



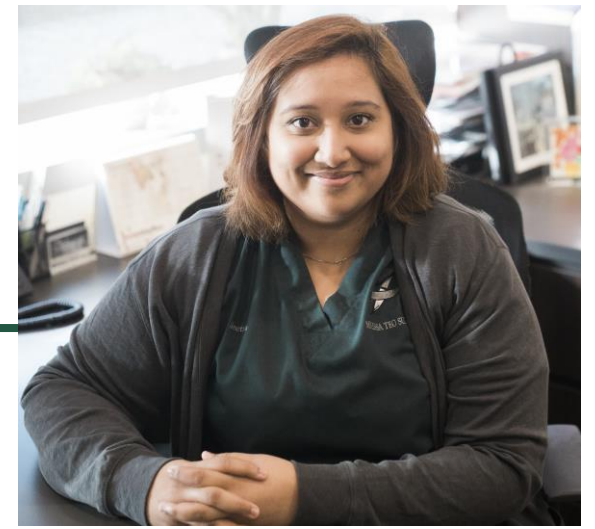
The Management of Complex Acute/Chronic Wound with the use of Negative Pressure Wound Therapy

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Surgical Oncology Nurse Specialist, Singapore

1st August 2022

Once upon a time...



- Nursing journey started in 2009
- Trained in Surgical ICU/HD
- Joined Department of Advanced Surgical Oncology in 2012 as the first Surgical Oncology Nurse in Singapore.

- Underwent intensive training in Oncology, General Surgery, Nutrition care, Wound and Ostomy care and palliative care.

- Pioneered Surgical Oncology Nursing in Singapore since 2012



Who is a Surgical Oncology Nurse?

A surgical technician for cancer

Understands the biology and natural history of the disease

Works in multidisciplinary teams

- - collaborates with medical and radiation oncologists to plan neoadjuvant and adjuvant treatments
- -collaborates with pathologists regarding tumour immunophenotyping and mutational analysis to optimise treatment

The Big Bad Ugly

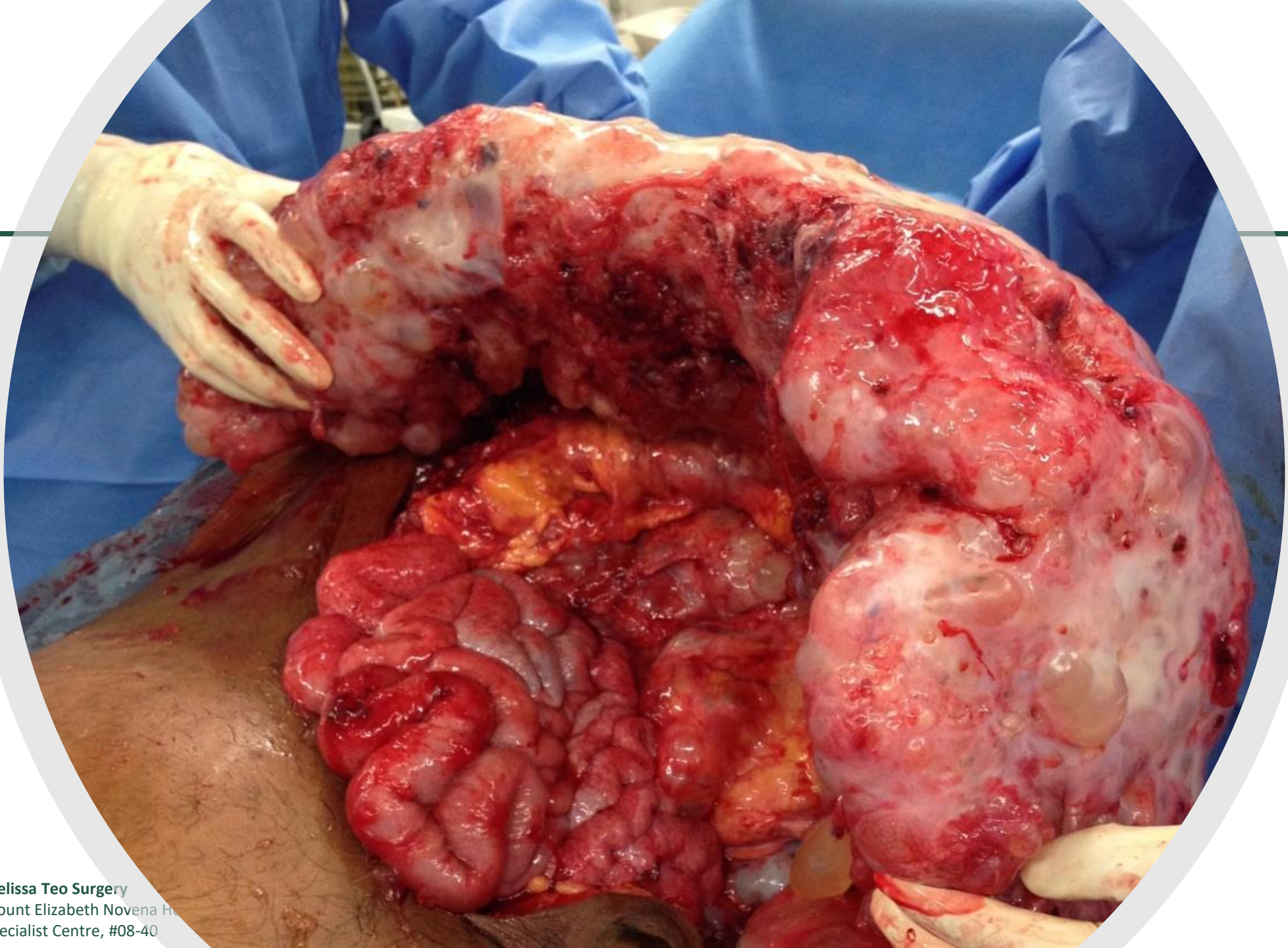
By Don Taylor



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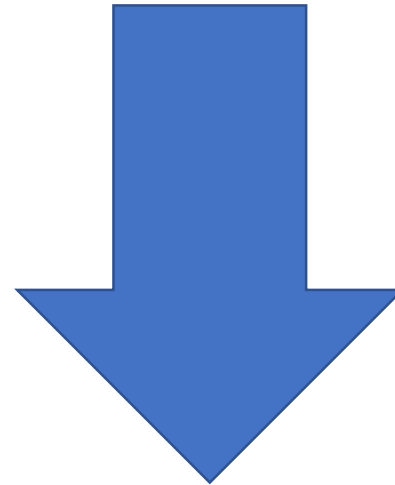




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TOPIC OF DISCUSSION TODAY



NEGATIVE PRESSURE THERAPY SYSTEMS IN MY PRACTICE(SURGICAL ONCOLOGY WOUNDS)

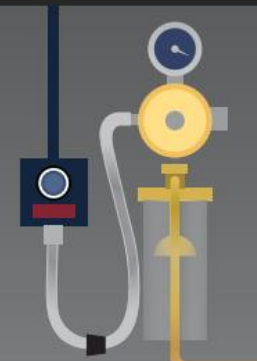





In the beginning, before the novelty of 3M Activac was popularized in Singapore

- Wall Suction was heavily utilized

Reasons for Switching to Conventional NPWT

Wall Suction (DIY)
VS
Conventional NPWT

3M™ ActiV.A.C.™ Therapy System

Variable, High risk of infection	Components <small>(e.g. Foam Filler, Canister, Pressure)</small>	Reliable, Sterile
Long, Tedious	Preparation Time	Short, Ease of use
Complex	Application Technique	Simple, Straightforward
Uncertain wound outcomes	Clinical Outcome	Clinically proven outcomes, Effective
Restricted	Mobility	Portable
High	COVID-19 Risk Exposure	Low
None	Alarm (Leak/Blockage)	Yes

Added Benefits during the demanding times of Covid-19



Benefits of 3M™ ActiV.A.C.™ Therapy System

Patient

- ▶ Reduce risks of infection exposure in hospitals
- ▶ Treatment in the comfort of your home
- ▶ Reliable and certainty to good clinical outcome

Clinician

- ▶ Optimize nursing resources and time to treat COVID-19 patients
- ▶ Prevent complications and reduce hospital readmission rates
- ▶ Rapid discharge with good wound clinical outcome

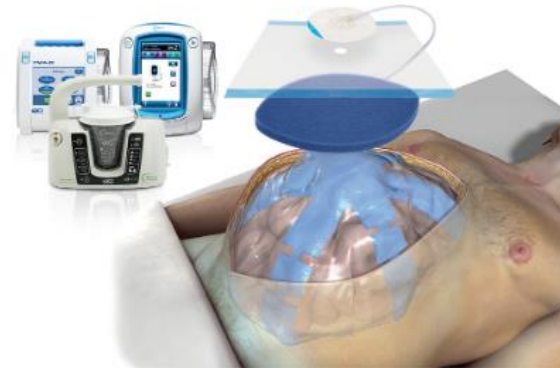
Evolution of NPWT Systems and their varying Modalities



Not Forgetting...

ABTHERA™ Open Abdomen Therapy

1

A dark blue rectangular box containing the text 'ABTHERA™ Open Abdomen Therapy' in white. To the right of the text is a grey octagon with the number '1' inside.

3M™ Snap™ Therapy System

2

A photograph of the 3M Snap Therapy System. It features a green and black syringe-like device with a clear tube connected to a white and blue grid-patterned adhesive pad. A grey octagon with the number '2' is overlaid on the left side of the image.

3

A photograph of the PREVENA PLUS Incision Management System. It includes two white control units, two purple adhesive dressings, and a clear tube. A grey octagon with the number '3' is overlaid on the left side of the image.

PREVENA PLUS™ Incision Management System

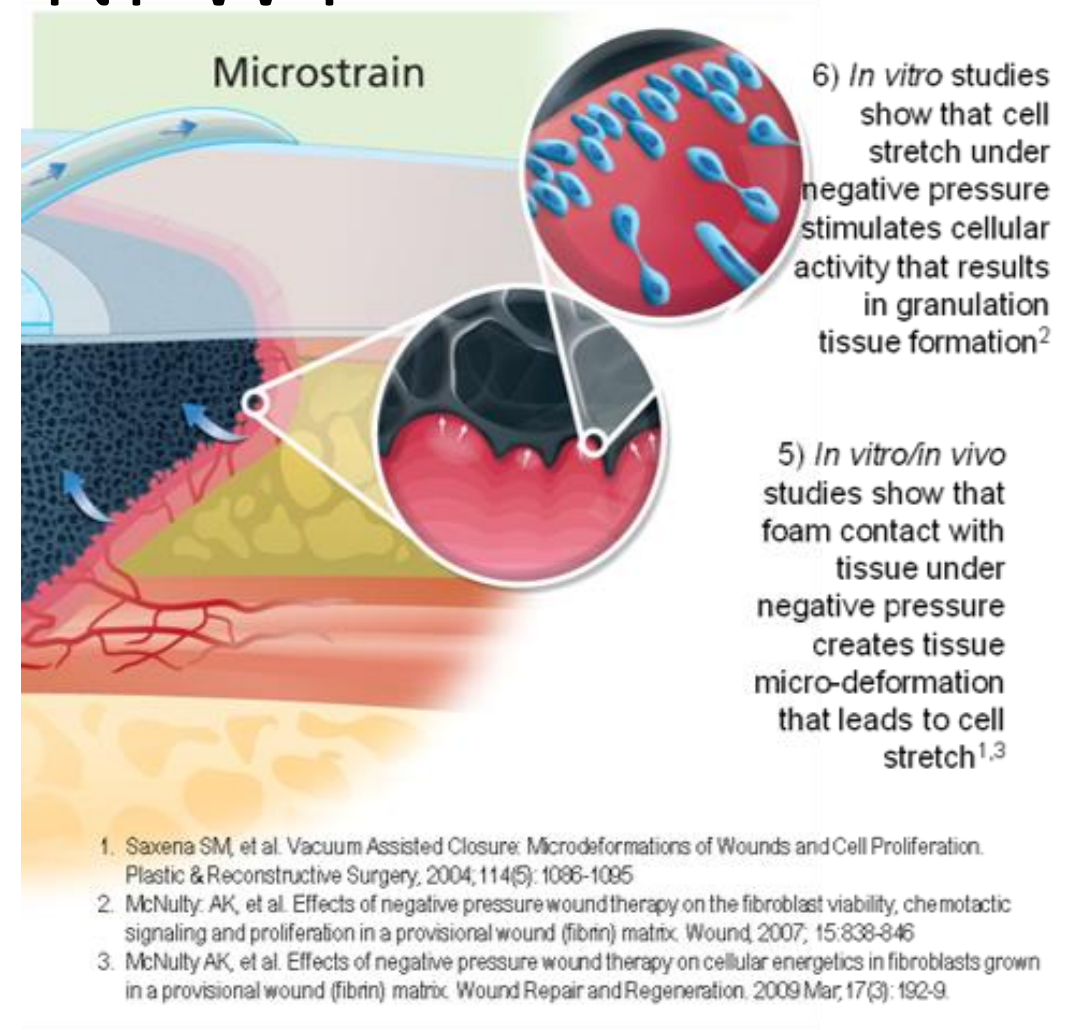
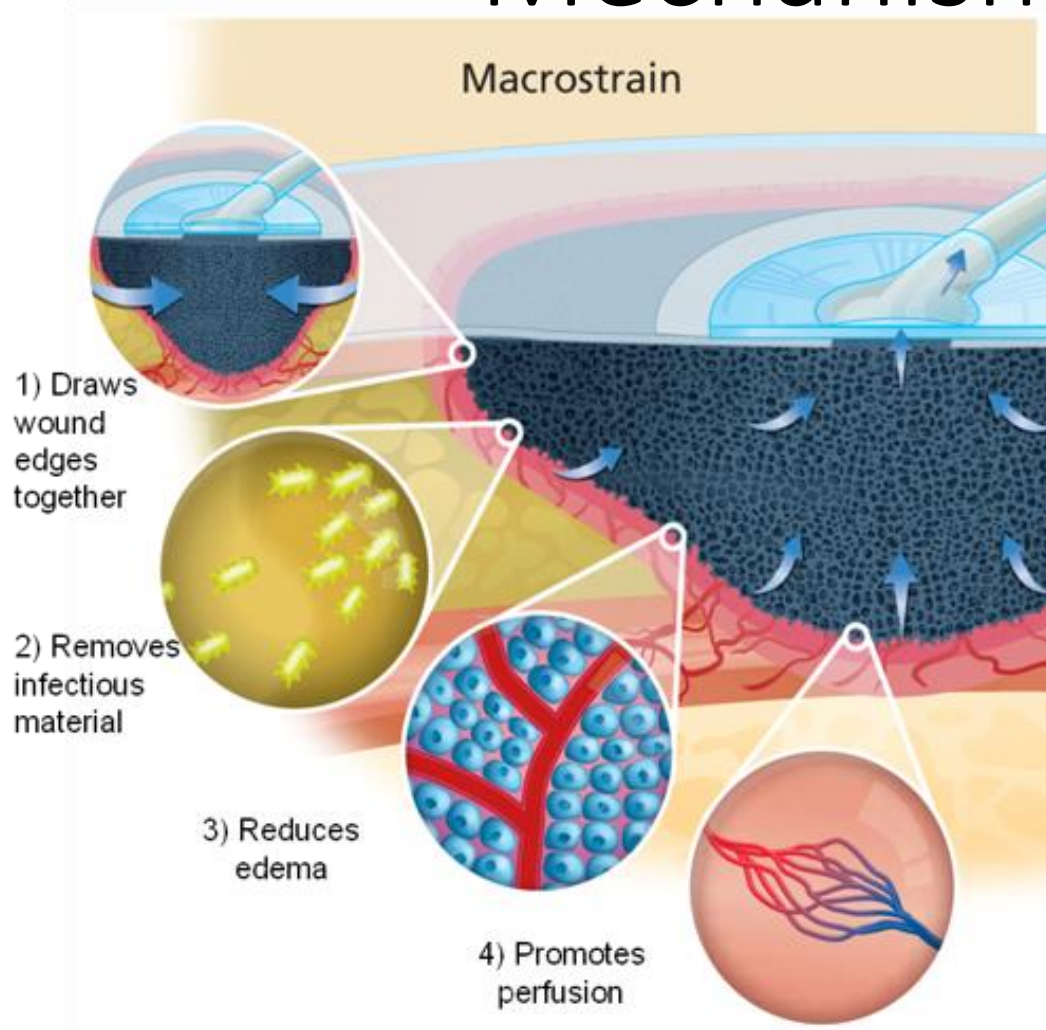


Basic understanding of Vac Therapy Usage

- Protection (Close system)
-
- Exudate Management
-
- Faster Tissue Granulation
-
- Reduce Dressing time change
-
- Allaying Patient's Discomfort



Mechanism of NPWT

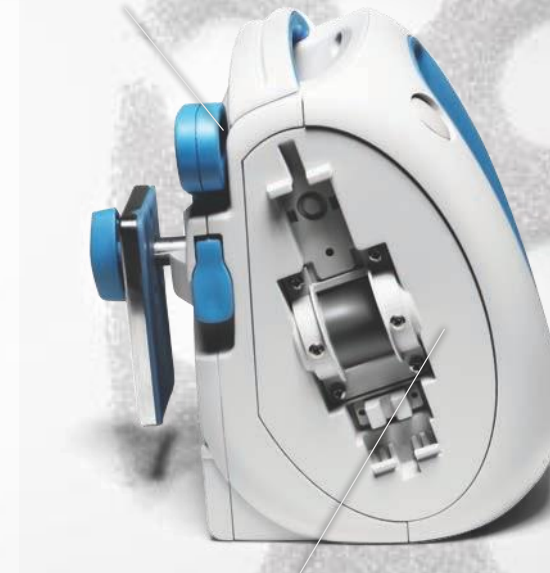


V.A.C. VERAFLU™ Therapy Provides Automated, Volumetric Fluid Delivery



Large Interface Screen
Intuitive, easy to use menu for simplified therapy programming

Hanger Arm



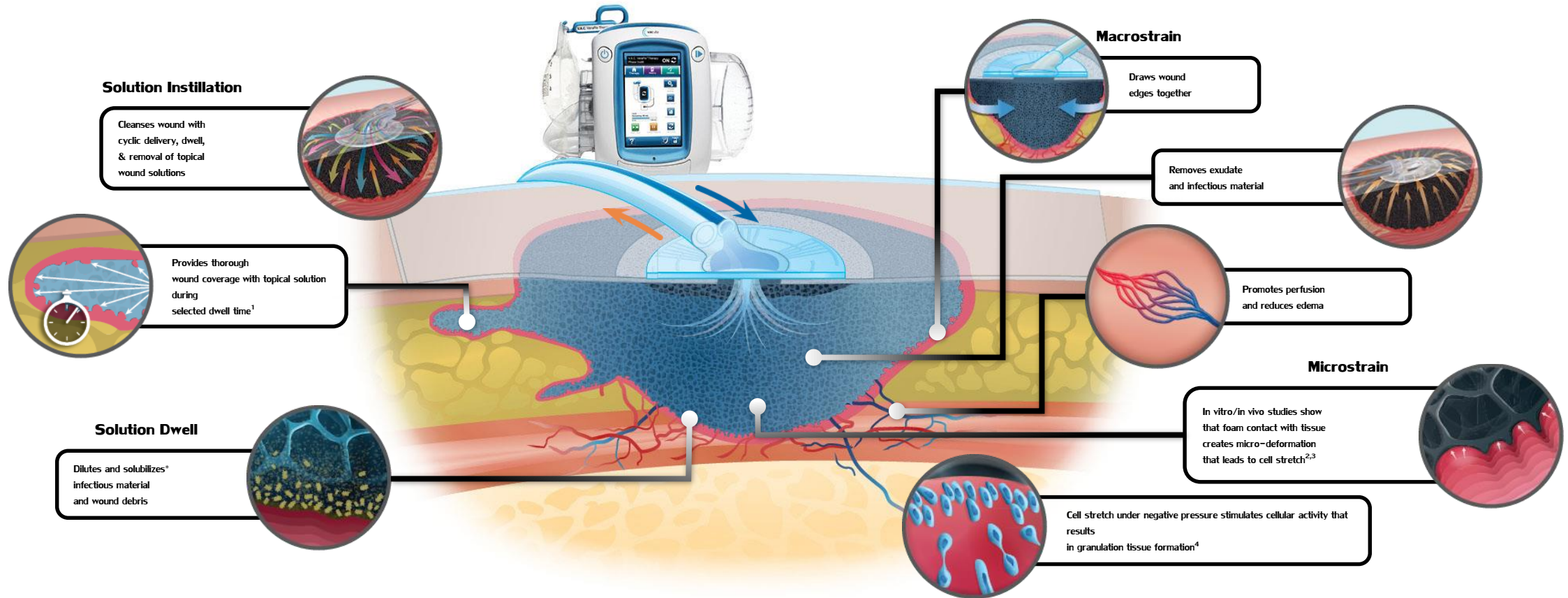
Volumetric Fluid Delivery

Utilizing a pump for reliable fluid delivery differs from other NPWT systems that provide instillation solutions under continuous flow or use gravity to instill solutions

Veraflo™ Therapy Mechanisms of Action (MOA)

Instillation & Dwell Phases

V.A.C.® Therapy Phase



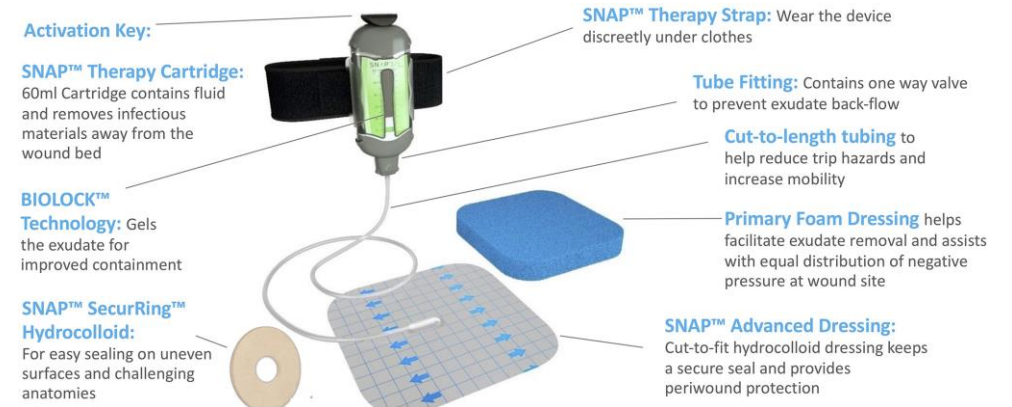
*Topical solution dependent

References: 1. Rycerz AM, Slack P, McNulty AK. Distribution assessment comparing continuous and periodic wound instillation in conjunction with negative pressure wound therapy using an agar--based model. *Int Wound J.* 2013;10:214--20. DOI: 10.1111/j.1742-481X.2012.00968.x. 2. Saxena SM, et al. Vacuum Assisted Closure: Microdeformations of Wounds and Cell Proliferation. *Plastic & Reconstructive Surgery.* 2004; 114(5):1086--1095. 3. McNulty AK, et al. Effects of negative pressure wound therapy on cellular energetic in fibroblasts grown in a provisional wound (fibrin) matrix. *Wound Repair and Regeneration.* 2009 Mar;17(3):192-94. McNulty AK, et al. Effects of negative pressure wound therapy on the fibroblast viability, chemotactic signaling and proliferation in a provisional wound (fibrin) matrix. *WOUNDS.* 2007; 15:838--846.



What is SNAP Therapy?

• International Wound Journal, Volume: 16, Issue: 4, Pages: 891-896, First published: 21 March 2019, DOI: (10.1111/iwj.13114)



What is PREVENA™ Therapy



- 1. Physical protection of wound**
(physical barrier properties of the drape)
- 2. Mechanical stabilization**
(computer modeling/bench studies)
- 3. Increase in blood flow**
(clinical data)
- 4. Reduction of edema**
(via removal of wound fluid)
- 5. Reduction in hematoma / seroma**
(porcine wound model; clinical data)
- 6. Increase in lymph flow**
(porcine wound model)
- 7. Early increase in wound breaking strength**
(porcine wound model)
- 8. Narrower zone of dermal scar histologically**
(porcine wound model)

*In a canister † In computer and bench models

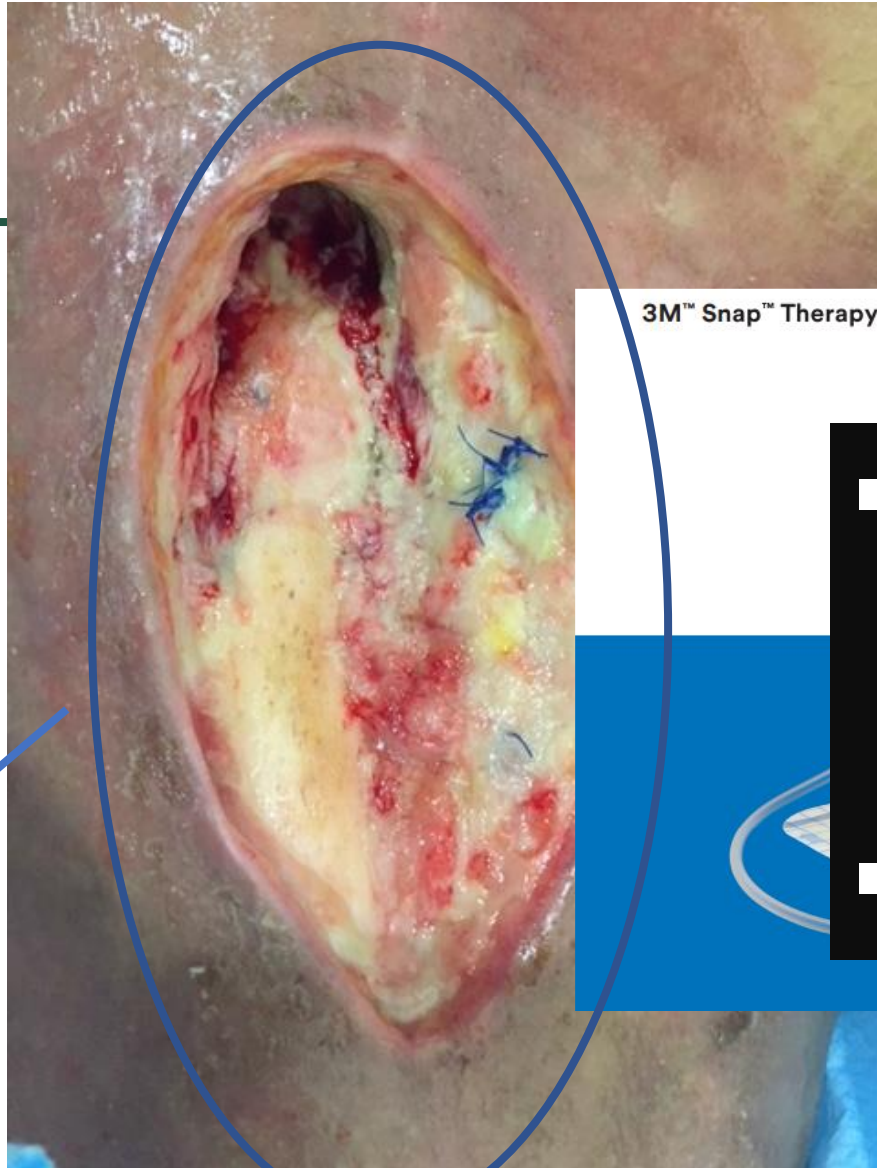
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Real world application of NPWT : CASE STUDIES

Case Scenario 1

- 56 yr old female
- Diagnosis: High grade thigh sarcoma
- Had initial resection of the tumour in 2019
- Underwent **radiotherapy** thereafter
- Developed, abscess during a holiday in Paris
- Wound further deteriorated
- Had a DIY wall suction applied in Indonesia
- Femoral artery blow-out, that required surgery
- Came to Singapore for treatment
- Started on SNAP Therapy beginning of Aug 2019
- Used **white foam** as interface dressing to protect the vessels ,nerve, and bone

Thigh
Sarcoma



3M™ Snap™ Therapy System



- Patient wanted mobility as she was ADL independent
- Patient wanted portability

Aug 7

Aug 24

PhotoGrid



Case Scenario 2

- 76 year-old male
- Had long standing sacral pressure ulcer which was non healing with conventional dressing(has been hospitalized for 4 months prior my assessment)
- Constantly soiled from urine and faeces
- There was exposed bone, muscle and extremely sloughly
- High bioburden and unable to perform sharp debridement due to pain
- Perfect candidate for Veraflow Therapy
- Protected peri-wound with cavilion and used duoderm thin to isolate the wound from the anus

Dwell time: 5mins

Cycle : 3hrs

Solution: Dermacyn

Solution volume: 20mls

Day 1

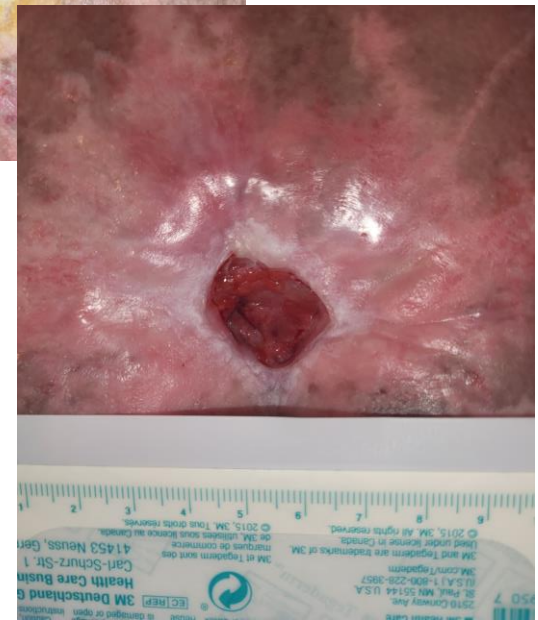
VeraFlo™ Therapy

Day 36



- Significant size reduction within a month
- Successfully converted chronic wound to acute status by reintroducing angiogenesis
- Changed to activac therapy on Day 44

Day 31



Day 44



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Case Scenario 3

- 82 year old female
- Diagnosis: High grade thigh sarcoma and underwent radiation therapy
- Wound broke down, and the surgeon revised the wound and performed a rotational flap
- There was tension along the sutures, dermal edema and erythema(infection)
- Managed wound conservatively and wound broke down again
- Patient was extremely distressed as she had to go for another major surgery
- Applied activac therapy immediately after 2nd surgery
- Wound reduced is size within 3weeks
- On going therapy

Previous thigh sarcoma wound , post radiation



Radiated tissue (minimal to no tissue perfusion)





Wound broke down again



Day 23 measuring 11x 3.8cm



Immediate post surgery measuring **22x11.5cm**

Case Scenario 4

- 91 year old male
- Diagnosis: Shin melanoma
- Underwent wide resection of shin melanoma
- As skin was too tight to oppose together, decision was made for Split Skin Graft(SSG)
- Activac was immediately applied post SSG
- Initial therapy was kept for 7days
- 95% of SSG took
- Total of 2 cycles of Vac therapy was applied
- Vac therapy application to aide SSG to be “stuck down” onto the wound is increasingly becoming Standard of Care around the world



Research

Open Access

Outcomes of skin graft reconstructions with the use of Vacuum Assisted Closure (VAC®) dressing for irradiated extremity sarcoma defects

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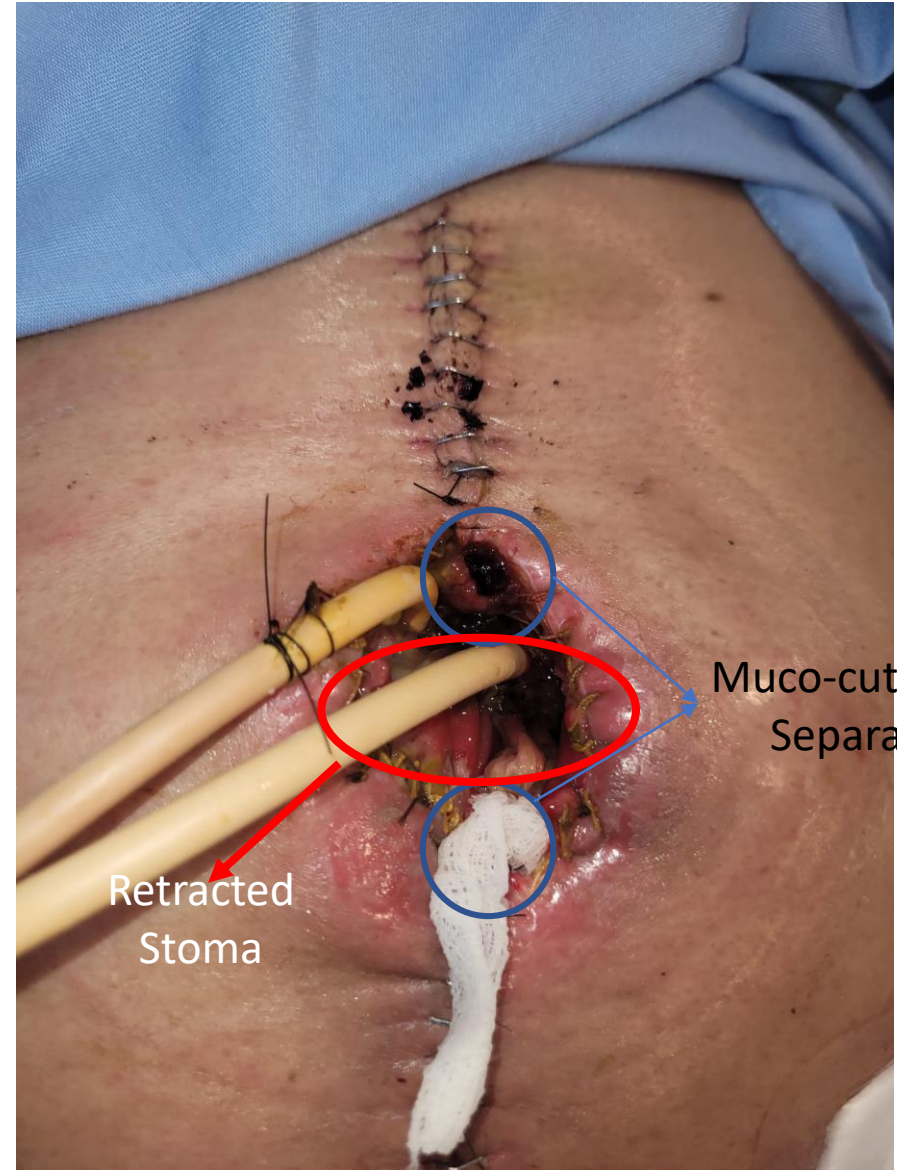
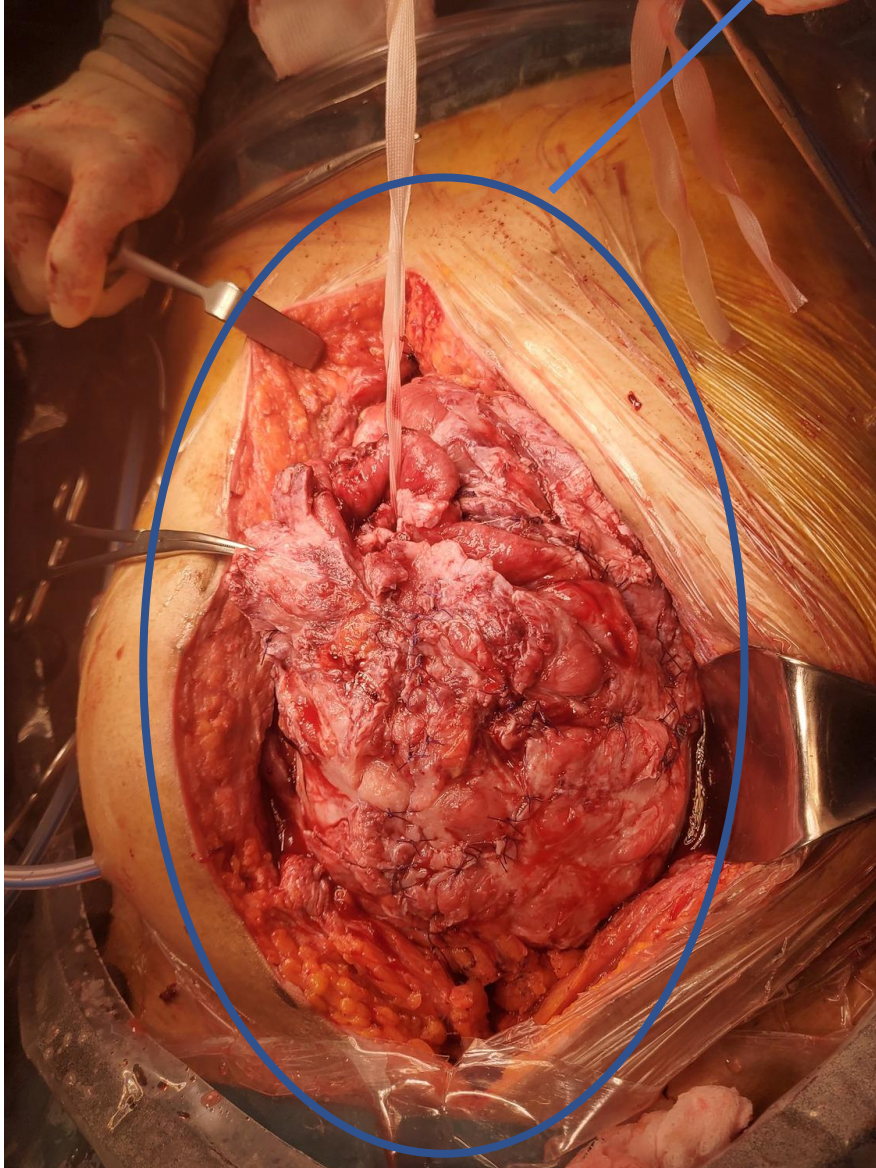
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Case Scenario 5

- 69 year old male
- Diagnosis : Peritoneal Mesothelioma
- Patient was in subacute intestinal obstruction
- He required bowel resection and bypass/Stoma creation
- Upon entering his abdomen, noted to have “frozen belly”
- Had to close the abdomen and pull out a Stoma
- Intestines were very edematous and cocooned
- Could not pout Stoma well, and it was deliberately retracted
- wound healing was poor due to intrinsic factors(chemotherapy and poor nutrition)
- Stoma was a high output Stoma (2.5 to 4L)

Bowel cocoon-ing

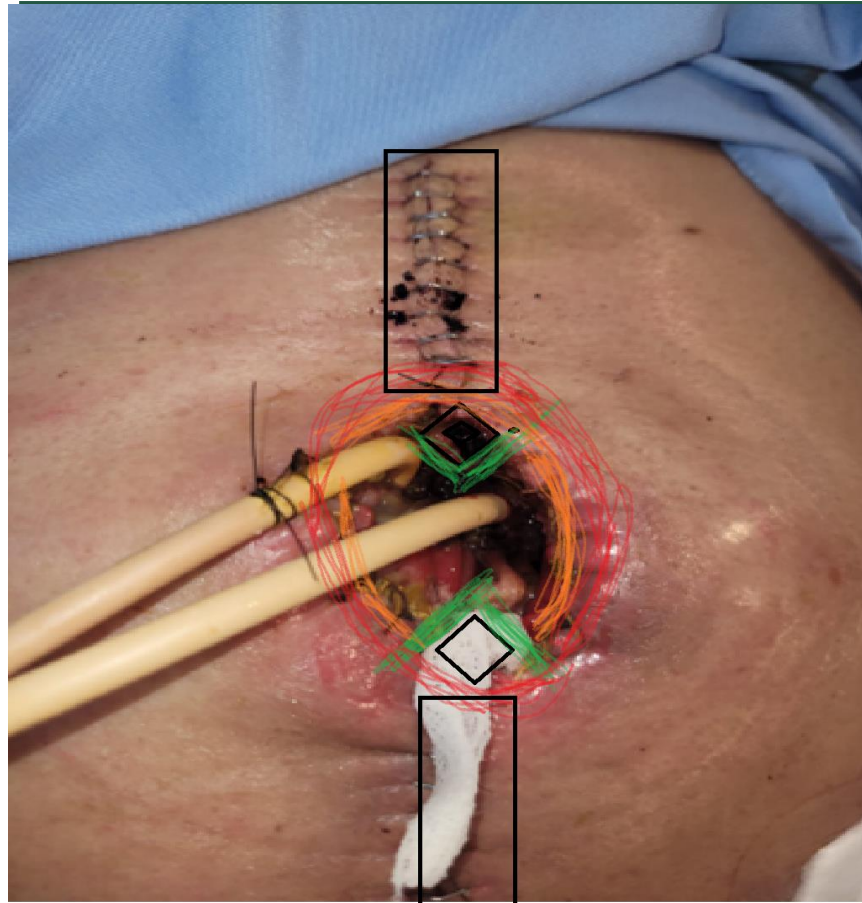




Challenges I faced

- I had to isolate the mucocutaneous separation from the retracted high Stoma output
- I had to heal the wound and protect the peri-wound and pouch the Stoma with no leak

Key: Isolation of wound and stoma



- **Green:** gauze soaked in dental to isolate the muco-cutaneous wound from the Stoma mucosa



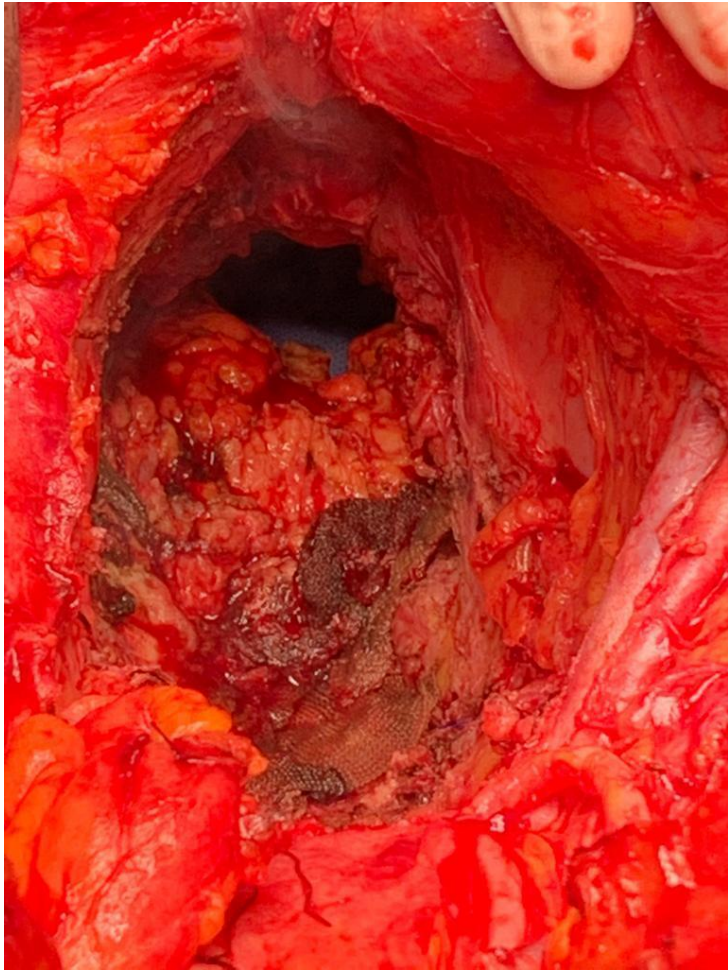
- **Black:** Areas that the granufoam has been used
- **Orange:** Duoderm thin to protect the peri-wound
- **Red:** stomahesive paste to aide with poaching of Stoma bag

Case Scenario 6

- 59 year old male
- Diagnosis: Advanced rectal cancer
- Underwent total pelvic exenteration
- Created a rotational VRAM flap
- Large amount of lymph nodes harvested at the rectum
- Prevena incision management applied immediate post op
- applied for 3cycles of 7days/cycle
- Flap took and healed 100%

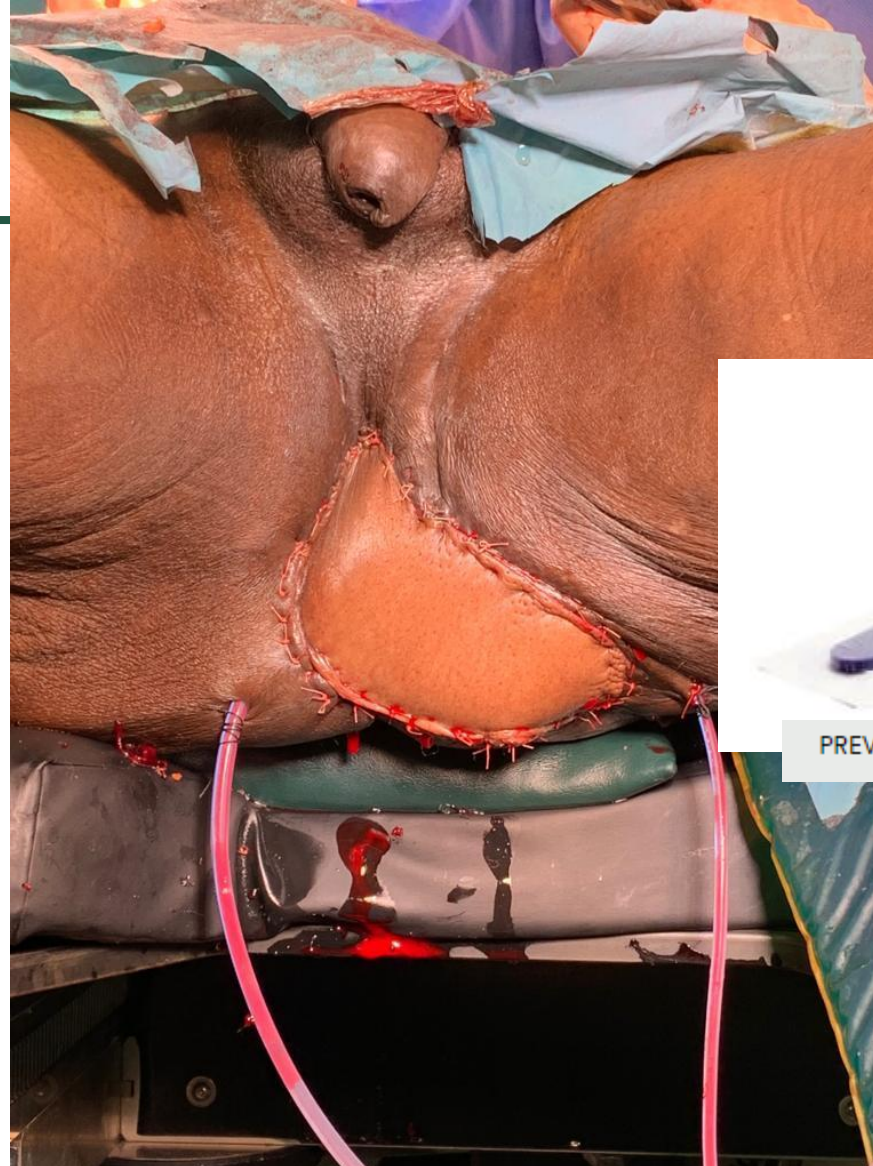


Advanced
Rectal
Cancer



VRAM Flap mobilization





PREVENA PLUS™ Incision Management System



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E. Sternal incision was closed following soft tissue approximation.



F. PREVENA™ PEEL & PLACE™ Dressing was applied over the sternal incision.

Passive therapy

PREVENA™ Therapy

Prophylaxis is better than cure !!!

Mechanism
of Prevena



Merits of all Vac Therapy Modalities

- Versatility in usage
- Clinician specific
- Used as a primary therapy instead of a “last resort” therapy
- Total Cost reduction , reduce hospital/clinic visits
- Less distressing for patients
- Decrease bioburden and infection rates
- Exponentially increasing angiogenesis
- Speed up wound healing/closure for patient (i.e., can proceed to next stage of treatment)
- Portability/ smaller systems are discreet in nature

Clinician-friendly, but more importantly, patient-friendly

Thank you

My Mentor :
Prof Melissa Teo

