

# Device and method for isolation of fistula and ileostomy drainage within open abdominal wounds

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## Introduction

The effectiveness of negative pressure wound therapy (NPWT) on open abdominal wounds has been limited by wound dressing failure due to fistula and ostomy effluent leakage. Effluent contamination causes tissue breakdown and infection with a loss of dressing seal as the system is overwhelmed with effluent, requiring frequent changes of expensive NPWT dressings.

## Methods

This poster describes the use of a one-piece, compressible isolation device with NPWT and reticulated open cell foam (ROCF) that directs effluent to a containment pouch. The application method illustrated in Figure 4 allows for easy output measurements and preserves the integrity of the NPWT dressing. The isolation device and method are the result of an innovative work partnership between an abdominal reconstructive surgeon and a CWON to deliver improved patient outcomes.

## Results

The device and methods have been used in both trauma and non-trauma cases in the SICU of a Level I trauma center. Specific histories in this poster are an ischemic bowel with an ileostomy in an open wound after a coronary artery bypass, a gunshot wound to the abdomen with an enteroatmospheric fistula and an open abdomen after sepsis with multiple bowel resections. Each patient was not pouchable and dressings were being changed several times per hour. Applying the device in combination with NPWT increased the dressing change interval to three days, accelerated wound healing, and facilitated accurate output measurements.

## Conclusions

The isolation device described in this poster has been used effectively with the separation technique on enterocutaneous fistula (ECF)/enteroatmospheric fistula (EAF) and stomas that drain into open abdominal wounds with moderate to high output levels to extend NPWT dressing change intervals and accelerate wound healing. During treatment patients were mobile, were weaned off Total Parenteral Nutrition (TPN), and had high comfort levels.

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Wound Crown  
isolation device produced by  
Fistula Solution Corporation  
[www.fistulasolution.com](http://www.fistulasolution.com)

## Case Description: Patient 1

- 59 year-old female admitted for coronary artery bypass grafting
- Post-Op day #39 patient ill with an mesenteric ischemia. Re-exploration resulted in externalization of small bowel and damage control closure
- Post-Op day #40 a partial abdominal wall closure was completed, leaving the ileum externalized in the middle of the abdominal wound
- Effluent management was a major problem until the isolation device/ROCF system was applied. Dressings then remained intact for three-day intervals without significant leakage. Effluent was accurately measured via pouch

**Result:** Patient discharged from the SICU seven days after the initial employment of the compressible effluent isolation device as part of the NPWT dressing

**Figure 1:** Healing sequence for Patient 1 demonstrating the use of the device in isolating NPWT dressing from ileostomy effluent



**A)** Wound was complicated by the need to tack the bowel edge to skin. Frequent dressing changes, at times more than one per hour, left periwound skin raw and tender



**B)** ROCF was cut to fit the wound bed shape and a small hole was made in ROCF to center the isolation device over the ileostomy



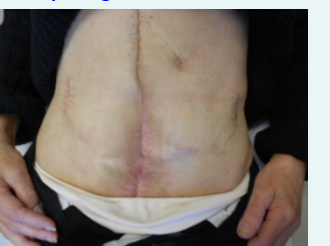
**C)** The entire isolation device/ROCF assembly was sealed with clear drape. The ileostomy was clearly visualized through the inner ring of the isolation device



**D)** NPWT was applied, then the clear drape covering the inner ring of isolation device was cut open. A collection appliance was adhered to the top flange of the isolation device




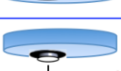
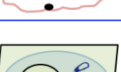


**E)** A two-piece pouch system was used for easy visualization of the ileostomy. The NPWT dressing showed no signs of leakage



**F)** Post abdominal wall reconstruction, 8 weeks Post-Op

**Figure 4:** Application method for isolation device

- 1) Disinfect isolation device per institutional protocol. Cut hole in base of device to create open skirt. Trim skirt and bottom flange to best fit fistula or wound bed surface. 
- 2) Cut hole in wound dressing that will center isolation device over fistula or wound. 
- 3) Insert isolation device fully into hole until top flange is seated on top of wound dressing. Ensure bottom flange is flush with bottom of wound dressing and skirt extends below wound dressing. 
- 4) Prepare wound bed. Place assembled isolation device and dressing onto wound bed so that isolation device base is centered over fistula or wound. 
- 5) Seal entire isolation device and dressing assembly with clear drape. Begin negative pressure wound therapy if prescribed. Cut drape from inner ring of isolation device and apply collection appliance to top flange. 

### Case Description: Patient 2

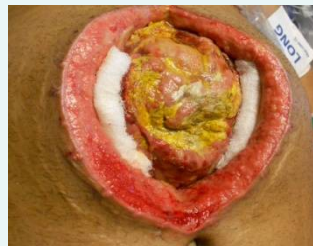
- 29 year-old male with multiple gunshots to chest and abdomen and a prolonged recovery due to respiratory insufficiency and hemodynamic instability
- Underwent trauma laparotomy and resection of jejunum and colon
- Post-Op day #2 patient underwent abdominal washout and closure, however hemodynamic instability and respiratory insufficiency prolonged recovery
- Post-Op day #8 the closure of the abdomen was reopened
- Post-Op day #9 an enteroatmospheric fistula (EAF) was identified

**Result:** Surgery team successfully employed the isolation device with NPWT. Stopped NPWT dressing failure due to effluent leakage

**Figure 2:** Healing sequence for Patient 2 demonstrating the use of the device in isolating NPWT dressing from enteroatmospheric fistula effluent



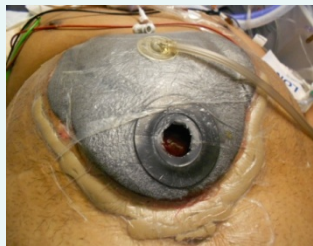
**A)** The wound contained a small EAF just above the 6:00 position. The wound bed and peri-wound skin was prepped for NPWT



**B)** Antimicrobial gauze was placed into lateral gutters to protect sutures



**C)** A fine polyester mesh was placed over the bowel/wound bed, with the exception of the EAF mouth



**D)** ROCF incorporating the isolation device was cut to fit into the wound bed. Clear drape was placed over the assembly and NPWT applied. Clear drape was cut from center of device



**E)** An ostomy pouch system was placed on the top flange of the isolation device and the effluent was collected for measurement



**F)** Post abdominal wall reconstruction, Post-Op day #75

### Case Description: Patient 3

- 47 year-old female originally admitted for an elective robot-assisted hysterectomy and salpingectomy for menometrorrhagia
- Post-Op day #2 a cecal bascule with intestinal ischemia was resected
- Underwent bowel resections and reexploration related to abdominal infection and ischemia on Post-Op days #9,11,13,15,17,19, and 20
- Post-Op day #19 surgical ileostomy created. Diverting malencot tube inserted
- Post-Op day #21 diverting malencot tube was removed and NPWT was initiated with the isolation device placed to protect the bowel

**Result:** NPWT effectively used to heal a wound that ordinarily would not have been a good NPWT candidate because of effluent leakage into dressing

**Figure 3:** Healing sequence for Patient 3 demonstrating the use of the device in isolating NPWT dressing from ileostomy effluent



**A)** Ileostomy stoma at wound edge



**B)** Isolation device cut to mirror wound bed shape and contours



**C)** Wound-bed side of ROCF with isolation device inserted. Note the skirt and flange are trimmed to fit the wound bed and cradle the ileostomy



**D)** Isolation device/ROCF assembly placed on wound bed. Gauze temporarily placed in isolation device opening to facilitate cutting an opening in the clear drape later



**E)** NPWT was applied. Note effluent on white gauze inside isolation device. The clear drape was cut open and gauze was removed



**F)** An ostomy pouch system was placed on the top flange of the isolation device and the effluent was collected for measurement