

## Description

A self-contained dynamic off-loading wheelchair cushion, designed to alleviate pressure under the primary at-risk sites for the seated individual: the ischial tuberosities and coccyx/sacrum.

## Background

Most alternating pressure wheelchair cushions on the market currently are designed similar to alternating pressure mattresses. Adjacent components alternate between high and low inflation to sequentially raise and lower pressure. In contrast, this project is based upon unique patented technology (US Patent 6,367,106 *Therapeutic support for the reduction of decubitus ulcers*). The cushion incorporates three bladders, which are deflated via a vacuum pump to vary loading on the buttock tissues. Further, the cushion uses programmable electronics which allows customization of a pressure relief schedule. The Mobility RERC has partnered with the patent holder, Z Development, to optimize design features and demonstrate clinical utility.



Above: Off-loading at the ischial tuberosities

Below: Off-loading at the coccyx/sacrum

## System Characteristics

- **Low cost:**
  - Cost of goods \$150-175
  - Target retail \$750- \$875
- **Portable:** Cushion is battery operated & components are self contained.
- **Battery life:** The cushion will operate for up to 16 hours.
- **Weight:** Total cushion weight  $\leq 9$  pounds.



## Market Opportunity

Sale of such a cushion would be to individuals, as well as to health care facilities with a focus in wound healing. This cushion could be an integral component of acute rehabilitation status post pressure ulcer surgery. The target end user population consists of any wheelchair user with a current pressure ulcer or at high risk of pressure ulcer development due to impaired mobility and sensation, especially those with history of a pressure ulcer or ulcers. A HCPCS code exists for alternating pressure cushions, but CMS has determined that medical benefit has not been demonstrated for this category of cushions. The dynamic off-loading cushion is uniquely designed for clinical research as the programmable electronics allow for complete customization of the duty cycle to determine an optimal pressure relief schedule.

## Primary Competing Devices

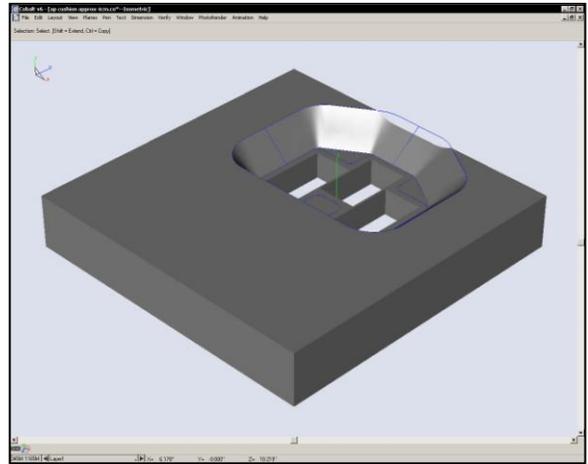
Aquila Corp Airpulse PK  
Ease Seating System G-100+  
Ergo Air EDS 2000  
Pegasus Airwave Altern8  
Talley Trinity Medical Dynamic Cushion System

## Design Features

### Contoured foam base

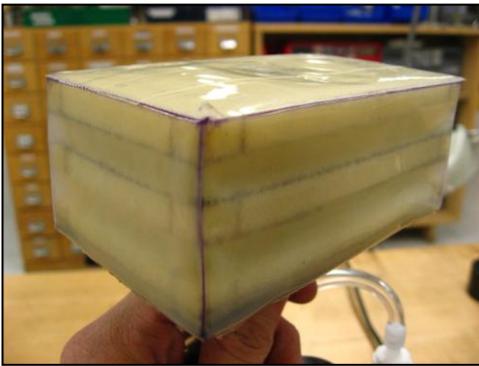
Contour based on anthropometry to ensure good postural support and pressure distribution.

The contour is designed to be scalable in size to accommodate larger and smaller size cushions.



### Unique bladder design

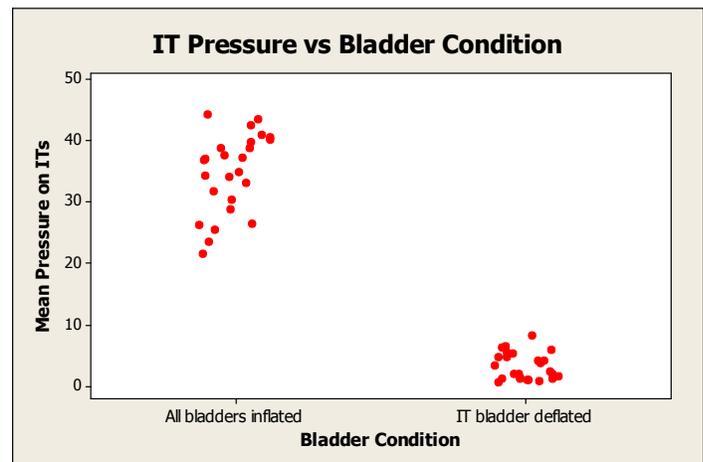
Foam and base within the bladder optimize uniform deflation shape for consistent offloading



## Interface pressure Testing

Interface pressures measured while wheelchair users sat on the cushion over multiple inflation-deflation cycles

Average ischial and sacral pressures were less than 10 mmHg while respective bladder was deflated



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