

## **EXPERIENCE WITH THE RIMJET LOCKING HUMERAL ROTATOR**

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In our experience, persons with bilateral arm amputations greatly benefit from devices that allow flexibility in positioning of the terminal device in space. We have reported our experience with the Four-function Forearm Set-up (FFS) where cable control of wrist rotation and wrist flexion are added to the conventional body-powered trans-humeral configuration [1]. We have recently added humeral rotation to the prosthetic design used by three of our experienced clients (prosthesis users for more than five years) who have high-level bilateral amputations.

At present, these individuals consider this new component as an improvement. Two of these clients present with bilateral trans-humeral amputations and one has bilateral shoulder disarticulations. For the two with bilateral trans-humeral amputations, it was necessary to use a conventional laterally-routed cable in order to retain the functional advantages of the Four-function Forearm Set-up. This required trade-offs in the positioning of the humeral rotation device.

The manufacturer of the locking rotator recommends a medially-routed cable [2]. With this routing, the forearm generally moves toward internal rotation when the rotator is unlocked because of tension applied to the control cable at the time of unlocking. Since a medially-routed cable is not compatible with the Four-function Forearm Set-up, the ease of internal humeral rotation was compromised somewhat for the trans-humeral fittings. This problem was resolved in one case by the addition of an external spring which biased the unit into internal rotation. This problem is not an issue for the shoulder disarticulation client because he uses a nudge control for unlocking the humeral rotator and therefore the control cable can remain slack allowing easy internal rotation by gravity.

We are currently investigating two modifications to the Rimjet Locking Rotator. The first is the addition of an internal spring mechanism to facilitate internal rotation. The second modification is to increase the number of locking positions. Our clients felt that there were too few locking positions on the standard Rimjet unit. We will discuss these issue and others found in fitting this device.

1. Heckathorne, C., "Control of Limb Prostheses", Atlas of Limb Prosthetics, p.192, 1992.
2. Ivko, J., "Independence Through Humeral Rotation in the Conventional Transhumeral Prosthetic Design", JPO, pp 20-22, Volume 11, Number 1, 1999.