

# Challenge in Wound Care: The Open Abdomen with Intestinal Fistula and Stoma. Providing Patient Comfort and Mobility by PHMB Gauze under NPWT.

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## Introduction & Aim

Open abdominal wounds with active fistula present some of the most challenging wounds to resolve and require innovative solutions in management. These wounds often have repetitive insult from underlying intestinal fistula with no surgical solution, and therefore are particularly difficult to resolve. In this case series, NPWT system\* with PHMB gauze interface\*\*\* was evaluated to treat these difficult postoperative situations, which could not be re-operated. Necessary stoma pouches further complicated dressing application.

Besides the standard treatment for infected abdominal wounds, a wet-to-dry gauze dressing moistened with 0.04% PHMB solution, NPWT has also been established as standard treatment for different indications in the Ludwigsburg hospital. Evidence is accumulating for the system's effectiveness, particularly in areas where hygienic reasons, patient and nursing comfort are a concern plus the added benefit of less dressing changes with this NPWT system\*. Additionally, a secondary suture can be applied, supporting good aesthetic outcomes.

## Methods

Three patients were evaluated. One suffered from a deep skin infection surrounding an ostomy, two underwent complicated abdominal surgeries and post operatively suffered from non-closing abdominal wounds exacerbated by intestinal fistula (small intestine, colon, and urinary ileum conduit). These wounds could not be managed by standard dressings due to the high fistula or stoma output and necessary stoma pouches. A management solution consisting of a NPWT system\* using a PHMB gauze\*\*\* interface was initiated with dressing changes every 2-3 days or upon visible discharge through the fistula. To facilitate closure of the wound, intestinal fistulas were temporarily closed by sutures if possible and then covered directly with PHMB gauze\*\*\*, which provided up to 3 days of fistula closure.

## Results

The NPWT system\* offered a solution to dressing these complex wounds and maintained a tight seal allowing continuous application of NPWT throughout therapy. All wounds showed clean granulation tissue formation and secondary healing occurred. These positive outcomes enabled a conventional dressing and stoma bag to be administered on the epithelialized wound area around the remaining fistula without NPWT.

## Conclusions

The NPWT system\* with PHMB gauze\*\*\* showed an outstanding capacity in treating challenging postoperative abdominal wounds with intestinal fistula. During treatment patients were mobile with a high degree of comfort. For the three patients, the therapy revealed its efficacy and met clinician's expectations. Both the nursing and medical teams as well as the patients were satisfied with the system.

### Notes:

\* Invia® Wound Therapy for NPWT, Medela Inc., Chicago, U.S.A.

\*\* Invia® Liberty, Medela Inc., Chicago, U.S.A.

\*\*\* AMD™ is a trademark of Tyco Healthcare Group, LP.

Patient de-identification is implemented in all photographs.

- These authors contributed equally to the study

Although the manufacturer's instructions for use with the NPWT pump\* recommends pressure of 60-80mmHg, the primary researcher in this study has been investigating sub atmospheric pressure settings in the management of wounds and has experience with higher pressure settings in the management of wounds and therefore applied pressures commiserate with this experience.

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### Case Description: Patient 1

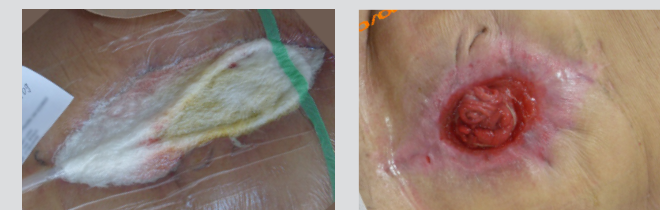
- 72 year old male patient, hospitalized from 9/20/2009 until 11/20/2009.
- Diagnoses: Urothelial carcinoma G3-4, pT2
- Operations: 09/01/2009 cystectomy and ileal conduit for urothelial carcinoma G3-4, pT2; 09/03/2009 relaparotomy, ileal segmental resection; 09/06/2009 relaparotomy and protective ileostomy for perforated rectum with peritonitis; 09/13/2009 relaparotomy and resection of ileal conduit for hemorrhagic infarction and open abdomen with vacuum therapy; 09/19/2009 until October 2009 multiple sutures of small bowel perforation and change of vacuum dressing on the open abdomen.
- Complications: Abdominal compartment; multiple catheter septicemia; entero-cutaneous fistula; liver insufficiency under parenteral nutrition; pre-renal kidney insufficiency; reactive depression
- NPWT system\* with PHMB gauze\*\*\* interface management September 2009 to October 2009.
- Result: Stable small bowel fistula

Figure 1

Patient 1; Abdominal wound infection: Before and after pictures comparing visual characteristics of the wounds before and prior to initiation of NPWT system\* with PHMB gauze interface\*\*\*.



A) Day 1, Suture of fistula and application of NPWT system\* with PHMB gauze interface\*\*\* (10/09/2009)  
D) Day 41, Technique for preparation for application of stoma bag, patient discharged from hospital (11/19/2009)



B) Day 1, NPWT system\* with PHMB gauze interface\*\*\* in situ (10/09/2009)  
E) Patient follow up with epithelialized wound around fistula (03/10/2010)



C) Day 41, Post wound cleansing and upon NPWT system\* with PHMB gauze\*\*\* dressing change (11/19/2009)

### Case Description: Patient 2

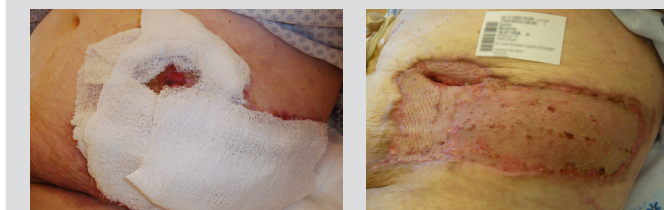
- 75 year old female patient, hospitalized from 11/22/2009 until 01/18/2010.
- Diagnoses: Parastomal infection with complete dermal necrosis; miles operation for rectal cancer 1997.
- Operations and Wound Management Regimen:
  - NPWT system\* with PHMB gauze interface\*\*\* 11/22/2009
  - Transpositioning of colostomy and NPWT\* with PHMB gauze interface\*\*\* dressing change 11/27/2009
  - NPWT system\* with PHMB gauze interface\*\*\* dressing change 11/30/2009
  - Partial mesh graft and change of NPWT\* with PHMB gauze interface\*\*\* dressing change 12/04/2009
  - NPWT system\* with PHMB gauze interface\*\*\* dressing change 12/12/2009
  - Partial mesh graft and NPWT\* with PHMB gauze interface\*\*\* dressing change 12/18/2009
  - NPWT system\* with PHMB gauze interface\*\*\* dressing change 12/23/2009
  - End of NPWT system\* treatment 12/28/2009
- Result: Small defect (old stoma position), closed secondary in March 2010

Figure 2

Patient 2; Dermal necrosis due to infection: Before and after pictures comparing visual characteristics of the wounds before and prior to initiation of NPWT system\* with PHMB gauze interface\*\*\* and mesh graft.



A) Day 1, Initiation of NPWT system\* with PHMB gauze interface\*\*\* (11/24/2009)  
D) Day 1, NPWT system\* with PHMB gauze interface\*\*\* in situ (11/24/2009)



B) Day 1, PHMB gauze\*\*\* dressing in situ (11/24/2009)  
E) Patient follow up with almost completely healed mesh graft (03/11/2010)



C) Day 1, NPWT system\* with PHMB gauze interface\*\*\* in situ (11/24/2009)

### Case Description: Patient 3

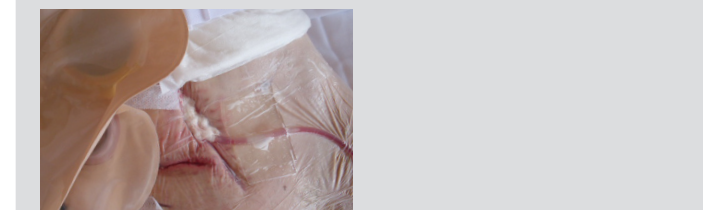
- 75 years old male patient, hospitalized from 03/11/2009 until 06/24/2009
- Diagnoses: Local advanced adenocarcinoma of the prostate (pT3b, pN1, pM1, G3, GS-8, pR1) 2001; papillary urothelial carcinoma March 2009; Postoperative deep wound infection with ileal conduit fistula
- Operations: Laparoscopic radical prostatectomy for local advanced adenocarcinoma of the prostate (pT3b, pN1, pM1, G3, GS-8, pR1) 2001; 03/15/2009 radical cystectomy with ileal conduit for papillary urothelial carcinoma; 04/04/2009 relaparotomy and ileocecal resection and suture of small bowel leakage; 04/06/2009 relaparotomy and ileostomy for small bowel leakage.
- Bedside treatment with NPWT system\* with PHMB gauze interface\*\*\* from 30th April until 10th June 2009
- Results: Ileal conduit fistula closed and all wounds closed

Figure 3

Patient 3; Abdominal wound infection: Before and after pictures comparing visual characteristics of the wounds before and prior to initiation of NPWT system\* with PHMB gauze interface\*\*\*.



A) Day 1, Initiation of NPWT system\* with PHMB gauze interface\*\*\* (04.2009)  
C) Patient follow up with healed wounds and closed urinary fistula (06.2009)



B) NPWT system\* with PHMB gauze interface\*\*\* dressing in situ (04.2009)