

A Creative Approach to Seating with Clients with a Spinal Cord Injury

Application of a Contoured Foam Base (CFB) to Reduce Seating Related Peak Pressures



Danielle Collins, BAppSc(OT)
Spinal Seating Service
Prince of Wales Hospital,
Randwick, NSW, Australia.

Background

The Seating Clinic at Prince of Wales Hospital is closely associated with The Spinal Injuries Unit. The Seating Clinic has 1.5 full time GMCT Occupational Therapists dedicated to servicing both Spinal Inpatients and Outpatients.

Frequently referrals to the Seating Clinic are for assistance following pressure areas acquired through sitting.

Often these clients had been issued with High Profile Air Flotation cushion (e.g Roho) as this was deemed most suitable following pressure mapping (and taking into account other functional issues).

Problem

What to do about those clients with significant gluteal muscle atrophy resulting in prominent Ischial Tuberosities (ITs)?

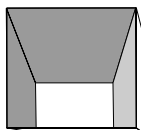
These clients generally showed poor immersion in air cushions (thereby minimising the pressure relief they offer).

Research

- Trial of under cushion contoured board (e.g. Harmon Board) – minimal results
- Review of commercially available equipment on the internet
- Literature review
- Discussion with other clinicians: no other options commercially available

What is the Contour Foam Base?

- The Contour Foam Base (CFB) is a foam support that sits underneath standard air flotation cushions (e.g. Roho, Kineris) to maximise pressure distribution for clients with high pressure needs.
- It is based on the principle that it provides better “wrap” around the Greater Trochanters (GTs) therefore increasing the immersion.
- The air cushion wraps higher up the lateral aspect of the thighs therefore allowing greater contact surface for pressure distribution.



The Contour Foam Base (CFB) prior to upholstery in neoprene material

Fabrication (including covering)

- 10mm thick EVA Foam base,
- Side wedges: Made from 905 Foam (50mm high, 125mm wide however this can vary according to skeletal structure)
- Anterior/anti-thrust wedge: made of 905 Foam (50mm high and approx 250 mm long - length depends on the clients IT position)
- CFBs are covered with neoprene material (rubber side out) to minimise movement on the seat board

Clinical Applications

- Beneficial for those clients with very prominent Ischial Tuberosities (IT).
- Used on a variety of clients with varying degrees of success.
- Most commonly used with clients that have little body tissue around their ITs (very boney).
- Useful for those where it has been difficult to stabilise their pelvis as it has some anti-thrust properties.
- Has been beneficial in assisting those with long standing pressure problems that could not be resolved by air flotation cushion alone.

Case Study

Mr G. was referred to the Prince of Wales Hospital Seating Clinic by the community nurses. 37 year old gentleman living with his partner and 2 school age children. He is enrolled in a TAFE computer course.

Background

- C5 quadriplegic (has been in a power chair for 5 years)
- 1st developed Gr 2 left IT pressure area 4 years earlier. Pressure area has an intermittently recurring pattern.
- Depressed: reported poor appetite (underweight: 50kg).
- Has been on bed rest for 3 months, unable to attend TAFE or pick his children up from school and look after them whilst his wife is at work.

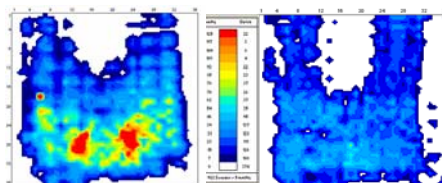
Existing Wheelchair Set-Up:

- Power Wheelchair : M1 Roller with tilt in space
- Custom made foam backrest
- Roho High Profile Quadro Select cushion – Reports he checks cushion on a weekly basis, but does not use Isoflo valve for postural correction.

Intervention

Contour Foam Base added to wheelchair set-up in addition to Roho Cushion after pressure mapping session

Education provided re: Correct set-up of Roho Cushion using Isoflo Valve



Roho Cushion

Roho Cushion with Contour Foam Base

Results

After 12 months of using the CFB; Mr G.'s pressure area remained healed. Other contributing factors to assist with wound healing included commencement of anti-depressant medication and improved diet.

Mr G. reported completion of his TAFE course and has re-enrolled in further computer courses. He continues to look after his children after school.

Evaluation

- May need to increase width of air cushion
- Requires less air in Roho when using contour base than if using Roho alone, therefore people CANNOT swap cushion between car & wheelchair
- When utilising the cushion the user's seat to floor height is raised, thereby altering the centre of gravity making the chair more “tippy”; therefore consider the persons wheelchair skills if using it for manual wheelchair users.
- The anterior wedge means there is a tendency to lift the clients knees higher than a stand alone cushion, resulting in a reduced thigh to trunk angle. Ensure the person has sufficient Hip ROM.
- Do not make the sides too high as this can result in the outside cells sitting horizontally (therefore the person bottoms out).



- Use Roho Quadro or Quadro select cushions. With single valve cushions clients are at higher risk of bottoming out on anterior wedge

Changes from the standard pattern:

- Flattening the top of the side wedge. This allows more opportunity for the outside cells to sit vertically
- Creating leg channels in anterior wedge. This was done to allow client to reach footplates of wheelchair (fixed height)
- Obliquity build up- to accommodate a fixed pelvic obliquity

Future Directions

Preliminary testing was completed to assess the vertical forces applied to the CFB when in use. There appeared to be minimal pressure on the CFB as most of the forces were absorbed by the Roho. It is difficult to determine the longevity of the CFB. The CFB had been supplied to more than 30 clients over a three year period, nil CFB's have returned to the Seating Clinic for replacement.

Further development to determine “formula” for CFB based on anatomical measurements – currently this is done according to therapists experience and clinical judgement.

