

# Rochester Parapodium

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The Biomechanics Team at the University of Rochester Medical Center has been developing and testing design modifications to the Toronto parapodium since 1975. Early in 1983, these design modifications had stabilized, and prototypes of the new design were offered to medical centers and orthopedic laboratories in the United States and Canada. The Rochester parapodium has now been fitted to over 80 young children of ages 17 months to 14 years. Most of these children have flaccid paralysis due to spina bifida or spinal injury from L5 to T12.

The Rochester parapodium differs from the Toronto design in the hip and knee hinge and locking mechanisms. The hip joints unlock together with a single lever release and lock automatically on extension. The hip joints unlock with a forward motion and have no lateral projections, which allows ease in releasing hip lock in a confined space such as a wheelchair. The knee joints also unlock independent of the hip joints with a second single lever release and lock automatically on extension with the aid of an extension assist bar.

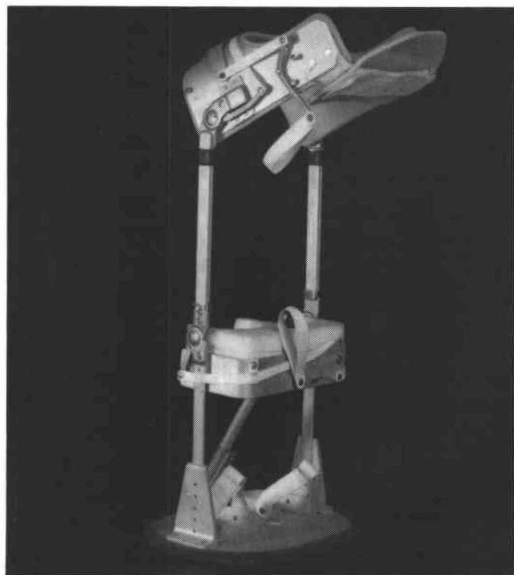


Figure 1. The hip joints unlock independent of the knee joints.

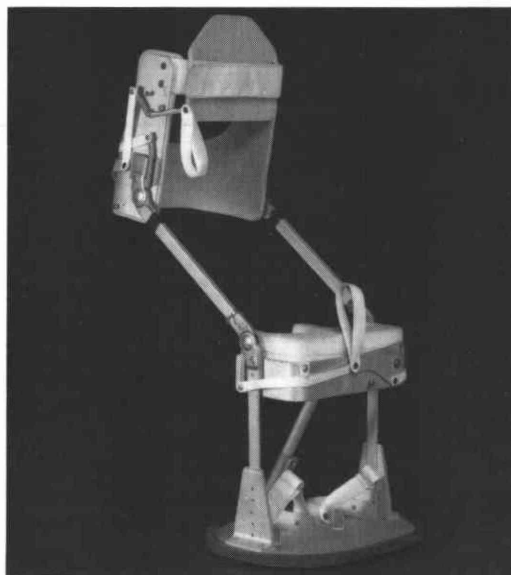


Figure 2. Both joints unlock with a pull of a lanyard.



Figure 3. A child can bend over to pick up objects with hips flexed and knees locked.

Without lateral projections, rolling is easier for the child who applies the orthosis sitting or in the supine position on floor, then rolls to prone position in order to elevate to a standing posture. This separated locking and unlocking action has simplified many everyday activities for the paraplegic child.

With increased control, the child can become independent in sitting and standing from a chair with arms. He can also bend over to pick up objects from the floor with hips flexed and knees locked. These are important functions for a preschooler exploring his or her surroundings and participating in peer group activities.

Previously, children wearing the parapodium had to get up from a prone position on the floor by pulling to standing with fully extended knee

and hip joints. Now a child can use jackknife-like movements to stand. These movements appear to require much less energy and open the activity to children with higher levels of paralysis.

The lateral supports have also been redesigned for the Rochester parapodium, using bar stock instead of tubular sections. These flat lateral supports facilitate rolling, a very important movement for a child who is independent in dressing and changing positions. The new side bar design, a more rigid construction, also improves the child's momentum during swivel walking. With polypropylene added to the bottom of the base, many children can learn to swivel-walk at functional speeds, with hands free.

The activities now possible with the new design allow the paraplegic child to function at home and in school with relatively little need for adult supervision or assistance.

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