From the Field: Clinical Notes on Cushion Prescription

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The work being done by Susan Garber (see, for example, Garber & Dyerly, 1991, pp. 550–554 in this issue) and other researchers is invaluable to us in our efforts to select or recommend the best technical solutions for our clients. We must accept, however, that although these studies can help us stay up-to-date on the clinical effectiveness of the technology available, no amount of data collection and analysis can ease the responsibility of making clinical decisions. As Garber said (Garber & Dyerly, 1991), every situation is unique, and we must be diligent in our efforts to learn every bit of information we can from our clients during our assessments. Repeated studies have shown that there is no ideal cushion and that many other factors must be accounted for in the prevention of pressure sores and promotion of cushion use. In a review paper presented in 1984, Garber stated, “The wheelchair cushion is often viewed as the primary pressure relief mechanism, not only by the professional who prescribes it but by the consumer who utilizes it” (p. 57). In her present study, however, skin breakdown was shown to play a relatively small role in people’s decisions to continue using their cushions. Most of the subjects who stopped using their cushions reported such reasons as change of wheelchair, mechanical failure of cushion, preference for another cushion, or change in living situation. Incidents of skin breakdown were reported by a higher percentage of persons who continued to use their cushions than by those who had discontinued using their cushions. Therefore, we must become familiar with the characteristics of cushions as they relate to function in order to help our clients select the most appropriate seating interface for themselves.

Most persons with spinal cord injuries receive their first cushion and wheelchair while still in the acute rehabilitation setting. Although many centers have developed their own protocols for equipment evaluation, I suspect that cushion prescription is based largely on the therapists’ previous experiences, the availability of specific brands of cushions for demonstration and trial, and a certain amount of subjective information. There are no data reporting what percentage of cushions are evaluated objectively with pressure-measuring devices. If persons are sent home with cushions that they have used in the hospital, then they have at least had some supervised trial time to identify pressure problems and to learn how to function on the cushions. Garber (1984) pointed out that “devices used during the early stages of hospitalization and rehabilitation may not be appropriate once an individual returns to social, vocational or educational activities” (p. 58), so it is important that therapists anticipate the changes the user may undergo after leaving the hospital and what his or her functional constraints will be.

Cushion prescription is more haphazard once the person has left the medical establishment and reentered the community. At this point, cushion replace-
ment relies heavily on the knowledge of the user and his or her contacts within the rehabilitation community. One can easily go to the corner drugstore or local medical equipment dealer to replace a cushion that has worked well, but for persons with spinal cord injuries, the kinds of changes undergone over the years may require reevaluation by a more knowledgeable specialist. Our discharge goals in occupational therapy, therefore, must include a strong component of consumer education. Consumers need to know not only how to take care of their own bodies, but what sorts of technology may be useful to them and how to access services and information. Consumers need to know not only how to take care of their own bodies, but what sorts of technology may be useful to them and how to access services and information.

An example of the need for a comprehensive assessment is that of a 50-year-old client whom we saw last year at our clinic in Newington Children's Hospital, Newington, Connecticut. The client had injured his spine while still in high school, resulting in T-7 quadriplegia. He was able to propel his tall, narrow, adult Everest and Jennings Premier manual wheelchair with rim projections well enough to be independent in mobility within his home and for short distances outdoors. He had maintained his skin integrity by using a T-foam cushion in his chair, with periods of alternative positioning in bed. He was able to transfer from chair to bed and back independently, although he needed assistance getting in and out of his car to drive. Over the years, however, his recurrent bowel and bladder problems and a worsening of his nutritional status led to an ostomy, which interfered with his ability to lie prone. He lost weight and strength, which reduced his muscle bulk and made it more difficult for him to propel his chair. The provision of a lighter-weight chair, improperly sized and adjusted for him by a local vendor, actually decreased his function because of its backward instability. He also began having severe, chronic problems with skin breakdown.

After nearly 10 years of fragmented medical services, which included considerable plastic surgery, periodic confinement in a hospital bed, and numerous cushion trials, the client was referred to our multidisciplinary adaptive equipment clinic for evaluation of his need for a new cushion. The team recognized immediately, however, that this was more than a cushion problem. The client needed a series of changes to increase his level of independence as well as a more effective means of relieving pressure. He had very little muscle tissue left in his buttocks, because he had undergone multiple flap procedures; his plastic surgeon said the next step would be amputation of one or both legs.

The solution proposed, which was funded by Medicare under Connecticut's pilot prior-approval program for custom and powered wheelchairs, was a powered wheelchair with a power-tilt-in-space system and a dual-valve Roho cushion. The client quickly found that the powered wheelchair restored his ability to get around and that he could use the power-tilt system periodically throughout the day to shift his weight from his buttocks to his back. The dual-valve Roho cushion allowed individual adjustment of the pressure beneath each side of his buttocks to compensate for marked asymmetry resulting from the plastic surgery. His skin has remained intact since he got this equipment, a period of 6 months as of this writing, and he is now investigating trading in his old car and getting a van so that he can return to work.

Consumers need to know the quality of different types of cushions and the advantages and disadvantages of each in order to participate in the cushion selection process. Garber (1985) classified cushions by type and described some of their assets and liabilities. Since that time, however, manufacturers have developed a number of modifications and new products to alleviate some of the most common complaints about their classic cushions. Perhaps if the subjects in Garber and Dyerly's (1991) study had known of some of these modifications, they would have found ways to make their cushions work better for them. The following brief review of some of the changes introduced by Jay Medical and Roho provides some ways to solve the most common problems.

The Jay cushion consists of a contoured foam base, a Jay Flolite, or gel-like, fluid-filled pad, and a cover. The Flolite pad is wider than the base cushion, allowing it to be pocketed within the rear depression to provide some viscous support for relieving pressure on the ischial tuberosities and for moving with the user during functional activities. Some users have complained that they have difficulty transferring onto and off of the Jay cushion because of the contouring and that it is difficult to move the heavy cushion onto and off of their chairs. Many users of lightweight wheelchairs who order their chairs as narrow as possible for maneuverability find themselves sitting up on the sides of the contoured base. This diminishes the effectiveness of the Flolite pad in distributing pressure and increases the pressure on the trochanters. The newer Jay Active cushion is not only lighter, which makes it easier to move during transfers, but also has a softer, less

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1Available from Everest and Jennings Inc., 3233 East Mission Oaks Boulevard, Camarillo, CA 93010.

2Available from Roho Inc., PO Box 658, Belleville, IL 62222.

3Mailing address: Jay Medical Ltd., 4745 Walnut Street, Boulder, CO 80301.
contoured base and smaller Flolite pad for less entrapment of the buttocks and a narrower profile. The Jay Active cushion does not, however, provide the postural support needed by many persons with spinal cord injuries.

In both the original Jay cushion and the Jay Active cushion, the Flolite pad requires some maintenance and periodic replacement. The fluid in the pad can pool, thus decreasing its coverage under very bony prominences and allowing excessive pressure on the base foam. Some users have found that ordering the pad overfilled or with divided quadrants can help keep the fluid where it is needed, although this should be evaluated carefully, particularly in a powered reclining wheelchair, before ordering. One example of when such an alteration was inappropriate was with a tall, somewhat heavy man with C-4 quadriplegia. This client had been using a Jay cushion for several years when he got a new powered chair with a zero-shear reclining back. Without adequate evaluation, we recommended a larger cushion to accommodate his seat width and depth better and, for good measure, included a pad that had been overfilled and divided into quadrants. We had trouble recognizing why the client suddenly began having problems with an old, chronic skin breakdown site in his gluteal cleft until I sat in his chair and reclined in it several times. I discovered that the trapped fluid tended to squeeze my buttocks together as the chair reclined. We then ordered a standard pad, and the client has had fewer problems.

Jay cushions are often used when stability and postural control are concerns, but some users have complained about the cushions not fitting them or accommodating their asymmetries. The Jay Box has a full complement of pads to provide more specific positioning. They can be attached to the cushion base beneath the Flolite pad with a touch fastener or glue. These pads are designed to build up the base foam under a pelvic obliquity, to abduct or adduct the thighs, to provide lateral support for the hips, or to supplement the Flolite pads. Jay Medical can provide information about custom modifications that one can make by trimming or reshaping the base foam and then resealing the edges with a vinyl coating material.

Training in proper use and maintenance of any cushion, with periodic reminders at follow-up visits, cannot be overemphasized. I got a call from one of our outpatient clinics one day that a young man who had been using a Jay cushion for about 6 months had a red spot on his coccyx. On my way to the clinic, I wondered if his gel pad had hardened and needed replacement. As soon as I felt the cushion, however, I discovered that well-intentioned care providers had put the cover on the cushion backwards after washing it, despite the "Rear" label on each component. The client was sitting with his coccyx on top of the abductor buildup and had been doing so for at least a week. I demonstrated what the problem was and instructed the care providers in proper placement and use.

Most of the studies of the effectiveness of Roho cushions were conducted with 4-in. thick single-valve cushions, but many other models and variations are now available. The most common complaints concern durability and instability. Although the manufacturer offers an 18-month warranty on workmanship, some conditions can damage the cushions and invalidate the warranty. Smokers run the risk of dropping hot ashes or lighted cigarettes on the cushion, and users who have very narrow chairs often have problems with the sides of their wheels rubbing against the sides of the cushion. One young man we saw who had gained 20 lb in the previous year had not only worn through both sides of his Roho cushion with his wheels, but also had worn through his pants and had developed severe skin abrasions on the outside of his thighs. We prescribed a wider chair and cushion, making sure that the chair had nylon clothing protectors, and talked at length with him about how to monitor the condition of his skin.

Another common problem with Roho cushions is their tendency to fall through the space between the seat and back upholstery, resulting in distribution of weight over a smaller area and inadequate support of the pelvis and lumbar spine. Roho makes an inexpensive nylon mesh piece called a cushion retainer that keeps the cushion in place. It can be installed in almost any wheelchair with a sling seat and back.

Seated instability on a Roho cushion is usually the result of overinflation of the cushion. Proper inflation allows the user to settle down into the cushion, and someone with intact sensation can feel the air move from one section to another with each weight shift. Although we always instruct users in proper inflation techniques, some persons find such techniques difficult to perform, and many users either do not believe that settling down into the cushion is better than sitting up on top of it or they think that overinflation protects them in case of a slow leak. A pressure measurement device can be useful in demonstrating to users how to minimize pressure. Although the standard 4-in. Roho cushion naturally accommodates some asymmetry in sitting, multiple-valve cushions and combinations of different cell heights can be useful for more significant accommodation or for some postural control. Roho's Enhancer cushion uses 2-, 3-, and 4-in. cell heights with separate valves controlling the higher and lower cells to emulate the contour seen in the Jay cushion.

Garber and Dyerly (1991) pointed out that there is a wealth of researchable information in our occupational therapy clinics. Documentation of the efficacy of equipment prescription will require more than the single-center studies that have thus far been reported. We need to use a multicenter approach, looking at trends across the country in a variety of settings, to determine who is pre-
scribing equipment and how well they are doing so. Are these centers using pressure-evaluation devices? How do they arrange trial times with devices? We also need to look at users' characteristics related to successful use of specific cushions, not just by level of injury and sex, but also by body-type differences such as muscle-to-fat ratio and skeletal structure. Although we cannot expect to develop a cookbook approach to equipment prescription, we must deepen our understanding of the factors that contribute to the success or failure of our recommendations.

References

