The seating dilemma in aged care

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Choosing the most appropriate easy chair for elderly clients is often difficult. The demands that need to be fulfilled by the chair chosen need to be identified and considered in order of priority. Benefits of good seating are identified, as are consequences of poor seating. Some guidelines are provided for choosing specific chair characteristics. There is discussion of the thought provoking points raised. [Nitz JC (2000): The seating dilemma in aged care. Australian Journal of Physiotherapy 46: 53-58]

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Introduction

The major question for physiotherapists working in aged care is “What chairs should be chosen for my clients?” Determining which chair to recommend for a client is very vexing as there are many different geriatric chairs available on the market. Matching the occupant to the chair, the concept that has been utilised over the last two decades for wheelchair prescription, is an option when selecting easy chairs for our elderly clients. In the case of wheelchair prescription, this includes assurance that the size of the wheelchair user is matched with the appropriate dimensions (Nitz and Bullock 1983) in his or her wheelchair. It also means that the purpose for which the wheelchair is used, such as everyday activity, playing basketball or track racing, will be matched by the chair so that maximum efficiency of use with minimal energy expenditure is achieved (Mâsse et al 1992, Nitz 1985). The same demands need to be considered for easy chairs for the elderly. That is, matching the size of the occupant and the use to which the chair will be put, to the chair chosen. Another pertinent consideration is the cost of special seating for the elderly client. Utilising favourite chairs belonging to clients might reduce cost if the chairs can be made appropriate by simple modifications. In some instances, no chair changes are needed - often the only requirement is that care is taken when positioning the client into the chair, so that it provides support. Perhaps the most important criterion to consider is comfort. If the occupant does not feel comfortable, he or she will not use the chair even if it matches his or her needs completely. Perhaps the best place to start is to identify the goals you want to achieve through supplying a suitable chair. Client status, environmental needs and cost will determine goal setting. Some information that could make the choice of chairs for elderly clients easier is presented.

Environment driven needs

Physiotherapists are involved in the prescription of chairs for their clients in a variety of environments. These include the person’s own home, a residential care facility or a hospital. These venues demand differing approaches to decision making. A chair that will be used by a person in his or her own home can be very need specific. On the other hand, when recommending chairs that will be provided for multiple client use, individual differences between the potential users of the chairs must be considered. This encompasses size, shape and gender as well as the presenting physical problems. The decision regarding the sacrifice of some element of comfort to retain independent egress (Alexander et al 1996) becomes important for clients living in the community as well as in low and sometimes high dependency residential care. Another consideration is the time span over which the chair will be utilised by a client. For example, a person with advanced rheumatoid arthritis who is still middle aged will have a potential for many more years of life and chair use, while the chair will also need to accommodate to the ageing process as it affects this individual. Conversely, a very elderly frail client might have only a short life and chair use expectancy.
Advantages of good chairs

The advantages of providing good seating for aged clients are numerous and include the following:

- Providing a chair it is easy to get in and out of helps maintain mobility and community living (Alexander et al 1996, Sweeney and Clarke 1991). Maintenance of mobility becomes especially important when assistance is needed to mobilise safely, as is often the case for residents of nursing homes.

- Communication and social interaction is encouraged when a person is positioned in a chair so that they can see from a normal upright perspective to whom they are talking.

- Posture will be optimised, thus preventing or reducing onset of pain from lack of support. Acquisition of postural deformities can be accelerated if the chair provides no spinal curve support and in consequence encourages a long “C” curve position. If osteoporosis is a problem, lack of spinal curve support might precipitate advancement of the thoracic kyphosis and the onset of pain.

- Postural stability afforded by good support leads to security and safety for the client.

- Comfort means there will be less agitation, especially for clients with dementia.

- Encouraging the upright position rather than using a chair that supports the occupant in a very reclined position helps keep vestibular input integrated. The upright position reduces the tendency for clients to push into extension and lessens the likelihood of falls in a backwards direction when the person is assisted with activities of daily living or, in some instances, when mobilising. Judicious use of the reclined position is acceptable.

- Nutritional intake and appropriate hydration will be possible if the chair controls the client in a safe upright position for oral intake (Steele et al 1997).

- Respiratory function is maximised in a chair that provides good postural support to maintain the spinal curves and encourages an upright position. A reclining position that is similar to supine lying leads to a reduced functional residual capacity in the lungs (Rehder 1998). The diaphragmatic action is inhibited, so the tidal volumes are reduced and there is a change in the uniformity of inspired gas to pulmonary blood flow (Rehder 1998). This reduces the respiratory function and might be sufficient, when added to other medical conditions, to cause cerebral hypoxia with the consequent agitation and aggression in a dependent resident.

Prescribing the correct wheelchair can provide the occupant with independent or assisted mobility.

Important features of chairs

Chair features that should be considered when matching the client and his or her needs to a chair will now be discussed.

Seat size The seat size must be considered in the width and depth dimensions. These are determined by the anthropometric measurements of the client using the chair, if for individual use, and by the average user size where multiple occupants are expected. Ideally, combinations of depth and width sizes should be catered for, the short leg group and the long leg group as well as the broader bottom and narrow bottom. Seat depth should be sufficient to support almost the full length of the thighs but leaving some space (about two or three finger breadths) behind the knees so that circulation is unimpaired (Sweeney and Clarke 1991). Thigh support enables spread of weight bearing to a greater surface area thus reducing pressure under the buttocks or coccyx. Seat width depends on the spread of the thighs and buttocks when the occupant sits. Many elderly clients need wide seats but because of short legs, need less depth and seat height. A high density foam filler that has spinal curve contour support and is placed in front of the back rest is one way of accommodating to this common problem. It also eliminates the situation where the occupant leans back to use the back rest and gets poor and often damaging back support that facilitates a “C” curve posture. A seat that is too wide will inhibit the use of armrests for support. If this is accompanied by little or no lateral support from the back rest, the occupant will lean sideways and such postural deviations might lead to pain or deformity.
Pressure relief/cushions  The relative immobility of many elderly chair users increases the likelihood of pressure area occurrence if inadequate pressure relief is provided. Ideally, the occupant should be encouraged to regularly change their sitting position and, where possible, go for regular walks to stimulate the circulation. In many instances this is not possible, as the chair user is no longer capable of mobilising. In this case, some pressure relieving mechanism should be incorporated into the chair seat. This might take the form of cushions such as are used with wheelchairs. These include cushions with silicone gel inserts, pneumatic compartments and various foam densities. It is possible to use these cushions over the seats of easy chairs but beware of changing the back support and armrest heights if adopting this solution. When cushion inserts are not available, the onus falls on the care staff to ensure the position of the chair occupant is changed regularly. Supportive seat cushions of firm consistency can often be uncomfortable for the elderly, especially when age has reduced the soft tissue bulk over the buttocks. With this in mind, many easy chairs are provided with deep foam seating. Alexander et al (1996) found that the increased comfort provided by deeper seat cushioning made chair egress more difficult for elderly people. Therefore, some compromise between function and comfort might need to be made.

Seat cushions can be used to accommodate for lack of hip flexion. Generally, hip flexion of 90 degrees is needed for the normal use of a chair for support. In some instances such as failed hip replacement, hip arthrodesis or arthritis, the hip is unable to be flexed to 90 degrees. The obvious response is to recline the back rest so that the deformity is accommodated. As will be indicated later, this adaptation can lead to further problems due to shear forces acting on the bottom. A better solution is to utilise a thick foam cushion into which a trough is cut that slopes down from the back to the front of the seat to accommodate the thigh where hip range is lost. This retains a comfortable seat to back rest angle and the shared weight-bearing potential of the thighs and bottom. Ease of egress is also retained by this adaptation.

Seat to floor height  A seat height equivalent to knee height is most easy to rise from (Alexander et al 1996, Hughes et al 1996 and Sweeney and Clarke 1991). When a chair seat is lower than knee height, a longer time is taken to rise to standing and the older occupant needs to use faster and larger trunk flexion movements to rise (Alexander et al 1996, Hughes et al 1996) and this might compromise stability. Although certain conditions such as lower limb weakness or arthritis might require the seat height to be raised to enable independent egress, Alexander et al (1996) have found that unimpaired elders find rising from higher chairs more difficult than from a knee height chair. This might be related to the need to scoot the buttocks to the front of the seat so that the feet can reach the floor to stand or to the perceived instability imposed by reaching the feet down to the floor. A foot rest may be used to raise the feet so that the knee assumes a joint angle of 90 degrees, thereby reducing posterior thigh pressure and discomfort while sitting in a chair that has a seat raised above knee height. There still remains the possible safety problem of tripping over the footrest on getting up (Sweeney and Clarke 1991).

Back rest  Sweeney and Clarke (1991) recommend that the back rest support the whole length of the back with contoured spinal curve support. Lumbar support is lost if the seat is flat, as this tends to cause the buttocks to slide forwards on the chair. In other circumstances, if the chair occupant slides their buttocks towards the front of the seat in an endeavour to gain comfort, any spinal support afforded by the chair will be lost. In either situation, there will be some amount of shear acting between the seat and the client’s buttocks that might prove disadvantageous.

Head rests might be incorporated into the back rest. Ideally, the head rest should be adjustable so that the chair occupant’s head is not pushed too far forward or allowed to fall backwards through too little support (Sweeney and Clarke 1991). Small neck support pillows might afford the flexibility in the support required by the chair occupant when the chair is upright or reclined.

Seat to back angle  The ideal seat to back angle is around 95 degrees (Alexander et al 1996). However, the most appropriate support is afforded to the occupant if the chair (seat plus back rest) is tilted back at an angle of around 6 degrees (Sweeney and Clarke 1991). This is about the chair tilt (10 degrees) found by Alexander et al (1996) as being comfortable when evaluated by elderly people. This configuration was more difficult to get out of than a chair with a horizontal seat. Therefore, when recommending a chair for a client, the importance of comfort or ease of egress must be weighed up. Alexander et al (1996) demonstrated that when the seat to back angle
remained the same and the chair tilted in space posteriorly, the greater the recline, the more difficult it was for unimpaired elderly to move from sitting to standing.

The tilt in space option has been recognised as a successful method of improving sitting balance in wheelchair users. In this instance, the chair component is tilted posteriorly while the seat to back angle is constant by using an axle block that has multiple axle positions so that the back of the seat can be lowered in relation to the front, thereby tilting the chair in space. This allows the client to sit upright for eating and communicating but, when tilted back, allows them to rest or change the site of most pressure from ischial tuberosities, thighs and coccyx to the sacrum and the rest of the back. Hobson (1992) found that a tilt in space of approximately 25 degrees reduced shear force under the bottom to almost zero. In contrast, reclining the back rest to make an angle of 25 degrees to the seat that remained horizontal increased the shear forces by 25 per cent.

Another advantage of tilt in space is afforded to the client who has a progressing kyphosis. In the upright position, the line of the centre of mass of the head and upper trunk falls well anterior to the axis of the thoracic curve and, due to the influence of gravity, this situation will potentiate an increase in the curve. If the seat is tilted backwards in space to a point where the line of the centre of mass falls behind the axis of rotation for the thoracic curve, then a straightening moment that is desirable will be applied to the back. Commercially available reclining chairs will provide this option. If this position is still uncomfortable due to protruding spinous processes, add a simple foam cushion that is cut out to accommodate the spinous processes.

Armrests Alexander et al (1996) found in their study involving community dwelling elders that low armrests or those positioned to the front of the chair had little bearing on ability to get in and out of a chair. However Sweeney and Clarke (1991) consider that the height and position of the armrests should be tailored to the individual user, especially as the group they were considering had arthritis or low back pain. Since most clients who find chair egress a problem have some arthritis, arm rests that are positioned so that they are level with the front of the chair seat are most useful. The height of the arm rests is more appropriately determined by the height of the elbow when the occupant is seated. Support should be afforded so that the shoulder is not pushed up into elevation nor should the occupant need to slouch to reach the support (Nitz and Bullock 1983).

Foot or leg rests The reason why feet and legs need to be elevated should be considered. If swelling is a problem, then the reason for this occurrence should be addressed. Postural oedema from leg dependency and poor or no muscle pump is one of the most common reasons. Consideration should be given to enabling easier chair egress so that the client is encouraged to walk more often, thereby reducing the swelling rather than providing leg support that makes it harder for the occupant to mobilise. Ankle oedema can be due to cardiorespiratory or renal dysfunction or may even be drug induced. Careful medical assessment and management might reduce the problem. Elevation of the legs should be only one aspect of management when ankle oedema is present.

Leg rests attached to the easy chair that can be elevated without reclining the back rest simultaneously will facilitate forward slide of the buttocks in the seat through the effect of short hamstring muscles limiting hip flexion and knee extension range. Even when the back rest reclaims, the shear forces acting on the buttocks may be undesirable in a debilitated occupant. One aspect of this type of leg rest that is undesirable is the total lack of foot support. The feet hang in space and assume a plantar flexed and inverted position that facilitates calf contracture. Shortened calf muscles cause reduced range of ankle dorsiflexion that in turn reduces the ability to move from sitting to standing. Balance will also be affected, as the person is prevented from utilising the ankle balance strategy because of calf shortening. Thus the client is put at risk of falling if still managing to mobilise with or without assistance. Those occupants who can not easily move their legs also risk the development of deep venous thrombosis from the pressure on the calves from the leg rest interfering with venous return if they sit in this position for any length of time.

Consequences of poor seating

Consequences of poor chair to client matching will lead to many undesirable outcomes that compromise quality of life. These consequences might take the form of:
• excess pressure and shear forces leading to the possibility of pressure area development;
• discomfort leading to agitation and disruptive and aggressive behaviour in a dementing client. This might also lead to falls through trying to get up from the chair;
• difficulty in egress leading to greater dependency and ultimate immobility;
• postural deformity and pain in the back, shoulders, legs or any body part;
• inability to position the feet such that the ankles are supported in a plantigrade position. This might lead to reduction in ability to recruit the ankle balance strategy through lack of dorsiflexion range of movement, thus increasing the risk of falls;
• continual use of a reclined position when seated will lead to vestibular dysfunction and inability to gain or maintain the upright position that is needed to assist with activities of daily living including walking; and
• respiratory function might be compromised to an extent that hypoxaemia becomes a problem.

Discussion

Your perception of the seating needs of the elderly is heightened if you consider how much you wriggle and shift your own position when sitting for any length of time, whether the chair you are in feels comfortable or not. Sweeney and Clarke (1991) recommend that potential occupants need to try sitting in a chair for at least 30 minutes before deciding whether it meets his or her requirements. However, some of our elderly clients are unable to tell us whether they are comfortable or not. In these situations, it is our responsibility to find the chair we consider most appropriate, then observe the individual’s response to using it over the usual period during the day they would be expected to sit in it. Behaviour such as agitation or vocalisation might indicate unsuitability. On the other hand, behaviour might have improved, indicating that the occupant is happy and a good choice has been made. Day to day fluctuations in client status should be kept in mind however, and where possible, a trial time for the chair of a few days is desirable and should be negotiated with suppliers.

The best quality of life for our elderly clients is paramount. In order to achieve this, every opportunity must be taken to maintain the ability to mobilise safely. To that end, chair egress should be easy. Dysfunction such as lack of ankle range of movement, vestibular problems and poor posture that might be contributed to by poor chair design and use should be controlled.

When and what to recommend might be helped by using an holistic approach when considering recommending a chair for a client or group of clients. Some points have been broached regarding the aspects of chair usage other than providing body support. Generally, these points relate to loss of functional ability induced by injudicious chair use and lack of understanding regarding the effect of such use.

Consider the number of very dependent residents of nursing homes. When not in bed, these residents are commonly “sitting out” in a horizontally reclined easy chair. When the effect of this management on vestibular and respiratory function is considered, it is no wonder that care staff describe difficulty in sitting these residents upright for dressing, bathing and toileting.

A number of requests from physiotherapists working in aged care who were seeking advice regarding chair prescription initiated this paper. I hope some solutions have been found to help with the odd presentations found in our elderly clients. Stimulation of thinking over a broad perspective when considering seating for elderly clients was a major purpose of this paper.

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