Prove the Value Program

A program to objectively demonstrate the clinical and financial outcomes of advanced surface technologies for pressure ulcer patients.

The following Case Study is a continuation of the *Prove the Value* information published in the September/October 2015 issue of *Wound Care Advisor*, available at here[A]. The Hill-Rom *Prove the Value* program is based on collecting and analyzing information on individuals who have recently used or are current using a Clinitron bed or P500 wound surface and helps demonstrate the value of advanced wound care solutions through local assessments within facilities. Contact your local Hill-Rom representative for more information, click here[B].

Enhancing outcomes for patients and their caregivers: Hill-Rom

Content and funding provided by Hill-Rom

Prove the Value Program Case Study

A clinical assessment on the outcomes and key findings of complete pressure ulcer healing while on the Clinitron® Air-Fluidized Therapy System

Facility

South Mountain Healthcare and Rehabilitation Center Skilled Nursing Facility – Vauxhall, NJ

Overview

A 67 year old female resident with multiple Stage IV and one Stage II pressure ulcers experienced positive wound healing while using the Hill-Rom® Clinitron® Air Fluidized Therapy System. The healing occurred over 4 months.

Patient History/Background

Mrs. Smith* is a 67 year old resident at South Mountain Healthcare and Rehabilitation Center. She presents with a history of Multiple Sclerosis and as a result of this condition, she suffers from abnormal posture and contracture of the lower legs, ankles, feet, upper arms, and hands. Her subsequent diagnoses also include pneumonia and septicemia. As a result of her comorbidities, Mrs. Smith developed multiple debcubitus ulcers that she had acquired prior to arriving at South Mountain. These were in the form of multiple Stage IV's (sacrum, ischium, left and right trochanter) and one Stage II (left proximal buttock). Her condition and health comorbidities gives her a high risk score of 10 on the Braden Scale. This score signifies Mrs. Smith's high susceptibility to skin breakdown.

Early Clinical Intervention

Mrs. Smith was admitted to South Mountain with Stage IV pressure ulcers at the sacral, ischial, and left trochanter region. She was placed on a facility owned low air loss mattress for prevention and treatment measures.

In efforts to prevent additional wounds from developing and stop current ones from regressing, a Group 2 Titan Integrated Low Air Loss Bed System was ordered for Mrs. Smith on September 24, 2013. Furthermore, Mrs. Smith's wounds were treated with Dakins solution to control odor, Collagenase SANTYL® Ointment, calcium alginate dressing, and border gauze applied twice per day. As the wounds improved, Calcium Alginate was no longer needed but Collagenase SANTYL® Ointment continued. This wound dressing method was done throughout the entirety of Mrs. Smith's wound care treatment.

While Mrs. Smith was on the Group 2 Titan Integrated Low Air Loss Bed System, varying degrees of wound regression and healing were observed. Some wounds appeared to have decreased in volume but had turned necrotic or developed slough and eschar. It was also documented that while the size of the wound decreased (length and width), the depth increased in some cases exposing underlying muscle, tendons, and bones.

On November 11, 2013, Mrs. Smith was admitted to the hospital for complications related to pneumonia and septicemia. She received treatment for the admitting diagnosis and her Stage IV sacral wound was debrided by a clinician in the hospital. The hospital ordered for a negative-pressure wound therapy for Mrs. Smith upon her return to South Mountain.

Mrs. Smith was discharged from the hospital 11 days later on November 21, 2013 and readmitted to South Mountain. Her readmission diagnoses included metabolic encephalopathy, hypernatremia, functional quadriplegia, plural effusion and sepsis. On that same day, a wound VAC was placed on Mrs. Smith's sacral wound—which had become infected with Methicillin-resistant Staphylococcus aureus. The wound VAC was used for five days and wet to dry dressings were changed three times during that period. Mrs. Smith had returned back on the Titan Integrated Low Air Loss Bed System.

Mrs. Smith remained on the Titan Integrated Low Air Loss Bed System for 157 days after her hospital episode; however, her wounds were not steadily progressing. Furthermore, Mrs. Smith had developed two more pressure ulcers. On January, 23, 2014, a wound measuring 4.2 cm^3 (2 cm x 2 cm x 0.05 cm) was identified on the right trochanter and on February 18, 2014, a clinician at a wound clinic documented a wound that measured 0.144 cm^3 (0.9 cm x 0.4 cm x. 04 cm) on the left proximal buttock. Care providers at South Mountain recognized that it was necessary for Mrs. Smith to be upgraded to a more aggressive intervention and turned to the option of using a Group 3 Clinitron® Air Fluidized Therapy System.

Hill-Rom Clinical Solution

The Hill-Rom® Clinitron® Air Fluidized Therapy was ordered for Mrs. Smith and placed on February 28, 2014. Within the first few weeks, Mrs. Smith's wounds showed considerable signs of healing and continued to steadily improve over a course of four months. Care providers at South Mountain assessed that the Clinitron® Air Fluidized Therapy System facilitated the healing process, as the wounds responded favorably after being upgraded.

On June, 30 2014, Mrs. Smith was removed from the Clinitron® Air Fluidized Therapy System after a total of 122 days. Her pressure wounds had either completely healed or were progressing adequately and contracting. She was stepped down to a Group 2 surface and has remained on it since.

*Due to HIPPA regulations, name of the resident has been changed to preserve privacy.

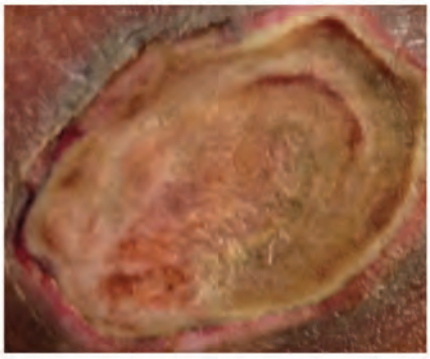
Wound Healing Outcomes:

Wound site: Right Trochanter - Stage IV

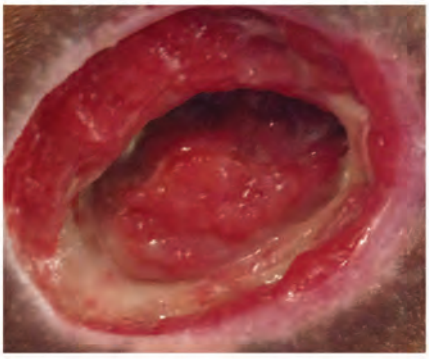
The most notable wound healing occurred at the Stage IV right trochanter site. Mrs. Smith visited a wound clinic on February 18, 2014, and the wound was documented as unstagable due to the development of slough and eschar. The wound was debrided exposing underlying muscle and bone. 10 days after her visit to the clinic, Mrs. Smith was transfered on to the Clinitron® Air Fluidized Therapy System.

On March 4, 2014, the first measurements collected since Mrs. Smith started using the Clinitron® Air Fluidized Therapy System, muscle and bone were still exposed at the wound site. However, over a few months, the wound bed had 100% red granulation tissue indicating that it was properly healing. On June 26, 2014, a few days before Mrs. Smith stepped down from the Clinitron® Air Fluidized Therapy, the wound volume decreased to 0.6 cm^3.

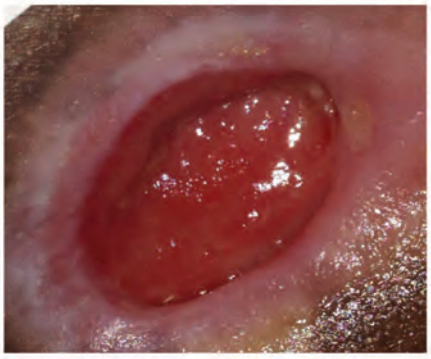
A wound with full thickness tissue loss experienced a substantial healing rate of 98.5% in four months.



Taken on 2/14/14 prior to Clinitron® Air Fluidized Therapy System



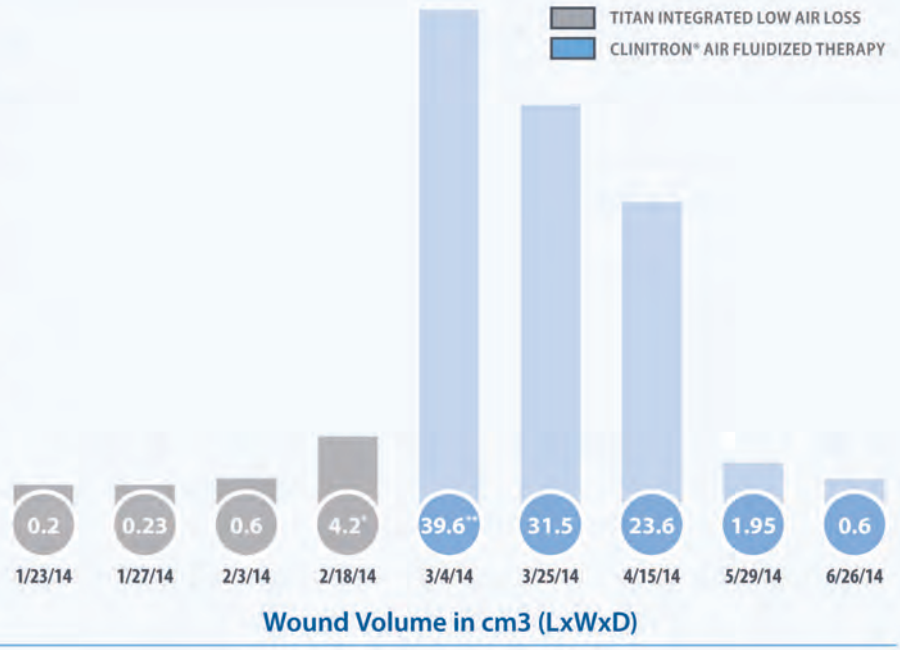
Taken on 3/27/14 during Clinitron® Air Fluidized Therapy System



Taken on 5/21/14 during Clinitron® Air Fluidized Therapy System

Pressure Ulcer Healing Rate

Date	Length (cm)	Width (cm)	Depth (cm)
1/23/14	2	2	0.05
1/27/14	2.3	2	0.05
2/3/14	4	3	0.05
2/18/14*	5	4.2	0.2
3/4/14**	4.8	5.5	1.5
3/25/14	5	4.2	1.5
4/15/14	3.5	4.5	1.5
5/29/14	1.3	3	0.5
6/26/14	2	1.5	0.2



*Immediately after debridement
**Wound volume increased as a result of debridement on 2/18

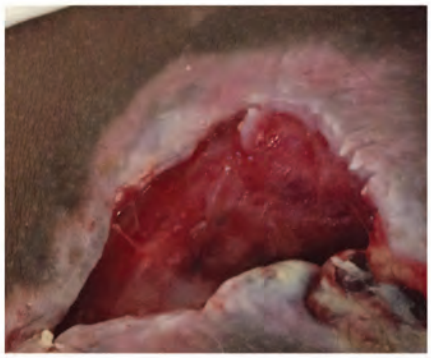
Wound Healing Outcomes:

Wound site: Right Ischium - Stage IV

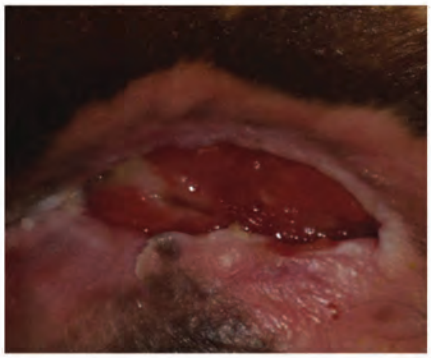
Another significant wound healing occurred at the Stage IV right ischium site. Prior to the Clinitron® Air Fluidized Therapy, the wound was drastically failing to heal. This is evident by the upward trend in the graph from September 24, 2013 to February 18, 2014. However, after Mrs. Smith was upgraded, the wound began to improve.

On March 4, 2014, the wound volume measured 30.8 cm^3. Three weeks later, the wound improved 63% and the volume had decreased to 11.34 cm^3. The wound continued to heal and in three months, the wound bed had 100% granulation tissue growth and measured 0.3 cm^3.

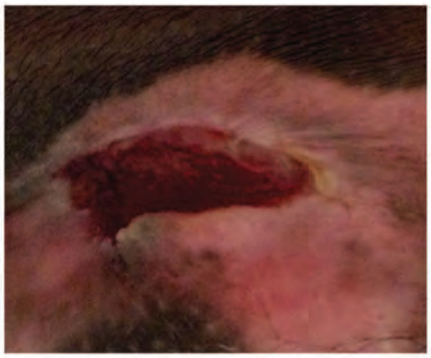
From the time Mrs. Smith began using the Clinitron® Air Fluidized Therapy, the ischium wound had an overall healing rate of 99.03%.



Taken on 2/14/14 prior to Clinitron® Air Fluidized Therapy System



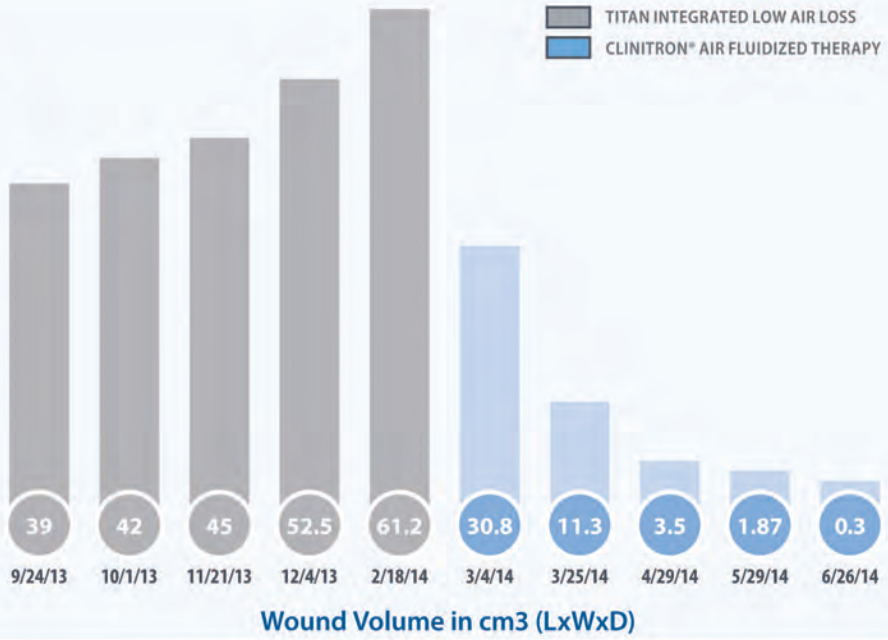
Taken on 3/27/14 during Clinitron® Air Fluidized Therapy System



Taken on 5/21/14 during Clinitron® Air Fluidized Therapy System

Pressure Ulcer Healing Rate

Date	Length (cm)	Width (cm)	Depth (cm)
9/21/13	6.5	4	1.5
10/1/13	7	4	1.5
11/21/13	6	5	1.5
12/4/13	7	5	1.5
2/18/14	9	4	1.7
3/4/14	5.5	2.8	2
3/25/14	4.5	1.8	1.4
4/29/14	3.5	2	0.5
5/29/14	2.5	1.5	0.5
6/26/14	0.5	1	0.6



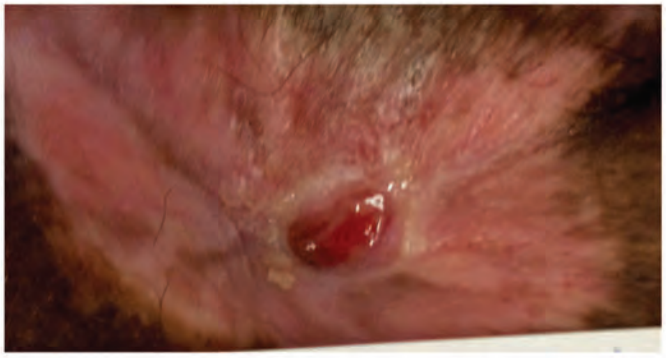
Wound Healing Outcomes:

Wound site: Left proximal buttock - Stage II

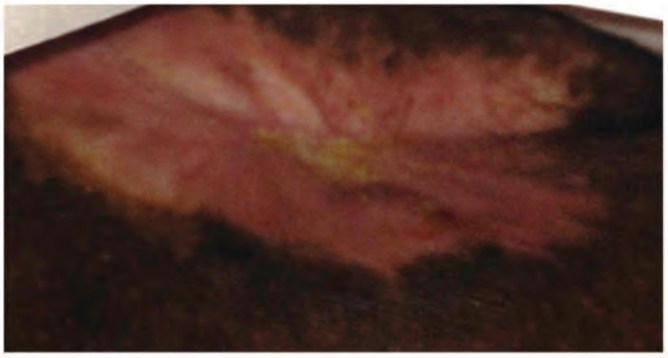
A Stage II wound on the left proximal buttock was discovered during Mrs. Smith's visit to a wound clinic on February 18, 2014. This was one of the factors that influenced South Mountain to upgrade Mrs. Smith to a Group 3 Clinitron® Air Fluidized Therapy System support surface.

Within two months of using the Clinitron® Air Fluidized Therapy, the wound achieved complete healing and has remained closed.

The Stage II wound had a large amount of scar tissue surrounding the open area. The wound bed was red with slough around the perimeter and bled easily. Bacitracin was initially used to treat the wound, but when slough developed, it required Collagenase SANTYL® Ointment with border gauze dressing once daily. The volume noted by the wound center clinician was 0.144 cm^3.



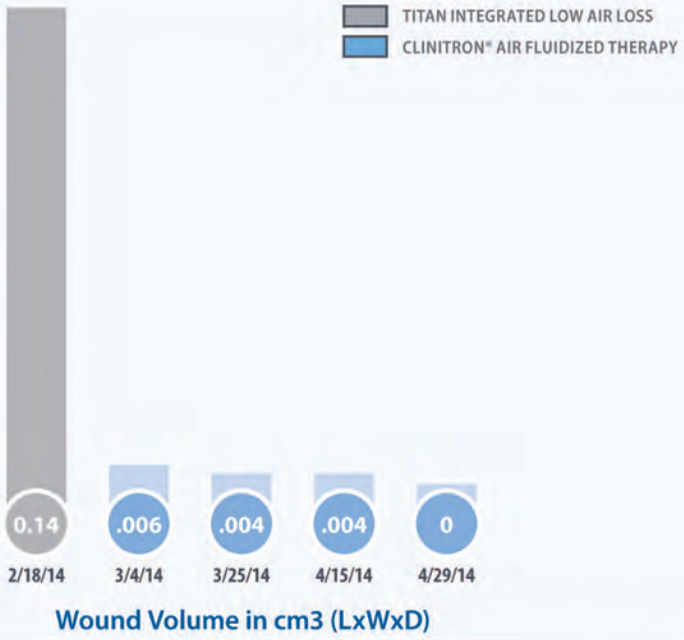
Taken on 2/14/14 prior to Clinitron® Air Fluidized Therapy System



Taken on 4/28/14 during Clinitron® Air Fluidized Therapy System

Pressure Ulcer Healing Rate

Date	Length (cm)	Width (cm)	Depth (cm)
2/18/14	0.9	0.4	0.4
3/4/14	0.2	0.1	0.3
3/25/14	0.2	0.2	0.1
4/15/14	0.2	0.2	0.1
4/29/14	0	0	0



Please note scale change due to smaller measurements for this wound site

Wound Healing Outcomes:

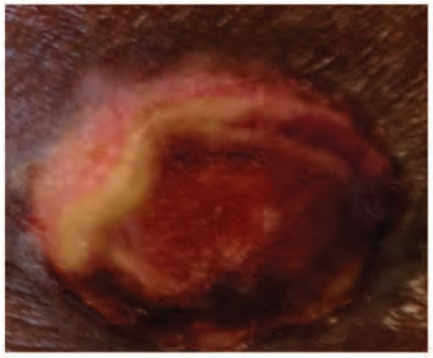
Wound site: Left Trochanter - Stage IV

The Stage IV left trochanter wound proved to be complex and difficult to heal. The graph indicated that the wound progressed, but then regressed before it started to properly heal for a second time.

A week after Mrs. Smith went on the Titan Low Air Loss on October 1, 2013, the wound began to develop tunneling and slough. The tunneling increased for the next two weeks up until October 15, 2014. The wound had improved to some degree between November 2013 and February 2014. However, on February 18, 2014, a clinician at the wound center documented necrotic tissue at the wound site. The necrotic base of the wound was scored by a physician on that same day.

On March 25, 2014, a few weeks after using the Clinitron® Air Fluidized Therapy System, the wound volume increased to 27 cm^3 due to debridement of necrotic tissue. It was also documented that tendons and muscles were exposed. The following week, the wound bed had 50% granulation tissue and decreased in size. The wound continued to progress over the next couple of months.

On June 26, 2014, a few days before stepping off the Clinitron® Air Fluidized Therapy, the wound had decreased by 78% and had 100% pink granulation tissue indicating continuation of wound contraction.



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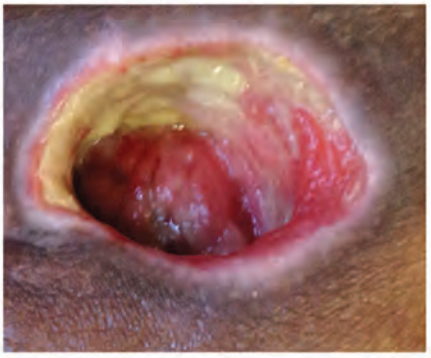
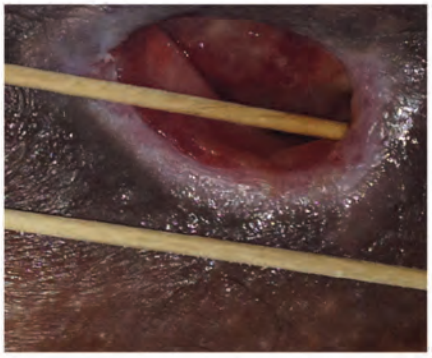


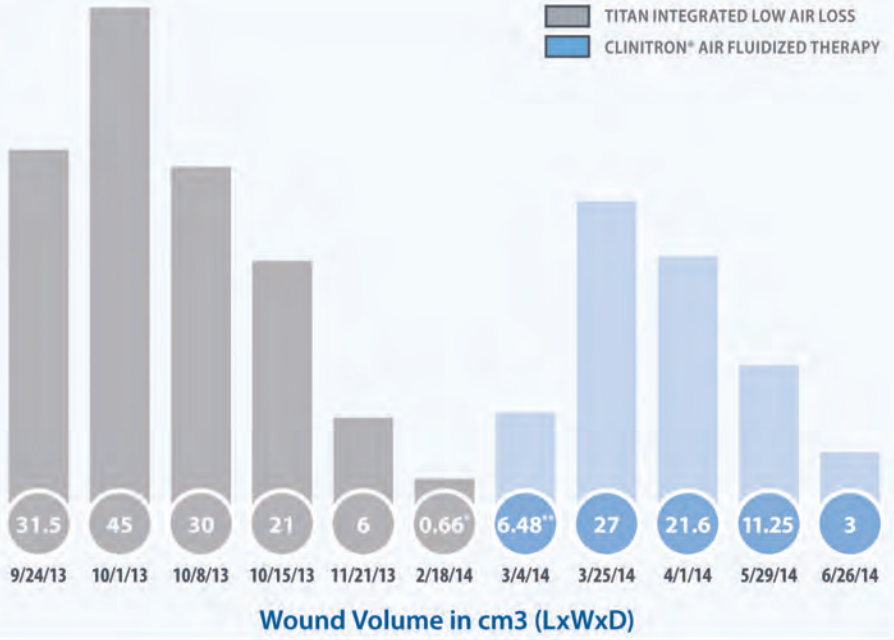
Taken on 3/27/14 during Clinitron® Air Fluidized Therapy System



Taken on 5/21/14 during Clinitron® Air Fluidized Therapy System

Pressure Ulcer Healing Rate

Date	Length (cm)	Width (cm)	Depth (cm)
9/24/13	6	3.5	1.5
10/1/13	6	5	1.5
10/8/13	5	4	1.5
10/15/13	4	3.5	1.5
11/21/13	3	2	1
2/18/14	3.3	2	0.1
3/4/14	4	2.7	0.6
3/25/14	4.5	3	2
4/1/14	4	3	1.8
5/29/14	3	2.5	1.5
6/26/14	2	1.5	1



*Necrotic tissue noted at wound base
**Wound volume increased as a result of debridement on 2/18

Wound Healing Outcomes:

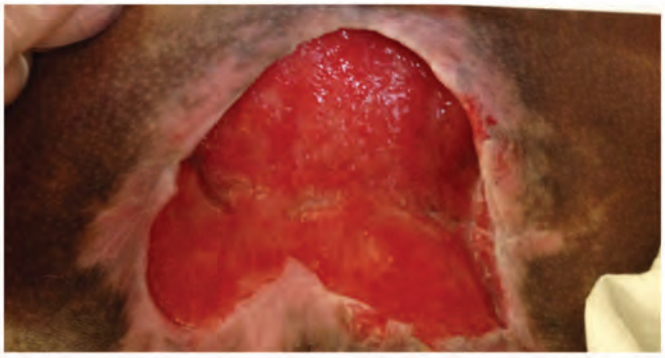
Wound site: Sacrum Stage IV

The Stage IV sacral site experienced similar wound healing to the Stage IV left trochanter site. Prior to the Clinitron® Air Fluidized Therapy System, the wound had varying degrees of healing.

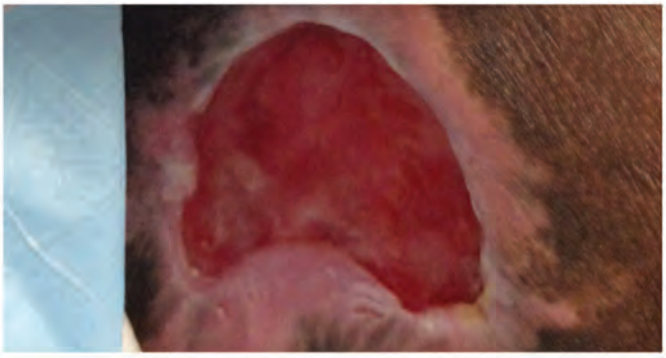
The most significant regression was from October 1, 2013 to November 21, 2013 when the wound increased by 300% to 200 cm^3. On February 18, 2014, measurements indicated that the wound was regressing once more. On March 4, 2014, a few days after using the Clinitron® Air Fluidized Therapy, the wound decreased to by 40% from the prior month.

The volume increased slightly a few weeks later but returned to normal healing progression over the next two months.

On May 29, 2014, the wound measured 20.4 cm^3. This was the smallest that the wound had ever been throughout Mrs. Smith's stay at South Mountain.



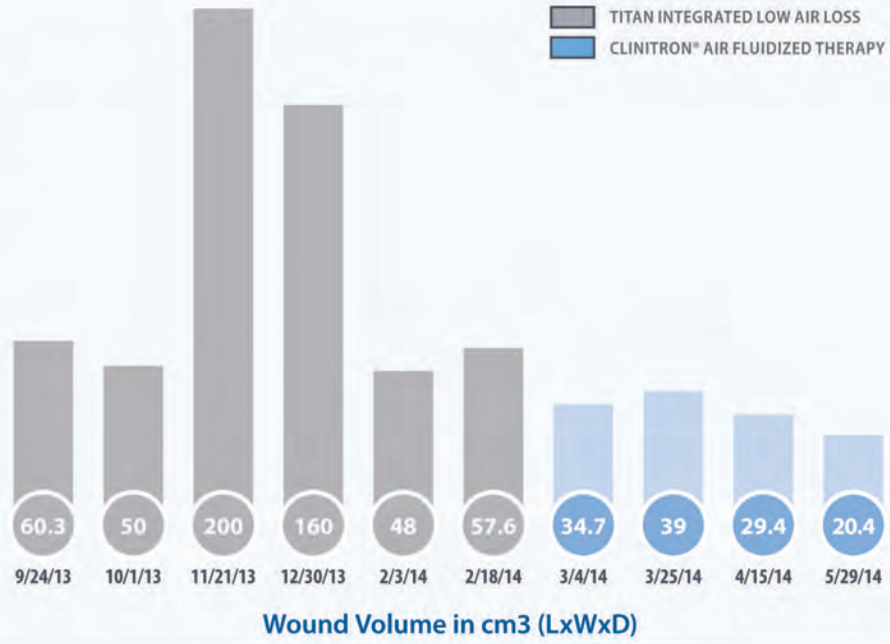
Taken on 2/14/14 prior to Clinitron® Air Fluidized Therapy System



Taken on 4/28/14 during Clinitron® Air Fluidized Therapy System

Pressure Ulcer Healing Rate

Date	Length (cm)	Width (cm)	Depth (cm)
9/24/13	11.5	10.5	0.5
10/1/13	10	10	0.5
11/21/13	8	10	2.5
12/30/13	8	10	2
2/3/14	8	6	1
2/18/14	7.2	8	1
3/4/14	6.2	8	0.7
3/25/14	6.5	7.5	0.8
4/15/14	6	7	0.7
5/29/14	6	6.8	0.5



Financial Considerations

There are a variety of factors that influence costs associated with healing complex pressure ulcers. These factors include the age and physical condition of the resident, type and number of comorbidities, treatments and dressings, and medical options such as Group 2* support surfaces, Group 3* Air Fluidized Therapy, and Negative Pressure Wound Treatment devices. Labor costs associated with wound treatments also need to be considered.

While every situation is unique, favorable results have been achieved when advanced wound care products have been used to treat pressure wounds. Research indicates these products have helped facilitate faster healing rates, can have a favorable impact on nursing care, and can promote increased resident satisfaction – all have a direct or indirect impact on costs.

Clinitron® Air Fluidized Therapy System reduced pressure ulcer incidence in extremely high risk patients, which resulted in an estimated 88% reduction in cost to treat.[1]

Nursing home residents who had a Stage III/IV pressure ulcer, and were treated with a Group 3 surface, healed 4.4 times faster and had 2.6 fewer hospitalizations or ER visits compared to residents on Group 2 surfaces.[2]

Residents who have been placed on the Clinitron® Air Fluidized Therapy System often acknowledge they are comfortable and experience less pain caused by pressure ulcers.[3]

Hill-Rom is pleased to partner with facilities like South Mountain Healthcare and Rehabilitation Center in Vauxhall, NJ to better evaluate and understand outcomes and costs associated with effective wound care management.

South Mountain Healthcare and Rehabilitation Center is a 195 Bed and CMS 5-Star facility for most of the years since its inception. The facility is accredited by The Joint Commission since 1998, and received the Post-Acute Care Certification in 2013. South Mountain is also a six time recipient of National Circle of Excellence through National Association of The Directors of Nursing Administration (NADONA), and most recently in 2015, the recipient of National Embracing Quality Award 2015 from Providigm (ABAQIS).

*According to the Healthcare Common Procedure Coding System (HCPCS), Group 2 support surfaces include powered air flotation beds, powered pressure reducing air mattresses, and non-powered advanced pressure reducing mattresses. Group 3 support surfaces are complete bed systems called air-fluidized beds. This product category uses circulation of filtered air through silicone beads, creating the characteristic of fluid.

1. Jackson, et al. Pressure Ulcer Prevention in High-Risk Postoperative Cardiovascular Patients. Critical Care Nurse 2011;31:44
2. Ochs R. et al. Comparison of Air-Fluidized Therapy with Other Support Surfaces Used to Treat Pressure Ulcers in Nursing Home Residents. Ostomy/Wound Management 2005;51(2) 28-46.
3. VanGilder C., Lachenbruch CA. Air-Fluidized Therapy - Physical Properties and Clinical Uses. Annals of Plastic Surgery 2010; 65(3):366-368.

Online Resources

A. http://woundcareadvisor.epubxp.com/i/566063-september-october-2015/32

B. http://www.hill-rom.com/usa/