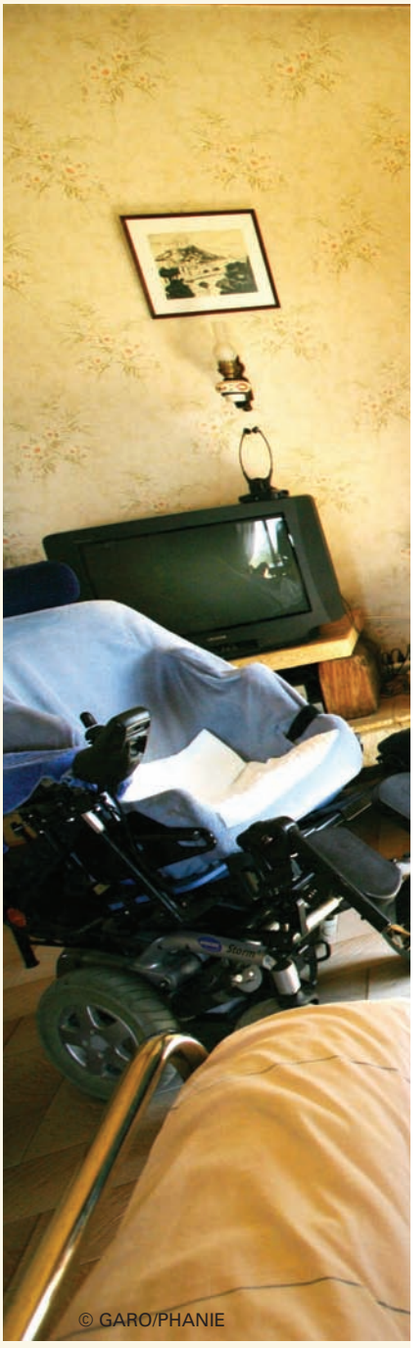
Should My Patient Use a Mechanical Lift?

PART 2: ALGORITHM AND CASE APPLICATION



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The use of algorithms for safe patient handling in the acute care setting has been established and integrated into the standards of practice. This is not the case in the home care setting where the patient and caregivers are at risk for injury during patient transfers. Many factors need to be assessed before recommending a mechanical lift for home use. Some of the factors include the patient's weight-bearing status, cognitive level, and upper extremity strength, and the caregiver's ability to lift more than 35 pounds. All of these factors have been included in the clinical decision-making algorithm described in this article. Two case scenarios are presented to assist the reader with the analysis and application of the algorithm.

Introduction

Algorithms, care pathways, and clinical practice guidelines have been used in healthcare to provide a standard of evidence-based care for a broad spectrum of diseases, disorders, and clinical decision making. Algorithms are formulas or sets of steps for problem solving and there is strong evidence that algorithms based on clinical research will assist in standardizing best care practices (Miller et al., 2005). By providing a systematic methodology for clinical problem solving, algorithms can prove effective in dealing with critical problematic areas such as safe patient handling particularly in the patient's home.

In the current healthcare environment where accountability and cost-effectiveness are top priorities, this logical and sequential approach is essential to determine the most effective intervention program.

In healthcare, algorithms have the ability to increase worker and patient safety and decrease variation in practice. In the article by Radawiec et al. (2009), the authors describe the components of an ambulation algorithm. Assisting a patient to ambulate is an example of a high safety-risk activity where determining the need for manual assistance or patient handling equipment is essential. The ambulation algorithm incorporates scientific evidence, concepts of ergonomic safety, space requirements, and patient factors such as weight, ability to follow directions and cooperate, and medical conditions including neurologic deficits and comorbidities (Radawiec et al., 2009).

The use and value of algorithms for safe patient handling has been widely established and integrated into the standards of practice in a multitude of inpatient healthcare settings. Examples can be found in the nursing home settings guidelines that have been established and employed by the Veterans Administration (VA) and the Occupational Safety and Health Administration (OSHA) (Fragala et al., 2001; OSHA, 2009).

A collaborative effort of the American Physical Therapy Association, the Association of Rehabilitation Nurses, and the Veterans Health Administration resulted in a white paper publication that recommended use or adaption of algorithms in the guidelines for making decisions about safe patient handling and movement (APTA, 2006). Incorporation of strategies such as algorithms in all healthcare settings can be effective in reducing musculoskeletal injuries (Garg & Kapellusch, 2012). Additional support for the use of algorithms for safety is enforced by OSHA. OSHA has a general duty clause that states "employers must keep their workplaces free from recognized serious hazards, including ergonomic hazards" (OSHA, 2012). Satink (2007) cites effective prevention measures to include access to appropriate equipment necessary to make ambulation, transfers, and repositioning safer for the healthcare worker. Additional important measures include regular training on patient transferring, handling, and repositioning techniques; monitoring of employer work practices in the home; availability of additional caregiver(s) (CG) as needed; and a procedure for prompt functional reassessment to ensure that safe handling occurs at all times (Satink, 2007).

Purpose

The purpose of this article is to present a clinical decision-making algorithm for use of a mechanical lift in the home. Case scenarios will be presented for analysis and application of these models.

Adult Case Study

Mrs. A is a 56-year-old female with a 15-year history of exacerbating/remitting multiple sclerosis (MS). Another relevant diagnosis is chronic urinary tract infections that do not respond well to antibiotics. Her height is 64 in, weight is 160 lbs, and body mass index is 27.3. Mrs. A lives with her husband who sustained a large myocardial infarction (MI) 3 weeks ago and 20-year-old daughter who has a hearing impairment. The daughter works and goes to school but assists her mother with showering as her schedule allows. In-home medical equipment consists of a power wheelchair (w/c), power bed, power recliner, walker, and transfer board. The bathroom was remodeled to include a roll-in shower and elevated toilet with grab bars on either side. Mrs. A presents with moderate extensor hypertonicity in the lower extremities (LE), right greater than left, and little active controlled motion. Bilateral upper extremities (UE) are weak but she is able to use them for activities of daily living and turning in bed. Up until the current exacerbation of MS, Mrs. A was independent with toilet transfers, required minimal assistance transferring bed to w/c using a transfer board, and was able to walk 10 feet with a walker and moderate assistance. She is incontinent of urine 50% of time, but continent of bowels. Mrs. A's functional level has declined to where she is unable to ambulate and transfers fluctuate between moderate and maximal assistance depending on muscle tone and time of day. Mrs. A has a home health aide (HHA) who has been performing a bed bath two times per week. The patient is alert and oriented $\times$ 4 and motivated to return to her prior level of function. As the patient has a history of frequent UTI and bladder incontinence the HHA and daughter would like to get the patient into the shower as often as possible but are hesitant due to the

difficulty of the transfers. Do you think this patient is appropriate for a patient lift?

Initial Considerations

The safety of the patient as well as the CG(s) is pivotal when determining the need for a mechanical lift. An algorithm can guide the decision of the need for a lift by providing a step-by-step approach where responses to specific questions about a patient's functional and cognitive ability determine the decision pathway. Before using an algorithm, however, it is necessary to evaluate the patient within the context of his or her support system and living environment. For example, is there someone who is willing and able to learn how to use a mechanical lift? How much of the burden of transferring a patient will fall to the informal CG as opposed to the healthcare professional such as a HHA (Gonzalez et al., 2011)? Caregiving has been shown to be associated with declining physical and psychological health of the informal CG as well as impaired immunity and mortality (Garlo et al., 2010; Gonzalez et al., 2011; Limpawattana et al., 2013; Navaie-Waliser et al., 2002). Wright (2005) outlines multiple salient steps and questions that can be used to determine the capability and limitations of informal CGs to identify short- and long-term risk. These steps include an assessment of an informal CG's strength and flexibility when reaching, carrying, and lifting with varying weight loads. Additionally, is the CG capable of repetitive motions of the UE, LE (e.g., knee), or spine? Does the CG have the ability to perform the patient lift or transfer multiple times each day as is associated with the patient's daily routine (Wright, 2005)? Other questions that may prove to be helpful relate to the availability of social support and adequacy of communication with the healthcare provider. Social isolation and poor professional communication with the patient's healthcare provider have been shown to contribute to CG burden (Garlo et al., 2010). If the nonprofessional CG is found to be able to safely use a patient lift the next thing to evaluate is the patient's attitude toward a lift. Are they amenable to using the lift with a family member? Even with an algorithm-based determined need for a mechanical lift, patient preferences must be considered and respected particularly in the home setting where the locus of control lies with the patient and the family. The patient needs to agree to the use of a lift and there must be cooperation between the CG and the patient to have a successful mobility program (Wright, 2005). Some patients fear using a lift; however, studies have demonstrated that patients feel safer and more comfortable with the use of a powered lift to meet their transfer and mobility needs than with relying on the strength of others (Nelson et al., 2003). A patient with a challenging support network will require sensitive communication and careful consideration of resources to make the use of a mechanical lift feasible.

By providing a systematic methodology for clinical problem solving, algorithms can prove effective in dealing with critical problematic areas such as safe patient handling particularly in the patient's home. In the current healthcare environment where accountability and cost-effectiveness are top priorities, this logical and sequential approach is essential to determine the most effective intervention program.

The physical environment in the home setting must also be considered as diminished space can increase the risk for musculoskeletal injury to the CG (Gonzalez et al., 2009; Wright, 2005). A primary consideration is where the lift will be used in the home. For instance, is the patient confined to a single room and transferred from bed to chair or commode, or is the desire to transport the patient between rooms in the home such as the bedroom to the living room or the bathroom? Regardless of the response, adequate space is needed to safely maneuver a mechanical lift. Significantly, if the desire is to transport the patient between rooms, additional factors will need to be taken into account. If a patient lift device is being considered to transport a patient from one room to another, the proximity of the rooms to each other and the floor surface must be considered as the potential for tipping exists particularly on carpeted areas (Parsons et al., 2006). In situations with less than desirable space, rearranging or removing furniture

or moving the patient to another room or to another level of the home may provide a solution. If the patient is considering a power lift, there needs to be a readily accessible electrical power source to recharge the lift's battery.

Finally, a detailed generic assessment of the patient's physical, cognitive, and communication ability is essential in determining the safest and most effective means of transfers. The patient's ability to assist, weight-bearing capability, UE strength, level of cooperation, and comprehension are key algorithm variables in determining an appropriate transfer method and the actions that are safe for the healthcare worker to perform (Sedlak et al., 2009).

Based on a review of the literature, the algorithm in Figure 1 is offered to guide clinical decision making on the use of a mechanical lift in the home environment. A discussion of key elements on the decision-making process is provided to illustrate the application of the algorithm to the case of Mrs. A.

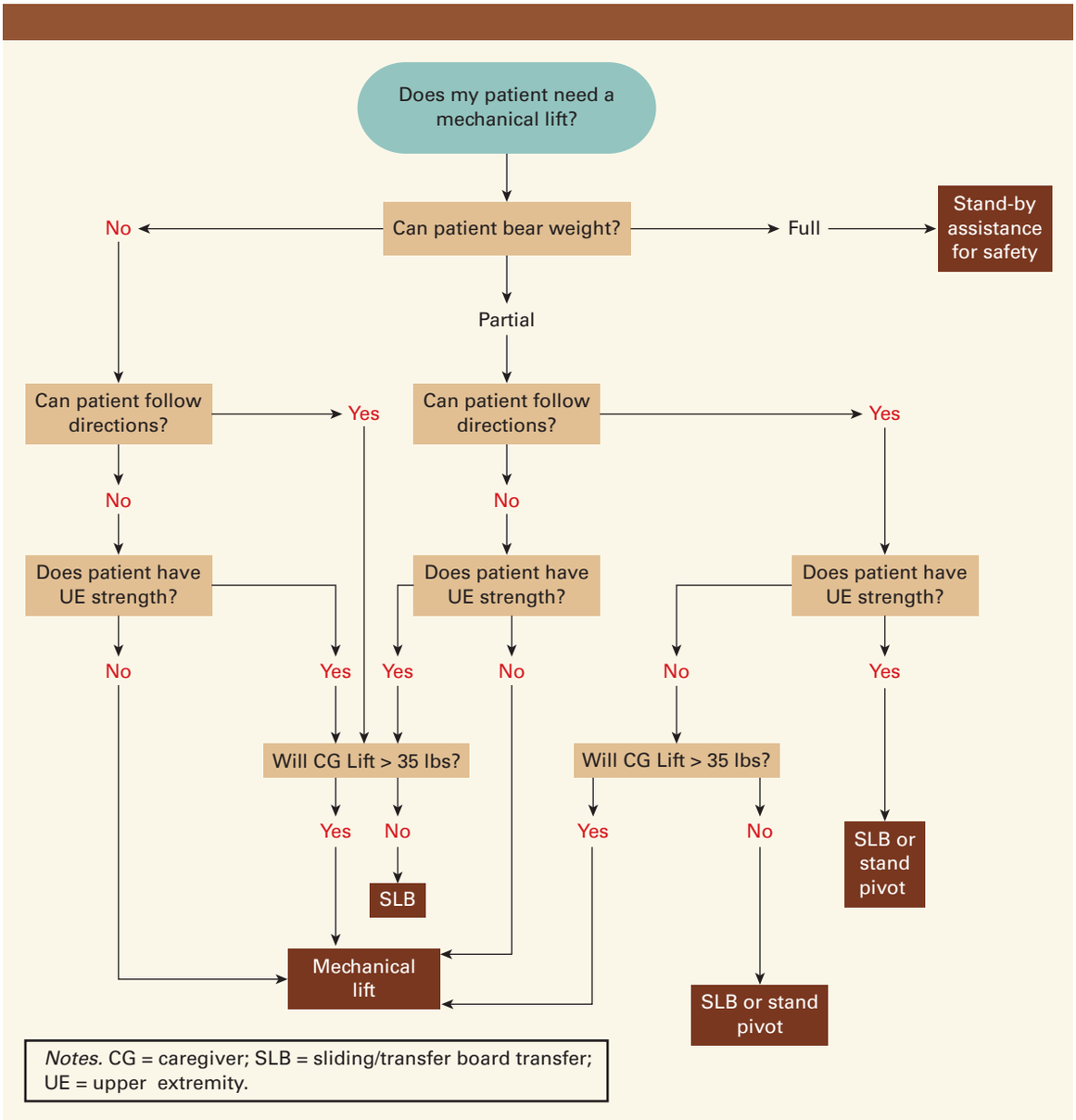

Figure 1. Algorithm for safe patient transfers.

Using the Algorithm

Weight-Bearing Status

The first consideration in determining the need for a lift is to identify the patient's weight-bearing status. If the patient is capable of independent weight bearing, then the use of a lift is not indicated. If the patient is partial or nonweight bearing, he or she may be a candidate for a lift depending on further considerations in the algorithm, including the ability to follow directions, willingness to cooperate, and the degree of UE strength. If the healthcare worker is required to bear more than 35 lbs of the patient's weight, and the patient is unable to use his or her UE to use a transfer board, the patient is a candidate for the use of a lift (Waters, 2007). The case study patient, Mrs. A, is unable to ambulate and transfers fluctuate between moderate and maximal assistance. In situations where the level of assistance fluctuates—meaning the CG has doubt about how much the patient is capable of assisting—the maximum level of assistance potentially needed is assumed. It is unsafe to assume a patient will be partial weight bearing when they may be nonweight bearing at the time of the transfer (OSHA, 2009). Uncertainty regarding the level of assistance a patient can provide sets up a situation where risk of injury to the patient and the CG is increased.

Ability to Follow Directions

The cognitive capacity of the patient to comprehend and follow directions is another factor to consider when determining the safest method for transferring a patient. The ability to follow directions includes the willingness to cooperate as well as the physical capability to follow directions. Patients with conditions prone to sudden movements or spasms, such as those with neurological conditions, may be cognitively able and willing to assist but have no control over their physical ability to follow directions (Gonzalez et al., 2009; Nelson & Baptiste, 2006). These patients are candidates for the use of a lift because unpredictable movements increase the risk of injury to the patient as well as the CG. Likewise, for the patient who can partially bear weight, a lift is indicated for those with cognitive impairments that preclude the ability to comprehend and follow directions, or with impairments that are manifested by combativeness, agitation, or uncooperativeness (Haglund et al., 2010; Radawiec et al., 2009). In the case of Mrs. A, she is alert and oriented and motivated to return to her prior level of function; however, her limited ability to control her movements or engage in purposeful movement makes her a candidate for the use of a lift.

The determination of when to use a mechanical lift in the home setting is complex. It requires a careful assessment of the patient's motor, communication, and cognitive abilities; physical characteristics; and the physical environment of the home.

Ability to Use Upper Extremities

Once the patient's weight bearing and cognitive status are determined, the next step is to assess the patient's ability to use their UE. Not only should the patient's strength be assessed, but the clinician should assess if there is any pain with UE weight bearing that would prevent the patient from using their UE. Manual muscle testing will give a general assessment of the patient's UE strength but it will not take into account the patient's ability to stabilize the upper trunk or if he or she will be able to use their arms to assist with a transfer. A good functional test is to have the patient attempt to lift their body while sitting by pushing on the arms of the chair. If the patient is able to unweight his or her body using their UE without pain, then he or she should be able to use their UE to assist with transfers. Patients with partial UE strength may be able to transfer using the stand-pivot technique or a slide board. In the case study, Mrs. A has weak UE but she is able to perform activities of daily living and reposition herself in bed. If the other considerations in the algorithm were all positive—meaning that her weight-bearing status and ability to follow directions were largely intact—and UE strength was the only question, her strength should be tested as outlined above to ensure it is adequate to assist with a transfer. Because Mrs. A has fluctuating LE weight-bearing status and is unable to follow directions because of

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uncontrolled movements, the decision to use a lift has already been made as per the algorithm and assessment of UE strength is not germane to the decision-making process in her case.

Can Caregiver Lift >35 Lbs?

In situations in which the CG is required to bear a portion or all of a patient's weight, the amount of weight will determine how many CGs are needed or if a lift is indicated to safely perform a given task. Patients who are partial or nonweight bearing increase the physical requirements of the CG and concurrently increase the risk for injury (Radawiec et al., 2009). The National Institute for Occupational Safety and Health (NIOSH) recommends the use of assistive technology including the use a lift if it is likely that the CG will lift more than the maximum limit of 35 lbs of the patient's weight for patient handling tasks. The 2007 Revised NIOSH Lifting Equation of 35 lbs is the current recommended standard of practice to help healthcare workers determine when assistive devices are needed to safely meet a patient's mobility needs (Waters, 2007). The difficulty of quantifying 35 lbs or less is recognized; however, it is recommended that the CG use their best judgment in making estimates (Waters, 2007). If the CG believes they will be lifting more than 35 lbs, an assistive device such as a mechanical lift should be used. Mrs. A, as described in the case, will require the CG to lift more than 35 lbs given her current exacerbated condition and physical limitations. Mr. A recently had a MI and heavy lifting is contraindicated for his condition. For the safety of Mrs. A and the CGs, the use of a mechanical lift is indicated.

Ability of Caregiver to Use Lift

Once it is determined that your patient will benefit from a mechanical lift, the ability of the nonprofessional CG to use the lift must be determined. Often, patients who require a mechanical lift receive some personal care from a HHA or personal care assistant who has been trained to use a mechanical lift. An additional consideration would be the hours the patient is in the home alone with their family members. Are these nonprofessional CGs able and willing to use the lift to transfer the patient back to bed or to use the toilet? The first consideration is if the CG is willing to use the lift and has the cognitive ability to learn how to do so safely. This can be determined by interviewing the nonprofessional CG. Through the patient/CG interview process questions should be asked that test the CG's short- and long-term memory and problem-solving skills. Has the CG been able to follow through with the medication regime? Have they remembered the patient's appointments with you and other members of the patient's healthcare team? The teach-back method can be used to ascertain if the nonprofessional CG can safely use the mechanical lift (Kripalani et al., 2008).

If the nonprofessional CG exhibits the mental capability and willingness to do so, the next step is to determine their physical ability to use the mechanical lift. The CG will need to be able to position the sling, move the handle up/down to raise lower the patient, and push/pull the lift into the correct position. The best way to accomplish this is to teach the CG how to use the lift and then watch them perform the task several times, exactly replicating the transfers that will be performed every day.

Many healthcare workers care for children in the home and thus are interacting with the child and family. The algorithm subsequently discussed is applied to the following case of a very young child being cared for in the home setting. It illustrates the need to consider the abilities of the child and critical factors associated with the physical environment.

Pediatric Case Study

"Miguel" is a 30-month-old male with spastic quadriplegic cerebral palsy and a poorly controlled seizure disorder. Miguel is nonambulatory and is completely dependent for all mobility. He presents with severe hypertonia in

bilateral upper and lower extermities; and severe hypotonia in the trunk and neck musculature. He has no head control or voluntary movement. Miguel appears to respond to his mother's voice, touch, and motion indicated by eye widening and a "brighter" appearance. He is nonverbal and is vocal at times, which his mother feels is meaningful but this is unclear to his home therapist and nurse. He weighs 32 lbs (75th percentile for age) and is 36 in. in length (50th percentile for age). He receives physical therapy and nursing services in the home through his local early intervention program. Miguel lives with his mother and older sister in a small two-bedroom rental apartment on the second floor of a house with five steps to enter the building and a full, steep flight of stairs to the apartment. Mother shares a small bedroom with Miguel, who sleeps on a cot. Additional equipment in the bedroom includes a portable suction machine, which Miguel requires due to his inability to effectively manage secretions, supplemental oxygen, and an oxygen saturation monitor.

Use of Algorithm

Miguel is unable to bear weight through his LEs to participate in a transfer. He has abnormal muscle tone and no voluntary control, which makes effective weight-bearing through his legs nonexistent. Miguel's ability to understand his environment is severely compromised as he is nonverbal and responds to rudimentary sensory experiences including auditory and tactile. It is unclear how much he understands verbal communication. Given his abilities, both motor and communication, he is unable to follow directions. At this point in the algorithm, the home healthcare worker should consider a mechanical lift. It is appropriate to consider such a device to ensure the safety of the primary CG, his mother, and the patient. In particular, his uncontrolled seizure disorder and the unpredictability of an episode should be taken into account.

However, one must consider Miguel's current living environment. The relative inaccessibility of the apartment combined with its small size may preclude the healthcare provider from recommending a mechanical lift. As discussed in an previous publication by the authors of this article, mechanical devices require a certain amount of space to aid maneuverability within the immediate environment in which the transfer will take place (Lowe et al., 2013). Given his weight, currently under the 35-lb limit, his CG should be able to safely transfer him. Given continued adequate nutrition, he may soon be over that weight limit. Moreover, the healthcare worker needs to anticipate issues the child and family will face as he grows, and which is consistent with the course of his conditions (seizures, respiratory compromise, and cerebral palsy). At this point, it will be critical for the healthcare worker to assess the parent's ability to safely maneuver the child within the apartment and to get in and out of the apartment. Miguel's plan of care should include a discussion of alternative living arrangements, access to social services to support accessible housing, and teaching the mother and older sibling safe lifting/handling and positioning. Once more accessible housing is acquired, the discussion and application of the algorithm will need to take place given the change in environmental conditions.

Conclusion

The determination of when to use a mechanical lift in the home setting is complex. It requires a careful assessment of the patient's motor, communication, and cognitive abilities; physical characteristics; and the physical environment of the home. The capabilities of the informal CG to use a lift must also be evaluated. The algorithm presented in this article should serve to guide the healthcare worker's decision making via a step-by-step, logical process that takes into account the critical factors associated with safe patient transfers. Two case scenarios were used to illustrate the algorithm's application and special considerations that influence the ultimate decision. The final decision to use a lift involves patient considerations and the ability and willingness of the informal CG and a home environment that can accommodate the use of a lift. ⌂

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