

# New protocol for NPWT in complicated wounds

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## INTRODUCTION

For many reasons, NPWT is the best option for the treatment of complex wounds with a large coverage defect and high exudation. The management of injuries through therapeutic vacuum reduces HR requirements, the consumption of disposable supplies and provides greater comfort to the patient by reducing the number of dressing changes. In addition to the material benefits, it actively stimulates the healing process, reducing the time required to heal in relation to methods without permanent suction in an almost hermetically sealed environment.

The cost of applying NPWT derives mainly from the requirement of disposable materials: filling material, adhesive film, suction, and reservoir. International guidelines suggest a dressing change frequency of 2-3 times per week. In Argentina, access to this therapy is limited by the absence of a National Industry, by the high costs and the great difficulties that exist for importing supplies. A situation that challenges health professionals to find cost/effective alternatives to maximize results.

## OBJECTIVE

The objective of this poster is to present our experience in the management of complex wounds using NPWT. By reducing the number of dressing changes we try to reduce application costs to extend the time of use and the number of users.

## METHOD

NPWT was applied as the first therapeutic step to 28 patients, with 32 complex wounds. We define complex as those wounds that meet at least two conditions: Thickness: total, Surface > 150 cm<sup>2</sup>, Exposure of joint elements, Exudation rate: >300 cc/day, Chronicity >1 year, Age < 1 year, Immunosuppressed patients.

The treatments were carried out between February 2019 and December 2021. The age of the patients ranged from three months to 85 years. The treated wounds are secondary to different pathologies and located in different locations of the body. NPWT was used as a first therapeutic step to prepare the wound bed for the coverage phase. For this, surgical maneuvers were carried out or the approach was simplified, using AWC or TC to favor organic epithelialization. The second therapeutic step was selected based on the patient's capacities and needs.

At the start of treatment, the patient and/or their caregivers received information about therapy functioning, general/particular care, and alarm guidelines. The therapeutic steps and objectives were also discussed along with the estimated time of use. The NPWT therapist was in constant contact with his patient through telemedicine.

A protocol of one weekly healing treatment was applied, which was carried out in different places: home, hospitals, and peripheral health centers. The therapy was controlled by health professionals, by the patient and/or her care group. (Including reservoir changes and leak repair when necessary). In the event of vacuum loss that could not be repaired, the care team and/or the patient were instructed to remove the vacuum dressings, turn off the device, and perform a coverage with AWC or TC. Informative guidelines were established to communicate every 24-72 hours according to the complexity of the pathology. This was carried out to control the good evolution of the wound until the next dressing change with NPWT.

## WOUND LOCALIZATION

LOSS OF SUBSTANCE ARM KNECK  
• Secondary to infection 1

ABDOMINAL WOUND DEHISCENCE  
• Secondary to surgical site infection 7  
• Present of fistula track 5

LOSS OF SUBSTANCE CHEST  
• Secondary to use of cytostatics 1

LOSS OF SUBSTANCE ON LEG  
• Secondary to infection 7  
• Secondary to burn 1  
• Secondary to trauma 1

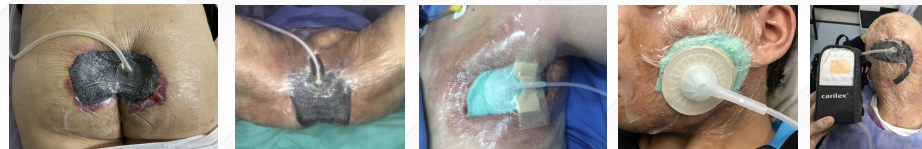
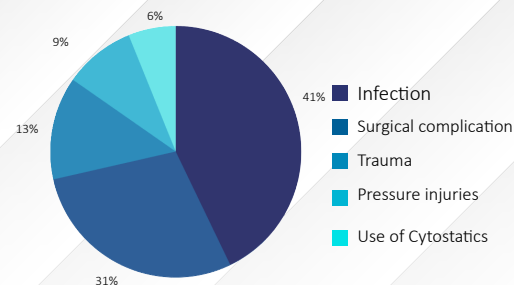
LOSS OF SUBSTANCE CRANEUM  
• Secondary to surgical site infection 1

LOSS OF SUBSTANCE SACRUM  
• Pressure injury (Stage IV) 2  
• Secondary to surgical site infection 1

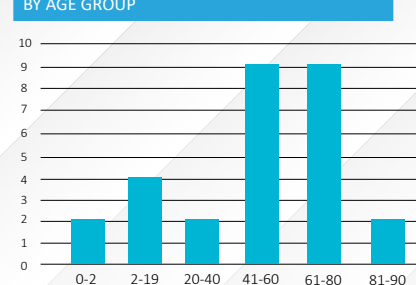
LOSS OF SUBSTANCE PERINE  
• Secondary to infection 1 (Fournier syndrome)

LOSS OF SUBSTANCE ANKLE/HEEL  
• Secondary to trauma 1  
• Pressure injury (Stage IV) 1

## WOUND ORIGIN



## NUMBER OF PATIENTS BY AGE GROUP



## RESULTS

Interruptions in operation: 199 dressings were applied with NPWT, on 14 occasions the vacuum seal was irretrievably lost, and it was necessary to remove the dressing. This yields an efficacy in the sustained operation of NPWT of 93%, that is, the vacuum curing environment was maintained for 7 days in 93% of the applications.

The location of the wound, the type and amount of exudate are the main factors that determined the loss of the seal. The most complex locations were perineum (34% efficacy), neck and sacrum (75% efficacy), and abdomen (87% efficacy). Wounds with the presence of intestinal fistulas lost vacuum in 13.10% of healings. Mainly due to blockages or saturation of the dressings.

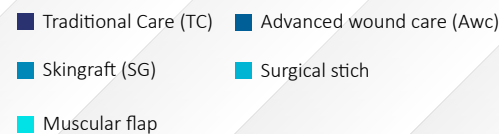
No wounds presented signs of infection or complications that delayed healing. 14 patients were discharged from the hospital to receive home care.

Type of closure: 15 wounds healed by secondary intention with an average time of NPWT application of 53.3 days. The second therapeutic step required an average time of 43.6 days (40.6 days using TC, and 60 days using AWC). The mean total treatment time was 95.3 days.

17 wounds were covered by surgical maneuvers: the average time of NPWT application was 40 days, the second therapeutic step required an average time of 5 days, and the total average treatment time was 45 days.\*.

\*This analysis does not consider the time required for the healing of the donor area and if there were complications in any case.

## TYPE OF WOUND CLOSURE



Type of wound	Average NPWT application time	Average dressing change number	Average healing time
Abdominal wound dehiscence (AWD)	69 days	9,6	101 days
Wound dehiscence	42,3 days	5,6	52,3 days
Pressure injuries	37,6 days	5,3	117,6 days
Infection	33 days	9,6	Tc: 61,3 days Sg: 41,4 days
Trauma	51 days	9,6	55 days
Use of cytostatics	30 days	9,6	76 days



## NPWT application keys for 5-7 days:

- To ensure its durability: The use of contact adhesives (not cyanoacrylates) notably favors the adhesion of the film, prevents leaks and protects the surrounding skin. Place the suction port in greatest decubitus area and ensure the exit of the tube to avoid jerks and falls. In wounds larger than 300 cm<sup>2</sup>, it is convenient to place an accessory suction port. In wounds with the presence of enteric fistulas, the patient needs a special diet in order to fluidize the intestinal effluent. It is advisable to bandage or mechanically protect wounds in areas of support or subject to friction.
- To avoid pain, bleeding, and tissue loss during dressing removal: Use Vaseline gauze under the filling material. To reduce pain, bleeding, and loss of tissue at the moment to remove the foam, interrupt the vacuum 6-12 hours before dressing change.
- Provide clear information on system care, alarm guidelines and when to contact the medical team.
- Develop permanent communication channels in case of queries, doubts, or problems. This allows for remote resolution of most patient issues.
- Attend to the special needs of each patient, including habits and behavior.

## CONCLUSION

Using NPWT as the first therapeutic step provides great benefits for the management of complex unstable wounds. Reduces the time and workload required to close a wound. A protocol of 1 weekly dressing change proved to be efficient for the application of NPWT in various regions of the human body. Clear therapeutic objectives, experience, training of the personnel in charge of the patient and maintaining permanent communication are key tools to maximize the benefits of the use of NPWT. Involving the patient and their care team builds trust, motivation, and commitment to the healing process. Our contribution as medical practitioners is the commitment to scientific and clinical development to optimize wound treatments in Argentina.

Several professionals were involved on this treatment application.  
I want to thanks all of them.