

## ADVANCED ADAPTATION OF QUADRILATERAL SOCKET

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During the past year, excellent results have been achieved with 20 carefully selected cases using the illustrated apparatus — an adaptation of the quadrilateral socket in severe lower extremity involvement with flail legs, and also where gluteals and abdominals are involved. Eighteen of these cases were polio victims and two were spinal bifidas.

“Wearer reaction” has been gratifying since each of the cases previously found other types of appliances unsatisfactory. Cases where there was marked waddling and unsteady gait have benefited immeasurably. Wearers report that they do not fatigue so quickly as formerly. They are not bothered by chafing and they welcome the elimination of knee cap pads and pelvic bands. They have found that this appliance is much more sanitary than the types they discarded.

The ages of the patients range from 9 to 40 years of age. A typical case was that of a 35-year-old polio victim with flail right leg who is required to stand for long hours since he is employed as an X-ray technician. His gait was poor. He leaned to the left with each step he took in order to swing his right leg forward. Equipped with the illustrated quadrilateral socket, he has much better control of the flail right leg and doesn't have to lean to the left at an extreme degree. He reports that the socket is fitted more comfortably than his previous braces. Observation of these twenty cases suggests that anyone requiring ischial seats or rings will do much better with the quadrilateral socket.

The illustrated appliances were used in our initial cases. Since these pictures were taken, the new modified Silesian bandage—described on Page 74 of the 1957 issue of *Artificial Limbs*—has been a very helpful addition in some cases.

Careful fitting of the illustrated belt has aided pick-up of appliance; it holds it more securely when the wearer is sitting and corrects rotational problems. While the fitting procedure and fabrication are relatively simple, we believe a Prosthetist and Orthotist team is the ultimate approach to its success.

Measurements for a quadrilateral socket are taken and also tracing such as is used for a long double upright. The socket and the double upright are roughed out and the patient is called in for a fitting and walking test. The socket is fitted first, being cut carefully to allow the foot to slide through the opening freely, stressing medial rather than lateral pressure at the lowest point of the socket just above the knee.

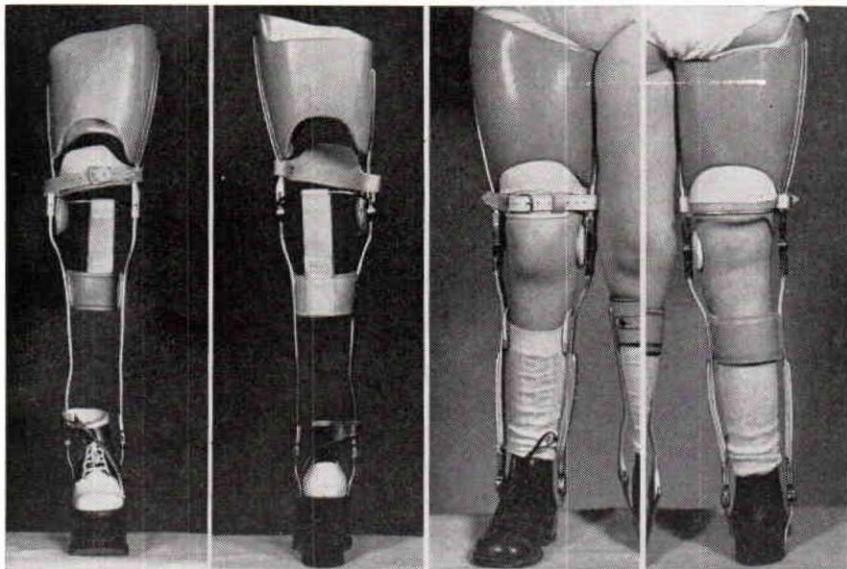
The double upright is then aligned to the socket—patient in a sitting position — and attached temporarily with wooden screws. The patient stands and pelvic level is checked. The Silesian bandage is applied and walking and sitting phases are again checked. Now the appliance is ready for finishing. Two tapped metal adjustment straps are recessed in lateral and medial sides of the socket. The socket is finished with plastic or rawhide covering.

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Extreme care must be exercised in locating anatomical and mechanical knee centers and alignment of socket. The rough fitting of the appliance without installing the knee disc may cause alignment trouble when attempting to add the disc to a finished appliance. In the bifida cases, with the usual swelling, it is wise to hinge the anterior side of the socket, enabling easier insertion and withdrawal of the limb.

Gait training is advocated as the wearers are taught to overcome many undesirable habits acquired with appliances which allowed them to plunge forward and down into ischial ring or cuff. During the first few days, the wearer may complain of back strain inasmuch as he is now walking without the pelvic tilt. In two or three cases, it was necessary to level pelvis with two-or three-length adjustments at spaced intervals. Each lengthening in these cases brought about an improved gait.



An 11-year-old post-polio case who previously wore pelvic band and hip joint.

## REVIEWS—

### *FRACTURES AND OTHER INJURIES*

*By the members of the Fracture Clinic of the Massachusetts General Hospital and of the faculty of the Harvard Medical School. Edited by Edwin F. Cave, M.D. Published by The Year Book Publishers, Inc., Chicago, Illinois, 1958. 863 pages, \$28.00.*

Twenty-eight dollars is a lot of money for a book, but then this is a lot of book! Its 863 pages and numerous illustrations, some in color, reflect credit on the authors and on the publishers. The orthotist will be especially interested in the chapters on the healing of fractures, and on fractures of the forearm, the knee joint and the femoral shaft.