

**carilex<sup>®</sup>**

# **CENTRIUS SYSTEM**



## **PRESSURE MAPPING REPORT**

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## Understanding Pressure Ulcers

### What is a Pressure Ulcer?

A pressure ulcer, also known as a bed sore or decubitus ulcer, is the progressive breakdown of the patient's skin and underlying tissue. Pressure ulcers most often occur on the parts of the body where the bone is closest to the skin such as the heels, ankles, hips, tailbone and elbows. Pressure ulcers develop quickly but can be prevented and most pressure ulcers will heal with treatment. (Mayo Clinic, 2018)

### What Causes Pressure Ulcers?

Pressure ulcers can be caused by any of these conditions being present on the patient's skin: pressure, shear, friction, moisture and raised temperature. The most influential of these is pressure on the patient's skin.

The patient's weight causes pressure to be applied to their skin and tissue, compressing it between the support surface and their bone structure. When external pressures are higher than the capillary blood-flow pressure in the patient's tissue, the capillaries can become occluded; diminishing blood supply and causing tissue damage from lack of oxygen.

### How can Pressure Ulcers be Prevented?

Pressure ulcers can be prevented by interface pressure distribution and regular repositioning of the patient. Interface pressure distributions that patients weight more evenly across their body and away from the critical areas where pressure ulcers can develop. Repositioning the patient regularly decreases the duration of pressure, reducing the occurrence of capillary occlusion.

#### *Therapeutic Support Surfaces*

##### *Alternating Pressure Support Surfaces*

Alternating Pressure Support Surfaces consist of a number of sealed air cells that alternatively inflate and deflate. The inflated cells provide adequate support to the patient whilst the deflated cells provide pressure relief, letting capillaries to recover their original size and shape to allow blood to flow normally.

##### *Constant Low-Pressure Support Surfaces*

Constant low-pressure support surfaces distribute the patient's weight more evenly and decreasing the resulting pressure on their body and thereby reducing the severity of capillary occlusion.

## The Centrius System

### Introduction

The Carilex® Centrius system offers wound care therapy designed specifically to take care of patient who are at risk of developing pressure ulcers, or already enduring distress and discomfort from pressure ulcers. Centrius provides multiple mattress sizes to choose from, it is compatible with various body types and an array of environments. Details were considered thoroughly in the design of our mattresses ensuring the gentlest healing environment for sensitive skin. With teams of research and design experts working tirelessly throughout the years, Centrius is a labour of love.

### How the Centrius System Benefits Patients

Simply but powerful, the Carilex Centrius is a cost effective therapy support surface that offers a combination of dynamic and CPL therapy modes and active alternating air cell technology and working with the state-of-the-art IPS technology, ensuring the patient receives pressure relief or pressure redistribution at all times. Centrius's intelligent pressure monitoring system keeps an eye on the mattress 24 hours a day, for exceptional patient comfort and healing.

### Centrius Mattress

The Centrius mattress is working with the state-of-the-art IPS technology, ensuring the patient receives pressure relief or pressure redistribution at all times. Adjustable weight settings for different body types, low pressure alert in case of abnormal pressure drop or power failure and Two Directional Stretch Textile for durability.

### Centrius Power Unit

The Centrius power unit has Intelligent Pressure Sensing (IPS) Technology that responds to patient movements on the mattress by automatically adjusting internal mattress pressure. This allows the Centrius power unit to regulate the interface pressure between the patient and the mattress, continuously providing total envelopment.

## Product Comparison: The Centrius System vs. A Standard Foam Mattress

### Introduction

In this section of the report the Centrius system will be compared to a standard foam mattress.

### CLP therapy Mode

#### *Testing Procedure*

The procedure used to test the system is as follows:

1. A pressure mapping test mat is connected to a computer and laid on top of a standard foam mattress
2. The patient lies on the standard foam mattress and data is sent from the test mat and recorded by the computer
3. The test mat is moved onto the mattress under test and the patient lies on the test mat again
4. The correct mode and weight settings for the test are selected on the power unit
5. Once the system is operating normally, data is sent from the test mat and recorded by the computer

#### *Interpreting Test Data*

##### *Method*

The test data is interpreted by finding the maximum interface pressure between the patient and foam mattress and the maximum interface pressure between the patient and the Centrius mattress are compared by calculating the percentage improvement that the Centrius mattress has over the foam mattress.

##### *Calculating the Percentage Improvement*

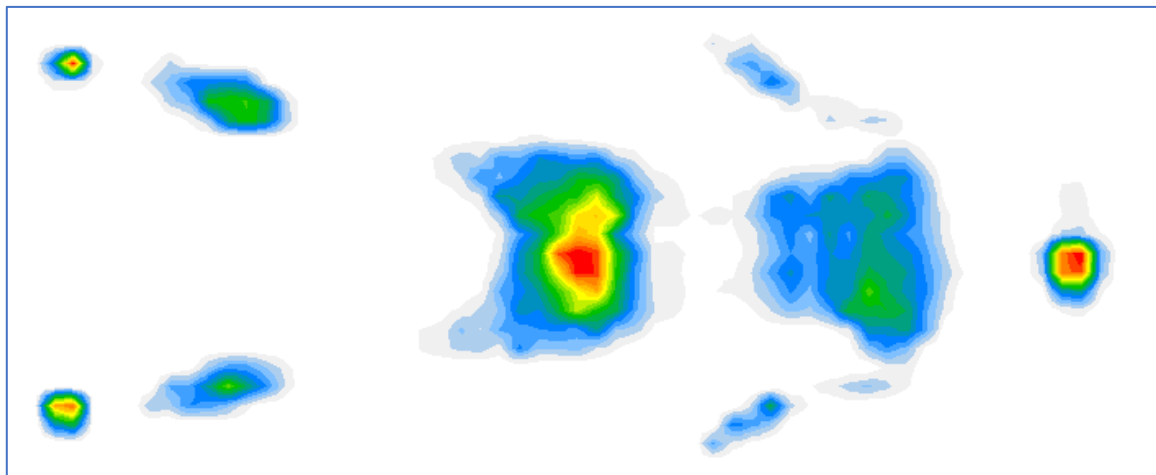
$$\text{Percentage Improvement} = 100 \times \left(1 - \frac{\text{Sample 2}}{\text{Sample 1}}\right)$$

*Test Results*

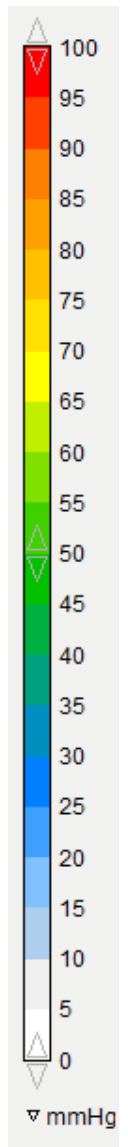
*Standard Foam Mattress vs. Centrius Power Unit with Centrius Mattress*

Standard Foam Mattress

Patient height: 156cm    Patient weight: 50kg

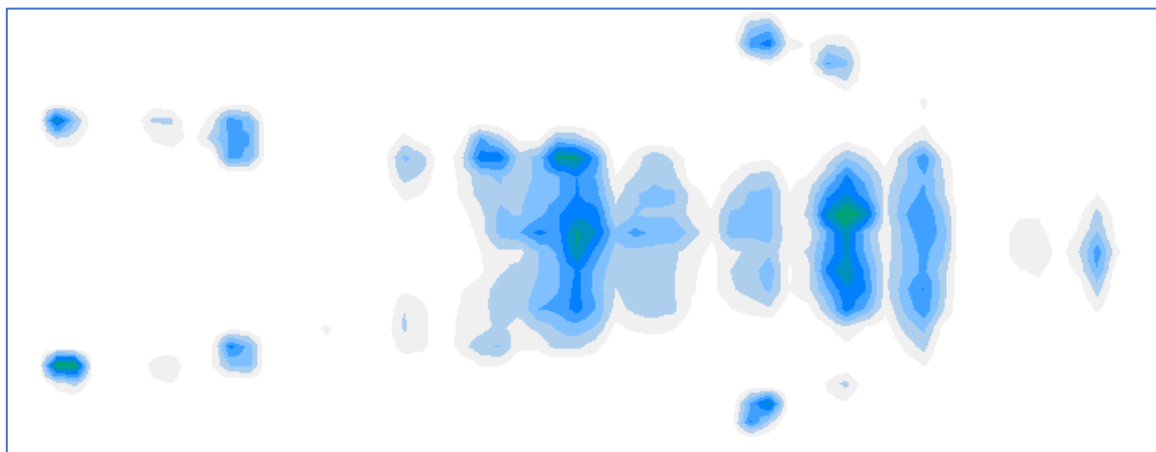


Measurement Area	Maximum Interface Pressure (mmHg)
Head	100
Left Shoulder	54
Right Shoulder	42
Left Buttock	94
Right Buttock	78



Centrius Power Unit with Centrius Mattress

Patient height: 156cm    Patient weight: 50kg



Measurement Area	Average Interface Pressure (mmHg)	Maximum Interface Pressure (mmHg)	Improvement on Standard Foam Mattress
Head	17	23	83%
Left Shoulder	18	26	67%
Right Shoulder	17	25	59%
Left Buttock	21	27	77%
Right Buttock	27	37	65%

## Product Comparison: The Centrius System vs. A Standard Foam Mattress

### Dynamic Mode

#### *Testing Procedure*

The procedure used to test the system is as follows:

1. A pressure mapping test mat is connected to a computer and laid on top of a standard foam mattress
2. The patient lies on the standard foam mattress and data is sent from the test mat and recorded by the computer
3. The test mat is moved onto the mattress under test and the patient lies on the test mat again
4. The correct mode and weight settings for the test are selected on the power unit
5. Once the system is operating normally, data is sent from the test mat and recorded by the computer

#### *Interpreting Test Data*

##### *Method*

The test data is interpreted by finding the maximum interface pressure between the patient and foam mattress and the maximum interface pressure between the patient and the Centrius mattress are compared by calculating the percentage improvement that the Centrius mattress has over the foam mattress.

##### *Calculating the Percentage Improvement*

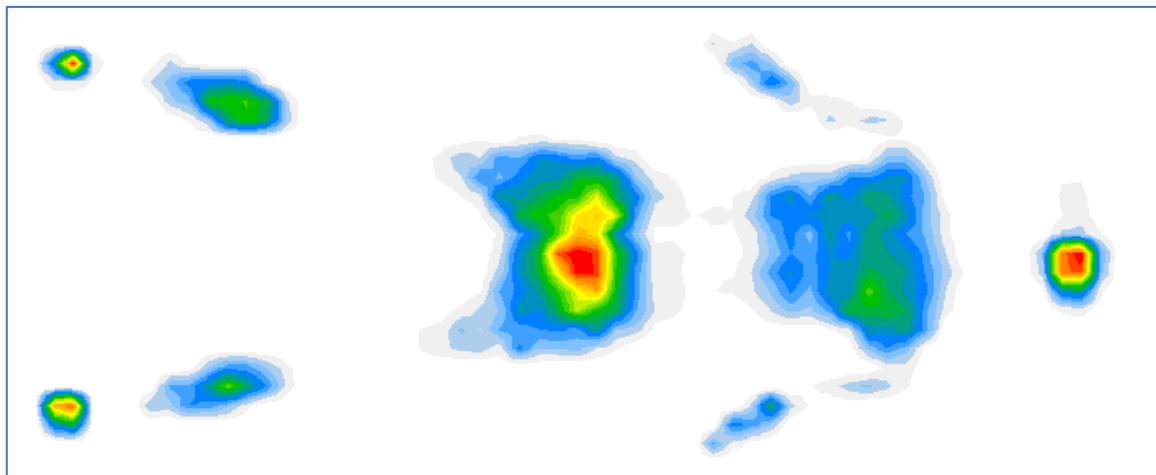
$$\text{Percentage Improvement} = 100 \times \left(1 - \frac{\text{Sample 2}}{\text{Sample 1}}\right)$$

Test Results

Standard Foam Mattress vs. Centrius Power Unit with Centrius Mattress

Standard Foam Mattress

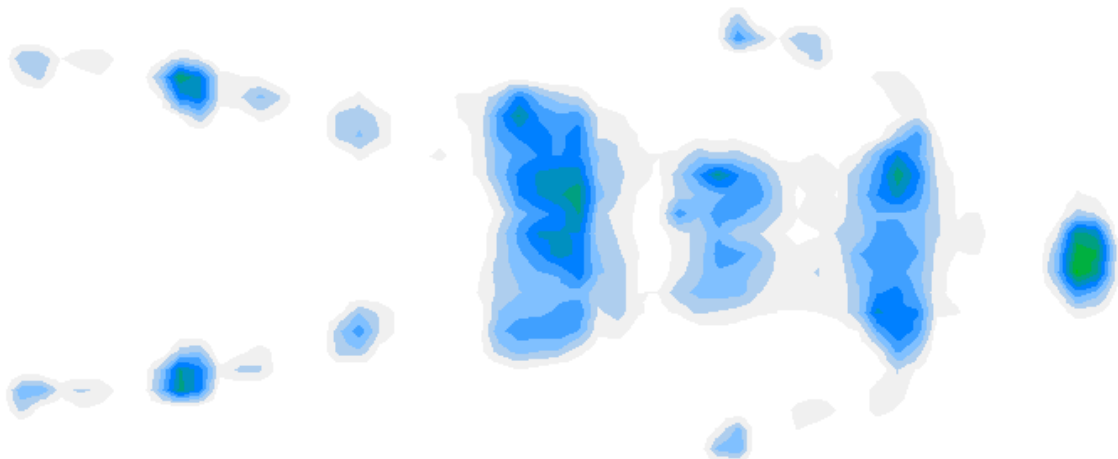
Patient height: 156cm Patient weight: 50kg



Measurement Area	Maximum Interface Pressure (mmHg)
Head	100
Left Shoulder	54
Right Shoulder	42
Left Buttock	94
Right Buttock	78

Centrius Power Unit with Centrius Mattress

Patient height: 156cm Patient weight: 50kg



Measurement Area	Average Interface Pressure (mmHg)	Maximum Interface Pressure (mmHg)	Improvement on Standard Foam Mattress
Head	41	63	59%
Left Shoulder	23	29	57%
Right Shoulder	25	39	40%
Left Buttock	24	32	74%
Right Buttock	28	38	64%



## Conclusions

The interface pressure between the patient and the mattress has been shown to be improved when a Centrius system is chosen as a replacement for a standard foam mattress. The effect will be that the system will aid the prevention and cure of decubitus pressure ulcers.

## References

Mayo Clinic, 2018. *Mayo Clinic*. [Online]

Available at: <https://www.mayoclinic.org/diseases-conditions/bed-sores/symptoms-causes/syc-20355893>

[Accessed 28th March 2018].



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