

Postural Supports: Seat Cushions, Back Supports, & Other Interventions

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Outline

- Classification & Coverage
- Pressure Ulcer Etiology
- Material Properties
- Types of Positioning Devices
- Clinical & Functional Indications
- Pressure Mapping



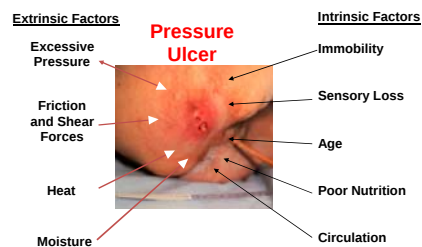
Types of Seats & Backs

(Medicare Language/Policy)

1. Sling or Solid Seat & Back
2. Captain's Style Seat & Back
3. General use seat cushion & general use back cushion
4. Skin protection seat cushion
5. Positioning seat cushion & positioning back cushion
6. Combination skin protection & positioning seat cushion
7. Custom fabricated seat cushion & back cushion



Pressure Ulcer Risk Factors



Stages of Pressure Sores

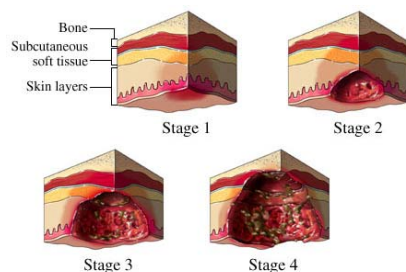


Image Source: <http://www.spinal-injury.net/spinal-injury-network/images/pressure-sore-stages.jpg>

PU Statistics

- 12% prevalence for high risk LTC residents (CMS, 2008)
- 31% over one year in men with SCI (Garber, et al., 2000)
- Most common secondary medical complication in all years post SCI (McKinley et al, 1999)

Seat Cushion Requirements

- Provides Function
 - transfers
- Comfortable
- Low Weight
- Easy to Use / Maintain
- Stability
- Pressure Relieving
 - emersion

Materials Properties

- Density (kg/m³)
- Stiffness - indentation load displacement (ILD)
- Thermal Characteristics (insulator or conductor)
- Friction

Cushion Properties Influence

- Pressure distribution
- Stability
- Interface temperature
- Reliability
- Immersion

Spectrum of Surfaces

- Solid base
- Flat foam
- Generic contoured foam
- Cut-out foam
- Viscous fluid (gel)
- Solid gel
- Air floatation

Others

- Plastic honeycomb
- Dynamic systems
- Custom molding



Sling Seat & Back

- Very Short-Term Use
- Stretchable Material
- Encourages Pathologic Postures
- Clients become accustomed
- Foldable Wheelchair



Photo Courtesy of Bengt Engstrom



Solid Seat Insert

- Good stability
- No pressure distribution
 - No immersion
- Conductor of heat
- Reliable



Captain's Style Seat & Back

Indications:

- Sensation
- Weight Shift
- Reposition
- Postural Symmetry
- Transfer



General Use Cushion or Back

(K0650/1 & K0660/1) (E2611/2)



Sunrise Jay Basic Backrest



Invacare Essential

Indications:

- Has manual wheelchair or power wheelchair w/ sling/solid seat/back

AND

- meets Medicare coverage criteria for it

AND

- Does not have a scooter or Power Wheelchair with Captain's style back



Flat Foam

- Good stability and dynamic
- Poor pressure
 - Little immersion
- Concerns with long-term resilience
- Insulator of heat
- Somewhat reliable
- Shear
- Low cost



Generically Contoured Foam (General Use Cushion)

- Insulator
 - depending on cover
- Pressure distribution is sensitive to the fit (immersion)
- Foam density and stiffness must be considered
- Low cost



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Generically Contoured Foam Cushions

- Good dynamic properties
 - damping
- High shear
- Light weight



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Skin Protection Cushion (E2603, E2604, K0734, K0735)

Indications:

- Has manual wheelchair or power wheelchair w/ sling/solid seat/back
- AND
- meets Medicare coverage criteria for it
- AND
- Current pressure ulcer
- OR
- Past history of a pressure ulcer
- OR
- Absent or impaired sensation in area of contact with seating surface
- OR...



**ROHO Single Valve High Profile
(K0734/5 \$331/\$422)**



**Action Xact Lite
(E2603/4 \$152/\$188)**

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Skin Protection Cushion (E2603, E2604, K0734, K0735)

Inability to carry out a functional weight shift due to:



**ROHO Triumph
(E2603/4 \$152/\$188)**



**Varilite Reflex
(E2603/4 \$152/\$188)**

SCI resulting in quadriplegia or paraplegia (344.00-344.1)
Other Spinal Cord Disease (336.0-336.3)
MS (340)
Demyelinating Disease (341.0-341.9)
CP (343.0-343.9)
Anterior Horn Cell/ALS (335.0-335.21, 335.23-335.9)
Post Polio (138)
TBI with Quadriplegia (344.09)
Spina Bifida (741.00-741.93)
Childhood Cerebral Degeneration (330.0-330.9)
Alzheimer's Disease (331.0)
Parkinson Disease (332.0)
Muscular Dystrophy (359.0-359.1)

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Positioning Cushions, Backs, and Accessories

(E2605, E2606), (E2613-E2616, E2620, E2621), (E0955-E0957, E0960)

- Has manual wheelchair or power wheelchair w/ sling/solid seat/back

AND

- Meets Medicare coverage criteria for it

AND

- Significant postural asymmetries that are due to one of the diagnoses listed for pressure relieving cushions

OR...



**Varilite Evolution Back Deep
(E2616)**



**Jay Combi Cushion
(E2605/6 \$269/\$420)**

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Positioning Cushions, Backs, Accessories

(E2605, E2606), (E2613-E2616, E2620, E2621), (E0955-E0957, E0960)

Significant postural asymmetries due to:

- Monoplegia of the lower limb (344.30-344.32, 438.40-438.42)

OR

- Hemiplegia (342.00-342.92, 438.20-438.22)

DUE TO

- Stroke
- TBI
- or other etiology
- Torsion Dystonias (333.4, 333.6, 333.71)
- Spinocerebellar Disease (334.0-334.9)



**J2 Deep Contour Back
(E2615)**



**Invacare Ulti-Mate Cushion
(E2605/6 \$269/\$420)**

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Headrest

(E0955)

Manual tilt-in-space, manual semi or fully reclining back on a manual wheelchair,

OR

Manual fully reclining back on a power wheelchair,

OR

Power tilt and/or recline power seating system.

AND

No Scooter or Power Wheelchair with Captain's Style Seat



POSITIONING & SUPPORT



Skin Protection & Positioning Cushion

(E2607, E2608, K0736, K0737)

<http://www.trustsolutionsllc.com/MedPolicies/WCS.htm>

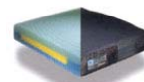
- Meets the criteria for both skin protection & positioning seat cushion



Otto Back Cloud
(E2607/8 \$290/\$348)



ROMO Low Profile Dual Compartment
(K0736/7 \$334/\$423)



Jay2 Cushion
(E2607/8 \$290/\$348)



Viscous Fluid

- Good weight distribution
- Low shear
- More Immersion
- Poor resilience = may bottoms out
- Poor dynamic properties
- Good thermal properties (neutral)
- Can be heavy



Viscous Fluid and Foam Base (Skin Protection & Positioning)

- Combines stability of solid base & Viscous Fluid



Jay2 Deep Contour



Otto Back Cloud



Air Filled Cushions

- Low weight
- Good immersion
- Good dynamic properties
- Absorbs impact & Vibration
- Reliability may be a problem
- Sensitive to initial inflation
- Instability issues



ROHO Air Cushion

- Interconnected flexible air chambers
- Equalizes pressure
- Insulates heat



Custom Fabricated Seat & Back Cushions

(E2609 & E2617)

- Criteria for skin protection or positioning cushion;
- Criteria for a prefabricated positioning back;
- Comprehensive written evaluation by a LCMP (OT/PT) with no financial relationship with supplier



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SPlastic Honeycomb Cushion

- Properties similar to precontoured foam
 - pressure distribution sensitive to fit
- Good dynamic properties
- Very light weight
- Ventilation qualities
- Moisture benefits



Dynamic (active) Seat Cushions

- Alternating surface shape
- Questionable effect of massaging action
- Complex systems
 - unknown reliability
 - expensive

Alternating Pressure

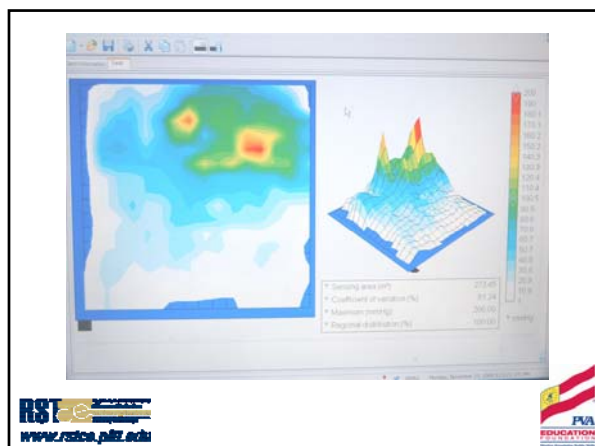
Pressure Mapping Technology

Measures Interface Pressures @ the sitting surface

Cushion Comparison

Client on Cushion A

Same Client on Cushion B



Bio-feedback



Pete's Cushion

- Jay Active
- Why chosen:
 - Not because of pressure mapping
 - History of sores
 - Worked well for years
 - Transfers
 - Stability and comfort



Rhonda's Cushion

- Ergo Seat
- Common to wheelchair
- Comfort
- Transfers



Summary

- What causes pressure sores?
- Pressure distribution Vs. stability
- Conduct Vs. insulate heat
- Reliability & ease of use
- Immersion characteristics

Clinical or Functional Requirements of Back Supports

- Improve functional and ADL skills
 - Transfers
 - Reach
- Comfortable
- Improve sitting tolerance
- Stability & support

Descriptive Characteristics

- Height
- Shape
- Stiffness
- Weight
- Adjustability



Low Back

- Lumbar or Sacroiliac support
- Freedom of movement
- Active users
- Requires good trunk support
- Limited support



High Back

- Provides support throughout spine
- Limited mobility
- Poor trunk control



Flat/Planar

- Does not accommodate shape of the spine
- Allows for some mobility
- Accommodate use of spinal orthotics



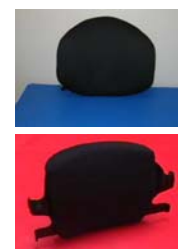
Generically Contoured

- Accommodates shape of the back
- Effectiveness sensitive to fit
- Provides some lateral support depending on depth



Rigid Shell

- Provides good stability and posterior pelvic support
- Generally not adjustable
- Effectiveness sensitive to fit



Contoured



- Cut-out for shoulder movement
- Maximizes trunk support
- Increased ROM for propulsion and ADL's

Adjustable Tension



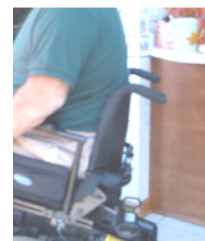
- Contours to shape of spine
- Adjustable
- Allows for change and repositioning
- Foldable

Adjustable Tension Back



Pete's Backrest

- Standard sling upholstery
- Personal preference
- Has worked for years
- Low back
- Freedom of movement



Rhonda's Backrest

- Ergo back
- Common to wheelchair
- Contoured
- Solid back pan
- Seat functions
- Comfort



Conclusion

- A wide variety of backrests and seating options
- Client centered practice
- Evidenced-based practice
 - Existing research should be applied.
 - Further research is warranted.