

# **INDIVIDUALIZED WHEELCHAIR SEATING: FOR OLDER ADULTS**

## **Part I: A Guide for Caregivers**

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980 S. Main St.  
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**This work was partially funded by grant #029269  
From the Robert Wood Johnson Foundation**

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## ACKNOWLEDGMENTS

The authors would like to thank the Robert Wood Johnson Foundation, especially Rona Henry, for their support and for understanding the importance of proper seating to the well-being of our older adults, particularly those in institutional settings. In addition, we would like to thank the following people for their assistance in reviewing and editing the content: Dr. Kenneth Brummel-Smith, Renate Powell, Jennifer Wood, Mary Emch, Elaine Trefler, and Tom Rader. Particular thanks goes to Liz Schultz and Kristina Compton-Sanchez for the many hours of work they put in to bring it all together. We are also grateful to Dr. Wilma Peterson and Joyce Semradek for their support and confidence in the work. The assistance of Tamara Schuman, Jesika Samuelson, and Cindy Brandt from Oregon Health Sciences University, School of Nursing, Office of Research, Development & Utilization in creating the figures and diagrams was invaluable and we thank them for their cooperation and patience during the process. Special gratitude goes to the residents, staff, and families of King City Living and Rehabilitation Center, Tigard, OR, for their patience and assistance in developing these materials.

Some of the material in Chapter 4, Finding Solutions, appeared in a slightly different form in Rader, J. (1995). *Individualized dementia care: Creative, compassionate, approaches*, published by Springer Publishing Company, and is used with permission.

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**CHAPTER 1**

**THE IMPORTANCE OF INDIVIDUALIZED SEATING**

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**INTRODUCTION**

Growing numbers of elderly spend much of their day in chairs that do not fit them or do not allow them the independence they could have. For many years we have treated our frail elders as if “one size fits all” when it comes to seating. The typical wheelchair used by frail older people in many settings is an upholstered wheelchair with a sling seat and back, and usually it is a poor fit because it is not measured individually for the person. There are very few adjustments on the chair. Usually they have fixed foot plates, arm rests, front hangers, no ability to adjust at the axle plate and therefore they can’t be adjusted for the individual. If the chair has misaligned wheels, it is difficult to push, and tends to go off to one direction. Sling-type wheelchairs are very energy consuming because they are heavy, usually weighing about 50 lbs. In addition, they are uncomfortable because they offer little posture stability. They work for brief transportation but are uncomfortable if used for long periods of time. A reclining gerichair is another device commonly used, sometimes with tray tables. Both types of devices are usually very uncomfortable, causing the person to constantly attempt to move to get more comfortable. After a short time in the wheelchair, the individual may end up leaning forward, sometimes to the point of falling out, or leaning to one side with one arm hung lifelessly over the armrest, or sliding forward to the floor. Often the person is tied to the chair to prevent sliding. In a gerichair the person often ends up curled into a ball or leaning over the side. Caregivers often resort to restricting, wedging, reclining or restraining because they think that these interventions will help. Yet, usually the only result of these actions is that the person continues to be uncomfortable and is unable to move. People using the chairs are trying to tell us something: they are uncomfortable. And often their suffering is unnecessary.

Current seating methods are clearly not meeting the needs of elderly persons. However, few caregivers know what to do about it. What is needed is individualized seating. Individualized seating means identifying the person’s body contours, range of motion, orientation in space, and implementing a seating system that best positions and supports the person for comfort and function. This manual guides caregivers towards recognizing problems and modifying seating or asking for professional help, if needed, to individualize and improve the seating for frail elderly people.

The questions the manual is designed to answer include these:

1. How do I know when someone would benefit from a different seating system?
2. What are the problems that require individualized solutions?
3. What are the “quick fixes” available, and why and when are they not helpful?
4. Who do I contact to get an assessment of seating needs?

5. Who will pay for the new equipment needed?
6. How do I maintain the seating equipment?
7. If the person is living in a health care facility, what can be done to assure that the equipment is used properly and doesn't get lost?
8. When do I need to re-assess the seating system?

**WHAT HAPPENS WHEN WHEELCHAIRS DO NOT FIT**

One study has found that as many as 80% of nursing home residents experience problems with their wheelchairs and a third of these problems are moderate to severe. Problems include discomfort, inhibited mobility, and poor posture (Shaw & Taylor, 1992). The most common observation – and subsequent rationale for restraint use – is that the person appears to be “sliding out of the wheelchair.” Why does this happen?

**The Wheelchair Frame or Seating System Size is Not Right for the Client**

What we routinely think of as a wheelchair has two basic components:

- The mobility base or frame (what we usually think of as the wheelchair)
- The seating system (which has a seat and a back component)

The standard wheelchair frame with sling seat and back is made for a person who is six feet tall and 18 inches wide. As a result, many elderly people are forced to sit in wheelchairs much too large for them. Their feet do not reach the ground or do not rest on foot rests, thus causing increased pressure under their thighs. This may lead to circulatory problems and edema in their legs. To gain support under their feet, they typically scoot out to the edge of the chair to reach the floor. But once the hips have been displaced forward in the wheelchair, the lower back is left unsupported and the trunk, chest, and abdomen collapse forward. This results in increased pressure across the upper back and can lead to skin breakdown and pain. If the person tries to reach over the armrests while in this position, the result may be an increase in pressure in the axillary region from improper armrest height, leading to neurologic and circulatory problems. In addition, poor positioning causes the arms to feel heavier, which makes it more difficult to do small tasks such as raising the arms for eating or grooming, thumbing through magazines or playing cards, let alone propelling the wheelchair. Thus, upper extremity function is compromised when the trunk is poorly positioned. Migrating to the edge of the wheelchair and pressing the trunk into the back upholstery to foot propel results in poor sitting posture and translates into poor standing posture. When the person stands or walks, he or she continues to lean backwards, making transfers and other upright activities difficult. If the chair is too wide, the person may experience decreased trunk support, difficulty reaching the wheel rim for arm propelling, and more difficulty making turns and getting through doorways.

Poorly fitted seating may lead to compensations in posture, causing long-term compression of the trunk, which in turn may cause problems with circulation, gastrointestinal and urinary tract dysfunction, and high blood pressure. Poor seating systems may also lead to problems with speech, swallowing, chewing, and breathing. The person may be unable to deliver a productive cough and achieve efficient lower lobe breathing, placing him or her at risk for pneumonia. Vital capacity may be compromised, requiring the heart to work harder and possibly leading to cardiac failure. Inactivity caused by poor posture further compounds these risks.

### **Wheelchairs and Parts are not Maintained Properly**

In addition to having the wrong size wheelchair and seating system, often the chairs are poorly maintained. For example, the upholstery may be overstretched or torn, creating a hammocking effect. Some tires have air inside and require proper air pressure to function easily. With low pressure they require enormous effort to move the chair. It is very unfortunate when an individual has to use a wheelchair with squeaky wheels that pulls to the left and wheel locks that do not work. This is sad, yet typical of the problems with wheelchairs in many settings.

When the person is fortunate enough to have been fitted for a proper chair, there can still be problems; for example, cushions can be lost, put in backwards, damaged, or improperly covered. In Chapter 6 the issues of proper care and routine maintenance will be discussed in more detail.

## **WHY THINKING AND PRACTICE HAVE CHANGED RELATED TO THE USE OF PHYSICAL RESTRAINTS**

It is important for caregivers to update their knowledge in the area of seating because much has changed in the last decade. One big factor is the way we think about the use of physical restraints. Based on observations of elder care in countries such as England, Scotland, Sweden and Denmark and a few facilities in the United States and Canada (Blakeslee, 1989; Evans & Strumpf, 1987; Mitchell-Pederson et al, 1986; Rader, 1987; Williams, 1990), it became clear in the 1980's that the standard practice of restraining persons to prevent falls, sliding out of chairs, interference with treatments, and disruptive behaviors such as wandering and aggression was unnecessary, ineffective and in some cases dangerous (see Appendix A). This realization prompted the National Citizens' Coalition of Nursing Home Reform (NCCNHR) to push for federal legislation to change practice. The change was accomplished through the Omnibus Budget Reconciliation Act (OBRA) of 1987 (often called the Nursing Home Reform Act), which went into effect in 1990 and required all nursing homes to rethink the practice of restraint use.

The reduction in the use of restraints and the positive outcomes seen in nursing homes have not gone unnoticed by other health care providers. Most hospitals and

home health agencies have integrated changes in restraint use into their practice standards. In some states regulation for assisted living facilities prohibit the use of restraints. In Oregon, adult foster care providers are discouraged from using restraints except in rare circumstances, and they must follow a process similar to that used in nursing homes, which requires consultation, getting a doctor's order, and trying alternatives prior to the use of a restraint. (Oregon Revised Statute for Adult Foster Homes, 1995, 443, 738, 9a, b).

The definition most commonly used for restraints comes out of the Nursing Home Reform Act:

“Physical restraints” are 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. “Physical restraints” include, but are not limited to, leg restraints, arm restraints, hand mitts, soft ties or vests, lap cushions and lap trays the resident cannot remove. Also included as restraints are facility practices that meet the definition of a restraint, such as:

- using bed rails to keep a resident from voluntarily getting out of bed as opposed to enhancing mobility while in bed;
- tucking in a sheet so tightly that a bed bound resident cannot move;
- using wheelchair safety bars to prevent a resident from rising out of a chair;
- placing a person in a chair that prevents rising; and
- placing a person who uses a wheelchair so close to a wall that the wall prevents the person from rising. (Health Care Financing Administration, 1995)

Key points to remember in the definition of restraints are these: the individual cannot easily remove the device, and the device restricts freedom of movement or normal access to one's body. Numerous negative consequences related to restraint use have been documented in the literature (Evans, Strumpf, 1989; Marks, 1992, Miles & Meyers, 1994; Parker & Miles, 1997). These are listed in Table 1.1. No studies have shown that restraints increase safety (see Table 1.2.)

Table 1.1

<b>Negative Consequences of Restraint Use Documented in the Literature</b>
<ul style="list-style-type: none"> <li>• Withdrawal, humiliation, depression, regressive behavior, resistance, anger, agitation</li> <li>• Complications of restricted mobility, including circulatory obstruction, edema or swelling, pressure ulcers, muscle wasting, joint contracture, osteoporosis, respiratory problems, infection, increased incontinence, and a drop in blood pressure when standing</li> <li>• Increased confusion</li> <li>• Decreased appetite, dehydration</li> <li>• Changes in body chemistry due to response to stress</li> <li>• Injuries and deaths related to restraint use</li> </ul>

Table 1.2

<b>Positive Consequences of Restraint Use Documented in the Literature</b>
<ul style="list-style-type: none"> <li>• None</li> </ul>

It is important for caregivers to understand, however, that restraint use is not really the problem, but a symptom of a bigger problem, which is lack of skill in individualizing care (see Appendices B & C). This became very evident when we began removing restraints from persons in wheelchairs. As noted earlier, caregivers were typing people into chairs not designed for comfort and function, and were making the chair work but creating disability and discomfort for the individual. When caregivers began to learn to assess each person's individual needs, and provide comfortable and supportive wheelchairs and seating, they saw that the usefulness of restrictive devices was diminished or non-existent.

### **Current Practice Needs to Change**

Wheelchairs should be prescribed to meet individual needs; one type of wheelchair will not fit all persons. Wheelchair companies are now trying to individualize wheelchairs by designing chairs with adjustments and options. We are all different sizes and shapes, and we all have different functional and mobility needs. Every person deserves to have a chair that is appropriate for his particular needs and wants. Frail elders still have places to go and things to do – whether that means from their room to the hallway or out in the community. Mobility and comfort allows choices and improves quality of life.

**INDIVIDUALIZED SEATING WORKS**

How people sit is fundamental to their health. The standard sling seat, sling-back, collapsible wheelchair was designed to transport people short distances, for short amounts of time, to assist the person pushing the chair, and to make storage easy. The chair works for the caregiver, but very poorly for the person in it, particularly if it is used for long periods of time and as the primary seating system for the individual. When frail elders are properly seated in chairs designed to meet their particular needs, improvements can occur in:

- Posture
- Comfort and wheelchair tolerance
- Skin condition
- Ability to care for self
- Efficient use of limited energy and endurance
- Socialization
- Quality of life
- Caregiver burden

**Improved Posture**

Improving posture can enhance a number of functions in the elderly; however, as a result of illness or orthopedic changes many elders have postures that cannot be corrected and can only be supported. The first step in achieving proper seating is a seating assessment. A seating assessment by a physical or occupational therapist is required to determine if the person needs accommodation of fixed posture and/or support of flexible posture. The assessment should include a physical evaluation, in which the person is transferred out of the chair or wheelchair and onto a mat or hard surface. This allows the therapist to evaluate the person both lying down and in a seated position for fixed joints, spasticity, pain, and skin problems.

With better positioning and/or support through proper seating, physiologic functions such as breathing, swallowing, digestion and elimination are improved. Respiratory function improves in several ways. The chest cavity more easily expands if the person is not slumped forward. Many frail elders have a delayed swallow that places them at risk for choking or aspirating (taking food or fluid into the lungs). It is essential that the person sit upright for meals so that food and particularly liquids can be better controlled and to aid the normal gravitational flow into stomach. Needless to say, if a person is constantly choking, food may often be refused. The ability to move the bolus of food in the mouth may be improved if the person with a normal swallow and kyphotic or curved back (resulting in a forward head and neck position) is properly supported and positioned so that gravity can assist in getting the food to the back of the mouth. Also, elongating the abdominal region through proper positioning allows food to

move more easily through the digestive tract and better utilize gravity to facilitate digestion and elimination.

Good positioning can also improve eye gaze, that is, the visual field created by the position of one's head. If older persons have stooped posture, the eyes naturally fall lower, sometimes to the floor, requiring a considerable effort to raise the eyes or head to see what is in front of them. Even if the posture is fixed, as with a kyphotic or curved spine, improvements can occur. For example, positioning the wheelchair at even a 15 degree recline may bring the eye gaze level, making it easier for the person to attend to what is going on around him and socialize (see Chapter 2).

### **Improved Comfort and Wheelchair Tolerance**

Comfort is an important concern of frail elders. Comfort is achieved or improved through proper support and positioning. Wheelchair tolerance or the amount of time the person feels able to be up in the chair can be used as a practical indicator of comfort. That is, comfort is directly related to wheelchair tolerance. If the person is uncomfortable in the wheelchair or gerichair, he will often ask to go to bed sooner and refuse to become more involved in activities.

Older adults experience more pain than younger people, for many reasons. They often suffer from arthritis or other chronic illnesses that have pain associated with them. Often pain is unidentified or under treated in the frail elderly. Many frail elders have diagnosed or undiagnosed spinal fractures that can be a source of pain. Often with proper positioning and support, this type of pain can be dramatically reduced.

Persons with dementia may not have the verbal or cognitive ability to express their pain in words or even respond appropriately when asked if they are in pain. However, their behavior is often a good indicator of pain. One nurse clinician working in a large Midwest teaching hospital found that out of 18 nursing home residents referred to an outpatient clinic, inpatient medical unit or inpatient psychiatric unit for screaming/yelling behaviors, 15 had undiagnosed or unstable fractures (Geri Hall, personal communications, August 8, 1997).

### **Prevention of Skin Breakdown**

Proper cushions and support prevent skin and tissue breakdown by more evenly distributing pressure, thus allowing the individual to be up for longer periods without causing damage. Some fabric cushion covers wick away moisture/fluid from the skin. Heat may also contribute to skin breakdown, and some cushion materials (air, fluid) are cooler than foam (see Chapter 6).

**Improved Ability to Care for Self**

A properly fitted wheelchair can improve the person's ability to care for himself in many ways. For example, correct arm rest length and height allow the chair to get under the table so that at meals the person can be close enough to reach the food and feed himself. It gives the person a level eye gaze so he can see in the mirror for grooming. Further, with the proper chair many people can wheel themselves from place to place.

**Better Use of Limited Energy and Endurance**

Frail elders often have limited stamina, endurance and energy. When one is not positioned properly, energy is required simply to remain upright. When properly equipped, the ability to self propel is enhanced and requires less expenditure of energy. The standard wheelchair weighs between 40-50 pounds, a lightweight chair weighs 24-28 pounds, and an ultralight chair can weigh even less (18-21 pounds). Choosing a lighter weight chair can save energy for use with other activities. Having the seat low enough so that the person who ambulates with his feet can get a good heel strike (connection of the foot to the floor) also improves efficiency. Providing a chair with the proper width so that the person can easily access the hand rims on the wheels is another way to better conserve limited energy. Being comfortably seated and positioned for eating may mean that the person will eat more because he is not too fatigued to finish the meal. With proper support, the person can relax and focus on other activities such as eating or conversing.

**Improved Socialization**

Improved socialization can result from a combination of the factors already mentioned such as level eye gaze, the ability to move oneself in and out of social situations, and increased comfort. Improved socialization may also be related to eliminating restraints. Individuals often find restraints uncomfortable, humiliating and degrading, causing them to shrink from social situations.

**Improved Quality of Life**

It goes without saying that if a person is more comfortable, more independent, and has better physiologic function, that person will have improved quality of life and self-esteem.

**Easing of Caregiver Burden**

When properly seated, frail elders may be easier to transfer, or able to transfer themselves, and able to feed or toilet themselves; they may require less repositioning (creating less back and shoulder stress for the caregiver), tolerate

being up for longer periods, and have fewer behavioral problems. All these ease the caregiver's burden.

### **CASE EXAMPLES OF BENEFITS OF PROPER SEATING**

The following case examples illustrate many of the benefits of proper seating.

#### **Case 1 – Marguerite Parker**

Ninety-seven year old Marguerite Parker was in the typical wheelchair with a sling back and a sling seat with an inexpensive foam cushion. Her thighs were rolled inward and her pelvis was in a posterior pelvic tilt, which made her trunk collapse and her movements limited, affecting her breathing and circulation. Consequently, Mrs. Parker suffered from considerable back pain, making her irritable, as manifested by crying, angry outbursts and refusing all activities. A physical therapist conducted an evaluation, including a physical assessment on the mat to assess her needs. She discovered that Marguerite had:

- A fixed posterior pelvic tilt or forward thrust of pelvis;
- Hip range of motion limited to 90 degrees;
- Shortened hamstring muscles;
- A fixed thoracic, kyphotic spine causing her head to be positioned forward

The therapist recommended a smaller, lightweight chair and a solid, contoured back and seat system. Putting Mrs. Parker in a wheelchair with smaller diameter (20-inch) wheels provided her with enough range of motion to bring her elbows back far enough to have full excursion on the wheel so she could more easily propel her wheelchair. The stability and contoured support that Mrs. Parker received from the new seating system also protected her skin with better distribution of pressure. Finally, the system stabilized her pelvis, allowing elongation of her trunk and resulting in better upright sitting, energy conservation and comfort.

The overall results were dramatic. Before, because of her pain, Mrs. Parker had been very withdrawn, not talking to people or attending activities. Following the improvements in her seating, she became clearer cognitively and moved easily through the facility talking to others. She was more comfortable, aware and pleasant. Her son was amazed and pleased with the differences. Mrs. Parker lived another four years, continuing to use her individualized wheelchair and maintaining her improved comfort and mobility (Pitts, 1995).

#### **Case 2 – Art Solum**

Art Solum, 75, had been residing in a nursing home for several years due to progressive gait instability and dementia. He was placed in a gerichair with a soft, tie-on restraint because he was sliding out of his facility-issued wheelchair,

even with a restraint. He continued to sit in this gerichair for two years. Like many gerichair users, during this time Mr. Solum's ability to perform daily care activities slowly declined, until he was totally fed and groomed by others. In addition, his wife and staff members had difficulty pushing and maneuvering the gerichair because it was designed mainly for lounging, not mobility. Because of the difficulty of maneuvering the chair, as well as his low interest, Mr. Solum rarely participated in facility activities.

The nursing staff were also concerned that his position in the chair posed a risk of aspiration during mealtime; and further, his transfers were becoming more difficult. At the time, the facility was working on eliminating the use of restraints and Mr. Solum had two devices in place that restricted his mobility: the recliner and a tie-on waist restraint.

The facility's rehab team, including an occupational therapist, a physical therapist, and a speech pathologist, identified Mr. Solum as a candidate for restraint elimination and improved posture through proper wheelchair seating. During the observation process, the team noted that Mr. Solum spent most of his time lying in the gerichair outside his room. He had ample room to move in the gerichair because of his small body size, and he was frequently found lying at an angle and sliding down in the chair. The mat assessment revealed:

- A slight posterior tilt;
- Mild thoracic kyphosis;
- Bilateral hip range of motion limited to 90 degrees of flexion;
- Fair trunk balance

Mr. Solum's knees were a little stiff but within normal limits for sitting, and his ankles were extended in slight plantar flexion with foot drop. His skin did not appear to have any redness or blanching and he had no previous history of skin breakdown.

Therefore, the initial equipment recommendation was a solid seat with contours to support and protect his pelvis and a solid contoured back that could recline slightly to accommodate his limited hip flexion, posterior pelvic tilt and thoracic kyphosis. The seat cushion needed enough length and padding to firmly support his thighs. He also needed the proper footrest height to secure his position in the wheelchair. Due to his slight frame, a 16-inch-wide wheelchair was also recommended.

Mr. Solum had only Medicare coverage and was not eligible for wheelchair and seating equipment through Medicaid because he was living in a nursing home. However, the facility had recently received a 16-inch-wide lightweight chair as a donation and the administration agreed to let him have the chair if it would improve his situation. In addition, the team selected a cushion and back to implement the recommendations from the assessment.

The results were again dramatic. With a few minor adjustments to the seat-to-back angle, foot rests and arm rests, Mr. Solum was able to sit upright in the wheelchair without sliding. At this point, the speech pathologist wanted to see if he could manage eating an ice cream sandwich. He not only opened the wrapper by himself but also was able to take a bite and swallow appropriately. When the occupational therapist wheeled him to the sink in his room, he washed his hands with little prompting. Although Mr. Solum still required assistance with his transfer, they were accomplished more easily from his upright seated position than from the gerichair. With his upright sitting posture in the wheelchair, he seemed more approachable and experienced more social interaction with other residents and staff members.

Mr. Solum's improved upright posture also led the restorative staff to begin a strengthening program with the goal of self-mobilization and increased strength for self-care. As he became stronger, the nursing staff recommended that the physical therapist see him for transfer training and possible gait training. He was fitted with an ankle-foot brace and could ambulate with assistance in the parallel bars. He continued a weightlifting and walking program. He managed his meals independently with some assistance in cutting up meat and opening packages. The staff and his wife found it easier to push the lightweight wheelchair than the gerichair (Jones, 1995). Mr. Solum was even able to enjoy a fishing trip to a local trout pond with the activities department.

The people in these two cases are representative of those who can benefit from individualized seating. There are many persons in care facilities and in the community with the same types of problems who could experience similar improvements. As caregivers, it is our job to identify who these people are and being the process of improving their lives through better seating.

In the last 10 years, there have been dramatic improvements in the types and costs of products available to meet needs for better seating. Chapter 4 discusses how some of the newer devices are more effective than the older ones. The fact is our population is aging and a market is developing for better seating.

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**CHAPTER 2**

**COMMON AGE-ASSOCIATED CHANGES  
THAT AFFECT SEATING**

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Physical changes commonly found in older people can affect their posture and functioning, so that seating and mobility needs differ from those of younger persons. There is a great deal of debate about what changes are part of the normal aging process and what changes occur as a result of disuse or disease. In this manual, we will refer to these commonly encountered changes as age-associated changes, without trying to make the distinction. Common age-associated changes that the caregiver should consider related to seating and mobility needs include:

- Decreased body fat and fluids so there is less padding over bony prominences
- Thinner, more fragile skin that is prone to injury
- Visual changes resulting in problems with glare and need for more light
- Changes in bladder and kidney function resulting in urinary urgency and frequency
- Cardiovascular changes resulting in a drop in blood pressure upon standing and a longer recovery period after exercise
- Respiratory changes resulting in increased energy expenditure for breathing, diminished cough reflex, fatigue and shortness of breath with exertion, and increased susceptibility to pneumonia and other respiratory infections
- Diminished muscle mass, increased osteoporosis, and limited range of motion, which may result in increased susceptibility to falls and fractures (Miller, 1995).

In addition to these age-associated changes, older people may have one or several health problems such as osteoporosis or diseases affecting the respiratory system, the heart, or the nervous system. Accompanying these may be mental changes such as dementia and depression. Eighty-six percent of those over 65 have at least one chronic condition and 52% of those over age 75 have some limitations in their daily activities (Federal Council on Aging, 1981). Forty percent of all disabled persons are over age 65 (Wedgewood, 1985). Three-fourths of strokes occur after age 65 (Warsaw, 1982). Osteoporosis, which is particularly common in elderly women, makes the bones more fragile and at risk for breaking. Osteoporosis can also alter posture, creating a kyphotic or curved spine. Heart disease can affect exercise tolerance and general energy levels. Dementia affects the person's memory, insight and judgment, increasing the risk of injury. Multiple diseases create the problem of disease interactions, which create further disability (Kemp, Brummel-Smith, & Ramsdell, 1990); for example, if a person has a stroke and also has arthritis in his hips, this will affect how well he is able to ambulate; she is likely to put additional stress on the hip on the side less affected by the stroke, increasing pain and limiting mobility.

**COMMON POSTURAL OR ORTHOPEDIC CHANGES THAT AFFECT SEATING AND MOBILITY**

Even though age-associated changes, plus the lack of activity make an elderly person more prone to deformities, one should not assume that all deformities are fixed. In fixed skeletal deformities, permanent changes have taken place in the bones, muscles, and ligaments that restrict normal range of motion (Cook & Hussey, 1995). Often increased tone and muscle tightness cause a person to assume certain postures and he may appear to have a deformity. If the deformity can be returned to a more normal position with support, than it would be considered a flexible deformity.

The approach toward fitting the person with a flexible joint will be different than for a fixed deformity. A professional such as a physical therapist (PT) or occupational therapist (OT), should be consulted to make the distinction between fixed or flexible joints. Fixed joints need to be accommodated whereas flexible joints need to be corrected within the person's tolerance. To accommodate means that a therapist determines through a physical assessment, that fixed (unmovable) joint positions exist and a seating system is selected that matches the person's fixed position, rather than trying to force him into a "normal" position he can no longer achieve. Frequently seen fixed deformities that can affect seating include:

- Abnormal spinal curvatures (e.g., kyphosis or scoliosis)
- Limited hip range of motion
- Limited knee range of motion
- Posterior pelvic tilt

In the text, diagrams will be used to illustrate various points. Figure 2.1 shows normal sitting posture and identifies the symbols that will be used; the triangle shape represents the pelvis and the hatched (striped) area represents the hamstring muscle.

**Abnormal Spinal Curvatures – Kyphosis or Scoliosis**

A kyphosis occurs when the spine is overly curved into a C-shape from a side view and is often the result of osteoporosis. With kyphosis and the resulting muscular imbalance and effects of gravity, the neck and head respond with

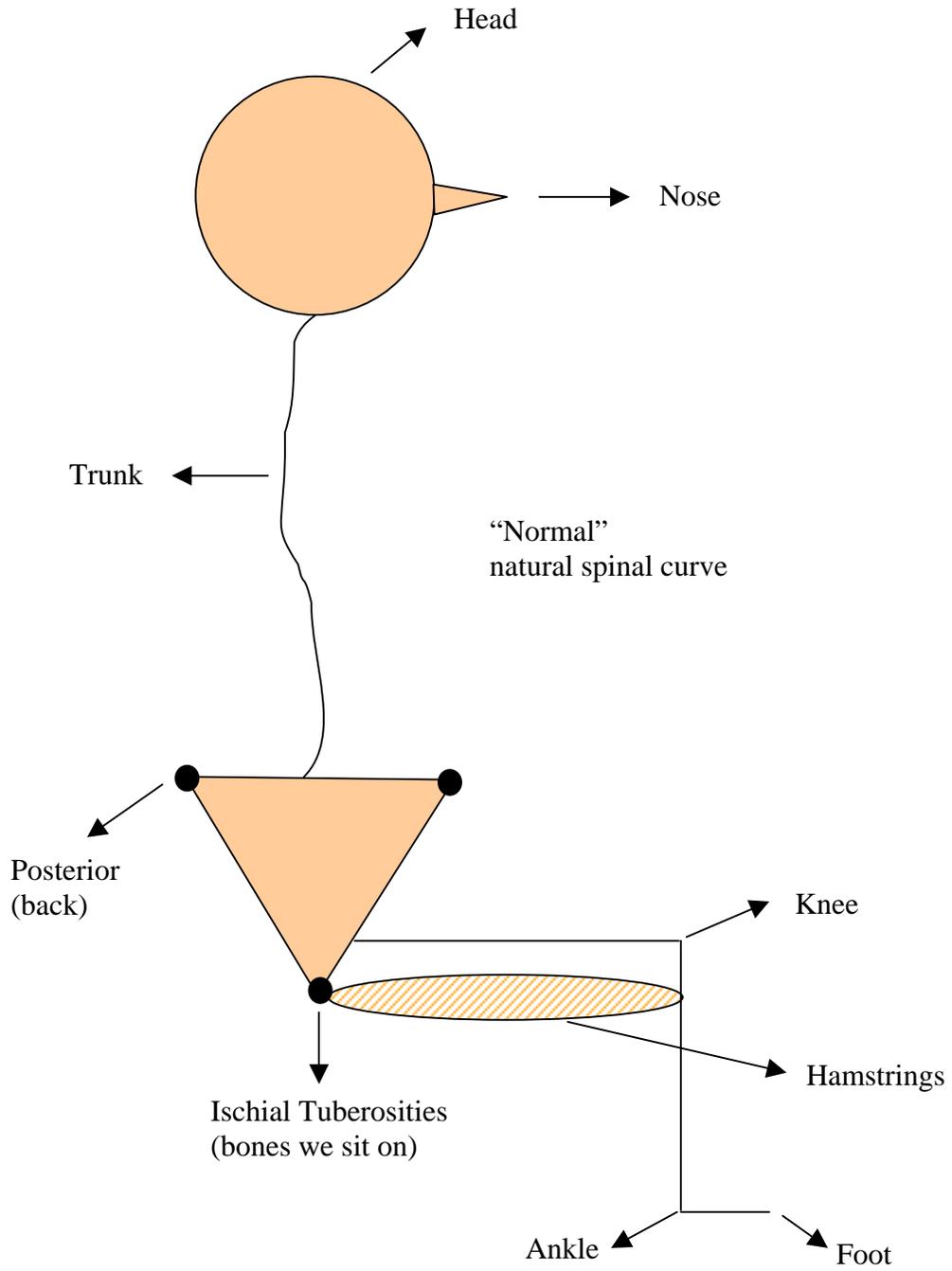


Figure 2.1 Parts of body affecting sitting posture

increased flexion so the person routinely looks down into his lap (see Figure 2.2). If there is flexibility, the person may lift his head into extension or slide down into the chair to maintain the ability to see forward (see Figure 2.3 and 2.7).



**Figure 2.2 Thoracic kyphosis with fixed neck**



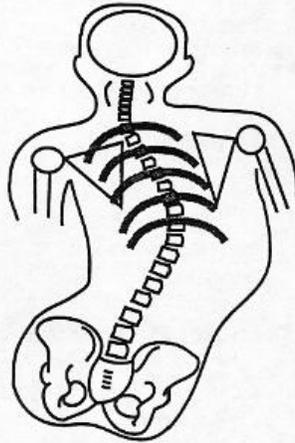
**Figure 2.3 Thoracic kyphosis with flexible neck**

The seating goal for a person with a fixed spinal deformity is to accommodate the curve with a standard back system that has a similar curve (Figure 2.4) or with a custom molded back system for more severe deformities. A corrective back system uses gravity to assist in positioning, allowing the trunk to recline to create a level eye gaze.

**Figure 2.4 Accommodation to allow level eye gaze**



A similar intervention would be used with a spinal deformity known as scoliosis (where the spine makes an S-shaped curve to the side;) (see Figure 2.5). Providing lateral trunk support assists in holding the person in a more upright position (see Figure 2.6). Adjusting the wheelchair seat and back angles to use gravity also assists a weak trunk to stay in a more upright position.



**Figure 2.5 Problem: Scoliosis of spine (rear view)**



**Figure 2.6 Solution: Use lateral support for trunk**

### Limited Hip Range of Motion

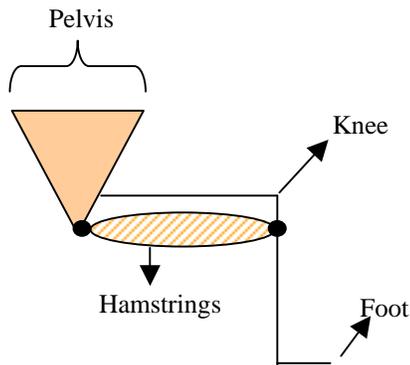
Limited hip range of motion is common in frail elders, especially those who walk infrequently or not at all. It is important not to over-flex (bend) a tight hip joint because this pulls the pelvis forward and creates a sacral sitting position with the pelvis thrust forward in the chair seat, causing the person to slide out. Positioning the person with limited hip range of motion may result in more severe tilting of the pelvis into a sacral sitting position to accommodate for the lack of hip range (see Figure 2.7). This in turn will cause increased pressure on the lumbar spine, resulting in discomfort and decreased wheelchair tolerance. To accommodate limited hip range of motion, the chair seat and back should be adjusted to the individual's specific needs.



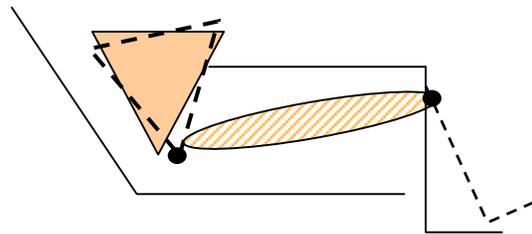
**Figure 2.7 Limited hip motion results in sliding out of chair**

### Limited Knee Range of Motion Because of Tight Hamstring Muscles

The hamstring muscles are located behind the knee, and they extend up the back of the leg to the pelvis (see Figure 2.8 a & b). The hamstrings tend to become tighter in frail elders who walk in frequently, resulting in decreased knee range of motion. As a result, they are unable to straighten their legs or sit in the standard wheelchair with foot plates and leg rests.



**Figure 2.8a Location of hamstring muscles**



**Figure 2.8b Foot placement affects pelvis due to tight hamstrings**

When the person's legs are forced out to the foot plates with heel loops, boards or tie-downs, the person may respond by sliding out of the chair to decrease the stretch of his hamstrings or the feet may fall off the foot plates (see Figure 2.7 and 2.9).

**Figure 2.9 Problem: Tight hamstrings may result in feet falling off foot plates**



Such individuals will need a custom foot plate or angle-adjustable foot plates, or their feet should be placed on the floor to reduce the pull or pressure on the hamstrings (see Figure 2.10).

**Figure 2.10: Solution: Placement of feet on floor or proper foot plates**



### Fixed Posterior Pelvic Tilt

A fixed posterior pelvic tilt is common among frail elders and is caused by boney changes in the spine. The pelvis of an elderly client tends to respond to the spinal changes by moving into a posterior tilt position so that the head and neck come increasingly forward (see Figure 2.2). This position helps to balance the person during walking. As the person begins to sit more than walk, the tendency for the pelvis to progress into further poor pelvic position increases. The seating goal for posterior pelvic tilt is to stabilize the pelvis with a seating system that includes a large well space for the buttocks, adequate femoral support and posterior stabilization of the pelvis. In addition, a properly placed seat belt placed over the upper thighs may be necessary to assist in femoral pressure to stabilize pelvis (see Figure 2.11).



**Figure 2.11** Accommodation of a fixed posterior pelvic tilt

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**CHAPTER 3**

**UNDERSTANDING THE SEATING  
ASSESSMENT PROCESS**

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## WHEN AND HOW TO ASK FOR A SEATING ASSIGNMENT

How does a caregiver know when to ask for a seating assessment? What are the signs that indicate a person would benefit from a seating assignment? Some key observations that should alert the caregiver to the need for seating assessment include: leaning to the side or sliding out of a chair, use of a tie-on restraint; use of a gerichair; indications of discomfort and pain through verbal complaints or behaviors such as crying or calling out; sliding or leaning out of the chair after a short period of being up in the chair, agitation and restlessness; and low wheelchair tolerance as evidenced by repeated requests to return to bed after a brief period in the chair.

Use of seat belts should also be assessed. Sometimes they serve to stabilize the pelvis and improve comfort and function. At other times, they are placed improperly, serving only to limit mobility; they may also create a hazard if they slide up over the abdomen, allowing the person to slide under it and perhaps getting trapped or strangled. Tray tables, lap pillows and wedge cushions used for positioning or restricting movement require investigation. Tray tables in particular should not be used to support the upper body. These devices are discussed in more depth in Chapter 4 and in Appendix A. (See Table 3.1 for a quick reference of observations that should trigger a seating assessment.)

Table 3.1

<b>Observations That Should Trigger a Seating Assessment</b>
<ul style="list-style-type: none"> <li>• Leaning or sliding in the chair</li> <li>• Use of a tie-on restraint</li> <li>• Use of the gerichair/recliner as a restraint</li> <li>• Crying and yelling behaviors in wheelchair bound elders</li> <li>• Agitation and restlessness in wheelchair bound elders</li> <li>• Seat belts that go over or above the abdomen</li> <li>• Use of tray tables, lap pillows, wedges, or bolsters for positioning</li> </ul>

Once a caregiver has identified that problems exist that might improve with a seating assessment, he needs to take action to begin the process. How this is done will depend upon the setting. In a nursing home or hospital setting, the caregiver who has made the observations or received a report from a family member or other staff usually contacts the physician to request an order for a physical or occupational therapy consultation. Often, an informal consultation with a therapist can be obtained to help the caregiver better understand the problem prior to requesting an order. The better informed the caregiver is about the person's needs, the more likely he is to get an order.

In a community-based setting (home, adult foster home, assisted living facility), a physician's order for the purchase of equipment is not necessary unless funding is being sought from a third party (insurance company, Medicare, Medicaid). Although a medical supplier or vendor can be directly contacted and come out to the home, this is not advisable without getting professional consultation from a physical or occupational therapist. Medical suppliers are not permitted to touch the client unless they are themselves a physical therapist (PT) or occupational therapist (OT). This means that the average supplier will not be able to accurately assess the person's body contours and angles to determine the best type of seating system.

The most useful approach to obtaining an assessment is through the physician. Family caregivers should contact the primary physician. If a therapist or nurse have been involved in the past or present, it is useful to consult with that person prior to calling the doctor, so that the nurse or therapist can help to clearly state the reasons for an assessment. In this time of managed care and cost containment, it is important to be a prepared and informed advocate. Many physicians, however, are still unaware of the importance of proper seating and may suffer from "ageism," thinking that the person is too old or sick to benefit. Therefore, the person who is requesting the consult needs to be well informed and prepared to build a case.

The following is an example of how a caregiver who is carefully monitoring behavior and trying individualized approaches could share information with the doctor. This conversation is one that a caregiver could have with the doctor about a person who is sliding out of her wheelchair.

Mrs. Smith has been sliding out of her sling seat wheelchair onto the floor at least 2-3 times a day. We have tried a variety of pillows and cushions to prevent sliding, including placing a non-slip surface on the wheelchair seat. This did not work. Mrs. Smith continued to slip out of the chair and complained that the seat was uncomfortable. In addition, we have tried seating her in a glide rocking chair for part of the day, which she sits in very well, without sliding. However, she likes to spend at least 2-3 hours a day out in the patio and garden. Currently, she is unable to stay positioned in her wheelchair long enough to do this. Our assessment is that she needs to be further assessed by a physical therapist to determine the best method for making her comfortable and improving her ability to move the wheelchair.

Not all therapists have the skills necessary to assess frail elderly clients. Every health care discipline has specialized and complex areas of knowledge and no one can be skilled in all areas. There is a new accreditation available for physical and occupational therapists, called an Assisted Technology Practitioner (ATP). These individuals have acquired the skills and knowledge necessary for seating frail elders. If you are unable to locate an ATP therapist when you call to make an appointment, ask for a therapist who has experience in the area of elder care.

Vendors also have developed this specialty area and may be designated an Assisted Technology Supplier (ATS) through the Rehabilitation Engineer Society of North America (RESNA).

## CONDUCTING AN ASSESSMENT

In most cases, either a physical or occupational therapist will conduct the individualized seating assessment. In order to be comprehensive, the therapist's assessment needs to involve a number of steps. Here's what the process should include:

- Step 1 – Problem identification
  - Chart review
  - Interview
  - Observations
- Step 2 - Full assessment
  - Physical
  - Functional
  - Environmental
- Step 3 – Strategizing possible solutions
  - Problem summary
  - Objectives
- Step 4 – Implementing solutions
  - Equipment trial
  - Reevaluation

### Step 1 – Problem Identification

The assessment process begins with someone (the person, caregiver or therapist) observing a problem and gathering information about the person's history, diagnosis and current problems with his wheelchair. This can be a lengthy process because of the multiple medical complications common among frail elders, such as dementia, hearing loss and blindness. If the person is residing in a health care facility, a chart review is useful and necessary. Interviewing the person is essential for determining his or her personal wheelchair goals. Very often the individual mentions comfort as the first priority, followed by functional needs such as mobility and self-care, and better seated posture. Other team members, including the family, can provide information about the person's daily routine, environmental obstacles, self-care issues, outdoor excursions and medical problems.

Direct observation is an excellent source of information; it is especially important when the person is a poor historian. Observing the individual's current body position and wheelchair equipment is helpful in determining whether any corrections can be made or whether the equipment must be modified or repaired. If the person can move the chair, the therapist should examine the method he or

she uses, in order to see if the equipment is hindering or helping movement. The therapist also should observe the person transfer from the wheelchair to a mat or bed, if appropriate, to see if this method can be improved with better equipment. It is important also to see if the person has the ability to reposition himself in the chair.

### **Step 2 – Full Assessment**

Three elements should be addressed in this step: physical assessment, functional assessment and environmental assessment. During the physical assessment, the therapist should have the individual transfer to a mat table (or other hard surface) to assess the available joint range of motion in both lying down and seated positions. It is important to assess the pelvis, trunk, hip and knee, and ankle range of motion as they are related to wheelchair posture. Sometimes, one or several of these joints have lost range of motion

During the physical assessment, the therapist should also examine neurologic influences as they relate to seated posture. A flaccid or limp extremity or trunk will require support and protection. A person who presents with trunk or lower extremity spasticity (stiffness of the limb) may require special positioning to reduce the spasticity in order to maximize upper extremity and head function.

The therapist should assess the skin for redness over bony prominences, for blanching where circulation is limited from excessive pressure, and for previous skin tears or flaps. Any of these conditions puts the resident at a high risk for skin breakdown.

Some of the information for functional assessment will have been obtained in the observational step of the evaluation, observing the person in the current wheelchair as he sits and moves and during the transfer to the mat. The therapist should also consider safety issues for both the person in the chair and the caregiver related to transfers and mobility and evaluate ways to make daily functioning safer and more efficient.

The environment in which the person lives, works, moves, eats, sleeps, bathes and “plays” should be assessed for safety, access, function and ease of mobility. This information will be useful in determining the type of equipment that will best suit the person’s needs. If the person is being cared for in a setting different from where the assessment takes place, the therapist must also take into consideration certain attributes of the care setting such as whether the door width accommodates the wheelchair size. If not, it is essential to see what can be done to adapt the environment. Sometimes door jams of bathrooms or bedrooms can be removed and a curtain put up for privacy to allow the wheelchair to get through the doorway. Furniture can also be rearranged to accommodate the person and the new chair. A ramp may be necessary for getting into and out of the home. The floor covering should be assessed to see how it will affect the mobility of the new

system. Bathrooms and bedrooms need to be evaluated for accessibility and transfers. The therapist must ask questions about all these aspects of the environment during the assessment process.

### **Step 3 – Strategizing Possible Solutions**

Once problems are identified through the physical, functional and environmental assessment, the therapist establishes the objectives for accommodating, protecting or supporting the person to deal with each problem; for example, providing better support for the person's thighs. Then the product characteristics that will accomplish those objectives, for example, a longer seat cushion need to be identified (see Chapter 4). Table 3.2 provides an example of the problem solving process.

**Table 3.2**  
**Problem Solving Process**

<b>Physical Assessment</b>		
<b>Problems:</b> <ul style="list-style-type: none"> <li>• Fixed posterior pelvic tilt</li> </ul>	<b>Objective:</b> <ul style="list-style-type: none"> <li>• Accommodate fixed posture</li> <li>• Support posterior aspect of pelvis</li> <li>• Protect skin over boney prominences</li> <li>• Maintain level pelvis</li> </ul>	<b>Solutions:</b> <ul style="list-style-type: none"> <li>• Deep well space for pelvis</li> <li>• Posterior pelvic stabilization</li> <li>• Cushion support to protect skin</li> <li>• Stable base in wheelchair</li> </ul>
<b>Functional Assessment</b>		
<b>Problems:</b> <ul style="list-style-type: none"> <li>• Limited energy and endurance</li> </ul>	<b>Objective:</b> <ul style="list-style-type: none"> <li>• Conserve energy</li> </ul>	<b>Solutions:</b> <ul style="list-style-type: none"> <li>• Lightweight wheelchair adjusted for efficiency</li> </ul>
<b>Environmental Assessment</b>		
<b>Problems:</b> <ul style="list-style-type: none"> <li>• Narrow doorways in home</li> </ul>	<b>Objective:</b> <ul style="list-style-type: none"> <li>• Allow access to bathroom</li> </ul>	<b>Solutions:</b> <ul style="list-style-type: none"> <li>• Remove door jams and put up privacy curtain</li> </ul>

### Step 4 – Implement Solutions

Once the assessment is complete, the problems summarized and objectives identified, it is helpful for the therapist to work with the wheelchair supplier or vendor to create a trial seating system before final equipment is purchased. Demonstration or borrowed equipment can be used to simulate the wheelchair to be used to meet seating objectives. Once the borrowed or demonstrator equipment is in place for a period of time, the person should be reassessed. The minimum amount of time required is one hour, however, it is best if the person can use the equipment for several days. Observations are usually made by the caregiver, who reports back to the therapist. During this time physical and functional goals such as transfers, mobility, and self-care should be assessed. For example, if a person was previously transferring independently from his or her wheelchair but now requires assistance because the seat is lower to aid foot propulsion, then a compromise will be needed to meet the new objective while still maintaining the previous level of function.

After the trial equipment has been assessed, the equipment for purchase can be identified and ordered. When it arrives, the therapist should reassess the person in the new equipment. It is also important to reevaluate the effectiveness of the chair routinely every six months to a year (depending on the person and wheelchair usage) and whenever there is a change in condition of the person.

### WORKING AS A TEAM

It is impossible to achieve the goal of individualized seating without teamwork, regardless of the setting. The size and availability of the team will vary depending on the setting and resources. In all settings the most important team member is the person in the chair. The family is also crucial. In community settings such as assisted living or adult foster homes, the team members who are available on a regular basis are the direct caregivers. These settings may also have access to nurse consultants and home health services. Nursing homes may have routine contacts with therapists such as OT's, PT's, and speech pathologists. Hospitals also have access to many other professionals. Psychiatrists (physicians who have specialized training in rehabilitation) can add a great deal to the team when they are available and involved. A physician must be involved if the individual or family seeks third party reimbursement for seating equipment. In some states, a physician's order is needed for a PT or OT to assess the client, while others, it is not necessary. In all settings the pharmacist should not be overlooked as a team member because medications can have side effects that influence the person's ability to sit properly in a chair.

Suppliers of durable medical equipment (DME) are team members that many caregivers are not familiar with. Suppliers can provide the following:

- Knowledge of wide variety of equipment
- Information on adjusting, modifying or repairing equipment
- Suggestions on getting equipment paid for
- Assistance with trial equipment and final selection of products

The person or family may approach the DME supplier directly to purchase the equipment. This can be done at the store, or the supplier may come to the person's residence.

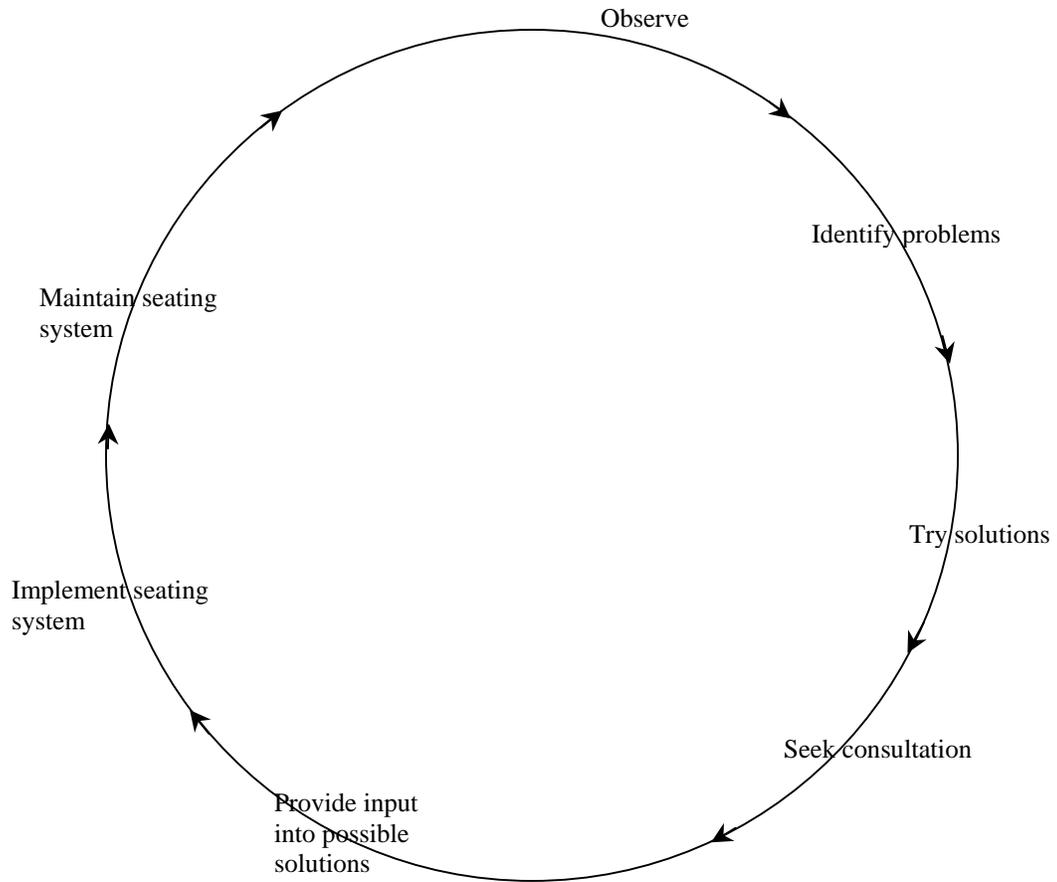
### **The Caregiver's Role in Meeting Seating Needs**

The first step for the caregiver is to carefully look at the posture and functional ability of the person in the chair, asking questions such as: "Does the person seem comfortable?" "Is the person complaining either by words or behavior that the chair is not working well?" Second, the caregiver should identify problems such as inability to move the wheelchair because the person's feet do not reach the floor. Asking the physician for a professional consult from a PT or OT often comes next. Although caregivers sometimes can resolve problems without professional consultation with a therapist, quick fixes can often create a different set of problems, so in most cases a consultation is appropriate (see Chapter 4). At times, it may be necessary to use a quick fix until new equipment is available, but it is important not to lose sight of the fact that a better solution exists and every attempt should be made to see that it is implemented as soon as possible.

As part of the consultation, the PT or OT gets input from and discusses possible solutions with all team members. After gathering information from team members, the PT or OT takes the ideas and assessment information and creates a trial seating system for the individual. The caregiver should then closely observe the new system to assure that the equipment is being used properly and to identify problems and improvements during this trial period and provide feedback to the therapist. When the final seating system is ordered and implemented with the individual, the caregiver's role is to see that the new equipment is used and maintained properly and to continue to observe for problems. This process is illustrated in Figure 3.1.

Figure 3.1

THE CAREGIVER'S ROLE IN MEETING SEATING NEEDS



### Funding Sources

Funding for individualized wheelchairs is often limited for elderly persons. Potential funding sources for wheelchairs and other seating equipment include:

Third party payors:

- Private insurance
- Medicare
- Medicaid
- Veterans' Administration

Personal funds:

- Client or family

Charitable organizations such as:

- Churches and service clubs

For Medicaid clients in a nursing home, the expectation is that often the facility will provide wheelchairs and walkers. However, this is based on the old way of thinking that "one size fits all." Medicare also does not routinely pay for individualized wheelchairs for persons who reside in nursing homes. Currently Medicare and Medicaid pay for some of the costs of individualized wheelchairs for elderly persons residing in non-nursing home settings such as assisted living facilities or adult foster homes. They also pay for individual seating for younger persons. This distinction based on age or where a person resides is out of date and discriminatory. Until new state and federal policies are developed, however, obtaining funding for nursing home clients with limited financial means will continue to be time consuming and tedious. Residents and/or families may have to be asked to purchase seating equipment. Chapter 5 gives examples of how prescriptions for wheelchairs can be written to clearly explain the need and expected outcomes so as to increase the chances for funding from any source. Donated wheelchairs can sometimes be adapted with individualized seats and backs to suit the needs of another person, as was the case with Mr. Solum in Chapter 1.

Nursing home staff (often the PT or OT) need to clearly explain the identified seating problems and expected outcomes to those they approach for funding. If a client has been a private pay client, but has spent down his resources and soon will qualify for Medicaid, and if he has some seating needs, it is sensible for the person to use some of the remaining funds for seating because obtaining Medicaid funding for equipment is often a lengthy and uncertain process. For those who have served in the armed forces, the Department of Veterans' Affairs (VA) is another possible funding source. With the client's name and the last four digits of

his or her social security number, the VA can verify eligibility. For Medicare/Medicaid clients in the home or community setting, it may be easier to obtain funding. However, very few funding sources will allow both a wheelchair and walker to be purchased at the same time. If a walker is requested first, the wheelchair request is usually denied, so it may be wise to first request the wheelchair; if it more expensive. Medicare will pay only 80% of what is deemed reasonable for equipment, and the client or family is responsible for the balance.

When approaching third party payors such as private insurance and health maintenance organizations (HMO) it is useful for the professionals to couch the request in terms of cost savings. For example, if there is a high risk for skin breakdown in the current chair, the organization would save money by investing in equipment that has better pressure distribution to prevent skin breakdown rather than pay \$60,000 for extensive care once breakdown has occurred.

The general lack of government and insurance funding for equipment may be causing an increase in private consumer purchases. When a professional approaches the family or client about covering the cost of equipment, he needs to provide them with documentation and justification, so that they clearly understand what improvements are expected. Having the family observe the client during the equipment trial period can be very convincing, since they can see what the differences are.

Sometimes it is possible to get donated equipment or funding from charitable organizations. Local chapters or national organizations related to specific illnesses such as multiple sclerosis, arthritis and Parkinson's Disease could be contacted to inquire about possible assistance. They usually do not have money to purchase equipment, but they may have access to some donated or used equipment that could be adapted. Some families and clients have received assistance from local service organizations or church groups. The professional should encourage exploration of all possible avenues before deciding that no funding or equipment is available.

Seeking funding is complex: if there are questions or concerns, it is useful to contact an experienced physical or occupational therapist, or other health care professional familiar with seating and funding issues.

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**CHAPTER 4**

**FINDING SOLUTIONS**

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Following the assessment, the team looks at possible solutions. This chapter discusses some of the devices used in the past and shows why they may not be the best solutions for many frail persons. The chapter then examines functional goals for the elderly and possible equipment options.<sup>1</sup>

## QUICK FIXES – PROS AND CONS

In the past, soft tie-on restraints, large pommels, seat belts and reclined gerichairs were used to prevent persons from sliding out of their wheelchairs. However, when the federal government mandated that nursing home clients should be free from unnecessary restraints, staff members at these facilities began looking for better ways to prevent wheelchair users from sliding out and having serious falls. The staff initially had few tools to accomplish these restraint-reduction goals. Therefore they began using items such as wedge cushions, lap trays, arm bolsters, and elevated leg rests to prevent sliding. However, sometimes these items do not work and they may even make the situation worse. Here's a look at some of those commonly used solutions – and why they don't work – as well as the steps necessary for a better solution: an individualized wheelchair assessment and properly prescribed seating (Jones, 1995a).

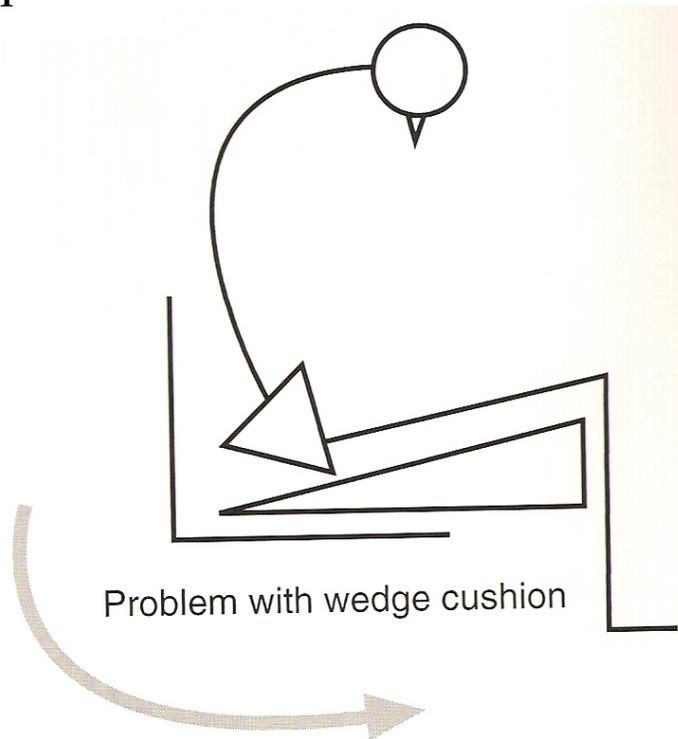
### Wedge Cushions

The wedge cushion is designed to wedge or hold the person's pelvis to the back of the wheelchair by decreasing the hip-to-back angle. Many frail elders sitting on wedge cushions do not have enough hip range of motion to comfortably sit in a wedged position. In order to compensate for this, they may assume a poor posture with increased posterior pelvic tilt, a flat unsupported lumbar spine and increased thoracic kyphosis (see Figure 4.1). This position can cause back pain, poor circulation, respiratory difficulty and increased pressure, resulting in gastrointestinal inefficiency.

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<sup>1</sup> Some of the material in Chapter 4, Finding Solutions, appeared in a slightly different form in Rader, J. (1995), *Individualized dementia care: Creative, compassionate, approaches*, published by Springer Publishing Company and is used with permission.

Figure 4.1



In addition, this position makes it more difficult for the person to move the wheelchair or to get out of the wheelchair. The person may continue to migrate out of the chair, leading to chronic repositioning by the caregiver. If the wedge cushion makes it impossible for the person to come to a standing position, it is considered a restraint. It is important to do a physical exam to assess the person's hip range of motion before issuing a wedge cushion.

### Lap Trays and Lap Pillows

Lap cushions or pillows, full lap trays or wheelchair bars for support and positioning do not address the person's underlying problem, which is usually fatigue, discomfort or poor trunk support. If they are used to prevent someone from rising or moving, this makes them a restraint and alternative measures should be found (see Appendices A, B & C). Lap trays are often used to prevent individuals from sliding or leaning out of the side of their wheelchairs, but this is not their intended use. Lap trays are designed to support the arms for activities such as writing, not to support the whole upper body or prevent sliding. For an arm rest that requires support, consider a half lap tray that attaches to the arm rest and can flip out of the way for transfers.

Instead of using a tray for chronic trunk support or to prevent sliding, an assessment should be done to determine the reason for the problem, and a plan

developed to solve the underlying problem. A simple solution to begin with is to position the person's hips properly on a solid contoured seat. If the individual requires more support, consider slightly reclining the trunk by setting the back of the chair a few degrees backwards from the straight vertical; in more severe cases, lateral trunk supports may be necessary (see Chapter 4).

### **Leg Rests/Foot Rests**

Elevated leg rests are sometimes used to "hold" the person's hips to the back of the wheelchair by raising the leg and using the feet to prevent sliding. This is not an appropriate use of leg rests; most older people are not capable of sitting in this position because they have tight hamstring muscles behind the knee. If a person's legs are elevated when the hamstrings are tight, the hamstrings will literally pull the person's pelvis out of the chair.

Many frail older clients have such short hamstrings that they cannot even reach standard foot rests. Therefore, it is important to evaluate hamstring length in relation to sitting before positioning the person with foot or leg rests. If foot rests are not needed for support, remove them and position the person's feet flat on the floor. Removing foot rests allows the person to use his feet to self-propel or reposition during the day. Removing foot rests also reduces lower-extremity skin tears and reduces the risk that the person will trip over the foot rests and fall. A custom foot plate could be ordered to accommodate tight hamstring muscles.

### **Tie-on Restraints**

The negative effects of physical restraints, particularly tie-on devices, have been well documented and are discussed in Chapter 1. Tie-on restraints such as vest, waist and extremity restraints are considered to be out-of-date, unnecessary and inappropriate except in extraordinary, life threatening situations or when the safety of the individual or others is immediately threatened. Even in life-threatening situations these restraints should be used only when all other alternatives have failed and only for brief periods. Because of their negative effects, these devices should not be used for positioning. The tie-on restraint is particularly dangerous for wheelchair users. It is often used to prevent the person from falling out when he reaches for the floor; however, the wheelchair may tip over on the person when he reaches forward, and increase the risk of injury. Further, the use of a tie-on restraint does not address underlying problems.

### **Gerichairs and Recliners**

A well-padded, properly sized reclining or tilting chair can be used for severely debilitated, immobile persons who need to get up and out of bed. However, these chairs are very difficult to transfer people in and out of, so are hard on the caregiver unless some form of mechanical lift is used. They should be considered a last resort for persons who continually slide out of their wheelchairs because

they often result in decreased ability to function. The recliner used should be the right size and should have proper contours to be comfortable. It is inappropriate to use a recliner for extended periods to prevent the person from rising.

### **Pillows or Bolsters**

Pillows or bolsters used for positioning often do not address underlying problems such as poor trunk support or fatigue. Also, they often slide out of position or push the person to one side in the chair, causing pressure and discomfort.

### **Seat Belts**

Seat belts can be very useful in cases where the pelvis needs to be stabilized to enhance posture. A seat belt can provide proximal stability, allowing distal function for the feet and/or arms. That is to say, when the seat belt is properly placed and used in conjunction with a contoured cushion, it can assist in holding the pelvis in place; and when the pelvis is properly anchored, the arms and legs function better.

The place of attachment of the belt to the chair and the angle of the seat belt are critical. The belt should be placed high across the thighs with a downward and slightly backward pull (see Figure 4.2) to prevent the pelvis from sliding forward without causing pain or pressure across the abdomen. This belt placement is less constricting and uncomfortable than the commonly used abdominal placement (see Figure 4.3).



**Figure 4.2** Effective seat belt placement for elders



**Figure 4.3** Poor seat belt placement for elders

Abdominal placement of a seat belt can be dangerous, because the user is more likely to slide down and under the seat belt, resulting in possible injury or death. The reason for thigh belt placement is that the person can tolerate more pressure because of more muscle tissue in this area and lack of bony prominences. The type of buckle on the seat belt is also important. It should have a self-releasing closure. A flip-latch (airline seat style) clasp is easiest for most people to use. The push button is difficult for the elderly to operate, and plastic locking closures are difficult for the person in the chair and caregivers.

## FUNCTIONAL GOALS FOR SEATING

Functional goals for seating include:

- Independent mobility
- Maximizing head and upper extremity function
- Minimizing trunk deformity and maximizing function
- Minimizing abnormal foot position
- Maximizing head control to facilitate interaction
- Preventing skin breakdown
- Achieving reasonable wheelchair tolerance (Jones, 1995b)

### Goal 1: Independent Mobility

When individuals are placed in a good position with the correct wheelchair and seating system, they have the potential for better functioning. It is important to enable frail elders to move in the most efficient way. Some will use both legs for mobility, others will use both arms, and still others, a combination of arms and legs. Positioning with proper, lightweight equipment should optimize the chosen method of wheelchair mobility.

#### *Optimal Method of Mobility*

##### *Legs Only Propulsion*

If a person is most efficient when using the legs for propulsion, then both feet must reach the ground easily while the pelvis stays back in the chair. Figures 4.4 and 4.5 illustrate problems that occur when feet do not reach the ground easily.



**Figure 4.4 Problem: Feet do not reach floor**



**Figure 4.5 Problem: Sliding to reach the floor**

To achieve the proper seat-to-floor height, the length from the back of the knee to the floor should be measured, making sure to add in the cushion thickness, prior to wheelchair selection or adjustment. Several adjustments can be made to the chair. For example, a wheelchair can be ordered as a hemi-height, chair, which allows seat-to-floor height two inches closer to the floor. Also, the wheel size can be altered on certain wheelchairs; instead of the standard 24-inch wheel, a 22- or 20-inch wheel can be used to get the person's feet to the floor with full support. If the rear wheel size is reduced, the front casters will need to be smaller to prevent a downward slant of the seat. The person's hips should be positioned to the back of the chair with the trunk leaning forward. This will allow for the downward pressure toward the floor that is necessary for forward movement (see Figure 4.6).

**Figure 4.6 Solution: Adjust seat to floor height**



If the person is wedged backward into the seat for stability, this will hinder self-mobilization because it is difficult to foot-propel when the hip-to-back angle is decreased. The person will move more easily if he or she is able to lean slightly forward. It is more efficient to have a flat seat or to angle the seat slightly forward to promote forward movement and to encourage the trunk to align in a

more upright position. Consultation with a seating specialist is recommended for assessment and trial of different seat angles.

A major advantage to having the feet on the floor is that the person then has the option to rock himself back and forth in the chair. This repetitive motion is not only good for exercising the legs but also produces a calming effect. In addition, when elderly persons have their feet on the ground, they can change not only their foot position but also their pelvic position. We all change our positions often in order to alleviate pain and discomfort. We need to allow the elderly this opportunity too.

When a person begins to use his legs more as a result of good positioning, he will be stronger and may attempt to stand, which should be encouraged. The person can then be seen by a therapist to determine if walking is indicated.

#### *Arms Only Propulsion*

When an individual is using both arms for propulsion, being by making sure that the wheelchair is the correct width for the person. This is determined by measuring the width of the person's hips and then selecting a wheelchair width that fits. The rule of thumb is to allow just enough space between the hips and the side of the wheelchair for the person to easily slip his hands between the wheelchair and the hips. Wheelchair width is important because the hand rims should be located in a plumb line under the person's shoulders. The person will then be able to achieve the most effective push. A wheelchair that is too wide is difficult to propel.

Once the proper wheelchair width is selected and the feet are fully supported on the footrest, without undue pressure under the thighs, the wheel axle placement should be looked at to determine how efficiently the chair can be propelled. If the rear axle is placed too far behind the person's back, the chair will be more stable but pushing will be hindered because the person will be unable to reach the wheel for a full push (see Figure 4.7). The optimum placement of the rear axle is directly in line with the spine line or slightly behind it (see Figure 4.8). This is not always possible on the "standard" wheelchair. If the wheelchair appears too likely to tip backward, adding anti-tippers to the back of the chair will help.



**Figure 4.7 Problem: Inefficient Propulsion**



**Figure 4.8 Solution: Modifications to enhance propulsion**

Other things to take into consideration include these:

- A small, 20-inch rear wheel may be easier to rotate than a large, 24-inch wheel. When the arms are used for mobility, the arms should move not only forward but also down and backward and then up. This motion will stimulate trunk extension and breathing (see Figure 4.8).
- The hand rims may be easier to grip if they are covered with a grip-ease material; gloves with leather in the palms also help to increase friction for propulsion, and they keep hands clean and protect hands from callousing
- A lightweight wheelchair is easier to propel, especially for the elderly, who often have upper extremity weakness.

#### *Combination of One Arm and One Leg*

For people who use one arm and one leg to move the wheelchair, the approach is the same as those given above, except that the cushion may need to be altered so that one leg is supported on a footrest while the other leg is on the floor. To make this adjustment, a cushion should be considered that can be shortened or scooped out for the thigh of the leg that will be contacting the floor for mobility.

#### *Transfer to and from the Wheelchair*

If the person has difficulty getting in and out of the wheelchair, there are several possible solutions.

- Remove or flip up foot rests to allow enough space for the resident to place his feet slightly under the wheelchair

- Remove the arm rest that interferes with the resident when he is transferring from the side of the wheelchair to another surface, with or without the use of a sliding board
- Consult a physical therapist for an evaluation to identify the best transfer solutions

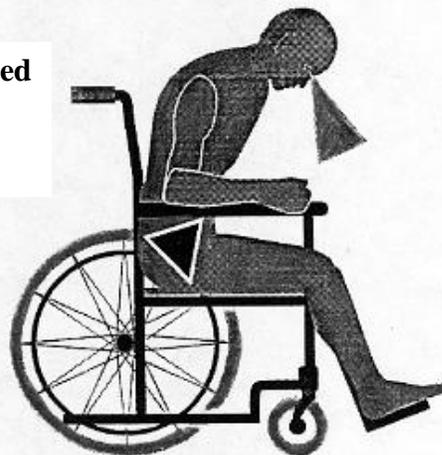
## Goal 2: Maximizing Head and Upper Extremity Function

### *Correct Hip or Pelvis Positioning*

The pelvis and the angle of the hips with the upper leg form the base for the upper body and the head. It is therefore extremely important that the pelvis and the hips are aligned. As mentioned earlier, the most common observation is that the person's hips are sliding out of the wheelchair. This position can cause a great deal of discomfort; low back pain, increased pressure on the sacral area, and poor trunk alignment leading to poor head position and decreased ability to use the upper extremities. Sometimes when a person has slid forward in the chair, it is because he is trying to reach the floor to use his feet for mobility or to change his position in order to relieve discomfort. But quite often frail elders are too weak to reposition themselves and they are then at risk for skin breakdown, slipping out of the chair, and injuring themselves by falling.

When an individual has thoracic kyphosis and his hips are positioned to the back of the chair, his trunk is pushed forward and he ends up looking at his lap (see Figure 4.9). He then needs to scoot his hips forward in order to have a more level eye gaze. There are several solutions to this problem.

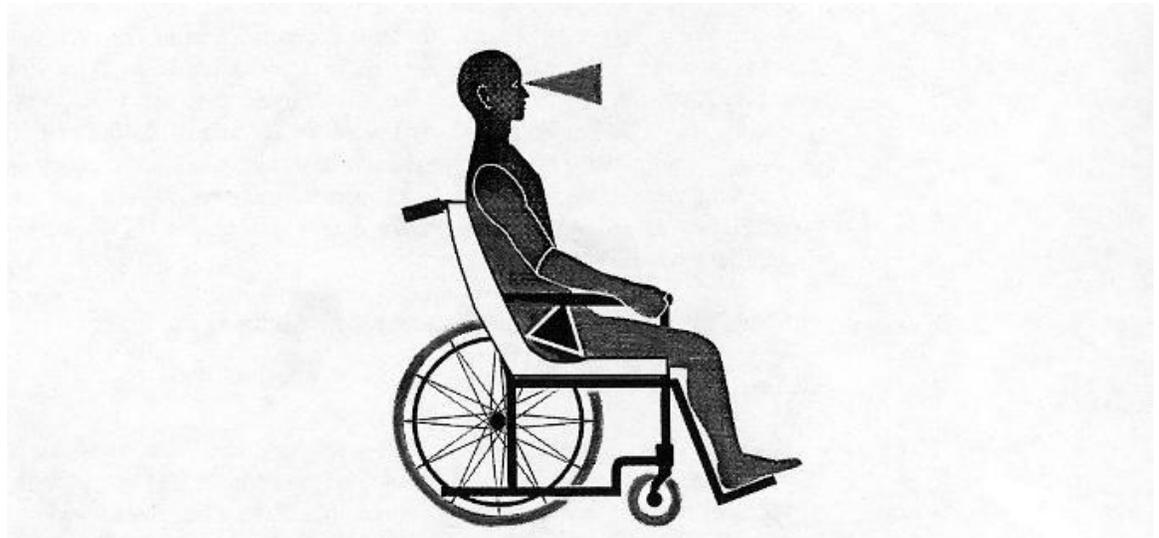
**Figure 4.9 Unaccommodated fixed kyphosis results in poor eye gaze**



- Attempt to reposition the person's hips to the back of the chair. If this is not possible, an evaluation is necessary to determine if there are fixed joint limitations, deformities, or muscle tightness.
- If the person's hips can be relocated to the back of the chair, see that his feet are supported – either flat on the floor or on footrests with adequate

support under the thighs. If the feet are not supported, a simple footrest adjustment may support the feet better. A different wheelchair with a lower seat-to-floor height may be indicated for the person who is a foot mobilizer and needs feet flat on the floor.

- Sometimes a positioning hip seat belt (either push-button or latch type) is needed to keep the hips in the proper place. A hip belt is not a restraint if the resident can take it off at will. However, if the resident cannot remove the hip belt independently, it is considered a physical restraint and less restrictive interventions should be considered.
- To accommodate a kyphotic spine, the back of the wheelchair needs to be reclined enough to allow for the deformity without compromising pelvic positioning (see Figure 4.10).
- It may be useful to consult a specialist for proper trunk placement, alignment for function, and appropriate choice of equipment.



**Figure 4.10** Accommodated fixed posture results in level eye gaze and improved comfort

### *Correct Equipment (Seating)*

A common reason for improper pelvic positioning is sling seating. This type of seating does not provide a level base on which to align the pelvis and thighs. Instead it tends to roll the resident's legs inward and support the buttocks and thighs unevenly. Many older wheelchairs have sling upholstery that is stretched out, increasing the hammocking effect and causing discomfort, pain, and sitting intolerance. As mentioned earlier, sling seating was intended for transportation purposes and to allow folding of the wheelchair, not for the long-term sitting in the way that many elderly clients use them. There are two ways to address this problem.

- Sling seating can be replaced with solid seating. Some solid seats are adjustable and can be lowered in order to reduce the seat-to-floor height; some also can be adjusted to angle the seat backward or forward to achieve an upright pelvis and position the pelvis back in the seat.
- A solid seat insert can be added across or between the seat rails of a wheelchair that has sling seating. Most solid seat inserts can be placed under the cushion or inside the cushion cover; this consolidates the pieces and may prevent improper placement. A cushion over the solid seat insert is necessary for comfort and positioning.

When the pelvis is positioned, the hips are positioned in the back of the wheelchair, and the back is supported to achieve upper trunk and head control, then the arm rest height should be adjusted to support the forearms comfortably. Unfortunately, many wheelchairs have fixed armrests that cannot be adjusted. The length of the armrests also needs to be considered. Full-length arm rests provide greater support for transfers. A desk-length armrest, however, allows the resident to pull up closer to a table or sink, which facilitates activities of daily living.

### **Goal 3: Minimizing Trunk Deformity, Maximizing Function**

#### *Need for Trunk Support*

Once the hips are in the proper position, it is time to observe the trunk. If a person has poor trunk control, the trunk tends to collapse, the shoulder girdle becomes rounded, and the arms are more difficult to raise, all of which make it more difficult to use the upper extremities. Improper trunk position can also affect head position, breathing, swallowing, eye gaze, and socialization.

First, are the hips to the back of the wheelchair? (If not, see “Correct Hip or Pelvis Positioning” above.) Once the hips are to the back of the chair, observe the trunk position. Is the person leaning to one side, or is he falling forward? Usually leaning is caused by weakness, upright spatial orientation problems, or improper pelvis positioning (see Figure 4.11).



**Figure 4.11 Leaning of the trunk**



**Figure 4.12 Trunk supported**

Remember, installing a lap tray to help the resident achieve an upright position is not appropriate. The enormous pressure this places on the arms and shoulder joints can cause pain, skin breakdown, and shoulder joint limitation over a period of time. Also, fatigue occurs from trying to hold up one's trunk weight with one's arms. If a person needs trunk support, try one of the solutions below.

- The pelvis can be positioned level and upright on a firm seating surface against a firm back.
- A slight recline in the back of the wheelchair will decrease the gravitational forward pull and support the trunk better. This can be accomplished by replacing the back upholstery of the wheelchair with a contoured back that can recline but maintain posterior pelvic stabilization.
- Side trunk supports may be necessary to assist a weak trunk. Side supports can be attached to the sides of the wheelchair or ordered as an option with the back component of a seating system. A three-point system, in which support is properly supplied in three places along the trunk (see Figure 4.12), can be used for placement of the lateral supports to maintain trunk alignment.
- Sometimes trunk weakness is severe enough to require a combination of a reclining back and a side support for proper positioning and improved functioning.

Remember: the pelvis is the starting point. Make sure the pelvis is properly positioned before attempting to support the trunk. If problems persist or equipment options are unknown, consult a seating specialist.

**Goal 4: Minimizing Abnormal Foot Position*****Assess Foot Position***

Feet need to be properly supported in order to maintain the position of the pelvis (with the hips to the back of the chair) and have effective mobility. Wheelchair foot rests are used to support the feet, but they may not be high enough or low enough to enhance positioning and function. A change in the position of the feet or the pressure on the feet can negatively affect trunk and pelvis position. For instance, if the foot rests are too high, the thighs are inadequately supported and more pressure is placed on the bony prominences of the pelvis (ischial tuberosities) which may lead to discomfort and skin breakdown. If the footrests are too low, there is too much pressure on the thighs and circulatory problems can as well as skin breakdown occur. If the footrests are placed too far out or if elevated leg rests are used, the resident may scoot out toward the edge of the wheelchair to decrease the stretch on tight hamstrings. If the person is a foot mobilizer and the seat is too high, he may scoot out to the edge of the chair to get the full foot support needed to achieve efficient mobility.

First, make sure the pelvis is all the way back in the wheelchair because this affects the position of the feet. Then try one of these solutions to the problem.

- Depending on the wheelchair, the footrests can be adjusted by loosening the bolt at the end of the footrest hanger. If the footrests cannot be adjusted to the proper height, a different wheelchair may be needed.
- If the angle of the footrest hangers needs to be altered because of hamstring limitations, another set can be ordered (if available), or a solid footplate can be reversed and attached with brackets to the footrests. This supports the feet while providing the knee flexion needed to allow the tight hamstrings some slack. Now the hamstrings no longer pull the pelvis forward at their origin: the ischial tuberosities.
- If the person cannot reach the floor without full foot contact for mobilization, the seat can be replaced with a solid drop seat to reduce the seat-to-floor height and allow better floor contact. A hemi-height wheelchair can also be considered for persons who use their feet for mobility. The hemi-height chair can be used in combination with a dropped seat (allowing for the seat cushion thickness, which can add 2-4 inches to the seat-to-floor height). If the wheelchair is still not low enough, it may be necessary to use a smaller wheel size, such as a 22- or 20-inch wheel, and a smaller caster wheel, to lower the chair closer to the floor. Very short people who need to reach the floor may need to use a combination of a hemi-height wheelchair and a dropped seat and smaller

wheels to achieve the proper seat-to-floor height (see Figure 4.13 a & b). This type of arrangement is referred to as a super-hemi-wheelchair. If it is difficult to make the proper adjustments, a seating specialist should be consulted.



**Figure 4.13a Solution: Proper foot plates**



**Figure 4.13b Solution: Feet placed on floor**

### **Goal 5: Maximizing Head Control to Facilitate Interaction**

#### ***Need for Head Support***

Once the hips and trunk are positioned properly, the head should be positioned properly. If the head is weak, proper head support is necessary for level eye gaze, orientation, and socialization. If the head is leaning too far forward, backward, or to one side, an assessment is necessary.

If the individual appears to have poor head control, a head rest and reclined back could be considered. A more sophisticated seating system may be required, and a seating specialist should be consulted.

### **Goal 6: Preventing Skin Breakdown**

Pressure sores can be caused by improper seating and prolonged sitting, especially among individuals who have poor sensation and are unable to reposition themselves. It is important to check the buttocks and back for persistent redness (lasting longer than 20 minutes) and any open skin areas. Individuals who have existing open sores need special attention if they sit in a wheelchair. Here are three approaches to preventing pressure sores.

- Always check the skin thoroughly after transferring the resident from the wheelchair. Pay close attention to the ischial tuberosities, sacrum, coccyx, and spinous processes.
- When a person is beginning to use a wheelchair, start slowly until the person has built up a tolerance for wheelchair sitting. This is especially necessary for cognitively impaired person who cannot tell you what is wrong and cannot reposition themselves.
- Pressure distributing cushions are available for wheelchairs (see Chapter 6). These types of cushions allow the person to sit with minor open skin areas or sensitive skin that is susceptible to skin breakdown. Again, constant skin monitoring is necessary to ensure that healing is promoted. A good pressure distributing cushion needs to be used in combination with regular pressure relief such as shifting weight off of the buttocks.

### **Goal 7: Achieving Reasonable Wheelchair Tolerance**

It is important to note the individual's wheelchair tolerance: How long does he sit in the chair, and what are his reasons for wanting to get out of the chair? If the person is agitated, irritable, crying, or asking to go back to bed, the person is probably uncomfortable and cannot tolerate sitting any longer. Long periods of sitting, especially when one is unable to move, may cause increased pressure on bony prominences, which in turn may lead to discomfort, pain, and skin breakdown because of decreased circulation to skin areas.

To solve this problem, decrease the amount of time the person spends in the chair or allow frequent rests out of the wheelchair until a more thorough assessment can be done to determine the reason for the resident's intolerance. Many times the seating arrangement is the problem, and a seating consultant may need to assist with evaluation and equipment selection.

This chapter has described the hazards of quick fixes and ways that seating problems can be corrected. The next chapter describes in detail the benefits of individualized seating for a variety of persons and problems.

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Jones, D. (1995b). Seating problems in long-term care. In Rader, J. *Individualized Dementia Care: Creative, compassionate approaches*, New York: Springer Publishing Company, 169-189.

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## **CHAPTER 5**

### **CASE STUDIES & DOCUMENTATION**

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This chapter presents three case studies, each including: a brief history of the individual; findings from the therapist's assessment; goals for seating; and seating solutions. In each case, the wheelchair assessment and prescription forms and prescription process worksheet are included. The cases presented in this chapter are seen in the accompanying videos.

### CASE 1 – BERTIE PORTER

Ms. Porter is an 86 year old woman who entered the nursing home with a diagnosis of a right hip fracture. In the standard wheelchair she is unable to tolerate being up for more than two hours because of complaints of fatigue and pain. She is unable to propel her own wheelchair because of cognitive problems. When up in a standard wheelchair with sling back and sling seat, she slides down after only 10-15 minutes, requiring constant repositioning by the staff. The staff tried restraining her with various devices (waist, vest restraints) but they were ineffective and she continued to slide and complain of pain. In addition, the staff recognized the dangers of restraint use, particularly when the person is sliding and the restraint tightens around the resident's chest (see Appendix A).

The nurse referred her to the physical therapist for an individualized seating assessment. The therapist identified the following problems:

- Fixed thoracic, kyphotic spine
- Fixed posterior pelvic tilt
- Limited hip flexion
- Right foot contracture
- Risk for skin problems
- Limited socialization secondary to fatigue, discomfort and poor eye gaze (she was looking at her lap)
- An x-ray revealed compression fractures of her spine

The identified seating goals for Ms. Porter are:

- To accommodate her contractors
- Support her pelvis to prevent sliding and discomfort
- Protect her skin
- Create level eye gaze
- Decrease pain

Identified solutions are:

- Contoured back cushion to accommodate her contractors
- Contoured seat cushion to support her pelvis
- Back and seat angle to permit level eye gaze
- Adjustable footplate for right foot contracture

There are a number of products on the market that have the needed characteristics. The therapist worked with the durable medical equipment (DME) supplier to develop a demonstration chair with those characteristics and Ms. Porter was placed in the chair for a trial period before the final decision was made about what equipment would best suite her needs.

Figure 5.1 is a copy of her wheelchair assessment and prescription form which includes justification for her equipment, that was submitted to the funding source. Table 5.1 is a copy of her prescription process worksheet.

In her new chair, Ms. Porter is able to be up for 11 hours a day, with a short nap in the afternoon. She sits comfortably in her chair and requires no repositioning or restraint of any kind. She is more social, being able to make eye contact easily, now that her contoured chair back is reclined slightly to accommodate for her forward head (secondary to kyphosis). She actively participates in her restorative rehabilitation program and enjoys attending activities.

## **CASE 2 – LIEZE HILL**

Mrs. Hill is 85 years old and suffers from osteoporosis, thoracic compression fractures, and shortness of breath. She was physically and cognitively able to move herself around in a wheelchair, but her initial chair was too wide, too tall and too heavy for her, making this very difficult and fatiguing. When she was assessed by the therapist the following problems were found:

- Difficulty propelling her chair
- Shortness of breath
- Discomfort
- Limited activity due to impaired mobility and fatigue

Her range of motion was within normal limits and she had no fixed contractors.

The seating goals for Mrs. Hill are:

- Conserve energy
- Support her pelvis
- Provide comfort

The seating solutions included:

- A wheelchair that fits her measurements
- Light weight wheelchair
- Contoured foam seat cushion
- Solid seat insert

Mrs. Hill and her family noted dramatic changes with her new chair. It allows her to be independent in her activities of daily living including transferring and toileting. She is able to easily propel herself around the building and can reach the sink to wash and groom herself. She is much more comfortable having her spinal fractures supported and being properly positioned may also decrease the risk of further fractures. Figure 5.2 is her wheelchair assessment and prescription form. Table 5.2 is her prescription process worksheet.

### CASE 3 – JAMES LABAR

Mr. Labar suffered a head injury that left him with physical and cognitive impairments, requiring that he receive nutrition through a gastric tube. He was completely dependent in all activities of daily living. He used a sling back, sling seat wheelchair for a while, but was unable to maintain his position and continuously slid out. As a solution, the caregivers placed him in a gerichair. Upon evaluation the therapist discovered the following problems:

- Fixed thoracic kyphotic spine
- Fixed posterior pelvic tilt
- Right hip flexion contracture
- Left hip adduction contracture
- Bilateral knee flexion contracture

The seating goals for Mr. Labar are:

- Accommodate contractors
- Protect skin
- Support pelvis
- Provide mobility

The seating solutions included:

- Contoured seat and back cushion to accommodate contractors and distribute pressure
- Right ankle strap and foot plate for bilateral foot support
- Power mobility

Mr. Labar was given a power wheelchair when one was donated to the facility. He is now able to move himself around the facility, requiring verbal cuing at times. He remains dependent in most other activities of daily living. However, in his more upright, active position, he was reassessed for swallowing abilities. He began eating by mouth with assistance and eventually his gastric tube was discontinued. This tremendously increased quality of his life and also resulted in significant savings in the cost of his care. Mr. Labar went from being captive and poorly positioned in a gerichair to having the freedom to move and eat. Table 5.3

outlines his problem solving process and Figure 5.3 is his prescription process worksheet.

These three cases clearly demonstrate the kind of gains that can be achieved in frail older persons when they are properly seated.



Figure 5.1

# WHEELCHAIR ASSESSMENT AND PRESCRIPTION

Client Name: Bertie Porter Date: 00/00/00

Diagnosis: Lumbar compression fractures L 1-3; fracture of neck of femur

Client/Care Provider Goals: Increase wheelchair tolerance & comfort

Age 87 Height 5' 2" Weight 109

### CURRENT EQUIPMENT ASSESSMENT

Wheelchair: Width 18  Standard  Lightweight  Hemi-height  Recliner  Geri W/C

Seat:  Sling  Solid  Contoured Back:  Sling  Solid  Contoured  Head Rest: (type) None

Front Riggings (foot rests):  Fixed  Removable  Swing away  None  Other (Type): \_\_\_\_\_

Arm Rests:  Fixed  Adjustable  Desk length  Standard length  Upper extremity support (type): \_\_\_\_\_

Restraint (describe): \_\_\_\_\_

### CURRENT MOBILITY

Upper extremities only  All extremities  Power  Lower extremities only  One arm, one leg  Unable to self propel Transfer Method: 2 person max. assist

Propulsion N/A meters/minute

### PHYSICAL ASSESSMENT: (Check appropriate box, add F mark if fixed posture)

- |  |  |
|--|--|
| <input checked="" type="checkbox"/> Posterior pelvic tilt (mild, moderate, <u>severe</u> ) | <input type="checkbox"/> Scoliosis (mild, moderate, severe)  |
| <input type="checkbox"/> Neutral pelvis  | <input type="checkbox"/> Rib hump  |
| <input type="checkbox"/> Pelvic obliquity L or R (low ASIS) _____ "                        | <input checked="" type="checkbox"/> Forward cervical flexion   |
| <input type="checkbox"/> Pelvic rotation L or R (forward ASIS) _____ "                     | <input checked="" type="checkbox"/> Capitol extension  |
| <input checked="" type="checkbox"/> Thoracic kyphosis (mild, moderate, <u>severe</u> )     | <input checked="" type="checkbox"/> Susceptible to skin breakdown Describe: <u>Redness-sacral region</u> |

### SUPINE ROM MEASUREMENTS:

Hip flexion: L 90 degrees R 90 degrees (Normal = 90° or more)

Knee flexion with hip flexed L 70 degrees R 70 degrees (Normal = 70° or less)

Ankle range with hip and knee in flexion L Neutral R 45 degree (Normal = neutral)  
Plantar flexion - fixed

### SITTING ASSESSMENT:

- Hands free  Hands dependent  Propped
- Leg length discrepancy  Yes  No
- Upper extremity requires support, R or L  Yes  No

Hip width: 17 Hip to knee length: 20 Lower leg length: 16

### OBJECTIVES:

Pelvis: Accommodate & support

Hip: Support & maintain 90 degree angle

Knee: Appropriate foot hangers

Ankle/Foot: Accommodate right ankle; support left

Trunk: Accommodate contracture, posterior stabilization

Head/Neck: N/A

Upper Extremities: Forearm support

Skin: Protect, distribute pressure

Mobility: N/A

Transfers: Stand - pivot with max. assist X1

Client Name: B. Porter

**PRESCRIPTION:** (Check appropriate box, fill in the blanks)

- Wheelchair**
- |   |   |   |  |
|---|---|---|--|
| <input checked="" type="checkbox"/> New | <input checked="" type="checkbox"/> Lightweight | <input type="checkbox"/> Tilt in space frame              | <input checked="" type="checkbox"/> Multi-angle foot plate |
| <input type="checkbox"/> Repair         | <input type="checkbox"/> Heavy duty             | <input type="checkbox"/> Frame w/adjustable axel position | <input type="checkbox"/> Foot hangers _____degrees         |
| <input type="checkbox"/> Modification   | <input type="checkbox"/> Hemi-height            | <input type="checkbox"/> Power                            | <input type="checkbox"/> Removable arm rest                |
| <input type="checkbox"/> Standard       | <input type="checkbox"/> Super hemi-height      | <input type="checkbox"/> Adjustable arm rest              |  |

Seat width 18 Make \_\_\_\_\_ Model \_\_\_\_\_ Serial # \_\_\_\_\_

Justification

- |   |  |
|---|--|
| <input checked="" type="checkbox"/> Capabilities have changed | <input type="checkbox"/> Lacks strength to propel heavy chair functionally                   |
| <input checked="" type="checkbox"/> No wheelchair             | <input type="checkbox"/> Cannot sustain upright posture due to motor impairment or weakness  |
| <input type="checkbox"/> Chair worn out or broken             | <input checked="" type="checkbox"/> Would be bed or chair confined without use of wheelchair |
| <input checked="" type="checkbox"/> Cannot ambulate           | <input checked="" type="checkbox"/> Requires mobility base for seating system                |

Powered Mobility (type): \_\_\_\_\_

Justification

- Lacks strength or endurance for independent mobility in manual chair  
 In trial has demonstrated ability to drive and potential for learning

- Seat Cushion**
- |   |   |   |
|---|---|---|
| Seat depth <u>20</u>                                      | Seat width <u>18</u>                              | <input type="checkbox"/> Notched for front riggings |
| <input checked="" type="checkbox"/> Large well space      | <input checked="" type="checkbox"/> Longer depth  | <input type="checkbox"/> Cut to drop between rails  |
| <input checked="" type="checkbox"/> Pressure distribution | <input type="checkbox"/> Cut for foot propulsion  | <input checked="" type="checkbox"/> Comfortable     |
| <input checked="" type="checkbox"/> Stable                | <input type="checkbox"/> Trough for hip deformity |   |
| <input type="checkbox"/> Other: _____                     |   |   |

Product	<input checked="" type="checkbox"/> Solid seat	<input type="checkbox"/> Custom model foam	<input type="checkbox"/> Air
Options	<input type="checkbox"/> Contoured foam	<input checked="" type="checkbox"/> Hybrid	<input checked="" type="checkbox"/> Seat belt

Justification

- |   |   |
|---|---|
| <input checked="" type="checkbox"/> Improved pelvic & trunk alignment     | <input checked="" type="checkbox"/> Reduce pain   |
| <input checked="" type="checkbox"/> Reduce sliding/thrusting out of chair | <input type="checkbox"/> Assistance in healing skin ulcer (size & stage of ulcer) _____ |
| <input type="checkbox"/> Reduce asymmetry                                 | <input type="checkbox"/> Provide maximum stability for function                         |
| <input checked="" type="checkbox"/> Accommodate fixed deformities         | <input checked="" type="checkbox"/> Reduce risk of skin breakdown                       |
| <input type="checkbox"/> Other: _____                                     |   |

Type Jay Active Warranty 2 years

- Back Support**
- |  |  |   |                                      |
|--|--|---|--------------------------------------|
| <input checked="" type="checkbox"/> Stable | <input checked="" type="checkbox"/> Posterior pelvic support | <input type="checkbox"/> Recline                          | <input type="checkbox"/> Other _____ |
| <input checked="" type="checkbox"/> Curved | <input checked="" type="checkbox"/> Lateral trunk support    | <input checked="" type="checkbox"/> Pressure distributing |                                      |

Product	<input checked="" type="checkbox"/> Solid base	<input type="checkbox"/> Foam
Options	<input type="checkbox"/> Sling w/ added support	<input type="checkbox"/> Hybrid
	<input type="checkbox"/> Lateral(s)	<input checked="" type="checkbox"/> Custom mold

Justification

- Firm support for posterior pelvic control  
 Accommodation for fixed postures  
 Lateral support because of poor postural control and/or scoliosis

Type SHS Personal Back Warranty 2 years

- Head Rest (type)** \_\_\_\_\_

Justification  Lacks head control and cannot hold head up without support

Follow-up Notes: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Supplier: Joe Supplier Phone Number: 555-1212

Funding Source: Medicaid

Therapist: Debbie Jones, PT Physician: William Smith, MD

**Table 5.1**  
**Prescription Process Case 1**

<b>PORTER</b>	<b>Assessment Findings</b>	<b>Objectives</b>	<b>Product Characteristics</b>	<b>Product Options</b>
Pelvis:	<ul style="list-style-type: none"> <li>◦ Fixed severe posterior pelvic tilt</li> <li>◦ Pain with movement</li> </ul>	<ul style="list-style-type: none"> <li>◦ Accommodate &amp; support pelvis</li> </ul>	<ul style="list-style-type: none"> <li>◦ Large well space</li> <li>◦ Longer depth cushion</li> <li>◦ Back support for pelvic stabilization</li> </ul>	<i>Product options are rapidly changing and should be determined with the assistance of a</i>
Hip:	<ul style="list-style-type: none"> <li>◦ Bilateral limitation to 90<sup>0</sup> flexion</li> <li>◦ Pain at end range</li> </ul>	<ul style="list-style-type: none"> <li>◦ Support &amp; maintain 90<sup>0</sup> angle</li> </ul>	<ul style="list-style-type: none"> <li>◦ 90<sup>0</sup> or &lt; seat to back angle</li> <li>◦ Longer depth cushion for femoral support</li> </ul>	<i>Durable Medical Equipment (DME) Supplier. The needed characteristics are usually found in a variety of products.</i>
Knee:	<ul style="list-style-type: none"> <li>◦ Bilateral 70<sup>0</sup> extension</li> </ul>	<ul style="list-style-type: none"> <li>◦ Provide foot hangers that do not exceed 70<sup>0</sup></li> </ul>	<ul style="list-style-type: none"> <li>◦ 80<sup>0</sup> foot hanger</li> </ul>	
Ankle/Foot:	Left - within normal limits Right - severe plantar Flexion contracture	<ul style="list-style-type: none"> <li>◦ Accommodate right ankle contracture to provide full foot support</li> </ul>	<ul style="list-style-type: none"> <li>◦ Right angle adjustment foot plate</li> <li>◦ Left foot plate</li> </ul>	
Trunk:	<ul style="list-style-type: none"> <li>◦ Sever fixed thoracic kyphosis</li> <li>◦ Lumbar compression fracture L 1-3</li> <li>◦ Hands-free sitter</li> </ul>	<ul style="list-style-type: none"> <li>◦ Accommodate for contractures</li> <li>◦ Posterior pelvic stabilization to decrease pressure on lumbar region</li> </ul>	<ul style="list-style-type: none"> <li>◦ Back support with contours to match client</li> <li>◦ Posterior pelvic stabilization</li> <li>◦ Back system with recline</li> </ul>	
Head & Neck:	<ul style="list-style-type: none"> <li>◦ Increased fixed cervical flexion</li> </ul>	<ul style="list-style-type: none"> <li>◦ Support &amp; accommodate trunk</li> <li>◦ Level eye gaze</li> </ul>	See trunk section	
Upper Extremities:	<ul style="list-style-type: none"> <li>◦ Shoulder internal rotation</li> <li>◦ Scapular protraction</li> </ul>	<ul style="list-style-type: none"> <li>◦ Provide forearm support</li> </ul>	<ul style="list-style-type: none"> <li>◦ Arm rests &amp; pads</li> </ul>	
Transfers:	<ul style="list-style-type: none"> <li>◦ Two person stand - pivot transfer</li> </ul>	<ul style="list-style-type: none"> <li>◦ Continue with current method</li> </ul>	<ul style="list-style-type: none"> <li>◦ Wheel locks</li> <li>◦ Removable foot hangers</li> </ul>	
Propulsion:	<ul style="list-style-type: none"> <li>◦ Unable to self propel a manual wheelchair</li> <li>◦ Not a candidate for power mobility</li> </ul>	<ul style="list-style-type: none"> <li>◦ Provide frame for seating system</li> </ul>	<ul style="list-style-type: none"> <li>◦ Manual wheelchair frame for seating system</li> <li>◦ Push handles for caregiver</li> </ul>	
Skin:	<ul style="list-style-type: none"> <li>◦ Redness on sacral region &amp; thoracic spinous processes</li> <li>◦ Unable to assist with pressure relief</li> </ul>	<ul style="list-style-type: none"> <li>◦ Protect skin</li> <li>◦ Decrease pressure where redness occurs</li> </ul>	<ul style="list-style-type: none"> <li>◦ Seat cushion &amp; back cushion with contours to distribute pressure</li> </ul>	



Figure 5.2

# WHEELCHAIR ASSESSMENT AND PRESCRIPTION

Client Name: Lieze Hill Date: 00/00/00

Diagnosis: Thoracic compression fractures, cellulitis, fractures of radius & fibula osteoporosis

Client/Care Provider Goals: Improve mobility

Age 83 Height 5' 7 1/2" Weight 113

### CURRENT EQUIPMENT ASSESSMENT

Wheelchair: Width 18  Standard  Lightweight  Hemi-height  Recliner  Geri W/C

Seat:  Sling  Solid  Contoured Back:  Sling  Solid  Contoured  Head Rest: (type) None

Front Riggings (foot rests):  Fixed  Removable  Swing away  None  Other (Type): \_\_\_\_\_

Arm Rests:  Fixed  Adjustable  Desk length  Standard length  Upper extremity support (type): \_\_\_\_\_

Restraint (describe): \_\_\_\_\_

### CURRENT MOBILITY

Upper extremities only  All extremities  Power Transfer Method: Stand-pivot

Lower extremities only  One arm, one leg  Unable to self propel

Propulsion \_\_\_\_\_ meters/minute

### PHYSICAL ASSESSMENT: (Check appropriate box, add F mark if fixed posture)

<input type="checkbox"/> Posterior pelvic tilt (mild, moderate, severe)	<input type="checkbox"/> Scoliosis (mild, moderate, severe)
<input checked="" type="checkbox"/> Neutral pelvis	<input type="checkbox"/> Rib hump
<input type="checkbox"/> Pelvic obliquity L or R (low ASIS) _____ "	<input type="checkbox"/> Forward cervical flexion
<input type="checkbox"/> Pelvic rotation L or R (forward ASIS) _____ "	<input type="checkbox"/> Capitol extension
<input type="checkbox"/> Thoracic kyphosis (mild, moderate, severe)	<input type="checkbox"/> Susceptible to skin breakdown Describe: <u>Redness-sacral region</u>

### SUPINE ROM MEASUREMENTS:

Hip flexion: L 100 degrees R 100 degrees (Normal = 90° or more)

Knee flexion with hip flexed L 60 degrees R 60 degrees (Normal = 70° or less)

Ankle range with hip and knee in flexion L Neutral R Neutral (Normal = neutral)

### SITTING ASSESSMENT:

Hands free Leg length discrepancy  Yes  No

Hands dependent

Propped Upper extremity requires support, R or L  Yes  No

Hip width: 15 Hip to knee length: 18 Lower leg length: 15

### OBJECTIVES:

Pelvis: Support & maintain movement

Hip: Support & maintain

Knee: Support feet on floor

Ankle/Foot: Place on floor

Trunk: Support pelvis

Head/Neck: Support trunk

Upper Extremities: Forearm support

Skin: Maintain integrity

Mobility: Decrease weight of equipment for energy conservation

Transfers: Extended brake handles

Client Name: L. Hill

**PRESCRIPTION:** (Check appropriate box, fill in the blanks)

**Wheelchair**

- New                       Lightweight                       Tilt in space frame                       Multi-angle foot plate
- Repair                       Heavy duty                       Frame w/adjustable axel position                       Foot hangers \_\_\_\_\_degrees
- Modification                       Hemi-height                       Power                       Removable arm rest
- Standard                       Super hemi-height                       Adjustable arm rest

Seat width 16                      Make \_\_\_\_\_                      Model \_\_\_\_\_                      Serial # \_\_\_\_\_

**Justification**

- Capabilities have changed                       Lacks strength to propel heavy chair functionally
- No wheelchair                       Cannot sustain upright posture due to motor impairment or weakness
- Chair worn out or broken                       Would be bed or chair confined without use of wheelchair
- Cannot ambulate                       Requires mobility base for seating system

Powered Mobility (type): \_\_\_\_\_

**Justification**

- Lacks strength or endurance for independent mobility in manual chair
- In trial has demonstrated ability to drive and potential for learning

**Seat Cushion**

Seat depth 18                      Seat width 16

- Cushion**                       Large well space                       Longer depth                       Notched for front riggings
- Characteristics**                       Pressure distribution                       Cut for foot propulsion                       Cut to drop between rails
- Stable                       Trough for hip deformity                       Comfortable
- Other: \_\_\_\_\_

- Product**                       Solid seat                       Custom model foam                       Air
- Options**                       Contoured foam                       Hybrid                       Seat belt

**Justification**

- Improved pelvic & trunk alignment                       Reduce pain
- Reduce sliding/thrusting out of chair                       Assistance in healing skin ulcer (size & stage of ulcer) \_\_\_\_\_
- Reduce asymmetry                       Provide maximum stability for function
- Accommodate fixed deformities                       Reduce risk of skin breakdown
- Other: \_\_\_\_\_

Type Basic cushion                      Warranty 1 year

**Back Support**

- Stable                       Posterior pelvic support                       Recline                       Other \_\_\_\_\_
- Curved                       Lateral trunk support                       Pressure distributing

- Product**                       Solid base                       Foam
- Options**                       Sling w/ added support                       Hybrid
- Lateral(s)                       Custom mold

**Justification**

- Firm support for posterior pelvic control
- Accommodation for fixed postures
- Lateral support because of poor postural control and/or scoliosis

Type Lumbar pad                      Warranty 1 year

**Head Rest (type)** \_\_\_\_\_

- Justification**                       Lacks head control and cannot hold head up without support

Follow-up Notes: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Supplier: Joe Supplier                      Phone Number: 555-1212

Funding Source: \_\_\_\_\_

Therapist: Debbie Jones, PT                      Physician: Dr. Smith

**Table 5.2**  
**Prescription Process Case 2**

<b>Hill</b>	<b>Assessment Findings</b>	<b>Objectives</b>	<b>Product Characteristics</b>	<b>Product Options</b>
Pelvis:	<ul style="list-style-type: none"> <li>◦ Flexible</li> </ul>	<ul style="list-style-type: none"> <li>◦ Support pelvis &amp; maintain dynamic movement</li> </ul>	<ul style="list-style-type: none"> <li>◦ Stable contoured cushion</li> </ul>	<i>Product options are rapidly changing and should be determined with the assistance of a</i>
Hip:	<ul style="list-style-type: none"> <li>◦ &gt; 90° bilaterally</li> <li>◦ Flexible</li> </ul>	<ul style="list-style-type: none"> <li>◦ Support &amp; maintain angle</li> </ul>	<ul style="list-style-type: none"> <li>◦ Contoured cushion</li> <li>◦ Seat to back angle 95°</li> </ul>	<i>Durable Medical Equipment (DME) Supplier. The needed characteristics are usually found in a variety of products.</i>
Knee:	<ul style="list-style-type: none"> <li>◦ &lt; 70° bilaterally</li> <li>◦ Flexible</li> </ul>	<ul style="list-style-type: none"> <li>◦ Support feet on floor</li> </ul>	<ul style="list-style-type: none"> <li>◦ Super hemi-height wheelchair</li> </ul>	
Ankle/Foot:	<ul style="list-style-type: none"> <li>◦ Flexible neutral ankle</li> </ul>	<ul style="list-style-type: none"> <li>◦ Full foot support on floor</li> </ul>	<ul style="list-style-type: none"> <li>◦ Super hemi-height wheelchair</li> </ul>	
Trunk:	<ul style="list-style-type: none"> <li>◦ Slight fixed thoracic kyphosis</li> <li>◦ Hands-free sitter</li> </ul>	<ul style="list-style-type: none"> <li>◦ Provide support</li> <li>◦ Stabilize pelvis</li> </ul>	<ul style="list-style-type: none"> <li>◦ Posterior pelvic stabilization</li> </ul>	
Head & Neck:	<ul style="list-style-type: none"> <li>◦ Flexible</li> </ul>	<ul style="list-style-type: none"> <li>◦ Support pelvis &amp; trunk</li> </ul>	See trunk section	
Upper Extremities:	<ul style="list-style-type: none"> <li>◦ Within normal limits</li> </ul>	<ul style="list-style-type: none"> <li>◦ Provide support to forearms</li> </ul>	<ul style="list-style-type: none"> <li>◦ Padded arm rests</li> </ul>	
Transfers:	<ul style="list-style-type: none"> <li>◦ Independent stand - pivot</li> </ul>	<ul style="list-style-type: none"> <li>◦ Maintain current transfer</li> </ul>	<ul style="list-style-type: none"> <li>◦ Wheel locks with extended handles</li> </ul>	
Propulsion:	<ul style="list-style-type: none"> <li>◦ Uses both upper &amp; lower extremities</li> </ul>	<ul style="list-style-type: none"> <li>◦ Conserve energy</li> <li>◦ Maintains mobility</li> <li>◦ Access to hand rims</li> <li>◦ Full foot support on floor</li> </ul>	<ul style="list-style-type: none"> <li>◦ Lightweight wheelchair</li> <li>◦ Super hemi-height</li> <li>◦ 16" wide</li> </ul>	
Skin:	<ul style="list-style-type: none"> <li>◦ No redness noted</li> <li>◦ No previous history of skin breakdown</li> </ul>	<ul style="list-style-type: none"> <li>◦ Maintain skin integrity</li> </ul>	<ul style="list-style-type: none"> <li>◦ Contoured comfortable cushion</li> </ul>	

Figure 5.3



# WHEELCHAIR ASSESSMENT AND PRESCRIPTION

Client Name: Jim Labar Date: 00/00/00

Diagnosis: Intracranial injury, hemiplegia, hypertension, atrial fibrillation

Client/Care Provider Goals: Improve posture; wheelchair tolerance and mobility

Age 84 Height 6' 2" Weight 182

### CURRENT EQUIPMENT ASSESSMENT

Wheelchair: Width 20  Standard  Lightweight  Hemi-height  Recliner  Geri W/C

Seat:  Sling  Solid  Contoured Back:  Sling  Solid  Contoured  Head Rest: (type) \_\_\_\_\_

Front Riggings (foot rests):  Fixed  Removable  Swing away  None  Other (Type): \_\_\_\_\_

Arm Rests:  Fixed  Adjustable  Desk length  Standard length  Upper extremity support (type): \_\_\_\_\_

Restraint (describe): \_\_\_\_\_

### CURRENT MOBILITY

Upper extremities only  All extremities  Power Transfer Method: Mechanical Lift  
 Lower extremities only  One arm, one leg  Unable to self propel

Propulsion N/A meters/minute

### PHYSICAL ASSESSMENT: (Check appropriate box, add F mark if fixed posture)

Posterior pelvic tilt (mild, moderate, severe)  Scoliosis (mild, moderate, severe)  
 Neutral pelvis  Rib hump  
 Pelvic obliquity L or R (low ASIS) \_\_\_\_\_ "  
 Pelvic rotation L or R (forward ASIS) \_\_\_\_\_ "  
 Thoracic kyphosis (mild, moderate, severe)  Forward cervical flexion  
 Capitol extension  
 Susceptible to skin breakdown Describe: Incontinent

### SUPINE ROM MEASUREMENTS:

Hip flexion: L 75 degrees R 90 degrees (Normal = 90° or more) Left hip 30 degrees fixed external rotation

Knee flexion with hip flexed L 80 degrees R 90 degrees (Normal = 70° or less)

Ankle range with hip and knee in flexion L Neutral R Neutral (Normal = neutral) fixed

### SITTING ASSESSMENT:

Hands free Leg length discrepancy  Yes  No  
 Hands dependent  
 Propped Upper extremity requires support, R or L  Yes  No

Hip width: 17 1/2 Hip to knee length: 20 Lower leg length: 17

### OBJECTIVES:

Pelvis: Accommodate contractures & support

Hip: Accommodate contractures on left side; support right side

Knee: Support & maintain angle

Ankle/Foot: Support & maintain angle

Trunk: Support, accommodate & maintain trunk position

Head/Neck: \_\_\_\_\_

Upper Extremities: Provide arm support

Skin: Protect, decrease pressure under sacrum

Mobility: Provide power mobility

Transfers: Maintain current method

Client Name: J. Labar

**PRESCRIPTION:** (Check appropriate box, fill in the blanks)

**Wheelchair**

- New                       Lightweight                       Tilt in space frame                       Multi-angle foot plate
- Repair                       Heavy duty                       Frame w/adjustable axel position                       Foot hangers \_\_\_\_\_degrees
- Modification                       Hemi-height                       Power                       Removable arm rest
- Standard                       Super hemi-height                       Adjustable arm rest

Seat width 18                      Make \_\_\_\_\_                      Model \_\_\_\_\_                      Serial # \_\_\_\_\_

**Justification**

- Capabilities have changed                       Lacks strength to propel heavy chair functionally
- No wheelchair                       Cannot sustain upright posture due to motor impairment or weakness
- Chair worn out or broken                       Would be bed or chair confined without use of wheelchair
- Cannot ambulate                       Requires mobility base for seating system

Powered Mobility (type): Right hand control

**Justification**

- Lacks strength or endurance for independent mobility in manual chair
- In trial has demonstrated ability to drive and potential for learning

**Seat Cushion**

Seat depth 20                      Seat width 18

- Cushion**                       Large well space                       Longer depth                       Notched for front riggings
- Characteristics**                       Pressure distribution                       Cut for foot propulsion                       Cut to drop between rails
- Stable                       Trough for hip deformity                       Comfortable
- Other: \_\_\_\_\_

- Product**                       Solid seat                       Custom model foam                       Air
- Options**                       Contoured foam                       Hybrid                       Seat belt

**Justification**

- Improved pelvic & trunk alignment                       Reduce pain
- Reduce sliding/thrusting out of chair                       Assistance in healing skin ulcer (size & stage of ulcer) \_\_\_\_\_
- Reduce asymmetry                       Provide maximum stability for function
- Accommodate fixed deformities                       Reduce risk of skin breakdown
- Other: \_\_\_\_\_

Type Jay 2                      Warranty 2 years

**Back Support**

- Stable                       Posterior pelvic support                       Recline                       Other \_\_\_\_\_
- Curved                       Lateral trunk support                       Pressure distributing

- Product**                       Solid base                       Foam
- Options**                       Sling w/ added support                       Hybrid
- Lateral(s)                       Custom mold

**Justification**

- Firm support for posterior pelvic control
- Accommodation for fixed postures
- Lateral support because of poor postural control and/or scoliosis

Type Jay 2 tall                      Warranty 2 years

**Head Rest (type)** N/A

- Justification**                       Lacks head control and cannot hold head up without support

Follow-up Notes: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Supplier: Joe Supplier                      Phone Number: 555-1212

Funding Source: \_\_\_\_\_

Therapist: Debbie Jones, PT                      Physician: William Smith, MD

**Table 5.3**  
**Prescription Process Case 3**

<b>Labar</b>	<b>Assessment Findings</b>	<b>Objectives</b>	<b>Product Characteristics</b>	<b>Product Options</b>
Pelvis:	<ul style="list-style-type: none"> <li>◦ Severe fixed posterior pelvic tilt</li> </ul>	<ul style="list-style-type: none"> <li>◦ Accommodate fixed contracture</li> <li>◦ Support pelvis</li> </ul>	<ul style="list-style-type: none"> <li>◦ Large well space</li> <li>◦ Deeper cushion</li> <li>◦ Posterior stabilization</li> </ul>	<i>Product options are rapidly changing and should be determined with the assistance of a</i>
Hip:	Left - limited to 75 <sup>0</sup> flexion & 30 <sup>0</sup> fixed external rotation Right - 95 <sup>0</sup> of flexion within normal limits	<ul style="list-style-type: none"> <li>◦ Accommodate contractures for left side</li> <li>◦ Maintain &amp; support for right side</li> </ul>	<ul style="list-style-type: none"> <li>◦ Seat cushion that can be modified for left side contractures</li> <li>◦ Right foot plate for both feet</li> </ul>	<i>Durable Medical Equipment (DME) Supplier. The needed characteristics are usually found in a variety of products.</i>
Knee:	Left - 80 <sup>0</sup> Right - 90 <sup>0</sup>	<ul style="list-style-type: none"> <li>◦ Support &amp; maintain angle</li> </ul>	<ul style="list-style-type: none"> <li>◦ Foot hangers to meet angle</li> </ul>	
Ankle/Foot:	<ul style="list-style-type: none"> <li>◦ Lacks dorsiflexion bilaterally</li> </ul>	<ul style="list-style-type: none"> <li>◦ Support &amp; accommodate feet in neutral position</li> </ul>	<ul style="list-style-type: none"> <li>◦ Foot plates for neutral position</li> </ul>	
Trunk:	<ul style="list-style-type: none"> <li>◦ Moderate thoracic kyphosis</li> <li>◦ Propped sitter</li> </ul>	<ul style="list-style-type: none"> <li>◦ Support, accommodate &amp; maintain trunk position</li> </ul>	<ul style="list-style-type: none"> <li>◦ Back support with contours to match client</li> <li>◦ Lateral trunk support</li> <li>◦ Posterior pelvic stabilization</li> <li>◦ Back system with recline</li> </ul>	
Head & Neck:	<ul style="list-style-type: none"> <li>◦ Increased fixed cervical flexion</li> </ul>	<ul style="list-style-type: none"> <li>◦ Support &amp; accommodate trunk</li> <li>◦ Level eye gaze</li> </ul>	See trunk section	
Upper Extremities:	<ul style="list-style-type: none"> <li>◦ Internally rotated shoulders</li> <li>◦ Pronated scapula</li> </ul>	<ul style="list-style-type: none"> <li>◦ Provide forearm support</li> </ul>	<ul style="list-style-type: none"> <li>◦ Padded arm rests</li> </ul>	
Transfers:	<ul style="list-style-type: none"> <li>◦ Dependent</li> <li>◦ Two man or mechanical lift</li> </ul>	<ul style="list-style-type: none"> <li>◦ Maintain current transfer</li> </ul>	<ul style="list-style-type: none"> <li>◦ Wheel locks</li> </ul>	
Propulsion:	<ul style="list-style-type: none"> <li>◦ Unable to propel manual wheelchair</li> <li>◦ Can drive power wheelchair with supervision</li> </ul>	<ul style="list-style-type: none"> <li>◦ Provide means to self mobilize</li> </ul>	<ul style="list-style-type: none"> <li>◦ Power wheelchair</li> </ul>	
Skin:	<ul style="list-style-type: none"> <li>◦ Redness sacral region</li> <li>◦ Unable to assist with pressure relief</li> </ul>	<ul style="list-style-type: none"> <li>◦ Protect skin</li> <li>◦ Decrease pressure under sacrum</li> </ul>	<ul style="list-style-type: none"> <li>◦ Seat cushion with contours to distribute pressure</li> <li>◦ Posterior pelvic stabilization</li> </ul>	

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## **CHAPTER 6**

# **KEEPING THE WHEELCHAIR AND SEATING SYSTEM IN WORKING ORDER**

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### **General Chair Maintenance**

As mentioned in Chapter 1, a wheelchair is made up of both the wheelchair frame and a seating system that has a seat and back section. Both the frame and seating system require general maintenance. There are some important things for caregivers to know about the general maintenance of the wheelchair frame, including the wheels. Things that should be checked routinely include tires, hardware, and wheelchair locks. Some tires require air and can go flat over time. When tires are flat it requires a great deal more energy to propel the chair. All the bolts and hardware should be checked to see that they are in place and tight. Wheelchair locks should also be maintained in good working order to prevent falls during transfers. Often the hair, food, dirt, and other debris that accumulates around the wheel axles (both the front casters and the larger wheels on the chair) should be removed so that the chair moves easily. Wheels also should be lubricated routinely for efficiency.

### **Maintenance of Seating System**

The seating system is made up of the seat cushion and back support. These also require proper care and maintenance. If the system has a sling seat, it is important to notice if the upholstery is stretched and therefore over slung or bowed, or torn. If it is, it should be replaced. As discussed throughout this manual, a solid seating system is generally better than a sling system, so if a sling system needs to be replaced the caregiver should try to get a better, more comfortable and supportive system installed in the chair.

To individualize seating, a variety of types of seat and back cushions may be used. Some have a fitted cover. Care and cleaning techniques vary according to the material the cushion is made from and the type of cover that is used. Three main types of cushions can be used for the seats and backs of chairs; foam, fluid, and air. Most covers are made of a special two-way stretch material that gives with the weight of the person and conforms to the shape of the cushion.

Covers are used to maintain the cleanliness of the cushion and prevent dirt and other debris from soiling or penetrating the cushion itself, for air exchange and to maintain the integrity of the cushion (hold the pieces and parts together). **It is important not to place a lot of thick material between the person and the cushion and cover.** Increasing padding over the individualized cushion often eliminates the positive effects created by the cushion. Most covers can be washed by hand or in a gentle washing machine. It is recommended that some covers be line dried or dried in a low temperature dryer. Labeling the cover and parts of the cushions with the person's name is useful. Generally, it is helpful to have at least two covers so that cleanliness can be more easily maintained.

### **Foam Cushions**

Foam cushions can be purchased or fabricated to meet a variety of needs. They come in many different densities (soft, medium, firm). Some foams are closed cell, which means that they do not absorb fluids, and some are open cell which means that they can absorb fluid. The foam also comes in a variety of shapes, sizes, and contours. In addition, foam cushions can be layered with different densities to increase comfort and stability. See Table 6.1 for the advantages and disadvantages of differently types of foam cushions. The foam cushions are generally the least expensive but they have the shortest life span. The material in foam can be fragile and break down over time and when exposed to urine, water, body heat and the pressure of sitting. Egg crate foam (those with finger type projections) may need to be replaced every two weeks to a month depending on the amount of use. Other foam cushions may last six months to a year. If the foam is older than the guidelines or warranty recommends, it probably is not providing much cushioning because the foam cells break down from use. Open cell foam cushions should be covered to prevent absorption of fluids. Egg crate cushions can be washed in the laundry. Other foam cushions may need to be sprayed with a disinfectant spray and allowed to dry thoroughly. A person with an open sore on the buttocks, sacrum, or coccyx should **NOT** be sitting on a plain foam surface because this will not provide enough pressure distribution. A contoured, custom molded, hybrid or air cushion rated for skin protection is required for a person with skin breakdown or at high risk for skin breakdown. It is also important to remember that a foam cushion will absorb fluids or drainage and this can create an infection control problem.

### **Hybrid Cushions**

A hybrid cushion is a fluid or air filled membrane that fits into a closed cell, contoured, foam base. Hybrid cushions are more expensive than foam cushions but will last years if properly care for. Hybrid cushions provide good pressure distribution and help prevent pressure sores caused by prolonged sitting. They often have a firm base to provide proper leg support.

**Table 6.1**

**TYPES OF WHEELCHAIR CUSHIONS**

<b>TYPE</b>	<b>ADVANTAGES</b>	<b>DISADVANTAGES</b>
<b>Foam: slab contoured</b>	<ul style="list-style-type: none"> <li>• Least expensive</li> <li>• Easily modified</li> <li>• Wide variety of characteristics</li> <li>• Little maintenance</li> <li>• Lightweight</li> </ul>	<ul style="list-style-type: none"> <li>• Difficult to clean</li> <li>• Shortest useful life (varies from 1-6 months)</li> <li>• Allows heat buildup</li> <li>• Allows moisture buildup</li> <li>• Poor skin shear protection</li> <li>• Pressure distribution varies</li> </ul>
<b>Foam: molded</b>	<ul style="list-style-type: none"> <li>• More expensive</li> <li>• Lightweight</li> <li>• Little maintenance</li> </ul>	<ul style="list-style-type: none"> <li>• Same as above</li> <li>• Skin shear protection varies</li> </ul>
<b>Hybrid: contoured foam base &amp; fluid filled</b>	<ul style="list-style-type: none"> <li>• Longer useful life</li> <li>• Reduces heat buildup</li> <li>• Reduces moisture buildup</li> <li>• Good skin shear protection</li> <li>• Good pressure distribution qualities</li> <li>• Cleanable</li> </ul>	<ul style="list-style-type: none"> <li>• Expensive to purchase</li> <li>• Can be punctured</li> <li>• Routine maintenance varies</li> </ul>
<b>Air</b>	<ul style="list-style-type: none"> <li>• Lightweight</li> <li>• Longer useful life</li> <li>• Reduces heat buildup</li> <li>• Reduces moisture buildup</li> <li>• Good skin shear protection</li> <li>• Good pressure distribution qualities</li> <li>• Cleanable</li> </ul>	<ul style="list-style-type: none"> <li>• Expensive to purchase</li> <li>• Can be punctured</li> <li>• Requires routine maintenance and occasional adjustment</li> <li>• May be unstable for transfers</li> </ul>
<b>Fluid: gel water</b>	<ul style="list-style-type: none"> <li>• Reduces heat buildup</li> <li>• Cleanable</li> </ul>	<ul style="list-style-type: none"> <li>• Heavy</li> <li>• Allows moisture buildup</li> <li>• Poor skin shear protection</li> <li>• Poor pressure distribution</li> <li>• Unstable for transfers</li> <li>• Can be punctured</li> </ul>

The fluid or air is sealed in a pliable plastic shell and can be quickly cleaned by spraying with a disinfectant and wiped dry. Be sure the fluid or air pad is properly placed on the base after cleaning. The fluid or air pad protects the skin by allowing the bones to sink down into the medium, increasing the amount of surface to skin contact and therefore decreasing pressure and shearing on any one point. This is why it is important not to place thick materials, such as incontinence pads, between the resident and the cushion. Also, it is best if the skin is not placed directly on the cushion. Care should be taken not to set objects on top of the cushion that could cause a tear or puncture (e.g., foot rests). See Table 6.1 for the advantages and disadvantages of hybrid cushions.

### **Air Cushions**

Air cushions provide good pressure distribution, but have to be specially adjusted for each individual by someone trained in their use. Too little air in the cushion can sink the resident too low, causing the bones of the pelvis to "bottom out" onto the base of the cushion which can cause pressure sores or worsen existing ones. Too much air will eliminate the pressure distributing qualities of the cushion. Individuals are also at risk for sliding off an over inflated air cushion. Only a thin material or the cushion cover should be placed between the individual and the cushion. The air cushion cover is usually made of a special two-way stretch fabric and can be hand washed when soiled and hung to dry. The rest of the cushion can be sprayed with a disinfectant and dried thoroughly. Be sure to wash and dry between the individual cells of the air cushion. Air cushions can be punctured if sharp objects are placed on top of them. Take notice when the individual is sitting on the cushion to see if the air looks too low, and notify a consultant if you suspect it may be leaking air. Petroleum products like Vaseline and A&D ointment can break down the rubber on some air cushions and cause leaks, so they should not come in contact with the cushion.

### **Fluid Cushions**

Fluid cushions are more expensive than foam cushions but last longer. The fluid is either of a gel or water consistency. The fluid is captured in a section of the cushion of bladder and can be easily wiped clean. It has limited ability to conform to the body shape and may be unstable for transfers (see Table 6.1).

Although some cushions are costly, a well maintained proper cushion can provide greater independence and improved quality of life for residents. It is important that caregivers take good care of them so they last. A system should be developed for regular cleaning and maintenance of cushions. Sometimes damaged cushions can be repaired or replaced depending on the warranty. The caregiver should contact the manufacturer or supplier for details. Caregivers can help individuals improve their quality of life by helping to maintain equipment so as to provide the best possible benefits for the longest period of time.

**Suggestions Related to Seating Equipment in Institutional Settings**

Institutional settings sometimes have difficulty using seating equipment properly, because the parts are used improperly (for example, the seat cushion may be placed in the chair backwards) or the parts become lost. One technique that helps minimize the risk is to carefully label all parts with the person's name and also label characteristics, such as front and back, left or right on the pieces. Another useful strategy is to take photographs of the properly equipped chair both with the resident in and out of the chair, for the staff to refer to. It is most useful if this photo is placed in the resident's room so it is accessible to staff.

When thinking about an institutionally owned or purchased fleet of wheelchairs, several things should be kept in mind. These include type of seats and backs, weight, width and height of chairs and routine maintenance. When replacing or upgrading wheelchairs, facilities should select not only durable wheelchairs but also lightweight and adjustable wheelchairs. The wheelchairs should have armrest and foot plate adjustments that accommodate several different sizes of people and provide proper support. It is recommended that the hemi-height wheelchair be the standard issue for nursing homes. It is useful to have a variety of widths available also (14", 16", 18" & 20"). Solid seats with contoured foam or hybrid bases are preferable. Also, solid seat backs with pelvic support, deformity accommodations and upright postural control are recommended.

A variety of types of wheelchairs are available. A lightweight wheelchair is best for most older residents because of their upper extremity weakness and inability to efficiently propel a standard-weight wheelchair. This is even more important if floors are carpeted, since moving on carpet requires more energy than moving on a wood or vinyl surface. If a person is a foot propeller, it is important for staff to familiarize themselves with current types of wheelchairs and accessories in order to make the proper selection. It may be necessary to begin by removing the current sling upholstery from the wheelchair and replacing it with dropped solid seats and contoured padding until the mobility base can be replaced by a newer, more versatile, and durable lightweight wheelchair. Several commercially available cushion systems allow a lower seat-to-floor height.

**Care and Maintenance**

Ongoing in-services which include all of the staff are necessary to teach staff the proper use and maintenance of wheelchair equipment and accessories. It is also necessary to point out the improved positioning achieved as well as the functional advantages of proper positioning. If staff members are not trained in the wheelchair maintenance program, items could be lost, misplaced, or not applied correctly.

## **CHAPTER 6      Keeping The Wheelchair & Seating System In Working Order**

It is not enough for an individual to have a wheelchair assessment and receive improvement equipment. Unless caregivers are skilled in using and maintaining the equipment on a daily basis, the individual will not reap the benefits.

As noted in this manual, it is important that individuals be given the opportunity to be comfortably seated. Professional caregivers and family members have an opportunity and responsibility to pursue better seating options for the people they care for and about.

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**APPENDIX A**

**GUIDELINES FOR POTENTIALLY  
RESTRICTIVE DEVICES**

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# **GUIDELINES AND INFORMATION SHEET RELATED TO THE USE OF POTENTIALLY RESTRICTIVE DEVICES**

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**Coordinating Committee for Improving the Quality of Care in Oregon Nursing Homes  
Revised 3-20-98**

## **Introduction**

This document is designed to clarify the current philosophy of care in relation to the use of potentially restrictive devices, and to provide guidance about when these devices are considered physical restraints. The line between "enabling" or "restraining" an individual is sometimes unclear. The best way to decide is always to look at the effect a device has on the individual. What the device is called ("restraint" or "support" or "enabler") is less important than what it does to or for the person. For example, in some cases a device may meet the definition of a restraint and yet enable the individual to function at a higher level. This document reviews the categories of devices: tie-on, side rails, other adjacent devices, various alarms and secured doors, to help clarify their appropriate use.

The issue of restraint use must be examined as part of a whole philosophy of care. The overuse of physical restraints and other restrictive devices in health care settings is a symptom of the larger problems created by a "safety at all costs and medical model" mentality inappropriate to the needs of frail elderly.

The nursing home reform act that went into effect in 1990 encourages a philosophy of individualized care that calls for creativity and constant reexamination, rather than rote, standardized approaches to care. As caregivers move to a philosophy of care that honors the resident's dignity and choice, restraint use decreases and even becomes obsolete. In the U.S. this is an evolving process, and what is written here today as accepted practice may become unnecessarily restrictive and obsolete as we continue to learn new ways of thinking about and caring for the whole person in health care settings.

The use of any medical equipment (wheelchair, siderails, walkers, seatbelts, positioning devices) should be based on a thorough interdisciplinary assessment to determine the equipment's purpose, appropriateness, safety, and benefits. As with any other treatment, the resident or person with legal authority to make care decisions for the resident, must be consulted and consent obtained. This process should be documented whether or not the device is considered a restraint. The usefulness of a device should also be periodically reevaluated. When any restrictive device is used, it is essential to follow the standard practice of frequent position changes, toileting and exercise.

All forms of restraints have been identified as having numerous negative and dangerous consequences, and certain behaviors and circumstances involving restraint use have been identified as particularly hazardous. For example, if a tie-on restraint and/or siderail is used, and an individual attempts to get out of bed, the restraint and siderail become dangerous and potentially life threatening, therefore, they should not be utilized as medical treatments and certainly should not be presented as "safety devices" (Miles, 1996; Miles & Irvine, 1992; Parker

& Miles, 1997). A person with health care decision making authority (i.e., with durable power of attorney for health care, or a guardian) can only make decisions related to appropriate medical options and therefore can not demand that a device be used when it has been assessed as being an inappropriate or unsafe medical treatment.

In its Interpretive Guidelines for nursing home surveyors, the Health Care Financing Administration (HCFA) provides the following definition of restraints:

"Physical restraints" are 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.

"Physical restraints" include, but are not limited to, leg restraints, arm restraints, hand mitts, soft ties or vests, lap cushions and lap trays the resident cannot remove. Also included as restraints are facility practices that meet the definition of a restraint, such as: using bed rails to keep a resident from voluntarily getting out of bed as opposed to enhancing mobility while in bed; tucking in a sheet so tightly that a bed bound resident cannot move; using a wheel chair safety bar to prevent a resident from rising out of a chair; placing a resident in a chair that prevents rising; and placing a resident who uses a wheelchair so close to a wall that the wall prevents the resident from rising.

(State Operations Manual, July 1995, F tag 222, section 483.13(a))

However, this definition still leaves providers and regulators with questions about what is recommended practice and when certain types of devices are or are not considered restraints. The following information is offered in the hope that it will assist those involved to further expand their thinking and explore new actions.

## **The Use of Attached, Tie-On Restraints**

### Philosophy and Recommended Practice

Tie-on restraints (such as vest, waist, pelvic, extremity) are considered to be out-of-date, unnecessary and inappropriate except in extraordinary life threatening circumstances, or when the safety of the resident or another person is immediately threatened. This type of restraint should rarely, if ever, be used in health care settings. Even in life threatening situations, such restraints should only be used for brief periods when all alternative measures have failed. Because of their negative side effects, any use of these devices for positioning is to be avoided; this is especially true since there are other more appropriate/effective measures available for positioning/physical support. A physical or occupational therapy consult often is useful in developing alternative solutions.

### When is a Tie-On Device a Restraint?

Any tie-on device that restricts movement or access to one's body is considered a restraint.

## **The Use of Side Rails**

### Philosophy and Recommended Practice

There is no evidence that siderails promote safety (Rubenstein, Miller, Postel & Evans, 1983), and they may cause serious injuries and death if residents climb over them or become entangled in them (Parker & Miles, in press). There are other negative consequences of siderail use: creating noise, obstructing vision, separating the care receiver from others, creating a sense of

being trapped or jailed and potentially causing trauma if the person's body strikes them. (Donius, Rader, 1994). Their use to prevent individuals from getting out of bed when they wish is inappropriate and potentially dangerous. Staff need to develop their assessment skills and increase the use of alternative interventions if there is a perceived risk. Caution is necessary in using split rails because there have been reports of injury and deaths when individuals were trapped in the narrow space between the two rails (Miles, 1996). The combination of a tie-on restraint and siderails for individuals who attempt to get out of bed is particularly dangerous and should not be offered as an option, to either residents or other persons with decision making authority. A facility can comply with a request to use a siderail as a restraint only if there is a medical symptoms that would justify its use. (HCFA memorandum, 2-10-97). It is also important to confirm proper selection and fitting of siderails to the bed and the size of the mattress (Parker & Miles, in press) particularly with confused or restless persons, to prevent entrapment of the resident between the rails and mattress.

There are situations in which siderails are useful for enhancing bed mobility. Some residents choose to use them for this reason. (Overhead trapeze or bed bar are other alternatives to assist with bed mobility.) Also, some residents may request rails to feel more secure. In either of these cases, half or three-quarter length rails or a rail up on one side would be sufficient to assist the resident in turning or getting out of bed, and to prevent accidental falling out of bed.

Developing other safety interventions to replace traditional siderail use requires careful thought. Switching from full to half rails or no rails does not automatically make the situation better. Nor does placing the bed on the floor. All devices must be individually and carefully assessed for how they affect the safety, burden, comfort and well-being of the individual.

#### When are Siderails a Restraint?

Siderails that impede an individual from getting out of bed are considered to be a restraint. If the resident chooses to have a siderail up, in most cases, it is not a restraint unless the siderail interferes with desired movement or activity. If the rails are used to prevent a comatose or immobilized individual from falling out of bed it may not be necessary, but the rails are not a restraint because the person is not trying to leave the bed.

### **The Use of Other Adjacent Devices**

#### Philosophy and Recommended Practice

Other devices that can restrict mobility include reclining chairs, gerichairs, beanbag chairs, lap trays, wheelchair bars, lap cushions and seat belts. Well padded, comfortable reclining or tilted chairs are good for meeting a severely debilitated, immobile person's need to get up and out of bed. Reclining chairs and gerichairs may also be appropriately used for brief periods when an individual paces continually and a rest period is needed to prevent fatigue. A chair with a tray table that the resident is unable to remove may be useful when the individual has difficulty sitting still long enough to eat a meal. However, such devices should be used only after other, less restrictive interventions such as finger food or "food or drink on the run" have been tried and found ineffective. Chairs that prevent desired movement should be used for very limited periods (generally) not to exceed one hour) and only after a thorough interdisciplinary evaluation has been done to assure that the chair is the least restrictive, most comfortable alternative. If using a chair to restrict mobility causes the person to become more distressed, its use is not appropriate.

Many residents would benefit from an individual seating assessment by a PT or OT to determine if some additional form of support is needed and what seating solution would best maximize comfort and function. The old style gerichairs and sling back, sling seat wheelchairs lack comfort and support. They should gradually be replaced with newer, more individualized seating systems.

At times a half tray or lap board on only one side can provide needed support to the limb of a person with a stroke. Also, a portable lap tray may be useful for letter writing, meals, hobbies, etc. A full lap board used full time is often overly restrictive and unnecessary. Residents using a seatbelt or lap tray for positioning and/or function should be able to release the device if they wish. The use of lap cushions, tray tables or wheelchair bars for support and positioning often does not address the underlying problems such as fatigue, discomfort or poor trunk support. A PT or OT seating assessment should be done to determine the best approach.

There are specialized walkers (Merry Walker, Ultimate, Chariot) that surround the person and "walk" with them. These often enhance mobility and safety for persons such as those with dementia or Parkinson's disease who have poor balance, endurance, and judgment, but wish to walk unassisted. It is critical that the person be carefully assessed (PT, OT) to assure that the walker is the appropriate device for the individual and the appropriate size, so that it truly enhances, rather than restricts mobility.

Seat belts can be useful in some residents who need to have their pelvis stabilized to enhance posture, comfort and/or mobility. However, it is important that the seatbelt be properly positioned on the chair. Generally, this means coming up from a 60-90 degree angle from the chair and extending over the upper thigh. The most common placement seen is at a 45 degree angle from the back of the chair seat so that the seat belt fits over the abdomen. This is constricting and uncomfortable. In addition, it is dangerous, as the resident is more likely to slide down and under the seat belt, resulting in possible injury. Seat belts should have a clasp that is self-releasing.

Wedge cushions need to be used with caution. Some residents have such limited hip range of motion that a wedge cushion results in the pelvis pushing forward out of the chair. Also, if the cushion raises the person's feet off the floor and he/she propels with the feet, the cushion becomes a restrictive intervention. These are some of the reasons why it is advisable to get a seating assessment done by a PT or OT when problems exist.

#### When is an Adjacent Device a Restraint?

An adjacent device is a restraint if it prevents the individual from moving when he/she wishes (even if for only brief periods). A reclining chair used to provide a change of position or a way to get out of bed for a very debilitated non-ambulatory person or a way to move the person from place to place is not a restraint. A specialized walker is not a restraint when it is used to enhance the resident's mobility. If the person can walk well without the device and objects to its use, it would be unnecessarily restrictive. If the person continuously objects to its use, it is probably not appropriate and would be considered a restraint.

If a lap cushion or lap tray is used to provide support for an individual who is not attempting to stand or trying to lean forward, it would not be considered a restraint but it may not be the best seating option. If the lap tray or lap cushion is used to prevent rising or purposeful leaning forward, it is a restraint.

If a seatbelt prevents the person from standing and they are unable to release it, it is a restraint. If a wedge cushion prevents the person from propelling his/her chair, it would be a restraint.

## **The Use of Position Change, Pressure Change and Body Alarms**

### Philosophy and Recommended Practice

Alarms that sound when a person begins to move can be effectively used to determine the resident's usual pattern of movement so that staff can anticipate needs and actions, and develop an appropriate individualized plan of care. Alarms can be useful to alert staff when people with potentially unsafe ambulation are beginning to move, and they have been used effectively as a substitute call light for those who are unable to remember or comprehend the purpose of a call light. If too many of these are in use in one area, however, their effectiveness decreases. If the alarm stops individuals from moving when they desire, or if staff continuously tell the person to sit down rather than asking what they need when the alarm sounds on standing, it is restrictive. The goal is to maintain and improve mobility; therefore, devices used consistently to restrict movement are counterproductive.

Because an alarm is a medical device, a thorough interdisciplinary assessment should be done prior to initiating its use, and the purpose, benefits and burden should be addressed. Its use should be routinely reevaluated.

### Are Position Change Alarms Restraints?

The devices themselves are not considered to be physical restraints. But if staff respond by routinely restricting a person's mobility when the alarm is activated, the facility's response would be considered inappropriately restrictive.

## **Personal Wrist and Door Alarms**

### Philosophy and Recommended Practice

Some residents who are at risk for wandering out of a facility or into unsafe areas may wear a wrist/ankle device that causes the door to set off an alarm or the door to lock when they approach or try to exit. This type of device should be chosen only after a thorough assessment has been done to determine the meaning of the wandering behavior and other types of interventions have been tried. Some residents with exit seeking wandering behaviors may be at risk for injury if they wander out of a building or unit unaccompanied. The level of risk will vary depending on a number of factors such as the mobility status of the resident and the location of the facility. Personal alarms, or door alarms can be a useful safety device for some residents. How staff respond to the individual's desire to leave determines how restrictive the intervention is. If staff accompany the resident or try to use distraction and substitution of activity, the resident may not feel he/she is restricted. In order for the alarm device to be considered appropriate, an interdisciplinary assessment should clearly identify that the benefits of the device outweigh the burden for the individual.

### Are Wrist and Door Alarms Restraints?

These devices may restrict access depending on how staff respond, but they are not considered to be physical restraints.

## **Secured or Locked Units**

### Philosophy and Recommended Practice

Some facilities have installed doors on particular units and doors to the outside that are coded so that they may not be opened without punching in a code. As with persona wrist and door alarms, these can be useful safety interventions. How staff respond to a person's desire to leave determines how restrictive these doors are. Because they restrict access to other parts of the facility, other services and other people, they will not be appropriate for many residents. As with any restrictive intervention, a locked unit should only be considered after other alternatives have been tried and an interdisciplinary assessment has clearly identified that the benefits of the locked unit outweigh the burden for the individual.

### Are Secured or Locked Units Restraints?

Although these devices limit access to certain areas (depending on how staff respond) and therefore are restrictive, they are not considered to be physical restraints.

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## **APPENDIX B**

### **INFORMATION FOR INDIVIDUALIZING CARE & REDUCING RESTRAINTS**

- **Interventions for Individualizing Care Related to Specific Behaviors**
  - **Guidelines for Use of Low Beds**
  - **Guidelines for Use of Position Change Alarms**
  - **Siderail Decision Tree**
- 
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## **Interventions for Individualizing Care Related to Specific Behaviors**

The following "useful interventions" are meant to stimulate creativity and problem identification and resolution. The list is organized around the behaviors that most commonly lead to the use of restraints, and it gives types of interventions to explore with each behavior.

### **Ruling Out Medical Illness**

There are so many physical and medical interventions such as ruling out medical illnesses, treating medical illness when possible, toileting routinely, and managing pain -- that this list does not include them all. **The assumption is that you, along with the other health care team members, will consider those types of interventions before looking at environmental, psychosocial, and activities approaches.** In most cases, the medical-physical evaluation should precede the use of other interventions.

Some of the interventions/devices listed, like a chair tilted back or gloves on the hand, may be a restraint for some individuals at some times.

The list of interventions below can be utilized for specific behaviors such as falling, wandering, and climbing out of bed. Most devices or products listed can be found in the resource list (Appendix C).

### *Environmental Interventions*

- Have wheelchair or seating assessment done by physical therapist or occupational therapist
- Have wheelchair back and seat adjusted to create slight tilt back and wedge
- Try a type of specialized cushion
- Create a nonslip surface by using a variety of products: Dycem, Scoot-gard, nonslip rug backing, Rubbermaid shower or bath decals or bath mat. Place between cushion and wheelchair seat; **NOT** under the client. (The costs of these products vary but often the cheapest works fine.)
- Try overbed table
- Try self-releasing seat belts
- Try foam formed pads

- Adapt a wheelchair with extended, padded back (this can be fabricated or purchased). Try types of alerting devices and position change alarms (Personal alarms, Ambularm, Chair Sentinel, Posey Sitter, Tabs).
- Try having the person sit in a variety of types of chairs during the day
- Try a Lazy-Boy type reclining chair

Sometimes a combination of these approaches is necessary to solve the problems. For example, you may need to use both a reclining chair and an alerting device.

#### *Psycho-Social/Activity Interventions*

- Place the individual within view of caregivers
- Place interesting activities or objects in front of the person
- Coordinate regular visits from family, friends and or volunteers
- Try video-respite and or music from radio or headset

### **Behavior Related to Falling: Unsafe Mobility**

#### *Environmental Interventions*

- Have a seating and mobility assessment done by the physical therapist or occupational therapist.
- Use a position-change alarm: Ambularm, Chair Sentinel, Posey Sitter, Tabs, Radio Shack or other personal alarm
- Try pressure-change alarms: Bedcheck, Code Alert, Posey Sitter, Virgil 88 (guidelines for use of these alarms are given in Appendix B)
- Attach bells on lap robe, blanket, siderails, or shoes
- Place the bed lower to the floor to allow the resident's feet to touch the floor (see Appendix B)
- Check for appropriate shoes (a shuffling gait may require a sole that can slide)
- Remove unnecessary objects that might cause the resident to trip
- Assess the use of furniture with wheels and furniture that is unstable; remove if it is used by the resident for support
- Provide adequate lighting
- Monitor activity in the individual's room with a nursery intercom walkie-talkie (Mattel, Fisher-Price, etc.). Be sure to inform the person that this is in use and turn it off at their request.
- Provide supportive, assistive devices and keep them within reach of the individual (these include glasses and hearing aids if appropriate)
- Place a commode at the bedside

- With assistance from consultants, assess the use of various walkers - Chariot, Ultimate, Able Walker
- Use a nonslip bath mat or rug at the bedside or commode to improve traction (this is particularly helpful if the person is prone to slipping in his/her own urine)
- Try nonskid-bottom socks: You can purchase these or make them by using plain socks and rubberized fabric decorating pens to put nonslip lines on sock bottoms
- Try exit alarms that emit a beep when crossed (Radio Shack or Alert Care Exit Alarm, Sentry II)

*Psycho-Social/Activity Interventions*

- Anticipate the individual's needs
- Learn the person's past patterns and coping styles, toileting schedule, and habits
- Use balance boards or exercise pedals (restorators) while the individual is seated to improve balance and endurance
- Provide frequent accompanied walks; include family and show them how to assist their family member if appropriate
- Use naturally occurring opportunities to assist individuals to walk to and from the bed, bath, and meals instead of using a wheelchair
- Develop a routine exercise program geared to the individual's level of participation

**Behavior: Standing Unsteadily but Generally Lacking Ability to Walk**

*Environmental Interventions*

- Have a seating and mobility assessment done by a physical therapist or occupational therapist
- Place the individual's bed in a low position so that his/her center of gravity and bend of the knee make it hard for them to come to a standing position
- Try a Chariot or Ultimate Walker
- Try position change alarms

*Psycho-Social/Activity Interventions*

- Offer adequate stimulation and small group gatherings
- Offer the individual things to fiddle with and/or look at
- Try giving the person an apron, with dust rags and other objects in the pockets
- Try dolls or stuffed toys to provide comfort or diversion
- Try playing favorite music on Walkman type headset

## **Behavior: Climbing or Falling Out of Bed**

### *Environmental Interventions for Individuals Who Are Going Over the Siderails*

- Put the rails down; it becomes a hazard, not a safety device
- Re-assess the safety plan
- Have a mobility assessment done by a physical therapist or occupational therapist
- Place the individual in a low bed (guidelines for the use of low beds are given in Appendix B)
- Place the individual's mattress on a futon frame
- Place the mattress on the floor
- Use three-quarter - or half-length siderails to prevent rolling out of bed. (Be sure that there is a good fit between size of mattress and siderail, to prevent entrapment of the person between the rails and mattress. Deaths have occurred in this way.)
- Use a position-change alarm: Personal alarm, Ambularm, Tabs, Radio Shack (see Appendix B)
- Use a pressure-change alarm: Bed Check, Posey Sitter, Code Alert, Vigil 88 (see Appendix B)

### *Psycho-Social/Activity Interventions for Individuals Who Are Going Over the Siderails*

- Monitor activity in the room with a nursery intercom, walkie-talkie or call system (Sentry II)
- Try sitting with the person and soothing him with talk or touch to help him fall asleep or at least calm down
- Get the person out of bed, even at night; provide food and drink
- Try relaxation tapes or music
- Identify activities that the individual finds pleasurable
- Bring the individual into a lighted area

## **Behavior: Exit-Seeking Wandering**

### *Environmental Interventions*

- Decrease the noise and confusion level
- Eliminate the phone or create a "quiet time"
- Use simple signs and way-finding cues
- Personalize individuals' rooms
- Set up multiple socializing and sitting areas
- Provide textures and objects to touch
- Use "stop" signs
- Develop safe, enclosed outdoor and indoor wandering areas

- Make sure there are numerous safe things for wanderers to touch
- Make the environment more homelike - family pictures, the individual's own furnishings
- Decrease through traffic if possible
- Use personal wander bracelet alarms (Sentry II, Wanderguard)
- Develop an emergency plan in case an individual wanders away
- Plan proactively with family, police, etc., for the possibility that an individual with dementia may wander away
- Install door alarms

### *Psycho-Social/Activity Interventions*

- Use distractions
- Identify and follow the person's agenda
- Go along with the individual - out done door and in another
- Find ways to meet the individual's need to feel needed, secure, busy, and loved, by giving tasks and tools. (One woman, when given a cobbler apron, a feather duster, a dust rag, and a carpet sweeper, no longer wandered into others' spaces)
- Have the person's family make a video - or audio tape and play it for the individual or try a collage of family pictures
- Use touch and hugs
- Have objects that stimulate reminiscence available for the person with dementia to manipulate
- Take two to four individuals at a time for walks, inside and outside the building
- Take the person with dementia along when doing short errand in the car
- Personalize activities to fit with the individual's previous life experiences: if they sorted mail, give them a box of junk mail to sort

### **Behavior: Wandering into Others' Spaces or into Unsafe Spaces**

#### *Environmental Interventions*

- Try a door guard, vinyl or Velcro door barrier
- Use Dutch doors (check to see if they meet the fire code)
- Use "stop" signs
- Try dark tape strips, a grid, or a "black hole" on the floor in front of the doorway
- Try exit alarms (Sentry II, Ambularm, Radio Shack)

*Psycho-Social/Activity Interventions*

- Use distraction
- Anticipate and redirect the individual's actions
- Identify any agenda the person has and try to meet it in another way
- Provide companionship - family, volunteers, links with children, stuffed animals or dolls
- Determine the individual's past interests and activity patterns and provide similar activities when possible

## Guidelines for Placing Mattress on Low Platform

Being restricted in bed by a tie-on restraint or siderail is a source of distress and agitation, yet many residents are at risk if they attempt to get out of bed on their own. Many lack the memory or judgment to call for assistance. A successful safety intervention is placing the person's mattress on a low platform (14-18 inches from the floor). This platform may be a Hollywood-style metal bed frame with a sheet of plywood cut to fit in the frame or a wooden futon frame to support the mattress from a regular bed. Metal frames can often be obtained at secondhand stores. Be sure to round off the corners of the plywood platform so that they do not extend and create a hazard. It costs approximately \$30 to put the metal frame and plywood together; the cost of futon frames vary. Sometimes lowering the bed allows the resident better traction because the feet touch the floor. Sometimes the bed may need to be lowered so that he would not be at risk for a fall. Another reason to lower the bed is to shorten the distance if he rolls out of bed. If the floor is vinyl linoleum and the person's feet slide, a beveled-edge, rubber backed, low pile rug can be placed next to the bed to improve traction. This is also a useful intervention if the person is incontinent of urine because it ensures better footing. If the person is no longer able to stand but is at risk for rolling out of bed, in addition to lowering the bed you may "bring the floor up" and cushion the floor by placing a thick mat or foam egg crate mattress by the side of the bed. This can be slipped under the bed or rolled up out of the way when the person is not in bed.

Here are some useful questions to ask when considering lowering the bed:

1. Have all possible reasons why the person is at risk for falls been evaluated (medication, illness)?
2. Would the bed create other risks if positioned low (e.g., following hip surgery flexion greater than 90°)?
3. Have all the other ways to minimize risk that could be used in place of or in addition to placing the bed lower been considered, e.g., would the use of a position-change alarm increase the safety margin? This may be useful even when the bed is on a low platform.
4. Are there any additional interventions necessary to increase the resident's comfort and safety (e.g., rug or mat next to bed)?
5. Is the person's weight, weight-bearing status, and care needs such that a low bed will not place an undue burden on the caregivers?
6. Is any in-service required so that caregivers will be aware of how to care for and transfer the person in the safest way possible?
7. Have the person and family been consulted and have they agreed to this safety-intervention?
8. Has the assessment and intervention selection process been documented in the chart?

9. Are there other safety factors to consider in the room with the bed on the floor (e.g., need to put safety plugs in outlets or need to move bedside stand to prevent patient from pulling up on it)?

If these questions have been addressed and the assessment indicates that the person would benefit from placing the bed nearer the floor, lower the bed. Generally, caregivers have found that it is easier to utilize a low bed when it is on wheels.

Caution: this intervention may not be appropriate for people if they are very heavy, require frequent, complex care in bed, and/or are able to bear weight. Persons with some or all these characteristics may pose too great a risk of caregiver injury. This possibility would need to be included in the assessment process.

Caregivers are often very clever and creative and can find ways to care for people in low beds that are safe and convenient for them. For example, they might get the person up in a wheelchair and wash them at the sink rather than doing so in the low bed.

For the few people for whom the low bed is not appropriate, because of their weight or heavy care needs, there are high-low beds that have the capacity to be lowered for safety and raised when care is given.

## **Guidelines for Assessing Use of Position Change Alarms**

Alerting devices have been used in many settings as part of a safety plan and when decreasing or eliminating physical restraints. These types of devices sound an alarm when the person changes position, lifts his weight off a bed or chair, or exceeds the limits of a cord attached from the person to the chair or bed. One way these devices have been used is as a substitute call light for people who are unsafely mobile and cognitively unable to use the call light. When the caregiver hears the alarm, it is a message to assist the person, rather than to simply tell them to sit down – a command that may have the effect of reducing, rather than enhancing the person’s mobility. Alerting devices may be used routinely for specified times during the day or until balance or endurance improve. These devices in no way can assure safety, but are merely one part of a safety plan, and there may be times when the alarm will not work (the person removes it or the alarm fails to sound or is slow to do so). It is not fail-safe, but merely a tool intended to increase the person’s safety. Position and pressure-change alarms may restrict freedom and privacy to a degree, so ethically they must be used only after careful assessment and discussions with the person and/or family. These devices have been found to be particularly useful for the types of person listed below and for those with combinations of these problems:

1. Mild forgetfulness or impaired judgment and restricted weight-bearing status following orthopedic surgery
2. Impaired mobility, judgment, and balance following a stroke
3. Dementia and unreliable or unsteady gait
4. Ambulation to the bathroom at night by oneself but with incontinence along the way or periods of transient dizziness
5. Poor balance or unsteady gait when getting out of bed
6. A history of frequent falls

Before initiating use of a position or pressure-change alarm, it is helpful to take the following steps:

1. Assess the ability of the person to stand, walk, transfer.
2. If the person does well, it is probably not appropriate to use a position-change alarm.
3. If mobility problems are found, contact the person’s physician to explore the possibility of seeking an underlying cause or requesting a physical therapy consult for gait and/or balance training.
4. Discuss the use of the device with the person and/or family.

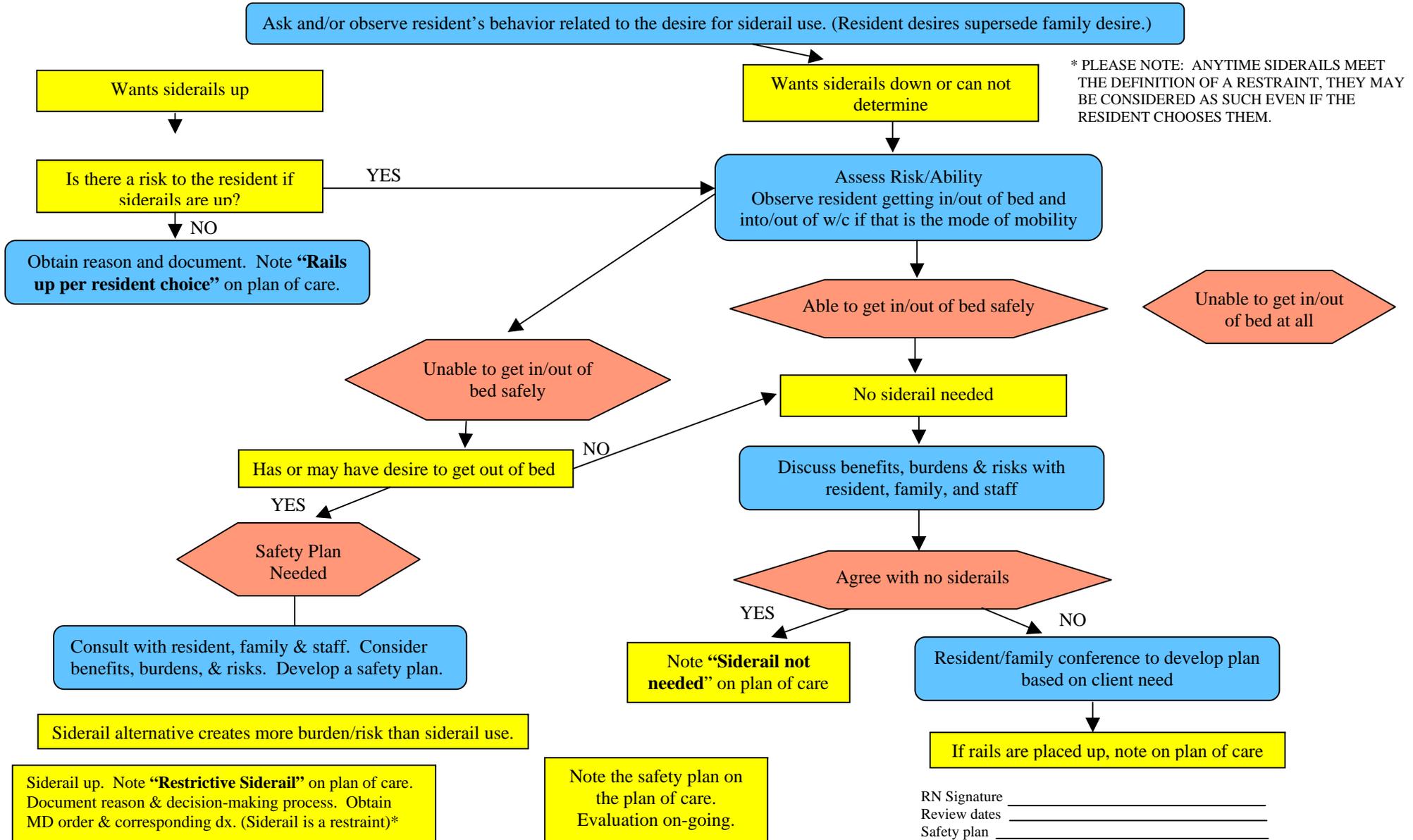
After initiating use of the device, consider the following:

1. If the person removes it frequently or tries to, it may not be the best intervention, and a different safety plan should be developed. Frequent attempts at removal may indicate that the device is a burden then.
2. Use of the device should be reevaluated as needed. If indicated and following a discussion with person and/or family, conduct a three-day trial without the device, evaluating the results from the person's perspective. During those trial days, caregivers should document how the person is doing.
3. If the person is no longer mobile or attempting to stand and the situation seems likely to remain unchanged, the device should be removed.

Costs of alerting devices vary greatly. Alarms designed specifically for fall monitoring use may cost up to \$150 to \$300 each. It is possible to adapt a personal alarm for this purpose by attaching the cord-pull in various ways to wheelchairs or beds; the cost of these devices is in the \$6-\$30 range.

Finally, there are no studies that prove that alarm devices alone prevent falls or injury. Since our culture tends to be over protective of the elderly and to seek solutions in technology, it is easy to over rely on these devices instead of seeking the underlying causes of falls and instability. When considering use of a device, it is important to ask, "Is this to increase the person's safety or to make the caregiver feel more secure?" A number of caregivers report that they found these devices initially useful as they were reducing restraints, but over time, as their assessment and intervention skills increased, they no longer felt the need to use the devices as extensively.

## SIDERAIL DECISION TREE



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**APPENDIX C**

**RESOURCE LIST**

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## RESOURCE LIST

### ACTIVITIES

*Cross Creek Recreational Products*, P.O. Box 289, Millbrook, NY 12545, (800)645-5816. Toys and devices for people to hold and manipulate, including the Tangle. Call for information and cost.

*Eldergames*, 11710 Hunters Lane, Rockville, MD 20852, (301)984-8336, (800)637-2604. Company makes products designed to stimulate memory and thought for persons with dementia. Games called Elder Trivia, Memory Joggers, Feel & Fold. Cost varies.

*Geriatric Resources, Inc.*, P.O. Box 239 Radium Sprints, NM 88054-0239, (800)359-0390. Sensory stimulation products for persons with dementia. Cost varies with product.

Songs to Remember, Hearth Song Production, P.O. Box 211, Mt. Angel, OR 97362. This is a series of cassette tapes specifically developed for the older population. Tapes 1-3 contain songs for the Catholic, Protestant, and contemporary Christian traditions, respectively. Tape 4 contain old popular favorites. Set of 4 is \$39 (shipping and handling \$3); individual tapes are \$10 (shipping and handling \$1.50).

### ALERTING DEVICES

Sentry II Wireless Attendant Station, MRW World, Inc., 15 Central Way Suite 313, Kirkland, WA 98033, (206)558-2688, FAX (206)889-9779. The Sentry II system was developed to suite the specific and unique needs of the foster care and assisted living providers. It is a call system and alerting devices that requires no wiring to install. It can simply be plugged in. The basic attendant station console (\$96) can handle up to eight residents. However, you need only purchase as many transmitters as you need. Costs of these vary with type of unit (from \$45-68 per unit). The system can be used in a number of ways depending on the resident's needs. Units can be set up as a portable call button, door alarm (alerts you if someone is leaving his/her room) or beside the bed beam sensor (alerts you if someone is getting out of bed). In addition they have a perimeter alert bracelet unit which alarms exits for only the individual wearing the bracelet. Cost for alarming the door is \$465/exit.

## **Position Change Alarms**

These alarms alert staff when a resident changes position, such as going from a seated to a standing position. This is done in a variety of ways, such as a sensor or a cord-like tether.

*Ambularm*, Alert Care Inc., Shelter Point Business Center, 591 Redwood Hwy., Suite 2125, Mill Valley, CA 94941, (800)826-7444. Approximate price \$185. The Ambularm is a lightweight, position sensitive alarm worn on the thigh. The new Ambularm plus can be verted to a position change, pressure change, tether or exit alarm system by adding different components.

*Chair Sentinel*, Powderhorn Industries, 931 N. Park Ave., P.O. Box 1443, Montrose, CO 81402. This is a resident releasable wheelchair seatbelt that emits an alarm when unfastened. Cost \$150.

*Patriot Alert*, Safety Technology International, Inc., 2306 Airport Rd., Waterford, MI 48327, (313)673-9898 or (800)888-4784. This device has to be adapted before it can serve as a position change alarm. The advantage is cost. Cost \$6.

*Personal Alarm*, Radio Shack, Payless or other drug or electronic stores (check phone directory for your local outlet). This device has to be adapted to function as a position change alarm. Cost approximately \$10-15.

*TABS Mobility Monitor*, Wanderguard, Inc., 1620 N 20th Street, Lincoln, NE 68503, (800)824-2996, FAX (402)475-4281.

## **Pressure Change Alarm**

Pressure change alarms for beds and chairs. These devices have a sensor pad that goes under the mattress or chair seat that sets off an alarm when the resident tries to leave. Some can be adapted for wheelchairs. They have an advantage over the position change alarms because the resident cannot remove them.

*Bed-Check*, Bed-Check, 4408 S. Harvard #A, Tulsa, OK 74135, (800)523-7956.

*Code Alert*, RF Technologies, Inc., 3720 North 124th Street, Milwaukee, WI 53222, (800)669-9946, FAX (414)466-1806.

*Posey Sitter*, Posey Company, 5635 Peck Road, Arcadia, CA 91006-0020, (800)44-POSEY or (814)443-3143.

## **Exit Alarms**

Alert Care Exit Alarm (See Ambularm)

Baby Nursery Monitors, Fisher-Price and Others. These devices allow you to hear if someone is moving about or calling out.

## **BARRIERS**

*Door Guard: Vinyl Barrier*, Bussard & Son, Inc. Custom Canvassing, 415 25th Ave. SW, Albany, OR 97321. A vinyl barrier for wanderers (yellow strip). This visual barrier meets fire code standards and can prevent problems with wanderers. \$10 plus UPS; 60" x 480". Price may vary according to size.

*Stopper Kit*, Clock Medical, P.O. Box 620, Winfield, KS 67156, (800)527-0049. Includes "stop" signs, "do not enter" signs, and mesh strips to put across doors. Cost is \$24.95.

## **MOBILITY EQUIPMENT** (see also wheelchairs and components)

*Chariot Ambulator*, First Choice International, 12 Westerville Square #335, Westerville, OH 43081, (800)235-0380. This is an adult walking frame for residents with good trunk balance who stand or walk unsteadily. \$385 in the continental U.S. plus \$39.00 shipping and handling.

*Dycem*, Alimed, 297 High Street, Dedham, MA 02026, (617)629-2900, FAX (800)437-2966. A non-slip rubber-like plastic material that is placed in the chair seat to prevent sliding (16in x 2yds) #8273, \$28.95. Also available in many sizes and configurations. (Can be obtained from many health equipment companies).

*Next Step & Rover*, Noble Motion, Inc., P.O. Box 5366, Center Avenue, Pittsburgh, PA 15206, (800)234-9255. These are four wheeled 8-inch solid tire walkers with hand brakes. Additional accessories can also be purchased. Available in single hand brake model. Cost \$375, delivery \$15.

*Scoot Gard*. This non-skid matting is used for boats and RV's. Can be used in place of Dycem. It is washable and has anti-microbial properties to inhibit bacteria and mildew. Can be purchased at many stores. Cost \$.70/foot or \$8.99 for 1 x 2 foot roll.

*Ultimate Walker*, (formerly Merry Walker), Direct Supply, 6761 N. Industrial Rd., Milwaukee, WI 53223, (800)634-7328. This adjustable wheeled walking frame (made from PVC pipe) allows residents to walk or wheel seated or standing. It is useful for residents who stand unsteadily or are unsafely mobile on their own. Cost is approximately \$300 plus shipping and handling. (Price varies according to quantity).

## **PRINTED MATERIAL**

*Aging in the Designed Environment*, M. Christenson, Hawthorne Press, 10 Alice Street, Binghamton, NY 13904-1580; 1990. This book provides detailed information on how to adapt the physical environment to compensate for sensory changes common to aging, enhance independence in the home and redesign long term care facilities. An excellent resource for modifying the environment. \$19.95.

*Avoiding Drugs Used as Chemical Restraints: New Standards in Care*, Sarah Burger. The National Citizens' Coalition for Nursing Home Reform, 1424 16th St., NW, #202, Washington, DC 20036 (202)332-2275, FAX (202)332-2949. Information on nursing home use of tranquilizers and other psychoactive drugs. When are they harmful- and how will you know? A lending expert offers consumer easily understood answers and advise. Cost \$7.50.

*Avoiding Physical Restraint Use: New Standards in Care*, Sarah Burger. The National Citizens' Coalition for Nursing Home Reform, 1424 16th St., NW, #202, Washington, DC 20036 (202)332-2275, FAX (202)332-2949. New standards require humane, restraint-free care in nursing homes. This clear, concise consumer guide explains the dangers and indignities of restraints, and shows how to achieve restraint-free quality of life and care. A guide for residents, families, and friends. Cost \$7.50.

*Care of Alzheimer's Patients: A manual for Nursing Home Staff*, L. Gwyther. Alzheimer's Association, 919 North Michigan Ave., Suite 1000, Chicago, IL 60611 (312)335-8700. This book explains what causes dementia and discusses approaches to common behavioral symptoms.

*Designing for Dementia: Planning Environments for the Elderly and the Confused*, M.P. Calkins. National Health Publishing, 428 E. Preston St., Baltimore, MD 21202; 1988. This book is an excellent source of ideas on how to arrange, design, and structure the physical environment to allow persons with dementia to function better. \$38.50 (plus \$7 shipping).

*Doing Things*, J.M. Zgola, Johns Hopkins University Press, Hampton Station, Baltimore, MD 21211; 1987. This book offers a guide to programming activities for persons with Alzheimer's disease and related disorders. \$10.95; \$28.00 hardcover (plus \$2 shipping).

*For Those Who Take Care; An Alzheimer's Disease Training Program for Nursing Assistants*, B.J. Helm, and D.R. Wekstein, Alzheimer's Disease Research Center, Dept. ADC, PO Box 8250, Silver Spring, MD 20907-8250. 45 slides, 182-p. manual and handouts. \$50/set.

*Holding on to Home: Designing Environments for People with Dementia*, U. Cohen, and G.D. Weisman, The John Hopkins University Press, Hampden Station, Baltimore, MD 21211. This book discusses the relationship between the physical environment, behavior and persons with dementia. It describes a variety of settings and would be particularly useful when considering building or remodeling a facility. \$45 plus \$3 shipping and handling.

*Individual Dementia; Creative, Compassionate Approaches*, Joanne Rader. Springer Publishing Company, 536 Broadway, New York, NY 10021, (212)431-4370. \$37.50 (\$3.50 shipping). This book describes a frame work for individualizing care which results in eliminating the need for restraints; contains a lot of practical information and a chapter on seating problems in Long Term Care.

*Life Worth Living: How Someone You Love Can Still Enjoy Life in a Nursing Home*, Thomas, W., VanderWyle and Burnham, Acton, MA, 1996. This book provides a detailed introduction to the principles and practices of the Eden Alternative, a model of nursing care that responds to resident's feelings of loneliness, helplessness and boredom and restores diversity socially and biologically, by integrating plants, children and animals into the nursing home.

*An Ombudsman Guide to Effective Advocacy Regarding the Inappropriate Use of Chemical and Physical Restraints*, National Citizens; Coalition for Nursing Home Reform (NCCNHR), 1224 "M" St., NW Suite 301, Washington, DC 20005-5183. NCCNHR is offering these papers by Sarah Burger developed for the National Center for State Long Term Care Ombudsman Resources, funded by the Administration on Aging. They include a resource paper (\$10) and trainer's guide (\$5). The resource paper and trainer's guide can be purchased together for \$13.75. Additional 10% for postage and handling.

*Optimum Care of the Nursing Home Resident with Alzheimer's Disease: "Giving a Little Extra"*, E.L. Ballard, and L.P. Gwyther, The Duke Family Support Program, P.O. Box 3600, Duke University Medical Center, Durham, NC 27710, (919)660-7510, 1991. Manual \$10 (postage and handling included).

*Reducing Restraints: Individual Approaches to Behavior*, N.E. Stumpf, J. Wagner, L.K. Evans, J.E. Patterson, Geriatric Resource and Training Center, 3501 Masons Mill Rd., Suite 501-B, Huntingdon Valley, PA 19006, (215)657-9990; 1992. 10-session education program focuses on myths, effects, and legal and ethical issues regarding restraints and describes a method for making sense of behaviors that often lead to physical restraints. Major emphasis is given to systematic ways to intervene with various behaviors. An important component focuses on the process of initiating and maintaining change. \$75 (plus \$3 shipping).

*Toward a Restraint-Free Environment: Reducing the use of physical restraints in long-term care and acute care setting*, Ed. J.V. Braun and S. Lopson, Health Profession Press, P.O. Box 10624, Baltimore, MD 21285-0624, (410)337-9585. This book provides step-by-step guidance and many helpful tools for restraint reduction. \$29.95 (add 15% shipping and handling); if prepaid, no shipping and handling is charged.

*Understanding Difficult Behaviors: Some Practical Suggestions for Coping with Alzheimer's Disease and Related Illnesses*, A. Robinson, and B. Spencer, L. White. The Alzheimer's Program, P.O. Box 981337, Ann Arbor, MI 48198 (313)487-2335; 1989. This book was written to help professional and family caregivers better understand the various causes of behaviors such as wandering, resistance to care, incontinence and agitation, problem-solving strategies for managing these behaviors are suggested. \$14 (includes shipping); make checks payable to Eastern Michigan University.

*Untie the Elderly*, The Kendal Corporation, P.O. Box 100, Kennett Square, PA 19348. This newsletter on restraint reduction is available by writing and requesting to be placed on the mailing list.

*Vadation; The Feil Method*, N. Freil, Edward Feil Productions, 4614 Prospect Ave., Cleveland, OH 44103, (216)881-0040. This book provides information and ideas on how to interact with the disoriented resident.

*Wilfrid Gordon McDonald Patridge*, M. Fox, Puffin Books, 1987. This illustrated children's book describes how a young boy helped an elderly resident find her memory. \$7.95 or \$13.95 hardcover.

## **TRACKING DEVICES**

*Care Trak*, Wildlife Material, Inc., Route 1, Box 427A, Carbondale, IL 62901, (800)842-4537. A radio tracking system that sounds an alarm when a wanderer leaves monitored areas; a mobile locator helps staff find the resident. Cost varies from \$810 to \$4, 310 depending on several variables. Call for cost.

## **VIDEOS**

*Caring for Residents with Dementia*, Benedictine Institute for Long Term Care, Mt. Angel, OR 97362, (503)845-9495, FAX (503)845-9210. 1/2" videocassette, 51 minutes/color, 1992. This video presents an overview of dementia, including important concepts such as excess disability, catastrophic reactions, agenda behavior, a verbal and non-verbal communication techniques. It suggests a problem-solving framework for addressing behavioral symptoms that energizes staff and fosters creativity. Study material, discussion questions and bibliography is available with tape. Cost to purchase \$185; one week rental \$40 plus \$5 shipping and handling.

*Caring for the Alzheimer's Resident: A Day in the Life of Nancy Moore*, The Duke Family Support Program, Center for Study of Aging and Human Development, P.O. Box 3600, Duke University Medical Center, Durham, NC 27710, (919)660-7510. This video is an inexpensive tool that demonstrates the critical role of the nurse's aide in dealing with difficult behaviors. Cost \$25 (postage and handling included).

*Choice Among Risks: Physical Restraints Rejected*, Health Professions Press, P.O. Box 10624, Baltimore, MD 10624, 9410)337-9585 or (888)337-8808. A useful tool for educating staff and helping to change attitudes. Length 30 minutes. Cost \$70 to purchase; \$35 to preview charge (may have for 10 days).

*The Corinne Dolan Center book and videotape package*, C.D.A.C. at Heather Hill, 12340 Bass Lake Road, Chardon, RH 44024. The Corinne Dolan Alzheimer Center at Heather Hill presents an alternative approach to the care of persons with Alzheimer's disease. The book provides descriptions of the Center's services, program activities, admissions criteria and process, staff duties and training, and research activities. The videotape focuses on the architectural features and provides an opportunity to experience the interaction of program and design. \$20 (U.S. orders), \$26 (Canadian orders), and \$36 (overseas orders), price includes shipping and handling. Make checks payable to Dissemination Package.

*Creative Interventions with the Alzheimer's Patient*, Geriatric Resources, P.O. Box 289, Radium Springs, NM 88054-0239; (800)359-0390. This three-tape series, by Mary Lucero, a well-known expert on care of persons with dementia, is designed to provide an introduction into understanding behavioral symptoms associated with Alzheimer's disease, current functional assessment tools, and interventions for proper caregiving. It comes with a 35-page handout. Three tapes and handout, is \$340 (plus \$5 for shipping).

*Designing the Physical Environment for Persons with Dementia*, Terra Nova Films, Inc., 9848 S. Winchester Ave., Chicago, IL 60643. 1/2 " videocassette and slides/20 min/color/1987. Producer; D. Coons. Describes Wesley Hall, a special care unit for persons with dementia. Examples of activities, attitudes, and homelike environment helpful for persons with dementia. Sale, \$110 (video); \$175 (slides); rental, \$45 (video only).

*Everyone Wins*, AAHSA Publication, Department 5119, Washington, DC , 20061-5119, (800)508-9442. A comprehensive training program that offers practical strategies for providing quality care without the use of restraints. It presents real solutions to real problems facing long term care providers. Wandering residents. Minimizing the risk of falls. Responding to aggressive residents in a non-threatening way. Looking at actual cases. *Everyone Wins* gives you proven, creative methods for solving these problems without restraints. The *Everyone Wins* library includes six training videos and resource guide for management, and a video and pamphlet for families. Prices vary according to your order.

*Managing & Understanding Behavior Problems in Alzheimer's Disease & Related Disorders*, Northwest Geriatric Education Center, University of Washington, HL-23 Seattle, WA 98195, (206)685-7478. This 10-module videotape series includes 10 videotapes and a written manual. It is a training program geared for institutional staff, covering an overview of dementia, depression, delirium, and managing behaviors such as aggression, hallucinations, wandering, and inappropriate sexual behaviors. A promotional videotape is available for preview. Module series and manual, \$250. Make checks payable to University of Washington/Alzheimer's Videos.

*Retrain, Don't Restrain*, American Association of Homes for the Aging, (mail orders) AAA Publication, Dept. 5117, Washington, DC 20061-5117. Phone orders prepaid (VISA/MasterCard) AAA Publication, 341 Victory Dr., Herdon, VA 20070. Available through American Health Care Association, P.O. Box 96906, Washington, DC 20090-6906, (800)321-0343. This video illustrates the interdisciplinary process of restraint reduction and includes a variety of alternatives. Developed through the New York Jewish Home Hospital for the Aged, Restrain Minimization project. \$99 if facility is a member of either AAA or AHA; \$129 if not. Price includes video, trainer's manual, and 10 workbooks; shipping for either is \$13.

*Wesley Hall: A Special Life*, Terra Nova Films, Inc., 9848 S. Winchester Ave., Chicago, IL 60643. Mm ½" and ¾" videocassette/28 min/color/1986. Producer: Institute for Gerontology, University of Michigan. The film is about a special unit designed for persons with dementia. It presents visual attitudes, environment, and approaches that are helpful. Sale \$245 (video); rental \$55 (plus \$7 shipping).

*Working with the Confused Elderly Clients*, Benedictine Institute for Long Term Care, 540 South Main St., Mt. Angel, OR 97362, (503)845-9495, FAX (503)845-9210. ½" and ¾" videocassette, 29min/color/1986. This video teaches specific verbal and non-verbal communication techniques designed to increase staff skills and decrease behaviors such as wandering and agitation often associated with dementia. Sale, \$200 (plus \$5 shipping); rental (7-days) \$35 (plus \$5 shipping).

## **WHEELCHAIR AND COMPONENTS MANUFACTURERS**

The following list of manufacturers is included to guide caregivers and professionals in finding appropriate products. It is not an endorsement of any company or product. Manufacturers of these products are consolidating and changing names frequently, so the best way to stay current is to consult Team Rehab Reports Annual Buyers Guide which comes out in November each year. Team Rehab can be contacted at Mira Mare Communications, Inc., 23815 Stuart Ranch Rd., Malibu, CA 90265, (310)317-4522.

### **Wheelchairs, Seat & Back Cushions, Head Supports**

*ETAC USA*, 2325 Parklawn Dr., Suite J., Waukesha, WI 53186, (800)678-3822

*Graham Field Health Products Inc.*, E & J and LaBac, 400 Rabro Drive E., Hauppauge, NY, 11788, (800)645-8176

*Invacare*, 899 Cleveland St., Leyria, OH 44036, (800)333-6900

*Otto Boch*, 3000 Xenium Lane N., Minneapolis, MN 55441, (800)328-4058

*Sunrise Medical*, 2842 Business Park Ave., Fresno, CA 93727, (209)292-2171

### **Heavy-Duty Strength Wheelchairs**

*Twenty-first Century*, 4915 Industrial Way, Coeur d'Alene, ID 83815, (208)667-8800

*Wheelchairs of Kansas*, PO Box 320, Ellis, KS 67637, (800)537-6454

### **Seating Systems & Components Only**

*Gunnell*, 8440 State St., Mitlington, MI 48746, (800)551-0055

### **Power Wheelchairs Only**

*Permobil*, 6B Gill St., Woburn, MA 08801, (800)736-0925

*Pride*, 182 Susquehanna Ave., Exeter, PA 18643, (800)800-8586

### **Seating Cushions Only**

*Cascade Design*, 4000 1st Ave., Seattle, WA 98134, (800)827-4548

*Crown Therapeutics, ROHO Inc.*, 100 Florida Ave., Belleville, IL 62221, (800)851-3449

*Freedom Designs*, 2241 Madera Rd., Simi Valley, CA 93065, (800)582-0077

### **Seat Belts, Ankle Huggers & Angle Adjustable Foot Plates**

*Body Point Design*, 704 NE Northlake Way, Seattle, WA 98105

### **Head Supports**

*Biomechanix Inc.*, 1833 Junwin Court, Tallahassee, FL 32308, (850)656-9448

## **Half Lap Trays**

*Canyon*, 10173 Croydon Way, Sacramento, CA 95827. (800)221-5499

*Sammon-Preston*, 4 - Sammon Court, Bolingbrook, IL 60440, (800)323-5547

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**APPENDIX D**

**ASSESSMENT TOOLS**

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Figure 5.1



# WHEELCHAIR ASSESSMENT AND PRESCRIPTION

Client Name: \_\_\_\_\_ Date: \_\_\_\_\_

Diagnosis: \_\_\_\_\_

Client/Care Provider Goals: \_\_\_\_\_

Age \_\_\_\_\_ Height \_\_\_\_\_ Weight \_\_\_\_\_

### CURRENT EQUIPMENT ASSESSMENT

Wheelchair: Width \_\_\_\_\_  Standard  Lightweight  Hemi-height  Recliner  Geri W/C

Seat:  Sling  Solid  Contoured **Back:**  Sling  Solid  Contoured  **Head Rest:** (type) \_\_\_\_\_

Front Riggings (foot rests):  Fixed  Removable  Swing away  None  Other (Type): \_\_\_\_\_

Arm Rests:  Fixed  Adjustable  Desk length  Standard length  Upper extremity support (type): \_\_\_\_\_

Restraint (describe): \_\_\_\_\_

### CURRENT MOBILITY

Upper extremities only  All extremities  Power Transfer Method: \_\_\_\_\_  
 Lower extremities only  One arm, one leg  Unable to self propel

Propulsion \_\_\_\_\_ meters/minute

### PHYSICAL ASSESSMENT: (Check appropriate box, add F mark if fixed posture)

- |   |   |
|---|---|
| <input type="checkbox"/> Posterior pelvic tilt (mild, moderate, severe) | <input type="checkbox"/> Scoliosis (mild, moderate, severe)                   |
| <input type="checkbox"/> Neutral pelvis                                 | <input type="checkbox"/> Rib hump   |
| <input type="checkbox"/> Pelvic obliquity L or R (low ASIS) _____"      | <input type="checkbox"/> Forward cervical flexion                             |
| <input type="checkbox"/> Pelvic rotation L or R (forward ASIS) _____"   | <input type="checkbox"/> Capitol extension                                    |
| <input type="checkbox"/> Thoracic kyphosis (mild, moderate, severe)     | <input type="checkbox"/> Susceptible to skin breakdown <b>Describe:</b> _____ |

### SUPINE ROM MEASUREMENTS:

Hip flexion: L \_\_\_\_\_ R \_\_\_\_\_ (Normal = 90° or more)

Knee flexion with hip flexed L \_\_\_\_\_ R \_\_\_\_\_ (Normal = 70° or less)

Ankle range with hip and knee in flexion L \_\_\_\_\_ R \_\_\_\_\_ (Normal = neutral)

### SITTING ASSESSMENT:

- Hands free  Leg length discrepancy  Yes  No
- Hands dependent  Propped  Upper extremity requires support, R or L  Yes  No

Hip width: \_\_\_\_\_ Hip to knee length: \_\_\_\_\_ Lower leg length: \_\_\_\_\_

### OBJECTIVES:

Pelvis: \_\_\_\_\_

Hip: \_\_\_\_\_

Knee: \_\_\_\_\_

Ankle/Foot: \_\_\_\_\_

Trunk: \_\_\_\_\_

Head/Neck: \_\_\_\_\_

Upper Extremities: \_\_\_\_\_

Skin: \_\_\_\_\_

Mobility: \_\_\_\_\_

Transfers: \_\_\_\_\_

Client Name: \_\_\_\_\_

**PRESCRIPTION:** (Check appropriate box, fill in the blanks)

**Wheelchair**

- |                                       |  |   |   |
|---------------------------------------|--|---|---|
| <input type="checkbox"/> New          | <input type="checkbox"/> Lightweight       | <input type="checkbox"/> Tilt in space frame              | <input type="checkbox"/> Multi-angle foot plate     |
| <input type="checkbox"/> Repair       | <input type="checkbox"/> Heavy duty        | <input type="checkbox"/> Frame w/adjustable axel position | <input type="checkbox"/> Foot hangers _____ degrees |
| <input type="checkbox"/> Modification | <input type="checkbox"/> Hemi-height       | <input type="checkbox"/> Power                            | <input type="checkbox"/> Removable arm rest         |
| <input type="checkbox"/> Standard     | <input type="checkbox"/> Super hemi-height | <input type="checkbox"/> Adjustable arm rest              |   |

Seat width \_\_\_\_\_ Make \_\_\_\_\_ Model \_\_\_\_\_ Serial # \_\_\_\_\_

*Justification*

- |  |   |
|--|---|
| <input type="checkbox"/> Capabilities have changed | <input type="checkbox"/> Lacks strength to propel heavy chair functionally                  |
| <input type="checkbox"/> No wheelchair             | <input type="checkbox"/> Cannot sustain upright posture due to motor impairment or weakness |
| <input type="checkbox"/> Chair worn out or broken  | <input type="checkbox"/> Would be bed or chair confined without use of wheelchair           |
| <input type="checkbox"/> Cannot ambulate           | <input type="checkbox"/> Requires mobility base for seating system                          |

Powered Mobility (type): \_\_\_\_\_

*Justification*

- Lacks strength or endurance for independent mobility in manual chair  
 In trial has demonstrated ability to drive and potential for learning

**Seat Cushion**

*Cushion Characteristics*

- |  |   |   |
|--|---|---|
| Seat depth _____                               | Seat width _____                                  |   |
| <input type="checkbox"/> Large well space      | <input type="checkbox"/> Longer depth             | <input type="checkbox"/> Notched for front riggings |
| <input type="checkbox"/> Pressure distribution | <input type="checkbox"/> Cut for foot propulsion  | <input type="checkbox"/> Cut to drop between rails  |
| <input type="checkbox"/> Stable                | <input type="checkbox"/> Trough for hip deformity | <input type="checkbox"/> Comfortable                |
| <input type="checkbox"/> Other: _____          |   |   |

*Product Options*

- |   |  |                                    |
|---|--|------------------------------------|
| <input type="checkbox"/> Solid seat     | <input type="checkbox"/> Custom model foam | <input type="checkbox"/> Air       |
| <input type="checkbox"/> Contoured foam | <input type="checkbox"/> Hybrid            | <input type="checkbox"/> Seat belt |

*Justification*

- |  |   |
|--|---|
| <input type="checkbox"/> Improved pelvic & trunk alignment     | <input type="checkbox"/> Reduce pain  |
| <input type="checkbox"/> Reduce sliding/thrusting out of chair | <input type="checkbox"/> Assistance in healing skin ulcer (size & stage of ulcer) _____ |
| <input type="checkbox"/> Reduce asymmetry                      | <input type="checkbox"/> Provide maximum stability for function                         |
| <input type="checkbox"/> Accommodate fixed deformities         | <input type="checkbox"/> Reduce risk of skin breakdown                                  |
| <input type="checkbox"/> Other: _____                          |   |

Type \_\_\_\_\_ Warranty \_\_\_\_\_

**Back Support**

- |                                 |   |  |                                      |
|---------------------------------|---|--|--------------------------------------|
| <input type="checkbox"/> Stable | <input type="checkbox"/> Posterior pelvic support | <input type="checkbox"/> Recline               | <input type="checkbox"/> Other _____ |
| <input type="checkbox"/> Curved | <input type="checkbox"/> Lateral trunk support    | <input type="checkbox"/> Pressure distributing |                                      |

*Product Options*

- |   |                                      |
|---|--------------------------------------|
| <input type="checkbox"/> Solid base             | <input type="checkbox"/> Foam        |
| <input type="checkbox"/> Sling w/ added support | <input type="checkbox"/> Hybrid      |
| <input type="checkbox"/> Lateral(s)             | <input type="checkbox"/> Custom mold |

*Justification*

- Firm support for posterior pelvic control  
 Accommodation for fixed postures  
 Lateral support because of poor postural control and/or scoliosis

Type \_\_\_\_\_ Warranty \_\_\_\_\_

**Head Rest (type)** \_\_\_\_\_

*Justification*  Lacks head control and cannot hold head up without support

Follow-up Notes: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Supplier: \_\_\_\_\_ Phone Number: \_\_\_\_\_

Funding Source: \_\_\_\_\_

Therapist: \_\_\_\_\_ Physician: \_\_\_\_\_

## Prescription Process

	Assessment Findings	Objectives	Product Characteristics	Product Options
Pelvis:				
Hip:				
Knee:				
Ankle/Foot:				
Trunk:				
Head & Neck:				
Upper Extremities:				
Transfers:				
Propulsion:				
Skin:				

