

Initial Acute Care Field Evaluation Results for the Envella™ Bed System

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Introduction

The Envella™ Bed System has just come on the market to replace the Clinitron® Air Fluidized Therapy (AFT) bed and Saint Joseph Hospital in Lexington, Kentucky was the first to evaluate it in the acute care environment. The results of the evaluation were extremely positive from both a staff and patient perspective. This paper summarizes their experience.

Saint Joseph Hospital: Saint Joseph Hospital is a 433-bed tertiary medical center in Lexington, KY, serving central and eastern Kentucky. The hospital has received numerous awards for heart and vascular services which include: 2016 Healthgrades recognition for excellence in cranial surgery, stroke care, and pulmonary care; 5 STAR Healthgrades recognition for excellence in heart failure; treatment of pneumonia; treatment of sepsis; esophageal/stomach surgeries and stroke. Known as Lexington's "Heart Hospital" the patient acuity remains very high. To meet this need at Saint Joseph Hospital, we have standardized with P500 mattresses housewide, and rent Clinitron AFT beds for selected patients.

Evaluation Objective

There were several objectives of this evaluation. The first was to gather feedback from nursing and ancillary staff related to satisfaction specific to the Envella Air Fluidized Therapy bed (Figure 1), which is a significantly updated version of the older Clinitron Rite Hite bed. The second was to collect clinical outcome data to assess the clinical performance of the Envella bed.

The Envella™ Air Fluidized Therapy bed includes significant improvements over the Clinitron® Rite Hite Bed, which are intended to help drive improved outcomes and a higher quality of care. Some of the new enhancements include: Head-of-bed angle indicator and alert to support responsive monitoring and protocol compliance; bed exit with alert silence to support fall prevention protocols; improved lumbar support allowing a smooth, and comfortable transition from head-of-bed section into the bead bath; auto leveling bead bath to help maintain immersion for optimal therapy; weight-based pressure redistribution in head section; side

transfer to help make it easy and safe for patients to get in and out-of-bed; integrated scale which facilitates less disruption to the patient; adjustable patient comfort settings and pendant; CPR quick-release handle; easy to remove, self-standing siderails; and central brake and alert.

Figure 1. The Envella™ Air Fluidized Therapy Bed



Methods

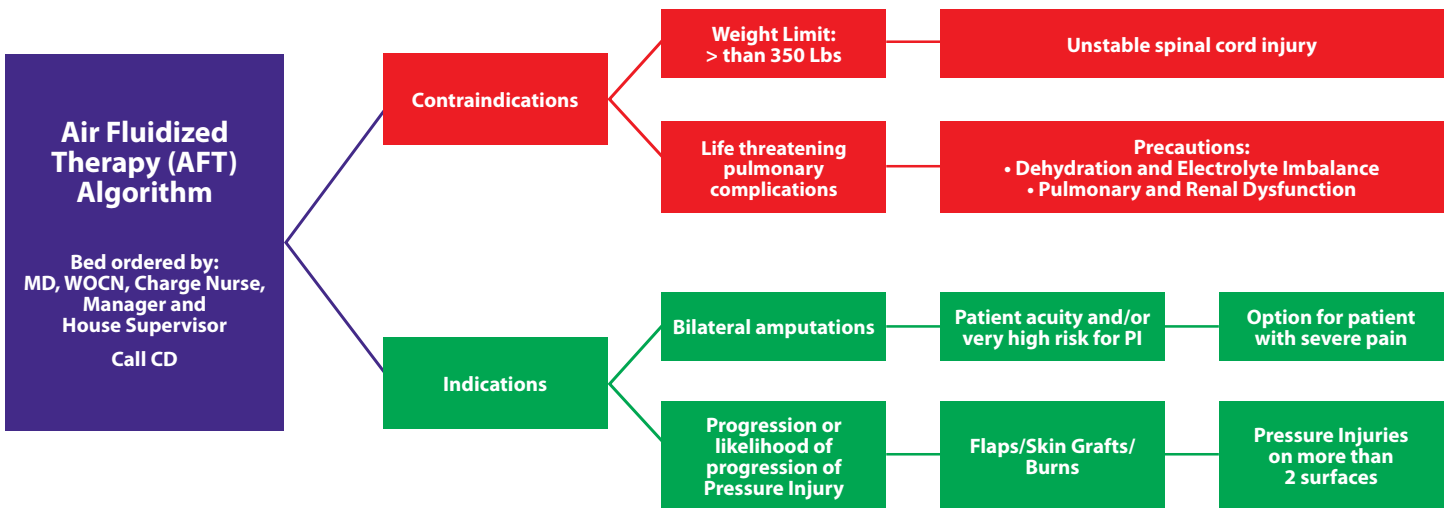
To be enrolled into the evaluation the patient had to require an Air Fluidized bed for their admitted condition per hospital surface placement algorithm as defined below (see Figure 2); the indication for placement on the Envella™ bed was consistent with the currently defined intended use for the bed, (intended for the treatment and prevention of pressure ulcers, post-surgical flap patients, severe or extensive burns); the patient, or their legal authorized representative, was willing and able to provide written informed consent; the patient had to fit comfortably in the bed, and be adequately repositioned from side to side; and patients were > 18 years of age.

Staff completed handwritten satisfaction surveys; patients were assessed periodically for wound healing; and patients were asked to complete a satisfaction survey after they were on the Envella bed for at least 24 hours.

Algorithm

The support surface algorithm is a method to allow our Wound Ostomy Continence Nurses to communicate standard support surface criteria to staff 24 hours a day, seven days a week. Although there are many compelling clinical reasons to provide AFT beds for a large population of our patients who are either at risk for pressure ulcer development or patients who have pressure injuries, there are financial implications. The goal of the algorithm is to balance the clinical need with the financial goals of the organization. The environment in which we work has extremely tight operational budgets, a huge emphasis on tracking of nursing sensitive quality measures, which are highly visible externally, we must provide adequate staffing and education, and manage extremely high patient acuity as new life saving measures have been successful. One of the tools that we have found to be highly effective is appropriate utilization of Air Fluidized Therapy beds.

Figure 2: Air Fluidized Therapy Algorithm



Results

There were 52 caregiver surveys completed during the evaluation. All of the features that were evaluated received average ratings between 4 (very satisfied), and 5 (extremely satisfied). Some of the key features evaluated with the highest satisfaction ratings, are outlined below.

Integrated scale for weighing patients received an overall rating of 4.7.

Staff commented:

- “Scale is 100% better, more comfortable for patients vs. using a lift. Many patients refuse to be weighed because the lift is so scary.” (Aide)
- “Weights are getting done on time. Less nagging on our end.” (RN Clinical leader)
- “Only need one person to weigh now. With lift, need at least two people.” (Aide)

Central brake and steer received an overall rating of 4.5.

Staff commented:

- Much easier to unlock (brakes). No longer have broken toes!” (RN)
- “The old one was like moving wet sand, for real, so heavy. Now it’s easy to move, like a ‘floating’ bed and I don’t bump into things.” (Aide)
- “I like that I can actually move the bed. Our (X-Ray) machine doesn’t fit in the rooms, couldn’t move the old bed. The old ones didn’t lock.” (X-Ray Tech)
- “It is much easier to roll the patient in the bed, down the hallways.” (Aide)

Self-standing siderails received an overall rating of 4.6.

Staff commented:

- “Rails are easier to get on and off, and are able to stand up and out of the way.” (RN).
- Additionally, the ease of locking the siderails was noted and staff liked the color coding that makes it visually easy to insure that the rail was appropriate for that specific part of the bed.

Foot pedals that enable a hands-free way to stop and restart fluidization received an overall rating of 4.7.

(These pedals allow staff to get the patient in the right position and then easily turn off the fluidization.)

Staff commented:

- “I use the foot pedals when both hands are busy. Turn the bed off, it holds the patient.” (Aide)
- “Controls on both sides is a big deal. I just drop my hand down and they’re there.” (WOCN)

Patients:

The 10 medically compromised patients that completed the evaluation had 24 pressure injuries (PI’s). Stages of the 24 PI’s were: 5 Stage 3; 5 Stage 4; 7 Deep Tissue Pressure Injuries (DTPI’s); 6 Unstageable; 1 Unable to Stage. Patient demographics are as follows: 3 female/ 7 male; average age of 61 years; average weight at 165 lbs and average Braden PI risk score of 10.7. The majority (n=8) were neurologically compromised and six suffered from spinal cord Injuries, 8/10 were not permitted out of bed. All 10 patients had fecal incontinence; seven had urinary catheters, and two had unmanaged urinary incontinence. Patients spent an average of 10.8 days (Range 4-27 days) on the Envella™ Bed.

Patient Satisfaction Ratings:

Patients were very pleased with the new bed. On a 10 point comfort scale, with 10 = Extremely comfortable and 0 = Extremely uncomfortable, the average rating was 9.6. Overall, patients reported the most satisfaction with the hand control, the lumbar transition, scale and bead bath temperature. Patients commented:

- “I don’t feel the bump! This is so much better than the Rite-Hite® bed. The hand control is easy to use and I already figured out how to make the back section softer.” (86 year-old Patient)
- “Feels longer and wider. I like the three zones.”
- “Bed is better than old Clinitron® bed, more comfortable.”
- “Extremely comfortable for pain management.”
- “I feel warm and comfortable.”

Clinical Outcomes

Of the 24 pressure injuries treated, we were unable to reassess 14 of the wounds due to emergent discharge. The 10 wounds that we were able to assess showed an average change in surface area of 0.668 cm²/day (total change in area / number of days on Envella™ Bed) or 4.75 cm²/week (0.668 cm²/day * seven days). One of the PI's that was on the study was a large DTPI, and even though that patient did well, as expected, the wound increased in superficial area from baseline. If that patient's wound is excluded in the healing analysis, the healing rates were 1.307 cm²/per day (total change in area / number of days on Envella Bed) or 9.15 cm²/week (1.307 cm²/day * seven days), which is much higher than reported in the Clinitron® literature.¹ Overall, even though the patients were very compromised, they did extremely well.

Examples of patients treated are as follows:

PATIENT 1:

A 76 year old deaf male was admitted for worsening of left lower extremity arterial ulcer with a history of left toe amputation, right above knee amputation, end-stage renal disease, on hemodialysis, peripheral vascular disease, hypertension, coronary artery disease, gastroesophageal reflux disease, insulin dependent diabetes and hyperparathyroidism. The patients

course of admission included an abdominal aortogram, left lower arteriogram, both a central venous and hemodialysis catheter placement in interventional radiology and a left below the knee amputation to tibia and fibula. During the patient's admission, he had multiple rapid response team interventions prior to pressure injury development. He has chronic anemia which resulted in a hemoglobin as low as 5.4, requiring transfusion of multiple blood products throughout his stay. He also has variable blood pressure, as low as 88/64.

The WOCN team was called for initial wound assessment for a sacral/coccygeal and buttock DTPI that was butterfly shape and very painful to touch. He was assessed to have incontinence associated dermatitis and fecal incontinence.

Interventions:

Patient placed on Envella™ AFT bed system, as directed by our AFT algorithm for the following indications: bilateral amputation, pain, high patient acuity and anticipated progression of wound. Patient's wound received enzymatic debridement, noncontact, low-frequency ultrasound (frequency per hospital protocol) and the wound was covered with a silicone bordered cover dressing. His wounds substantially improved as shown below.



(12/01/16): Area = 132 cm²,
Measures 11.0 x 12.0 x 0.0 cm



5 days on Envella™ bed (12/06/16):
Measures 12.5 x 13.0 x 0.0 cm



Follow up (01/11/17): Area = 30 cm²,
Measures 5.0 x 6.0 x 0.2 cm

PATIENT 2:

A 79-year-old female admitted with Methocillin Resistant Staph Aureus sepsis from home with a history of arthritis, type 2 diabetes mellitus, gastroesophageal reflux disease, hyperlipidemia, hypertension, status post myocardial infarctions and incontinence. She had two previous hospitalizations. The first admission was six months ago for acute coronary syndrome and stenting of the left anterior descending coronary artery within the last 60 days. The second admission was 14 days prior to current admission for acute pulmonary edema. Per family, the patient had been complaining of perineal discomfort with increasing weakness over the last two months. The patient has a history of sacral wounds, which have continued to close and reopen over the past year. Per family, the patient was unable to reposition herself for seven days prior to admission.

On initial assessment, the patient had two DTPI's. One located on her sacrum-coccygeal area and one located on her right calcaneus.

She was placed on the Envella™ AFT bed, as directed by our AFT algorithm for the following indications: high patient acuity, pain and anticipated progression of DTPI.

The sacrum-coccyx wound received enzymatic debridement, non-contact, low-frequency ultrasound (frequency per hospital protocol) and the wound was covered with a silicone bordered cover dressing. The right calcaneus was off-loaded and she was repositioned every two hours.

Her wound did very well over the course of her admission and she was discharged after nine days of therapy.



Sacrum-Coccyx (1/18/17): Area = 132 cm²,
Measures 11.0 x 12.0 x 0.0 cm

**20% reduction
in area in just
9 days**

→

**and is visibly
improved**



Sacrum-Coccyx (1/27/17): Area = 105 cm²,
Measures 10.0 x 10.5 x 0.0 cm

Summary

Managing compromised patients with severe wounds is very challenging. The Envella™ AFT therapy bed provides maximum envelopment and immersion and provides excellent therapy in the fight to heal pressure injuries even in significantly medically complicated patients. In this evaluation, the Envella bed increased patient autonomy and improved the overall patient experience. The patients had excellent clinical outcomes. The Envella bed was shown to improve patient comfort by reducing pain and had improved skin micro-climate control. During the evaluation, there were no patient adverse events or product problems. A surprising finding amongst our paraplegic/quadruplegic patients was a decrease in overall muscle spasms. This finding warrants further investigation.

1. Ochs RF, Horn SD, et al. (2005). Comparison of Air-Fluidized Therapy with Other Support Surfaces Used to Treat Pressure Ulcers in Nursing Home Residents. *Ostomy/Wound Management*. 51(2), 28-46.

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