A case study on the use of turntable transfer

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Abstract

This report describes the use of a simple yet safe and effective way of transferring patients from certain groups from their wheelchairs to the dental chair for treatment. A turntable was investigated to ascertain if this would safely and easily transfer wheelchair users, who still retained upper body strength, to the dental chair. The requirements were that it should be ergonomically designed to make it comfortable for carer and patient alike to use, to be height adjustable with padded knee and hand support for patient comfort yet be sturdy, easy to clean and space efficient, maintain dignity and overall be safe and user friendly.

Key words: Transfer disc, ergonomic design, disabled

Case report

A 47-year-old male patient suffering with disseminated Multiple Sclerosis (MS) presented for dental treatment. He had been diagnosed with MS in 1990 following CSF examination, normal CT myelogram, and delayed visual evoked potentials. In retrospect his symptoms began in 1987 from which time he experienced blurred vision and loss of balance whilst still living at home with his wife and family. In 1993 he was still able to walk with the use of a stick but by 1999 was only able to walk a few yards with the use of a Zimmer frame.

In 2004, his mobility had been further reduced and he used a manually propelled wheelchair. He could transfer with difficulty to the dental chair with limited assistance. By 2006 it was difficult to transfer him without the use of some mechanical aid such as a banana board but he resented the indignity of this form of transfer and felt unsafe. The use of a transfer aid such as the banana board requires that the patient is not cognitively impaired and can therefore follow commands easily. In addition, the side of the wheelchair must be capable of being removed to allow the banana board to be positioned. The arms of the dental chair need to be removed, or at least be altered, to be at right angles to the chair. On the particular dental chair in use, it is only possible to extend the arm to 45°, making banana board transfer difficult. Furthermore, the Warwickshire Trust’s manual handling policy prevented us from fully supporting the patient to transfer to standing upright and then be turned to access the dental chair.

The patient still had upper body strength and so advice was taken from the occupational therapists and several of their turntables tested before making our choice. We tried out five different turntables before deciding that the Saturn turntable fulfilled all of our requirements (Figures 1 and 2).

We selected this transfer disc for several reasons:

- It is simple to use
- It is kind to carers by promoting the correct ergonomic position of the body during transfer therefore reducing the risk of musculoskeletal injuries
- When used in day-to-day transfers it encourages maintenance of the lower limb function and helps users maintain upper body strength in rehabilitation
- It can transfer a patient of up to 190kg (30 stone)
- It has a padded knee support the height of which can be altered and a height adjustable hand grip therefore making it comfortable for patients of varying heights to use
- It is lightweight (epoxy aluminium-steel) with a polyurethane foam covered footplate, yet sturdy and space efficient
- It is easily cleaned with disinfectant and all contact areas are padded for comfort
- It has a foot brake which is used whilst the patient maintains their balance prior to transfer (Figure 3). The patient then needs minimal support whilst the turntable is rotated and sits back onto the dental chair. This has proved a very successful means of transfer, which maintains the patient’s dignity and self esteem at all times.
- It has wheels on the base so that it can be pushed under the foot plate of the patient’s wheelchair, allowing the patient to hold onto the handles and be turned towards the dental chair. This technique maintains a high degree of comfort for the patient (Figure 4).
The turn bases, however, rely on the patient still maintaining some upper body strength in order to use the handle bar and it needs to be positioned to allow space for the circumference of the base to permit a full $360^\circ$ turn. In function the turntable is positioned close to the dental chair to allow for $360^\circ$ rotation. The wheelchair user is then moved so that their feet are positioned over the turntable base and the footplates on their wheelchair either removed or turned back to allow the patient to place their feet on the turntable base. The brake on the turntable base is then utilised whilst the patient grips the arm rests of the turntable and regains their balance (Figure 3).

The brake on the turntable is then released and the patient turned $360^\circ$ so that they can sit back on to the dental chair and their legs made comfortable (Figure 4).

**Discussion**

Transferring wheelchair users from their wheelchairs to the dental chair has been a subject of investigation to improve accessibility and understanding and to prevent discrimination. As long ago as 1965, Bramer made recommendations both on architectural and structural designs that would help in wheelchair access to the dental chair. This has been followed by further observations on designs to ease wheelchair access published by others (Ettinger et al., 1979; Giangreggi, 1986; Tamazawa et al., 2004).

The transfer from wheelchair to dental chair is not required for every patient in order to provide dental treatment but when essential, Posnick and Martin (1977) and Felder et al. (1988) all advocated the sliding board and transfer belt. Beach (1977) advocated utilising the patient’s and/or family’s knowledge of, and experience with, such transfers.

Kaminsky et al. (1988) looked at simple aids to help in transferring patients from their wheelchairs to the dental
beneath the trailing hand were larger than those in the leading hand and if there is pain and weakness in one arm then this should become the leading limb. They concluded that to avoid excessive loading of the arms, technical aids and ergonomic design factors for similar transfers should be adjustable to clinical needs.

Such an adjustable device is the turntable transfer disc, a simple aid that readily completes the wheelchair transfer of patients with either side weakness. Some upper body strength is essential but larger patients need not be excluded as the turntable can be used for patients up to 190Kg. The surfaces of the turntable are appropriately smooth and padded where contact with patients occurs. Surface wiping with disinfectants can be used to comply with cross infection policies and the device is readily moved for easy storage. Dignity is preserved and the transfer completed with minimal risk to the patient or clinical staff.

Conclusion

For wheelchair users who still retain upper body strength this turntable has proved very efficient as a means of transfer from wheelchair to dental chair in a dignified, safe and efficient way. Importantly, it still allows the patient to be in control of their transfer, which is significant for their self esteem.

References


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