-Home service
- The PICO System is quick and intuitive to use, making it easy for private nurses to learn
- The PICO dressing controls the volume of exudate, and preserves the peri-wound skin
- Near-complete wound healing was observed by D10

Results

Near-complete healing at day 14 in a patient awaiting admission to Cardiac Surgery for a triple coronary bypass.

Day 0



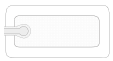
10 x 30cm dressing size

Day 6

Day 10

Note: The PICO sNPWT pump shown is no longer commercially available and has been superseded with PICO 7 sNPWT and PICO 14 sNPWT System.

Ordering information

		PICO 7 device		PICO 14 device	Multipack	PICO 7Y device
		+1 dressing	+2 dressings	+2 dressings	with 5 dressings	+2 dressings
Dressing	**Sizes**	**Code**	**Code**	**Code**	**Code**	**Code**
	Multisite small 15cm x 20cm	66802010	66802000	66802040	66802020	–
	Multisite large 20cm x 25cm	66802011	66802001	66802041	66802021	66802031
	10cm x 20cm	66802012	66802002	66802042	66802022	–
	10cm x 30cm	66802013	66802003	66802043	66802023	–
	10cm x 40cm	66802014	66802004	66802044	66802024	–
	15cm x 15cm	66802015	66802005	66802045	66802025	–
	15cm x 20cm	66802016	66802006	66802046	66802026	–
	15cm x 30cm	66802017	66802007	66802047	66802027	–
	20cm x 20cm	66802018	66802008	66802048	66802028	–
	25cm x 25cm	66802019	66802009	66802049	66802029	–

Consumables

Dressing	Sizes	Code
	Foam dressing filler 10cm x 12.5cm	66801021
	5 Antimicrobial Gauze Rolls 11.4cm x 3.7m + 1 SECURA® NSBF Wipe	66802127

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.

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