

# Clinical Guidelines: Using a Head Support in Wheelchairs

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## Background

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Wheelchair support and seating systems are widely used in clinical practice to provide support for those who cannot sit or maintain posture, prevent the progression of postural deformities, and improve the posture of people with spinal deformities. Individuals who use wheelchairs require personalized adjustments and supports to prevent a slumped posture that interferes with a user's ability to perform activities of daily living.<sup>1</sup>

**Posterior and anterior head support devices are intended to improve the position of the head. A properly fitted head support can positively affect critical functions, including respiration, safe swallowing, reduced pain, improved mobility, enable self-feeding, socialize, and communicate.**<sup>2,3,4,5,6</sup>

Medical conditions and mobility-related diagnosis that commonly relate to poor head positioning include muscular dystrophy, spinal cord injury, amyotrophic lateral sclerosis (ALS), cerebral palsy (CP), acquired brain injury, arthritis, multiple sclerosis, dropped head syndrome (DHS), radiation fibrosis syndrome, motor neuron disease, muscle tone issues (hypertonia, hypotonia, or mixed tone), hydrocephalus or other cranial deformities, and other conditions resulting in neck muscle weakness. Head support devices may be used any time the user is in the wheelchair or in other rehabilitation devices during specific activities, such as feeding or social activity, or during transportation in a motor vehicle. When a person with a disability lacks the ability to support their head, it is necessary to review the head positioning for each of these activities or devices and determine if additional support for the head and body are required. In many cases, the solution for how to support the head in one device cannot easily be moved to another device.

**Improper head support limits essential daily activities. Furthermore, it can cause adverse effects, such as pressure in the susceptible area, pain due to pressure on a sensitive area, and unwanted movement (instead of stabilizing the head).**

## Clinical Justification for Head Support

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There are various reasons why an individual might need a head support, and thus, the justification for such an item must be personalized to the specific user. Some examples for such justifications include:

- **Compensate for decreased stability and inability to maintain an upright head position throughout the day due to muscle weakness, abnormal muscle tone, poor balance, stability, poor endurance, or poor motor control.** Appropriate head support will increase the ability of the patient to participate in activities of daily living (ADL), including eating, performing personal care, writing, reading, communicating, operating/propelling the wheelchair, etc.

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- **Correct or prevent recurrence or progression of spinal kyphosis or other spinal deformity and promote an upright posture.**
- **Prevent development or progression of postural abnormalities that could result in impaired respiration, unsafe swallowing, poor visual field, and decreased ability to interact with the patient's environment.**

## Standards and Guidelines

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Standards for the design and safety of wheelchairs and other seating arrangements were developed by several American and international organizations, including:<sup>7</sup>

- American National Standards Institute (ANSI)
- Rehabilitation Engineering and Assistive Technologies Society of North America (RESNA)
- International Organization for Standardization (ISO) standards

Correct positioning of the head and neck is essential during wheelchair use. Many patients who use wheelchairs experience poor head control or incorrect posture, leading to swallowing and breathing disorders, malnutrition, fatigue, and posture deformities.<sup>8,9,10,11</sup> Additionally, head position and the resultant line of sight (i.e., eye contact and facial visibility) are crucial for communication and socializing, including expressing and recognizing emotions.<sup>5,6</sup> The optimal functioning of these patients depends on the use of both postural support and balance, including head supports.<sup>12,13</sup>

**RESNA's position is that (i) a comprehensive clinical assessment of seating and positioning needs is essential to ensuring the most appropriate use of supports in achieving proper body positioning; (ii) proper use and placement of supportive devices are essential for the safety and optimal benefits of the intervention, and (iii) selection of the required devices should consider the least restrictive support devices that meet the individual's needs.**<sup>14</sup>

*"The client's speech-language pathologist, respiratory therapist, nurse, recreation therapist, physician, etc., may be able to provide vital information regarding the impact of head positioning as it relates to activities such as feeding, vocal quality, communication, cardiopulmonary status, participation in leisure activities, vision, hearing, behavior, and any other vital input for a specific client. Remember that during the seating evaluation you are only seeing the client for a snapshot in time, so lean on other team members to help you gain a clearer picture of the client."*

RESNA further recommends using head control devices to maintain the posture and alignment necessary to optimize patients' health, comfort, and overall functional abilities.<sup>15</sup> The British Thoracic Society recognizes the importance of head control in its guidelines for respiratory management of children with neuromuscular weakness.<sup>4</sup> The Muscular Dystrophy Campaign also expressed a similar view in its practice guidelines for patients with muscular dystrophy and other neuromuscular conditions.<sup>16</sup>

In recent years, clinical practice is shifting away from achieving traditional seated posture to focus on facilitating function and personal goals of the individual patient. This view has been endorsed by the World Health Organization (International Classification of Function, Disability, and Health),<sup>17</sup> and further supported by various publications and textbooks on seated and wheeled mobility, suggesting that the assumption and maintenance of an upright head position should be a goal for patients.<sup>18,19,20</sup>

## Choosing Head Support

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Head support is usually considered once the trunk, pelvis, and lower extremities are in the best alignment possible, and it should provide lateral, anterior, posterior, height, and angle adjustability.

An appropriate device should support the head posteriorly and laterally while accommodating changes in the head position resulting from body movements. Positioning pad support in the suboccipital area can prevent excessive extension, rotation, or lateral flexion and avoid the head resting on the ear.

## Restraint Regulations

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Both Medicare and The Joint Commission (TJC) issued guidelines for proper use of physical restraint on people using wheelchairs.

A 'physical restraint' is defined as "any manual method or physical or mechanical device, material, or equipment attached or adjacent to the resident's body that the individual cannot remove easily which restricts freedom of movement or normal access to one's body".<sup>21</sup> These can include arm or leg restraints, hand mitts, soft ties, a full-body vest, or any device that forces the resident to remain in a fixed position and prevents free moves.

The Nursing Home Reform Act<sup>22,23</sup> includes provisions requiring nursing homes to protect and promote residents' rights to be free from any physical restraints other than restraints required to treat the resident's medical symptoms.

The Hospitals Interpretive Guidelines and RESNA state that methods improving body position, alignment, or balance intended to allow greater freedom of mobility or otherwise necessary to treat medical symptoms are generally not considered physical restraints if necessary to treat medical symptoms.<sup>24,25,26,27</sup>

Applying any physical or mechanical device that meets the definition of restraint requires a physician's documentation of a medical symptom that supports the use of the restraint, and an order specifying the type of restraint and parameters of use is required.<sup>28</sup>

## Head Support During Transportation

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Multiple organizations published standards and recommendations for proper use of wheelchairs, with references to head support devices.

**The Rehabilitation Engineering Research Center (RERC) on Wheelchair Transportation Safety<sup>29</sup> published recommendations for head support devices used during transportation, including:**

- **Using an adequately positioned headrest can help protect the head and neck during travel in a motor vehicle.**
- **The headrest should be placed close to the back of the head, no more than 2 inches from the rear of the head, and at a height such that the middle of the headrest aligns with the top of the ears.**
- **The rider's head should be positioned and supported to prevent the head from going under or**

**around the headrest pad while the vehicle is in motion.**

- **Ensuring that the headrest will not break in a crash.**

Partners for Child Safety<sup>30</sup> found that children using wheelchairs optimally restrained during travel in a motor vehicle are 70% less likely to suffer severe injury or die in vehicle accidents than children who are not properly restrained. While there are no mandatory federal standards for individuals who travel in motor vehicles while remaining seated in their wheelchairs, several voluntary standards do address the use of headrests:

- **ANSI/RESNA WC19 - Wheelchairs Used as Seats in Motor Vehicles.** The standard states that if a headrest is used, it should not slide out of its mounting during an abrupt deceleration, possibly injuring occupants inside the motor vehicle.
- **Automotive standard FMVSS 202, Department of Transportation (DOT)** specifies head restraint requirements intended to reduce the frequency and severity of neck injury in rear-end and other collisions. Dynamic testing specifies a rear impact deceleration that results in an angular displacement of the head. At the same time, a quasi-static test requires the head restraint to sustain an increasing rearward load of up to 200 lbs.

Accidents increase the risk of subluxation of the cervical spine or hyperextension of the neck. Nevertheless, the Rehabilitation Engineering Research Center guidelines for the safety of transportation of wheelchair users<sup>31</sup> state that the benefits of anterior head support outweigh the potential injury risk in a crash event. **The guidelines emphasize the importance of ensuring that anterior head supports used during transportation are designed to prevent the forehead band from falling over the face and/or neck.**<sup>16</sup>

## Summary

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Seating interventions must start at the pelvis, as pelvic support impacts head control and forward head posture. The head position must be addressed once the pelvis, lower extremities, and trunk are appropriately positioned. Head supports are needed in cases where pelvis and trunk positioning are not sufficient to provide head control. Based on the individual patient's needs, head support may include a headrest, lateral support, and anterior head support.

*Correct anterior head support can provide patients limited head control with an upright head position, maximizing their field of vision and ability to participate in social and daily living activities, provide stability, and alleviate pain.*

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