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Technical note— "Lawry" rotary attachment for paraplegics

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Abstract

Paraplegics usually transfer from wheelchair to water closet by side, rear or front approach. This necessitates removal of the arm support or back rest and sitting on the water closet in opposite to normal direction. The author has designed a rotary attachment which enables the patients to approach from the front and transfer easily so as to sit in the normal direction on the water closet without removal of the arm support or back rest. Further, this device enables the patient to move away from the water closet for washing purposes without having to get up from the water closet seat.

Introduction

Paraplegic patients normally attend to their toilet functions by the following methods:

Sitting in the wheelchair

Without transferring from wheelchair, moving the wheelchair over the water closet seat in the reverse direction and removing the special sliding seat under the buttocks.

Transfer from side

Bringing the wheelchair to the side of the water closet, removing one of the detachable arm supports and transferring themselves to water closet.

Transfer from front

Forward approach

Bringing the wheelchair in front of the water closet and transferring with the help of rail/ overhead support. In this case the patient sits on the water closet in a direction opposite to the normal.

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Rear approach

By removing the back rest of the wheelchair and transferring with the help of hand support. In this case the patient sits on the water closet in the normal direction.

The disadvantage in the above toileting methods is that the patient must wash while sitting on the water closet seat. This is most inconvenient. There are many patients who would prefer to wash themselves away from the water closet. With this in mind, the author has designed a rotary attachment with a water closet seat attached; this facilitates washing and bathing away from the water closet without getting up from the water closet seat.

The rotary attachment

The rotary attachment consists of a "U" shaped seat held horizontally with the help of an "S" shaped cantilever system, which is grouted at a depth of 500mm from the floor level with a socket and two bearings, one ball and the other taper. The cantilever system has been designed to withstand a dynamic load of 200 kg. An 80mm diameter pipe is used as a female socket. The socket mounting is such that it projects 50mm above the floor level to prevent water seeping through. The "S" shaped cantilever is welded to a 40mm diameter mild steel rod, which goes into the socket and has a taper bearing at the bottom and ball bearing at the top. A foot rest is also incorporated in the device which also acts as a cover to the female socket to prevent water entering.

The height of the mobile "U" shaped seat is the same as that of a standard wheelchair seat. This facilitates the incorporation of a supporting clamp under the tip of the mobile seat. When the

Fig. 1. Left, "Lawry" rotary attachment. Transfer is facilitated by use of the overhead support. Right, the rotary attachment is swung away from the water closet seat for washing. Note the water tap just below the back rest and separate shower hose.

wheelchair is brought in contact with this clamp, it prevents the wheelchair from toppling during transfer.

Salient features

1. Patients can tranfer to the "U" shaped seat from the wheelchair without help, by holding the circular overhead support (Fig. 1, left).
2. The rotary attachment can be adjusted to any desired angle, as it can be rotated through 360°. A locking arrangement has been provided to fix the rotary attachment seat at any desired angle.
3. The attachment can be fixed to any water closet of the pedestal type. Patients such as paraplegics, and above and below-knee bilateral amputees who retain strength in their upper limbs can use this independently.
4. Normal individuals may also use the water closet by swinging the seat of the rotary attachment out of the way.

Essential washing facilities are provided by a water tap with separate shower hose. A back support is fitted to the wall above the tap (Fig. 1, right).

Durability and maintenance

During the past year of use the device withstood both the static and dynamic loading of all patients without developing any defect. However, the locking arrangement for the rotary attachment has a tendency to slip. A change in design is in progress, and will be tried as soon as it is completed.

The mobile seat ring is supported underneath by a metal frame extension to the "S" shaped support. Hence the seat ring does not sag under any live load.

The bearing has to be lubricated as and when required. Painting of the device may be done once a year to prevent corrosion.

This attachment has been in use at the National Institute of Prosthetic and Orthotic Training, for the past year and patients have found it very convenient to use. The doctors of the Institute have also reviewed its performance and have accepted it as an excellent device for use by paraplegics. The Director of one of the leading Rehabilitation centres of the country has decided to install the device in his centre. Any suggestions for the improvement of the device would be welcomed by the author.

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