# Development of a Perineal Negative Pressure Wound Therapy System

STAMFORD HEALTH
Healing. Reimagined.
Affiliate Columbia University College of Physicians and Surgeons
Member NewYork-Presbyterian Healthcare System
A Planetree Hospital

***Thomas Tritt BE MBS MD PGY -III***

**Department of Surgery, Stamford Hospital, Columbia University College of Physicians and Surgeons**

COLUMBIA UNIVERSITY
*College of Physicians and Surgeons*

## INTRODUCTION

Fistula-in-ano and complex perineal wounds caused by necrotizing fasciitis are often difficult to manage and present many clinical dilemmas for colorectal surgeons and wound care specialists. Often these wounds have a prolonged healing course and few solutions exist to promote healing. The most recent advance in wound care has been the negative pressure wound therapy system which has improved the rates of wound closure, time to closure, and has decreased the risk of further infection. However, from the prospective of a surgical resident, vacuum therapy does not work well around the anal verge. Stool often enters into the wound causing inadequate suction and further infecting the tissue of the communicating wound. Often, these patients require a diverting colostomy in order to protect the wound. The objective of my device is to protect the rectum while providing vac therapy to anal/perineal wounds.

## Description of Technology

My device is a two-part system that drains the rectum of stool, while protecting the rectal mucosa and providing negative pressure therapy to a communicating wound. A thin porous plastic coating will be placed circumferentially in the rectum and adhere to the rectal mucosa with a surrounding adhesive around the anal verge. Stool will be able to flow freely into a collection bag. The communicating wound will consistent of the standard vac therapy system; sponge, lily pad, adhesive taping, and vac container. Granulation tissue will form around the wound, yet the rectal/anal mucosa will be protected by the thin plastic sheet. This two-part system will reduce suction leak rates and improves vac adherence to the anal verge.

## Acknowledgements

I would like to thank Dr Kevin Dwyer, Dr David Yuh and Stamford Hospital Surgical Residency Program in their support of resident research. I have no financial disclosures. All KCI products are registered trademarks of the 3M brand. I have no financial benefit and this project is purely to help patient care.

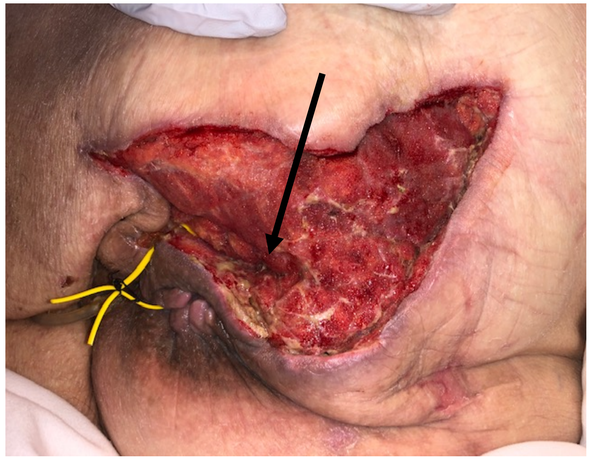


Figure 1: Complex Perineal wound due to pelvis sepsis. Seton marks fistula-in ano with communicating exposed rectum(arrow). Wound required serial debridements and diverting ostomy due to necrotizing fasciitis

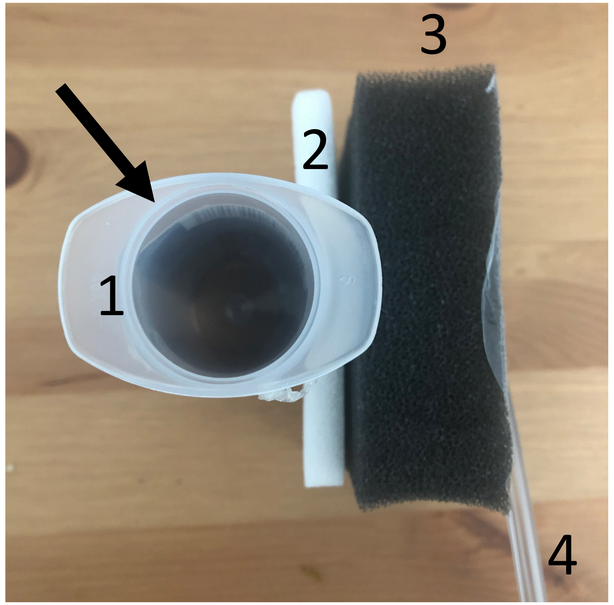



Figure 2: Wound vac system in axial plane. Arrow marks the anal verge. 1) Introducer system which is covered by thin porous plastic. Once at the anal verge 1 will be removed leaving a rectal tube that will evacuate stool into an isolated container. The posterior aspect of the rectal tube contains a thin rib of firm plastic keeping the tube in place 2) KCI Wound Vac white foam used on the rectal mucosa. 3) KCI Black foam used for promotion of granulation tissue of surrounding subcutaneous fat and muscle 4) Vacuum tubing that connects to negative pressure cannister.

## Conclusion

The goal of my device is to improve healing rates of large fistulas and complex perineal wounds, reduce rates of therapy failure, and reduce the rates of unnecessary diverting ostomy creation. These wounds are difficult to manage and lead to multiple sequela for patients. By creating a closed negative pressure vac therapy system we have created a solution to a complex problem faced by wound care specialists and surgeons.