

Setting Standards of Protocol for Replacement Schedules of Medical Equipment in a Life Care Plan¹

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Abstract. This article reviews issues associated with determining replacement schedules for some of the equipment that is commonly included in a life care plan. The author, with over 20 years experience as a rehabilitation equipment supplier, includes discussion on various protocols based on data from his equipment supply business as well as general issues and specific worksheets the life care planner can use to help determine replacement schedules of wheelchairs.

One controversial factor in life care plans has been the replacement schedule allowances for medical equipment (R. Weed, personal communication, April 20, 2002). As it is fundamental that all equipment has a useable life expectancy, when listing medical equipment for a life care plan, it is likewise fundamental that each piece of equipment has a noted replacement schedule. This is especially true of the more major purchases such as beds, pressure support systems and wheelchairs.

How crucial is the accuracy of the figures? As an example, consider the case of a 25-year-old tetraplegic who has a life care plan that lists a motorized wheelchair with a power actuated tilt-in-space system and standing features, programmable controls and other needed accessories. The manufacturer's list price is noted at \$31,000. One life care planner projects replacement of the chair every four years, while the other life care planner every five years. Based on a life expectancy of 69 years, the former planner allows for 10 replacement chairs; the latter only eight. The overall difference between the life care plans would be \$62,000! This of course is not discounted to present value and does not take the economist's adjustments for inflation into account.

Even with less expensive equipment, such as a Jay pressure relief cushion with a list price of \$425, the differences in replacement allowances can show some significant variances. In reviewing plans, the author has observed replacement for these cushions range from 2 to 5 years. Continuing to use the above noted client as an example, the five-year allowance equates to eight replacement cushions at a total plan cost of \$3,400. The two-year allowance equates to 20 replacement cushions at a total price of \$8,500 (not discounted to present value) for a difference of \$5,100 between the two plans.

More so than the variance in costs between plans, is the lack of any accurate standards to compute replacement allowances. This lack of any prescribed standards can easily allow an attorney to question not just the accuracy of the replacement costs of a particular plan, but also the accuracy of the methods of computation for all other medical equipment costs and allowances.

So what factors must be taken into account when figuring replacement schedules for equip-

ment? The first factor to consider is the manufacturer's warranty of the particular piece of equipment being recommended. The implied expectation of any warranty is that the piece of equipment will last throughout the length of the warranty period. If the equipment is defective, the warranty allows for replacement or compensation with little to no cost to the user. Most of us utilize equipment far exceeding the length of the manufacturer's warranty in our homes and although it is not uncommon to have the same refrigerator, stove, or washer for over ten years, the warranty on these items may expire after only one year.

In the author's experience, many life care plans include replacements of certain items that do not even meet or barely exceed the manufacturer's warranty of the product. The aforementioned Jay cushion has a complete replacement warranty (other than the cover) for up to two years and, if properly maintained (occasional cleaning and kneading of the gel pad and replacements of covers), the cushion's life expectancy should at least double the warranty.

Most items referred to as "durable medical equipment" are well described. That is to say they are quite durable. Most standard commodes, tub rails, tub benches and folding walkers have a lifetime warranty; however, it should be noted a lifetime warranty does not preclude a replacement allowance for these items. After a period of time, any of these items will show excessive wear and tear. This is particularly true of any items with many moving parts that will become shaky with time, or items that have padding that can eventually tear or wear out. Some pieces of equipment such as a trapeze bar attached to a floor stand are so durable, and their everyday usage fairly limited, that their replacement can safely be put at ten years or more.

In addition to the warranty and its relationship to replacement allowances, the life care planner must also take into account the need for repairs and maintenance to a piece of equipment. A pair of forearm crutches should last a client three years, but the crutch tips will have to be a replaced perhaps twice a year. The Jay pressure relief cushion previously referenced has a longer life than many allow for, but the removable covers should be replaced yearly. (A better strategy is to allow for the purchase of two covers when first buying a cushion to alternate their use while cleaning, and then allow for twice the replacement time, i.e., two years, for each cover).

Repairs versus replacement becomes a far more complicated equation when one is considering more complex pieces of equipment with more parts such as manual wheelchairs or power actuated products such as electric hospital beds, air powered support surfaces, and motorized wheelchairs.

When including a hospital bed in a life care plan, it is important to note that hospital beds have a lifetime warranty on all the welds of their frame (Invacare Corporation and Graham-Field, Inc. product warranty information, 2002). It is extremely rare for these frames to require repairs. Conversely, the mechanisms for adjustment, such as the shafts, motors and hand controls will require repair or replacement, and an allowance for maintenance should be made. Likewise, the mattress should be replaced every four to five years. There are certain factors that must be taken into account such as the weight of the client, the daily usage of the bed (for less active clients), and the use of higher end support surfaces or flotation mattresses that either put less stress on the mattress itself, or entirely replace the standard hospital bed mattress. (The author has seen a number of life care plans allowing for replacement of hospital bed mattresses when the client is using none).

Wheelchairs categorized as high strength lightweight or ultralight must have a lifetime warranty on the sideframe and crossbraces (Centers for Medicare and Medicaid Services, 2002). The other working parts of the chair are usually covered by a limited warranty of one year excluding wear and tear, or abuse. (The manufacturer many times upon return of a broken or defective part will determine if there was abuse of the product.). Likewise, there is a minimum of five years to

lifetime warranty for the frame of a motorized wheelchair and the electrical components all have a life expectancy minimum of one to two years (Invacare Corporation, Sunrise Medical, & Pride Mobility Products Corporation product warranty information, 2002). When recommending either a manual or motorized wheelchair, the life care planner should include maintenance and repair allowances, but after time must consider that the frequency of repairs and the overall wear on the frame will necessitate a replacement of the equipment.

How the replacement allowance for a wheelchair has been determined in the past seems to be a process that lacks any standardization or protocol. In Kendall and Deutsch's article on research methodology (2002), the authors state that life care planning is a "standardized process" (p. 158). They further assert that, "If Life Care Planning is a reliable tool in Case Management and the provision of patient care, then the results of a given LCP can be consistently replicated" (p. 157).

However, in reviewing life care plans, the author has observed that similar models of wheelchairs may be assigned a replacement with as little as two years or as great as every ten years! Although there may be a valid reason for the 10 year replacement, such as a rarely used backup chair, the plan rarely includes any notation as to the justification for a replacement number given. As shown in the examples given in the beginning of the article, these variances, when multiplied by a young client's life expectancy, can add up to significant cost differences in opposing plans.

There are a variety of factors that will have an effect on the replacement allowance for a wheelchair. Some of these factors will reduce the life of a chair, while others will add to its life. It is necessary for the life care planner to consider which factors are inherent in an individual client's lifestyle and account for those factors in the life care plan. By utilizing a standardized format, taking the factors noted below into a weighted scale for replacement allowance, a greater reliability both for the individual life care plan as well as a greater consistency, reliability and validity for the life care planning process as a whole should be achieved.

Contributing Factors to Replacement Time for Wheelchairs

Age

The age of the client is the first contributing factor. The general activity level of all individuals differs throughout different age ranges and the greater the activity level of an individual, the more wear and tear on the frame of a wheelchair.

Most children (4 years thru 16 years) are very active and those children who are wheelchair dependent are no exception. They usually are attending school five days a week and, when not in classrooms, most are playing with other children. Athletic programs now include children in wheelchairs in a large variety of games and events. The Special Olympics and other athletic associations for children with disabilities are a part of many school and recreation programs nationwide.

Another factor that must be taken into consideration with children regarding their wheelchairs is growth. Growth is a factor that must be addressed in each child on an annual basis. This is not to say a child will require a replacement of the wheelchair each year because the majority of pediatric wheelchair frames are built with adjustability for growth. A qualified RTS or ATS (Rehab Technology Supplier or Assistive Technology Supplier) will always try to allow for a maximum amount of growth in relationship to the current measurements of a child. Sometimes a child's measurements fall between two sizes of wheelchair frames, and less growth must be allowed for proper propulsion of a manual wheelchair. This is less of a concern in motorized wheelchairs where the ability to reach a joystick is far more adjustable than the ability to properly reach two

handrims. In the author's experience, pediatric wheelchair frames generally will last the child from four to five years with growth being modified and accounted for.

Growth also must be accounted for not just in the frame of a wheelchair, but also in any custom seating system for children. This too is easily accomplished by quality evaluations by rehabilitation professionals when first designing the seating system. All seating systems should have about four to five years of growth built into them. One exception to this rule is custom molded seating systems such as Contour U or the Otto Bock OBSS systems. As these systems are created utilizing an actual body mold of the child, there is far less available growth that can be built into them.

Young Adults (ages 16-30) also are highly active and from older teenagers through early twenties, the average individual is still attending school. Many are propelling for longer distances, especially throughout college campuses. In general, this age group is far less sedentary and the population who are wheelchair dependent are now spending far more of their time with able-bodied friends and out in the community than ever in our past. Most are in the same wheelchair for as much as 18 hours per day, seven days per week. Some also have become involved in wheelchair sports on a far more aggressive level (although the more serious of these athletes will probably purchase or utilize a separate sports wheelchair for their particular game). Again, the greater the activity level, the more wear on the wheelchair overall.

Adults (ages 30-65) in general will tend to have a bit lower activity level. Many wheelchair dependent individuals will be married, have families, and spend more time at home. Many who are working in offices are indoors in more confined spaces throughout the day, putting far less stress on the wheelchair frame. This is not to say that many individuals of this age range are not active in the community or their careers, but the stress on the wheelchair in this type of lifestyle is far less.

Senior Citizens (over 65) as a rule have a lower activity level. Many who are using manual wheelchairs (even lightweight frames) may not have the endurance or strength as they age to manually propel the chair long distances or in more difficult outdoor environments. Many may not be able to self-propel at all and are pushed by an attendant. With such a lower activity level, the replacement schedule for the wheelchair should obviously decrease.

Environment

Where the wheelchair is being used must be considered when one is computing replacement schedules. A suburban and urban environment where there are mostly paved sidewalks, graded curb cuts between streets and, thanks to the Americans with Disabilities Act, far more wheelchair accessible buildings, puts only limited fatigue on the wheelchair.

Clients who live in a more rural environment with far less of the above noted accommodations will fatigue the frames of their chairs quicker. Hills, rocks, and soft earth not only put more wear and tear on the frame, but also will require more frequent repairs to the chair.

On the other hand, individuals who live in a skilled nursing facility will put far less stress on the wheelchair. The linoleum floors, fully accessible environment, and inferred lower activity level will increase the overall lifetime of the wheelchair.

Behavior

How an individual behaves in a wheelchair can greatly influence its replacement. This factor is more relevant for those in manual wheelchairs, as an individual with uncontrolled behavioral

problems should probably not be driving a motorized wheelchair. The first instance to consider is whether your client can self-propel a manual wheelchair at all. If the client does not self-propel, either due to physical or cognitive deficits, their overall activity level in the wheelchair will usually be far less than those who functionally propel their chairs.

Some individuals, either through developmental delays or with serious head injuries, may exhibit hyperactive, athetoid, or extreme self-stimulation behavior and all of these behaviors will stress parts of a wheelchair frame. The author works with a large population of institutionalized clients who all perform some type of self-stimulation behaviors incessantly in their wheelchairs. For example, they may slam their bodies back and forth in a rocking motion for hours while seated in a chair and others, if not controlled, may beat the sides of the wheelchair with their fists, or, in transferring, will forcefully propel themselves into or out of the chairs. Any of these extreme behaviors will have an effect on the lifetime of the chair.

Body Type

Clients who are obese or are close to the weight limitations of a certain wheelchair frame will obviously put more overall wear on the chair. Most wheelchairs come with a 250 lb. weight limitation; however, there are custom bariatric frames that are capable of supporting an individual weighing between 600-1000 lbs. Obviously, the higher the weight limitation, the more it will compensate for this weight factor.

Lifestyle

How the client spends the majority of each week is another factor that should be considered. Does the client spend most of each day at home or do they go into an office or a school five days a week? If so, how are they transported? It should be noted that the very act of securing a wheelchair onto a van or school bus twice a day for a long ride will lead to some wear as the vibrations on the frame will eventually cause the bolts to “oval out” the holes in the frame. Wheelchair manufacturers and research facilities routinely test their frames in a “double drum vibration sled” to count how many cycles will lead to frame damage (Vitek, M., Cooper, R., Renschler, A., Algood, D., Ammer, W., & Wolfe, E., 2001; Johnson, D., 1996).

Lifestyle also must be reflected in the appropriate model of wheelchair chosen for the client. If the client is an active self-propeller, the chair prescribed should be a high strength ultralight frame. Various studies have tested the durability and cost comparisons of different wheelchair frames and it has been shown that “ultralight rehabilitation wheelchairs are the most cost effective over the life of the wheelchair, costing 3.4 times less (dollars per life cycle) than depot (standard frame) wheelchairs and 2.3 times less (dollars per life cycle) than the lightweight wheelchairs tested in the study (Cooper, Gonzalez, Lawrence, Renschler, Boninger, & Van Sickle, 1997). Likewise, if the client is obese or exhibits self-stimulation behavior, a heavy duty or even custom reinforced frame is required. Similar appropriateness of correct model selection must be assured in calculating the replacement of a motorized wheelchair.

One note in considering a lifestyle should be when your client has both a motorized and manual wheelchair. In most cases, the manual wheelchair will be used as a backup, so consequently its overall use may be far more limited than the use of the motorized wheelchair throughout the week. This too must be taken into account when projecting replacement schedules.

Replacement Allowance Worksheets

The author first introduced the worksheets included at the end of this article to participants of the Life Care Planning Summit in Chicago, IL on May 18, 2002. At that time, first drafts of the worksheets, based on available data, were sent to over 20 life care planners throughout the country for their comments on both accuracy and ease of use. Initial changes were made and the worksheets were then sent to another eight volunteers for additional comments. Responses from the life care planning community from both mailings were about 20% of all those sent.

It is hoped by the author that the worksheets will be considered a tool to improve the overall reliability of life care plans in the area of wheelchair replacement. By accounting for the factors described in this article, the assigning of a replacement value for a wheelchair can be better defended with a more objective basis. It is further hoped that this tool can be adjusted and improved with time by communication with the author as various life care planners utilize and perhaps supplement them based on the uniqueness of their individual cases.

Estimated Replacement Schedule Assessment Form Manual Wheelchair

All medical equipment will eventually wear out and must be replaced. The frequency of replacement is dependent on the individual using the equipment and various factors in their life. Two assumptions must be made for this worksheet:

- 1) The wheelchair frame is appropriate for the life style of the client; i.e., if they are active self-propellers, this should be a high strength ultralight frame. If the client is obese or exhibits self-stimulation behavior, a heavy-duty reinforced frame may be required.
- 2) Routine maintenance is done on an annual or as needed basis.

The following worksheet will assist the rehabilitation consultant with evaluating the factors and how they affect the overall replacement schedule of each item. Each of the factors will either add to or subtract from the life of the equipment being used.

Identify factors that affect your client, and then apply them to the chart based on the “value” instructions. The Adjusted Replacement Time in the lower right hand corner will be the estimated weighted replacement schedule for the particular piece of equipment.

Client Name: _____ Date of Birth: _____

Average Replacement Time: 5 years

Additional Determining Factors	Value	Effect on Replacement Time
Age: if client is...	Then +/-	From 5 years
4- 16 years	-1 year	
16-30 years	-.5 year	
30-65 years	No chg	
>65 years	+ 1 year	
Environment: if client lives in ...		
Suburban or Urban	No chg	
Rural Environment	-.5 year	
Skilled Nursing facility	+1 year	
Behavior: if client ...		
Can self propel	No chg	
Cannot self propel	+1 year	
Has self stimulation, athetoid, or other hyperactive behavior	- 2 years	
Body Type: if client is ...		
Over 250 lbs	-.5 year	
Lifestyle: if client ...		
Is highly active adult	-.5 year	
Locks wheelchair into a van or school bus several times per week	-.5 year	
Is using manual chair as a backup for a power chair	+ 2 years	
Adjusted Replacement Time	=	

Estimated Replacement Schedule Assessment Form
Motorized Wheelchair

All medical equipment will eventually wear out and must be replaced. The frequency of replacement is dependent on the individual using the equipment and various factors in their life. Two assumptions must be made for this worksheet:

- 1) The appropriate model of motorized wheelchair has been chosen to meet the lifestyle, environment, and weight capacity of the client.
- 2) Routine maintenance is done on an annual or as needed basis.

The following worksheet will assist the rehabilitation consultant with evaluating the factors and how they affect the overall replacement schedule of each item. Each of the factors will either add to or subtract from the life of the equipment being used.

Identify factors that affect your client, and then apply them to the chart based on the “value” instructions. The Adjusted Replacement Time in the lower right hand corner will be the estimated weighted replacement schedule for the particular piece of equipment.

Client Name: _____ Date of Birth: _____

Average Replacement Time: 5 years

Additional Determining Factors	Value	Effect on Replacement Time
Age: if client is...	Then +/-	From 5 years
4- 14 years	-1 year	
14-30 years	-.5 years	
30-65 years	No chg	
>65 years	+ 1 year	
Environment: if client lives in ...		
Suburban or Urban	No chg	
Rural Environment	-.5 years	
Skilled Nursing facility	+1 years	
Body Type: if client is ...		
Over 300 lbs.	-.5 years	
Very ataxic or has high muscle tone of upper extremities	-.5 years	
Lifestyle: if client ...		
Is highly active adult	-.5 year	
Locks wheelchair into a van or school bus several times per week	-.5 years	
Adjusted Replacement Time	=	

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