This article describes makeup boards designed for two quadriplegic women who had suffered traumatic injuries at the C5 spinal cord level and had expressed concern and frustration over their inability to open makeup containers and apply their own makeup. Both women had good minus muscle grades in shoulder flexion and abduction, elbow flexion, forearm supination and pronation, and wrist extension. Elbow extension, wrist flexion, and thumb and finger movement remained at zero to trace muscle grades. The women’s tenodesis grasps, even with a tenodesis splint, were usually not strong enough to open most containers, and the women did not have adequate hand function to hold applicators of various shapes and sizes. The makeup boards enabled the women both to manipulate their makeup jars and applicators independently and to apply their makeup skillfully.

The amount, type, and brand of makeup a woman normally wears, plus the various techniques and fine

![Figure 1: Makeup Board for Woman Without Flexor Hinge Tenodesis Splint](image)

Note: A = lip gloss, B = blush applicator, C = cream makeup, D = blush, E = mascara, F = cold sore cream, G = petroleum jelly, H = Q tips, I = cream makeup applicators.
motor skills needed for opening containers and applying makeup, make designing a makeup board a highly individualized project. Even with spinal cord injuries at the same level, there can be differences in grasp and release abilities. Therefore, a close working relationship between the therapist and each patient was necessary to develop the most functional makeup board for the patient.

Both women were well motivated and were involved in the modifications of their particular makeup applicators. One woman applied her makeup with the help of a flexor hinge tenodesis splint; the other did not. Although they therefore needed different adaptations, they became equally skilled in this self-care activity. Many of the ideas for the particular adaptations came from the patients, and most of the final adaptations were decided on only after trial and error.

Construction of the Makeup Boards

The basic design used for both makeup boards (see Figure 1) consisted of a base board securing two mirrors and a lazy Susan and a platform housing the makeup and applicators. The base board measured 27.5 cm x 60.0 cm x 2.5 cm (11 in. x 24 in. x 1 in.). A 7.5 cm x 10.0 cm (3 in. x 4 in.) stationary mirror was framed at the proximal edge of this board. This mirror was sometimes helpful for applying mascara. A lazy Susan fastened just distal to the stationary mirror held the platform. The lazy Susan made manipulation of the jar lids and applicators more convenient. Distal to the lazy Susan a 7.5 cm (3 in.) block raised an adjustable mirror above the makeup for an unobstructed view. The octagonal platform measured 32.5 cm (13 in.) across. Dowels on the sides of the platform assisted with rotating it. Underneath the platform were two blocks with felt glued to the top surface. The blocks, distal and proximal to the lazy Susan hardware, offered support to the platform, and the felt kept the platform from rotating too easily. All the edges on the base board and the platform were routed.

The patient's hand function and the particular makeup and applicators to be included on each board determined the adaptations made. For example, depending on the type of jar lids used, levers were either made from a high-temperature thermoplastic and glued on or made from doweling drilled through the lids. The patients were instructed to replace the lids when replacing the jars. A blush case was easily opened with a plastic lever glued to the lid (Figure 1). A mascara lid was adapted with a dowel (see Figure 2) for the woman with the flexor hinge tenodesis splint, but a cuff (see Figure 1) was needed for the woman without the splint. Because one woman requested her lotion be included on the makeup board, the lotion was transferred from a squeeze bottle to a pump bottle (see Figures 1, 3). Petroleum jelly, for the removal of makeup, came in a container too large for the board, so a smaller container was purchased and easily adapted with a plastic lever attached to the lid (Figure 1). Q-tips were placed in a small bottle, and a ceramic oblong jar was chosen for the cream makeup applicators (see Figures 1, 3). Other applicators were usually adapted with wooden handles and placed on the board at functional angles (see Figures 1, 2).

Makeup containers and applicators were attached to the platforms using a variety of methods and tools. The wooden applicator stands (see Figure 2) were attached with screws and glued. Blush containers
were screwed to the platforms. The ceramic jar and the odd-shaped lotion pump bottle were held in place by drilling four \( \frac{1}{4} \) in. holes around each container and fitting 2 in. dowels in place. If a drill bit of the right size was not available or if a jar was oddly shaped, a smaller size bit was used and then the hole was fit to the jar by using a router or smaller rotary tool. The caps to pencil-like applicators were fit into holes drilled at appropriate angles (see Figure 2). All stands and caps had to fit snugly to ensure efficiency when the board was used.

Conclusion
The woman with the flexor hinge tenodesis splint had a more functional grasp and needed less makeup adaptation than the woman who did not use a splint. This difference was especially apparent in applying blush and mascara. Putting on and taking off the splint as a part of the makeup application routine did add a certain inconvenience to the process, however.

Both women had strong desires to apply their own makeup and expressed feelings of accomplishment when they reached this goal. By their own choice, putting on makeup became a part of their daily self-care routines, and at the same time they seemed to have renewed interest in other areas of personal appearance, such as clothes and hair. The makeup board is a functional piece of adaptive equipment and can be a valuable part of the occupational therapy treatment program for a quadriplegic woman.

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