

# New NPWT Standard for Management of the Open Abdomen

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## Introduction :

Unintentional injuries were the third leading cause of death in 2019. Our acute care facility routinely sees trauma patient wounds from gunshot wounds and motor vehicle accidents.<sup>1,2,3</sup> Damage Control Surgery allows for stabilization of the patient by controlling abdominal blood loss and contamination to improve survival rates through a staged management approach<sup>1</sup>. Temporary management of the open abdomen is often required by purposefully leaving open the fascial edges of the abdomen while resolving Intra-abdominal Hypertension (IAH) and staged surgical repairs<sup>2</sup>. The open abdomen can be managed through several techniques which include bogota bag, absorbable mesh, dynamic retention sutures and the growing use of Negative Pressure Wound Therapy with a specialty dressing for Temporary Abdominal Closure (TAC).<sup>4,5,6,7</sup>

## Methods :

The European Wound Management Association (EWMA) describes the standard of care for NPWT devices contain an electronically controlled feedback system<sup>8</sup>. Our hospital adopted an innovative NPWT system that intelligently maintains set pressure at the wound site<sup>4</sup> and complies with the EWMA recommendations while dynamically adapting in real time to changes in wound exudate volume and viscosity<sup>9</sup>. The new NPWT system was utilized to treat open abdomen patients.

## Results :

Eight patients utilized the new NPWT system and the associated abdominal dressing for TAC. All 8 patients goal of therapy was met to temporarily manage the open abdomen with NPWT. Three of the eight patients expired from their injuries. Five of the eight patient abdomens were successfully closed.

- Three patient abdomens received primary (fascia to fascia) closure.
- Two patient abdomens received abdominal closure utilizing mesh and subsequent wound closure utilizing standard NPWT.
- Average use of NPWT for TAC was 4 days for the eight patients. The Median was 3 days for the eight patients.

## Discussion :

All eight patients were successfully treated with the new NPWT system for Temporary Abdominal Closure (TAC). These results were consistent with the use of our prior NPWT system. Additionally the two "mesh closure" patients utilized new NPWT system with standard dressings to help wound closure from granulation tissue. This eight patient case series supports there is a robust NPWT system option for complex open abdominal wounds. Our facility has standardized to new NPWT system that innovates on the standard of care<sup>8,9</sup>.

## RESULTS

Patient	M / F	Age	Closure Type	Days on TAC Dressing	Successful Temp. Ab. Closure
1	M	28	Primary Closure	1	YES
2	M	60	N/A	2	YES
3	F	38	Primary Closure	3	YES
4	M	21	Mesh Closure	7	YES
5	M	48	N/A	1	YES
6	F	34	Primary Closure	3	YES
7	M	67	N/A	4	YES
8	F	28	Mesh Closure	12	YES

**Patient 4:**  
After 7 Days of TAC Dressing, 18 weeks of successful use of traditional NPWT from innovative NPWT system.



Day 1 of tNPWT



21 weeks of tNPWT usage

**Patient 8:**  
After 12 Days of TAC Dressing, 21 weeks of successful use of traditional NPWT from innovative NPWT system.



Day 1 of tNPWT



Week 12 of tNPWT



Week 21 of tNPWT

## References:

1. Benz, Daniel; Balogh, Zsolt J. . Damage control surgery: current state and future directions. Current Opinion in Critical Care: December 2017 - Volume 23 - Issue 6 - p 491-497 doi: 10.1097/MCC.0000000000000465
2. Einav, S. et al., Management of a patient with the open abdomen. Ccritical care.com, 2021. 27 (6). 726-732.
3. Fowler K, Dahlberg LL, Haileyesus T, AnnestJL. Firearm injuries in the United States. Preventive Medicine, 2015; 79:5-14.
4. Temporary Abdominal Closure Techniques - StatPearls - NCBI Bookshelf (nih.gov)
5. Kaushik, et al. Journal of Wound Care. 2017;26(10):600-606
6. Ziederman, & Lee. Burns & Trauma. 2021 (9) tkab024
7. Krug et al., Injury, int. Care Injured, 2011; 42, S1-S-12
8. Apelqvist, J., Willy, C., Fagerdah, AM. et al. Negative Pressure Wound Therapy - overview, challenges and perspectives. J Wound Care 2017; 26: 3, Suppl 3, S1-S113.
9. Paglinawan R, Schwab P, Bechert K. Negative pressure wound therapy system Innovates standard of care via intelligent pressure control and dynamic exudate removal. Wounds. 2020;32(10):51-58.

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