



Evaluation of the Suitability of the *Flo-tech Xtra* Cushion For Use in a Tilt in Space Wheelchairs

Introduction

This evaluation is to examine a concern raised by a customer that the gel in the Flo-tech cushions is too fluid for safe use in a tilt in space wheelchair. Specifically, the concern raised is that when the seat/cushion is tilted, all the gel runs to the back of the cushion and is therefore not correctly positioned to adequately protect the ischial tuberosities of the user.

Objective

To evaluate the suitability of the Flo-tech Solution Xtra for use with a Tilt in Space Wheelchair, highlighting any areas for product development if required.

Method

The Flo-tech Solution Xtra was selected as the Solution is the most popular Flo-tech cushion, and the cushion recommended for use with the most vulnerable users, such as those requiring tilt. This cushion was evaluated in an Invacare Rea Comfort wheelchair which has a tilt facility of up to 30 degrees.

The Flo-tech Xtra was evaluated with the Rea Comfort in the most upright position, and then again with the Wheelchair adjusted to its most tilted position (30 degrees). The backrest angle on the wheelchair was not adjusted between each test. The cushion was left to rest without loading to allow the gel to flow in response to gravity, before the cushion was mapped in the tilted position. The Xsensor Pressure Mapping System was used with a 78 kg female model for both pressure maps.

Results

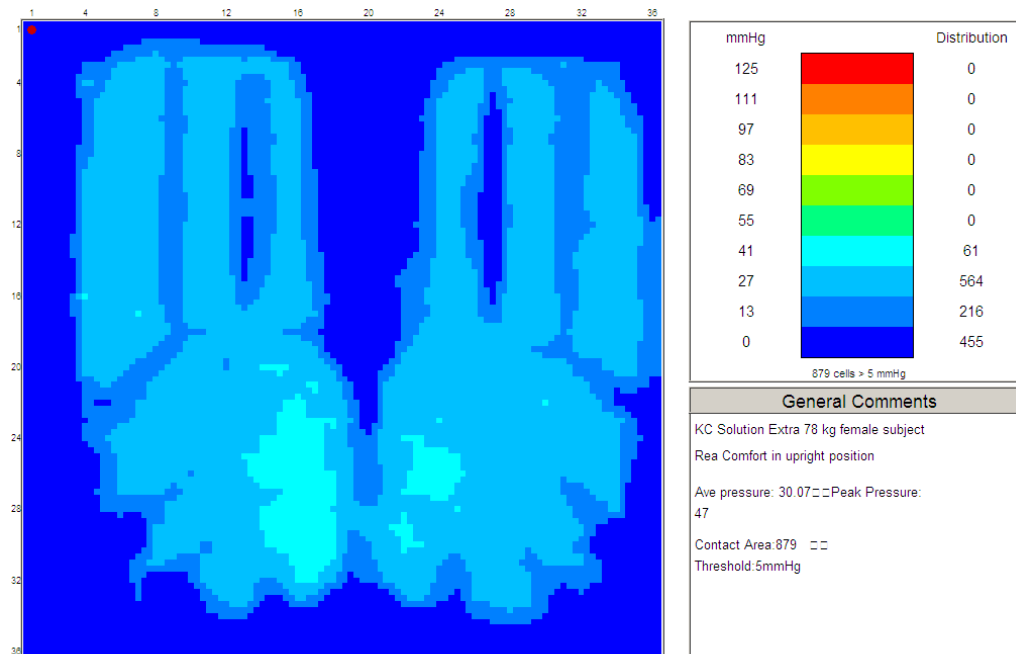


Fig 1. Flo-tech Xtra Pressure Map in Rea Comfort in Upright Position

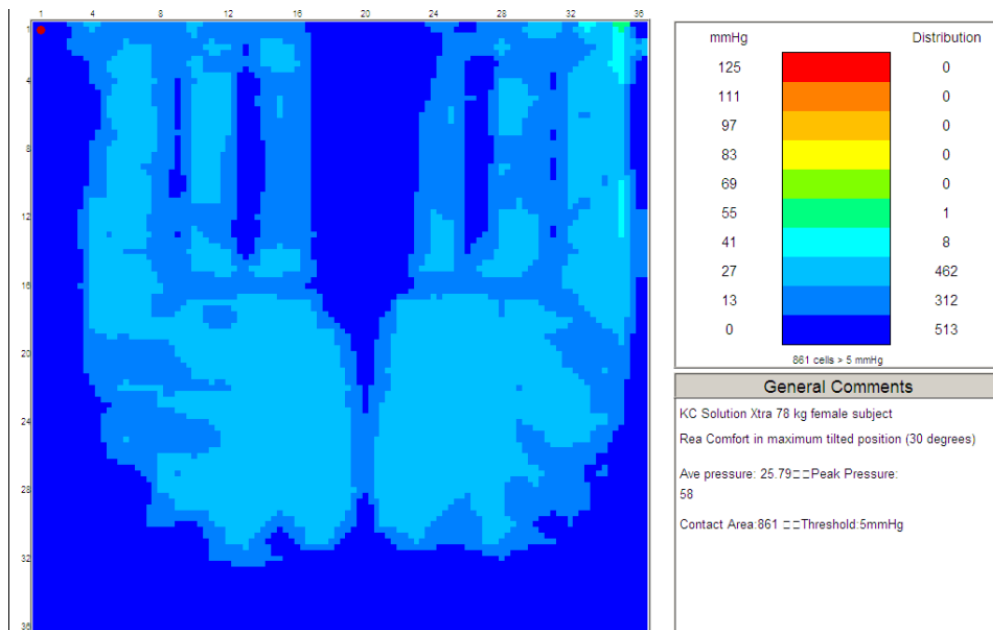


Fig 2. Flo-tech Xtra Pressure Map in Rea Comfort at 30 Degree Tilt



Evaluation

As would be expected, the average pressure reduces as the wheelchair is tilted; this is because more pressure is being distributed through the backrest. Peak pressure around the ischial tuberosity area also shows significant improvement at 30 degrees.

The tilted result (fig.2) does show a higher peak pressure with one sensor recording a higher pressure at the lateral side of the right thigh (see top right corner of the map). It is difficult to draw any conclusions from comparing results from this one sensor as the model did not remain in the chair between tests, and so the foot position may have altered slightly. However, it is possible this peak pressure is from the thigh pressing against the thigh adduction shaping of the cushion and therefore is not likely to relate to the performance of the gel at the rear of the cushion under evaluation.

As the cushion was tilted to 30 degrees, unloaded, the gel did flow to the rear of the cushion. However on loading, the gel appeared to readily move back around the gel sack (fig. 2) and perform in the same way as the cushion did with the seat in an upright position (fig. 1). This is evident by the very similar shape of the pale blue area at the rear of the cushion in both pressure maps (fig. 1 & 2)

Conclusion

This test is limited to one subject, and one type of Flo-tech gel cushion. However, the concern that the gel does not perform correctly in the tilted position has not been observed in this case.

When the Flo-tech Xtra is tilted, unloaded to 30 degrees, the gel does migrate to the rear of the cushion. However the Flo-tech Xtra base has a raised lip at the back cushion which prevents the gel from migrating out of the recess at the rear of the cushion. It appears that as this area of the cushion is loaded, the gel is pushed back around the gel sack, continuing to allow a good level of pressure relief to the ischial area.

This test suggests that the Flo-tech Solution Xtra continues to perform well when used in a tilted wheelchair such as the Rea Comfort. There is also no evidence of bottoming out when this cushion is used on top of a solid seat base such as those used by the Rea range of wheelchairs.