REPLACING THE OLD SHOE

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This case study is presented from the viewpoint of the clinician and the supplier when providing a new seating and mobility system as a replacement to an old, worn system, i.e., the old shoe. This can become a long, arduous process. What impacts the person's sitting tolerance, balance in the seat and ability to function? Control of muscle tone, dystonia, abnormal movement patterns, and pain/discomfort must be addressed. As everyone knows, one adjustment leads to having to adjust elsewhere. The time spent on delivery can add up to unrealistic billing times and sometimes volunteer hours to get it done.

CLINICIAN VIEWPOINT

During my 35-year career working in a seating clinic, I encountered many challenges replacing a client's seating and mobility. Many such individuals come to mind: A muscular dystrophy client who has been sitting in a sling seat that is so old that the seat upholstery has now conformed to his pelvis and thighs, trunk leaning forward with the abdomen approximating the thighs. In this case, the obvious recommendation was to transition this client to a power wheelchair with tilt. The angle of the back is brought to an acute angle to match the hip to back angle of the client. Tilt is recommended to compensate for the downward angle of the trunk and for weight shifting, but when using tilt, the client's head falls back. Now the client has limited sight and reach. The flat seat pan does not mimic the large convexity of the pelvis and thighs. How does one position this client for function when muscle grades are gravity assisted? Tilt systems are recommended to address progressing muscle weakness, but do we think about the impact of function when such a transition is made? Seat height is often an issue with the transition from manual wheelchairs to power. There are many ways for a new system to fail the client.

Many clients become used to their seating system; the shape, the density of the foam, the height and depth of the back and then years later the manufacturer changes something. Suddenly, the system no longer "feels the same," or simply is now new and no longer soft and worn out! So, our solution then becomes a custom seat or back:

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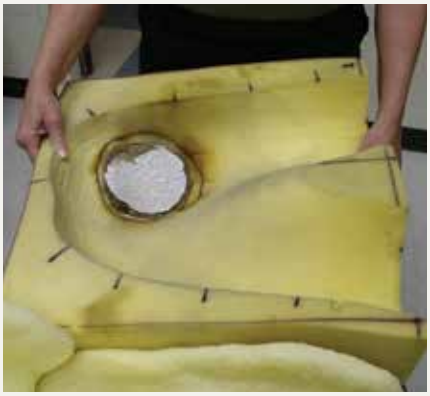
Can we duplicate the previous system? Can we add a lower density foam overlay? Do we have enough depth in the seat to do so? I have had numerous clients or family members reject molded systems when the density of the

Evaluation day in the old chair



Heather's original molded seat — 12 years old.

Make the arm trough just like this

foam is too "hard." I have learned to agree that the higher density foams do not allow for enough emersion into the foam for controlling rotation and providing some pressure relief on bony prominences. I will argue that total contact in some cases is just not enough.

Heather, our case study, is a young girl in her early 30s with mixed muscle and athetoid quadriplegia. She has a persistent ATNR, dominated by head extension and rotation to the right. Dystonia is quite severe in the upper body. She has a strong and persistent tremor in the hands. The tremor and athetosis is so severe that each arm and hand must be secured with straps to the arm trough. Her fingers are wrapped in padded tape so that her skin is not rubbed raw by her constant movement. Contractures are present throughout, but her arms can rest at 90 degrees in arm troughs if secured tightly. Hips flex to at least 90 degrees. She has some isolated movement in her ankles/feet.

Can she see the display?

She is verbal but very dysarthric. Her mother interprets most of the time. She has a communication device, but this is slower than interpretation. She has a high level of cognitive functioning as indicated by her ability to reply to our questions and to laugh often; probably directed at her seating team for being so stupid! Much of her replies are lost in translation. Dysautonomia was a problem, particularly heat intolerance. Her scoliosis is severe enough to make it obvious from the start that a custom molded seating system is in order as she has on her current wheelchair. Her old wheelchair is just that. Old and needs to be replaced. It works for her for the most part therefore we agree from the start that we will be trying to copy her system to promote functionality once again. Of course, we are always considering alternative and newer product options. Family members often want new alternatives as well but new means different and can be difficult to get used to.

SUPPLIER VIEWPOINT

Every supplier and clinician can share a story about providing replacement chairs. Our experience with Heather was an adventure and a valuable learning experience. The goal was to duplicate the current seating and postural supports as it had taken many years to fine tune the system for comfort and function.

Heather's current wheelchair was a Quickie P200 with a Tilt Master system that was over 12 years old. No problem there, right? Neither of these products was available. Her seating system was a carved foam seat and back provided by Jody Whitmyer[1]. (Yes, THAT Jody Whitmyer). Every component of her seating was custom modified in Jody's shop: the arm troughs, the headrest, the chest harness, the padded straps. Nothing that couldn't be reproduced with a sewing machine, welder, CNC machine[2]. This model of service was not an option.

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Heather in her new chair.

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Our approach for the new seating system was to measure each component carefully and send the specifications to the manufacturer with drawings. We had several options for molded seating, so we picked the type that offered the softest density of foam.

Heather chose to go with a mid-wheel power base with power tilt. Given that Heather drove the chair and operated all the functions with a joystick and three switches she operated with her feet, it was not possible to do a trial. Heather was confident she could adjust to mid-wheel over rear wheel drive.

With all the notes, drawings and measurements and funding approved, the orders were placed. This part of the process was more detailed and time consuming, but it was a commitment we made to duplicate the system that had served Heather well.

The initial fitting took place at the clinic. Everyone was anxious. How would the new postural supports feel to Heather? How would she tolerate the new molded seat and back? She was used to the carved foam that had lasted for 12 years! How would she like to drive a mid-wheel drive power chair with different electronics? How would the new shoe feel compared to the old shoe?

Heather was very adept at driving the new chair with a few programming tweaks. But, the seating, especially the seat cushion was not as comfortable. There is no way to duplicate the 12-year-old open cell foam. (Who knew that foam even lasted that long?) Within a few minutes, she had to be taken out of the chair. We carved out a relief area, adjusted the seat to back angle, adjusted the arm straps, the headrest and the arm troughs. Making too many changes at one time can complicate things. That was the first fitting.

Heather came back to the shop several more times for adjustments. Each time, we made a bit more progress toward increasing her sitting tolerance. We had provided all the prescribed custom-made components that came as close as possible to the old ones, but it just wasn't the same as that comfy "old shoe."

Throughout the break-in period, Heather never lost her sense of humor or her determination to adjust to the "new shoe." She faced respiratory complications along the way, further influencing her positioning and tolerance to the seating system. Sadly, Heather passed away in 2010.

CONCLUSIONS AND LESSONS LEARNED

- Manage expectations — There is no way to duplicate the "feel" of a old seating system. Prepare your client to expect a break-in period. Communicating this up front can help dissuade a person from immediately rejecting the system. It bears repeating this at every opportunity.
- Set realistic goals. As we noted, even if the client can get the same model of wheelchair, it is likely there will be changes in the newer model. Even minor changes can end up causing big problems in your client's functions.

Custom shaped chest harness

Old arm trough

Old headrest

In the molding frame

- Listen to your client and their caregivers carefully. They know what the specific needs are and how this technology will work best in their environment. Make sure you understand and ask questions when you don't.
- Plan for multiple follow-ups — The supplier and the client will need more time together for each to understand the issues and the limitations. Keep that communication open. Keep notes to show the progress you are making and the items that still need to be addressed.
- Be able to understand the difference between adjustments and postural support modifications. Know when it is time to return to the clinic for the therapist's input.

By all working together, we can reach a point of consensus that the new system is going to meet the client's goals so that one day it becomes the "old shoe."

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REFERENCES

[1] JODY WHITMYER-FOUNDER OF WHITMYER HEADRESTS AND WHITMYER BIOMECHANIX JODY WORKED WITH HEATHER DURING THE CREATION OF THE WHITMYER HEAD POSITIONING SYSTEM.

[2] CNC IS COMPUTER NUMERICAL CONTROL THAT AUTOMATES THE CONTROL, MOVEMENT AND PRECISION OF TOOLS, SUCH AS CARVING A SHAPE OUT OF FOAM

Diane Beckwith, PT, ATP, graduated from Emory University's Master of Physical Therapy in 1983. After a year working in an acute hospital setting, she was able to join the inpatient team at Emory's Center for Rehabilitation Medicine. After a brief stint on the general rehab floor, she worked on the brain injury unit for seven years, attending ISS in 1987. After attending ISS in 1987, the bug hit her. She used her skills providing seating and mobility for her ABI patients and in 1993 took over the Seating Clinic at Emory Rehab. The clinic served outpatient and inpatient complex wheelchair needs. Beckwith also provided services at the Emory ALS Clinic.

Beckwith retired in 2022. Due to reorganization of the hospital and her retirement, the seating clinic closed. Prior to retiring, Diane contributed to writing a chapter in the book "The Rehabilitation Specialist's Handbook" 4th Ed. 2013 by Roy, Wolf and Scalzitti entitled "Wheelchair Assessment and Prescription."

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