

Stabil-Air Pressure Mapping

Date: January 30th, 2014

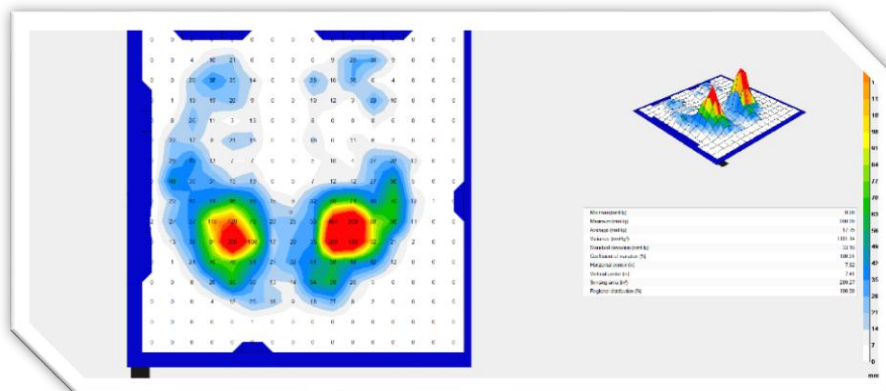
Patient: Female – Age 25 – Weight 135

In this study, the Stabil-Air Cushion was pressure mapped using an FSA system manufactured by Vista Medical. <http://www.vista-medical.com/subsite/stretch.php> The Stabil-Air cushion is Star Cushion’s newest innovation in multi-celled air cushion technology. The Stabil-Air cushion combines both air and foam in one cushion by utilizing contoured foam internal to each of the air cells. The contouring foam is designed to provide a shell of stability while the cushion is operating properly to aid in posture and for ease of transfers. The foam was also designed to provide a secondary or backup layer of protection in the event that the air cushion lost air, whether through a pinhole, by leaving the valve open, or other cause.

In performing this pressure mapping, we wanted to answer two questions. First, would the Stabil-Air cushion provide pressure equalization and redistribution while in proper use comparable to a multi-celled air cushion without internal contoured foam? Second, when ‘bottomed-out,” how would the backup layer of foam internal to the Stabil-Air compare with a deflated air cushion without internal foam?

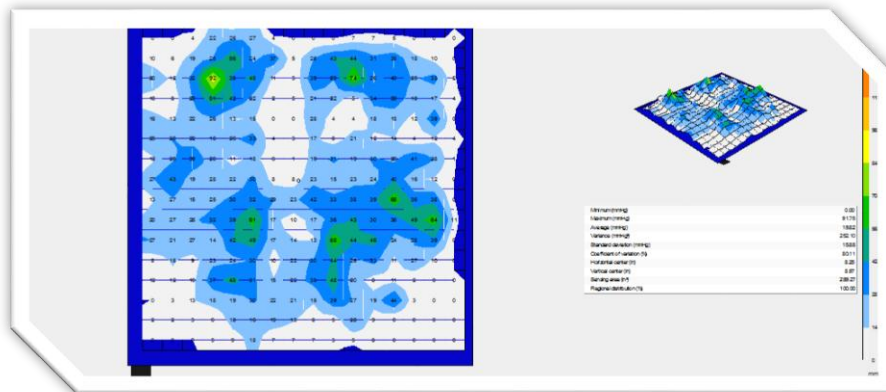
Pressure Mapping #1: No Cushion.

The first pressure mapping was performed in order to create a baseline comparison. The patient was seated directly onto 16”x16” wheelchair without a cushion. Without any sort of pressure equalization or redistribution, we can note the pressure is localized in two areas, indicated in red, directly under the patients’ ischial tuberosities.



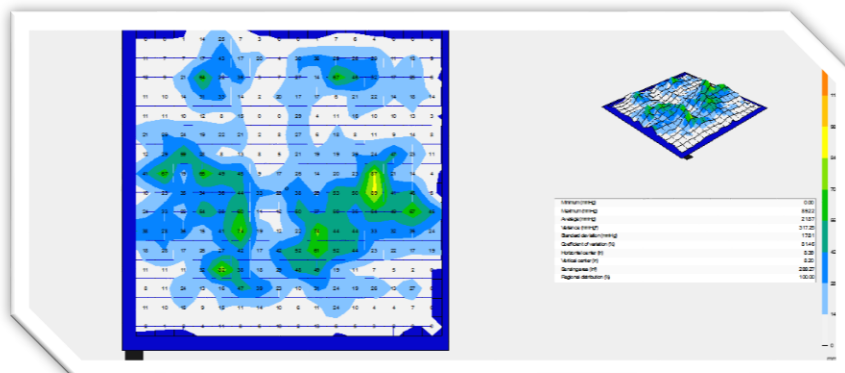
Pressure Mapping #2: Female patient was immersed into a 4" high 16"x16" Stabil-Air Cushion.

The second pressure mapping was performed by properly immersing in the Stabil-Air cushion. This was done by inflating the Stabil-Air Cushion, seating the patient on Stabil-Air Cushion, opening the valve to allow some air to leave the cushion, and then closing the valve once the patient was immersed 1-1.5 inches from the base of the cushion. The result, much as would be expected in a multi-celled air cushion without internal foam is the dispersion of pressure across a much wider surface area, specifically moving much of the previous 'red' areas under the patient's ischials forward to the patient's legs and outward across the patient's entire base. In addition, we see the pressure has equalized at a much lower level across the entire surface area, removing small zones of 'red or yellow' higher pressure to zones of 'green or blue' lower pressure.



Pressure Mapping #3: Patient "bottomed-out" in a 4" 16"x16" Stabil-Air Cushion.

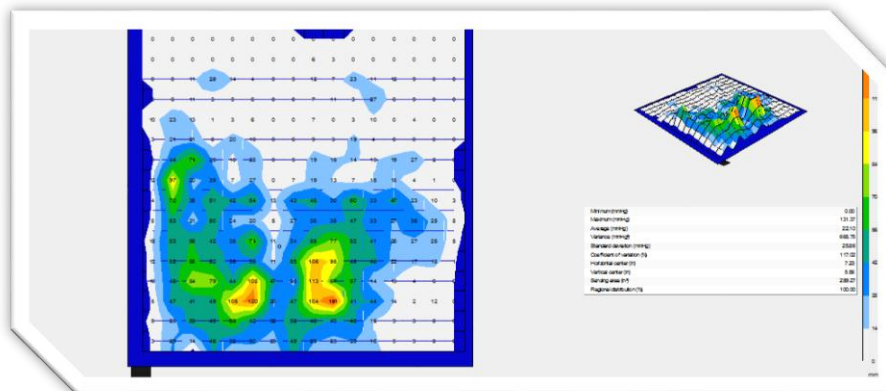
In this pressure mapping, the valve on the Stabil-Air cushion was completely opened to allow the cushion to flatten, or 'bottom-out.' This was done to test the pressure levels of the cushion with only the internal foam supports providing skin protection to the patient. In this result, some of the pressure has been returned to the patient's buttocks area and away from the legs. However, we can still note that the pressure is dispersed over a much wider surface area than expected and there are still no 'yellow or red' high pressure areas. While not as ideal at protecting the skin as a properly inflated multi-celled air cushion, this result still shows what is likely an acceptable level of pressure for a small amount of time (1-2 days) until the cushion can be re-inflated or repaired.



Pressure Mapping #4: ‘Bottomed-out’ in a 4” High Standard Contour Cushion 16” x 16”. (Please note this is not the same cushion used in pressure mapping #2 & #3)

Pressure mapping #4 was performed as a comparison to pressure mapping #3. In this mapping, the valve on the Standard Contour multi-celled air cushion was completely opened to allow the cushion to flatten, or ‘bottom-out.’ This was done to test the pressure levels of the cushion without the internal foam supports of the Stabil-Air cushion to see just how much skin protection to the patient is provided by the internal foam supports.

As can be seen, the pressure readings on a ‘bottomed-out’ air cell cushion show that much of the pressure has returned to the patient’s ischial tuberosities. The pressure readings directly underneath the ischials have increased to show areas of yellow, orange, and even slightly red. Furthermore, the pressure has been isolated solely within the buttocks area and away from the patient’s legs.



Conclusion: In response to the first question: would the Stabil-Air cushion provide pressure equalization and redistribution while in proper use comparable to a multi-celled air cushion without internal contoured foam? The answer appears to be that internal contoured foam of the Stabil-Air cushion does not hinder the pressure equalization and redistribution benefits of a standard air cushion.

In response to the second question: when ‘bottomed-out,’ how would the backup layer of foam internal to the Stabil-Air compare with a deflated air cushion without internal foam? It appears that as intended, the backup layer of internal foam in the Stabil-Air cushion helped to continue to disperse pressure away from the ischials and at acceptable levels for a period of time to allow the caregiver or user to re-inflate or repair the cushion back to its proper state.