

An innovative seating solution

for a tetraplegic client with multiple impairments

By Hayley Howells, MPT



Ed has had C5 ASIA A tetraplegia since 1967. Following bilateral above-knee amputations in 2004, Ed developed a stage III right lateral border sacral wound and a stage III right lateral flank wound. The goal of treatment was to find a seating solution to optimize wound healing, increase comfort and relieve pressure on wound areas.

CLIENT:
Ed, a 60-year-old male.

CONDITIONS:
C5 ASIA A tetraplegia and bilateral above-knee amputations.

TREATMENT PROCESS:
Fitting of a custom Aspen Seating Orthosis.

Seating is one of the most important factors to consider for a person with a spinal cord injury (SCI). Appropriate seating can ensure that skin integrity and posture remain in an optimal healthy state. It has been estimated that 80 per cent of SCI patients will have a pressure sore during their lifetime and many also experience postural impairment. Therefore, choosing the correct seating system for your client is imperative in achieving optimal seating outcomes.

Many clients with SCI present with multiple impairments such as a pressure sore, pelvic obliquity, scoliosis, impaired respiration, decreased balance and amputation. To address all of these issues, a custom seating orthosis is often required. When using a custom seating orthosis, it is essential for the therapist to have an excellent working

relationship with both the orthotist and the client. Communication is critical when fitting the orthosis. Achieving the optimum seating position with appropriately distributed pressures is only one of the factors to consider—for a truly successful outcome, it is also necessary that the client is comfortable with the seating system. The following case study describes a client with tetraplegia and multiple impairments who was prescribed a custom seating orthosis.

Client background

Ed is a 60-year-old white male who has had C5 ASIA A tetraplegia since 1967. Vern has received a moderate number of surgical interventions over the last 40 years, including irrigation and debridement and bilateral above-knee amputations. Following the amputations in 2004, Ed presented with a stage III right lateral border sacral wound. A stage III right lateral flank wound had been present since. Ed was admitted as an inpatient in June 2007 for his annual studies and wound evaluation. The next four months consisted of irrigation and debridement, rotational

flap surgeries, complications from surgery and fitting of a custom Aspen Seating Orthosis (ASO; Aspen Seating, Denver, CO, USA).

Client evaluation

Primary complaints: Dissatisfied with compromised skin integrity, experiences discomfort with current seating system, constantly has to reposition himself.

Goals: Optimize wound healing, increase comfort level, offload pressure on areas of wounds.

Skin integrity: stage III right lateral flank wound 2.2 x 1.6 cm, stage III wound right lateral border of sacrum 6.5 x 15.5 cm. Substantial scar tissue from prior surgeries.

Sitting posture: right pelvic obliquity approximately 10 cm, anteriorly rotated pelvis on the left, right trunk lean against arm rest, right posterior thoracic rib hump, left concave scoliosis, elevated right shoulder, left lateral flexion of cervical spine, left lower extremity abducted. Upper body shifted to the right of the backrest, with the right ischium almost midline under the trunk due to obliquity and scoliosis. **Supine on mat:** flared lower left ribs,

anteriorly rotated pelvis on the left, right obliquity 8–10 cm, elongation of right lateral trunk.

Pressure mapping: with the use of the ROHO XSensor (The ROHO Group, Belleville, IL, USA), pressure mapping was completed on the ROHO low-profile cushion. Pressures of at least 200 mmHg were present under the right ischium and sacral area on the right.

Intervention

Ed was considered appropriate for the ASO because this custom seating system would address all of his impairments, including the rotational component of his spine. Ed's shape was captured for the ASO. This involved the use of a Ride Custom Cushion Simulator (Ride Designs, Sheridan, CO, USA) for the base and vacuum consolidation with a molding bag for the backrest. The Ride simulator consists of low-density impression foam, which allows the individual's sitting shape to be easily captured. The molding bag captures the shape of the trunk. Training is necessary to use this custom

system and is provided by Aspen Seating (Joe Bieganek, Orthotist, Aspen Seating Inc., personal communication).

Brock foam composite is used to make the cushion and the lining for the backrest. Brock is breathable, closed-cell foam that has the ability to draw moisture away from a client's skin and allow air to travel through the cells. The shell of the ASO is constructed from polypropylene and is interfaced with the wheelchair.

The custom ASO is designed with the concept of force isolation. Force isolation is a technique whereby pressures are off-loaded from high-risk bony areas and transferred to areas of lower risk, such as the gluteal muscles and thighs. Fitting of the system takes up to four days.

Outcome and education

The following outcomes were achieved:

- Improved sitting posture
- More level shoulders
- More neutral cervical spine
- Increased trunk extension
- Decreased anterior L hip rotation
- Increased sitting stability

- Offloading of bony prominences
- Improved respiration

Ed has primarily a fixed pelvis and therefore his impairments were largely accommodated. After completing the fitting, Ed's skin had no areas of redness and the flaps remained intact. Ed and his wife were educated on transferring into the system and positioning in the wheelchair. They were instructed to check Ed's skin daily and to contact the clinic or Aspen Seating with any issues. Ed was advised to use a Hoyer lift, but over time reverted to using a slideboard with a scoot technique.

The ASO is an excellent seating system due to the technology involved and the materials used, but it requires time to be fitted correctly and successfully. Because of Ed's medical procedures, this process took six months from beginning to end. Yearly check ups with the orthotist and therapist should be scheduled. ❖

Hayley Howells, MPT, has worked in spinal cord injury at the San Diego VA Hospital since receiving her masters.