

Home Assessment in Life Care Planning

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Abstract

Of the originally published life care planning format, two pages or categories, Home Furnishings and Accessories, and Architectural Renovations, were dedicated to addressing requirements associated with living at home for clients with catastrophic injuries or complex chronic healthcare needs (Deutsch & Raffa, 1981; Deutsch & Sawyer, 1985). The category relating to home furnishings is generally understood to incorporate equipment and supplies, typically of a “medical” nature, such as with durable medical equipment and other required equipment. Examples include specialized beds and skin care mattresses, patient lift systems, and portable ramps (Deutsch & Sawyer, 1985; Weed & Field, 2001; Weed & Berens, 2006). Similarly, the category relating to architectural renovations provides for permanent alterations or modifications to a structure. Examples include accessible bathrooms, accessible entrances, wider doorways, modified kitchens, changed floor coverings, etc. However, in many situations, an existing structure may require such extensive modifications that the task is impossible to achieve or the cost benefit analysis results in a decision to design and build a new home that more appropriately fits the client’s needs.

The life care planner must also recognize that some clients will not have the funding to fully achieve recommended modifications or housing design, and such home furnishings and architectural renovations recommendations should be prioritized based on the level of necessity to achieve maximum value. This article will offer an overview of a suggested life care planning process for home assessments, including the recommended qualifications of the professional on whom the life care planner may rely for appropriate home assessment recommendations.

Key words: life care planning, architectural renovations, home modifications, home assessment, cost assessments.

Introduction

Qualified life care planners are trained to evaluate a client’s needs for specialized housing and home modifications in addition to future medical care and other factors (Deutsch & Sawyer, 1985; Grisham, 2004; Weed & Field, 2001; Weed, 2004). Example conditions that may merit evaluation for specialized home equipment, renovations, or environmental requirements include spinal cord injury (Ford & Duckworth, 1987; Winkler & Deming, 2004; Winkler & Weed, 2004a), amputation (Meier & Weed, 2004; Meier, 2004), brain injury (Ripley & Weed, 2004; Savage, Klingbeil & Fowler, 2004; Weed & Berens, 2006), burns

(Brown, Helm & Weed, 2004; Sheridan & Fox, 2004), cerebral palsy/neurodevelopmental disabilities (Neufeld, Monasterio, Livingston, Taylor, Grisham, & Taylor, 2004) visual impairments (Winkler & Weed, 2004b), geriatrics/elder care (McCollom, 2004), and any other disability or condition that impairs daily living functioning. Requirements can range from relatively inexpensive equipment to a complete rebuild of the home.

Selection of Qualifying Professional or Company to Perform the Home Assessment

In the authors' opinion and based on their professional experiences, the assessment of home needs can be one of the most critical areas of the life care plan and can potentially be one of the most expensive. Proper design for function, safety, hygiene, independence, attendant care, transfer and other activities need to be taken into full consideration. A general contractor, without appropriate knowledge, may look at the home and see the need for door widening, ramping and possible roll-in shower, but likely will miss fire safety exits, adequate door header height for accessible van for covered transfer, interior flooring issues, accessible kitchen, office areas, client mobility and function, etc.

In many cases, if not most, the entire home will need to be designed specifically to accommodate the client, giving consideration to their function, range of motion, and abilities. (Note: There may be occasions where a client will not require access to a second floor or a basement, so in some circumstances it may be justifiable to limit the assessment to the client's main living area.) Although the bathroom could be designed with a roll-in shower, the size of the shower will depend on the size of the individual, the type of shower chair, care attendant assistance requirements, and other factors. However, if the recommendation for the client is to include warm water therapy, then an overhead transfer system and bathtub sized to accommodate the client would be the best option rather than a roll-in shower. Another option may be the Shower Trolley, the latest bath item for individuals who are tetraplegic who require full bathing assistance (see photo 1). The Shower Trolley lays flat and will allow an attendant to turn the client on each side for full bathing and skin inspection. The trolley, which retails for \$7,995, requires a larger space and a different bathroom design than a roll-in shower or overhead transfer system, and the person performing the home assessment must be cognizant of such options.



Photo 1 - Shower Trolley (Photo by Jim Karl)

As the reader may begin to understand, selecting a professional or company knowledgeable of all the options for home modifications and design is critical. Equally important is the professional's ability to have proper understanding of the client's situation in order to support their assessment report and defend it, particularly if the life care plan is utilized in personal injury litigation or workers' compensation cases. Suggested

credentials for a home assessment professional include a Certified Environmental Access Contractor/CEAC (Note: The company responsible for this credential reportedly has recently discontinued issuing additional CEAC certifications), and/or Certified Aging In Place Specialist/CAPS (information and directory available at <http://www.nahb.org/>). There are also some architects and licensed general contractors (GC) who specialize in handicap accessible renovations and/or construction. Networking with peers who have had positive experiences with successful home assessments/modifications also may reveal good choices.

Home Assessment Process

The home assessment should consist of a full overview of all of the required modifications. To focus solely, as some less knowledgeable consultant might, on the bathroom and ingress or safety exits, will leave one with a home that is not properly designed for the individual's function, safety, independence and general mobility. One way to achieve a proper assessment is to consider that teamwork is a must. In these authors' opinion, it is important that the life care planner supply the home assessment consultant with as much information as possible, describing the client's physical functioning and range of motion, relevant mental or cognitive considerations, medical care recommendations, type of equipment used or recommended, level of home attendant care required, hobbies, and any other pertinent information. This information will assist the consultant in comprehensively surveying the home for function and safety. The home assessment should be discussed with the client and available family members, whenever possible, to insure that all relevant details regarding individual needs are considered and included. In the event that the client is temporarily residing elsewhere, such as a hospital or extended care facility, it is recommended that a meeting with the individual be arranged prior to the home assessment. A family member of the client, life care planner, case manager, occupational therapist, and, in some cases, an assistive technology expert and the client's attorney also may be included in the assessment process. Typically, the assessment will take on the form of questions and answers for each design area as to function, space, usable design, safety, independence and attendant care assistance. In these authors' view, all home areas that do not require modification for the client should be so noted in the assessment so that the reader will understand that the room or potential modification was not overlooked.

Based on the first author's experience, the usual time required for completion of a comprehensive on-site assessment generally will range from two to four hours. The typical assessment charged by the first author ranges from a flat rate of \$1,800 to \$2,800 and includes the time required for an on-site evaluation as well as researching design specifications and a written report. The difference in cost relates to the complexity and design sophistication requirements. When charging by the hour, the estimated range in the metropolitan Atlanta, GA area is \$150 to \$180 per hour.

As the reader can imagine, trying to modify an existing home can be very challenging and, if the home is too small, adding on or designing a new home to properly allow maximum function, safety and independence may be more cost effective. However, with today's pricing, in the first author's experience, approximately 30% of the remodeling costs are for demolition and restructure to allow for the new modifications. In many cases, the funds directed toward demolition would be better spent on new construction since renovations and modification often have "trade-offs" and do not entirely meet the needs of the client. In addition, some

homes, when modified, become much more expensive than other houses in the neighborhood and this can complicate recapturing the home's value when re-sold. That is, the same modified home in a "better" neighborhood potentially would sell at a higher price.

General Assessment Overview

The following is a guide to a general overview of a home assessment and suggests possible modifications for each area. As noted earlier in this article, client specifics will ultimately determine the actual home assessment report and the project cost range for each area. The authors note that the list below provides examples and is not inclusive of all options available to create the most accessible home.

I. Entrance to Home, Covered Transfer Areas and Fire Safety Exit

A. Ramps

Areas with a rise of 30" or less are appropriate for ramping. Several types of ramping can be developed and will be dependent on the style of home, location of ramp and homeowner's association requirements, if applicable. Aluminum ramping with handrails is preferred to wooden ramping for longevity, ease of maintenance, and safety. Other types of ramping include concrete and other solid surface products. The general cost consideration for ramping is \$150 per foot installed plus any additional site preparation work that may be required.

B. Porch Lifts

Areas over 30" in height or with limited space, such as inside of a garage, can be modified by using a porch lift (see Photo 2). When using a porch lift, it is important to always have a permanent type of ramp that can be used as an emergency exit in the event the porch lift malfunctions or the power supply is cut. The cost of the porch lift is approximately \$6,800 or more depending on height and site preparation.

C. Fire Safety Exits

Exits that require access through a kitchen, carport or garage, or past a gas furnace that is sometimes located in a hall will not qualify as safety exits, as these areas are the most likely to be involved in a fire. A preferred location is directly out of the bedroom or within 25' of the bedroom where the client sleeps. The cost to install a fire safety exit varies widely depending on exterior door installation requirements (moving electrical wire in walls, structural supports, brick or block exterior rather than wood or stucco, etc.), amount and style of ramping, and site preparation. At the low end, an uncomplicated exterior door installed would be about \$2,400.



Photo 2 - Mac's Porch Lift™
(Photo from: <http://www.macslift.com/>)

D. *Covered Transfer Areas*

The size of the client's van will determine the door header height of the garage. Keep in mind the size of the chair and age of the client as well. If the size of the chair or function of the client will change or limit the movement of the head, the style of van and correspondingly the size of the covered structure (carport or garage) may change. In general, the garage door height should be designed for the taller van and would typically require at least a 9' door header. Also, should the home be sold, the taller door header will open up the market to all clients with similar needs. Another consideration is that, due to the size of many handicap accessible vans, additional concrete for backing up and parking likely will need to be installed to accommodate the reduced maneuverability of larger vehicles. Further, the van that has a side-landing platform will limit the availability of another car in the garage and the entry door location into the home will also determine the function of the van in the garage.

II. Access Throughout The Home

A. *Type of Mobility Equipment Used for Assistance*

The type of floor covering, width of hall, width of door openings, and location of doors are considerations for using mobility equipment in the home. Not all areas of the home can be widened. Below is a description of possible options for in-home access.

B. *Two Story or
Basement Access
Required*

Possible options for home access include stair lifts inside the home (see Photo 3), incline platform lifts, and elevators or porch lifts. As mentioned earlier, there should be a direct exit out of the client's living area without having to use the mechanical device for maximum safety.



Photo 3 - Stair Chair (Photo Jim Karl)

C. *General Maneuvering Around the Home*

The size of rooms will depend on the type and style of furniture, space for transfers, flooring, width and length of hallways and any turns, trip hazards, throw rugs, extension cords and location of required controls, i.e., thermostats. Automatic door openers will provide major improvements for independence. Additionally, some clients will require voice activated home automation systems (see Assistive Technology below for more on this topic).

III. Bedroom

The size and layout of the client's bedroom will be directly affected by the type of equipment required, size of the client's wheelchair, level of attendant care, and method of transfers. Below are some considerations to be addressed:

- A. Adequate space by the bed is the first consideration because transfers can be assisted, unassisted, or involve specialty requirements which could increase the complexity of the room design. This would in turn necessitate extra special attention to room specifications.
- B. Attention to possible specialty lighting requirements, additional heat source or additional electrical outlets for the client's equipment, and the location of each.
- C. Some clients, such as one who is ventilator dependent, will require a back up generator for emergency power to operate equipment during a power outage.
- D. Overhead transfer systems exist which can reduce the number of people needed to transfer a client to a chair, bathroom or other locations with the home (see Photo 4). Certain designs allow for moving from room to room even with doorways between the rooms. Some lift systems have a hand control which a client with adequate function can use without assistance. Overhead lifts start at about \$5,200 installed but will increase in cost based on the complexity of installation (such as ceiling supports and doorways), track and run.
- E. For clients with adequate functional ability, clothing storage to include accessible closet and custom designed dresser drawers will be needed. The dresser can be designed with easy pull out drawers at wheelchair height and hanging rods that can be lowered or re-installed in the closet at wheelchair height. The cost of the glides to be added to a drawer costs about \$50



Photo 4 - Ceiling mounted powered lift with battery back-up (Photo by Jim Karl)

per pair. Closets that incorporate motorized technology to reduce physical effort or enhance access can also be employed.

- F. If extra space is required to accommodate therapy equipment that has been recommended by the OT and physician, a fold down therapy table is an option that will reduce the amount of space needed. Cost of a fold down therapy table depends primarily on size and can be expected to range from \$850 to \$1,800.
- G. The home should have a fire safety exit that does not require going through the kitchen, a garage, or by a furnace room. If a functional fire safety exit is not possible, a new home which provides a safe environment is strongly recommended. Many clients require substantially more time to exit a home (especially if in bed) or need an attendant to transfer. A plan for safe egress can not be emphasized enough.
- H. General room design to include a 14' x 16' room size is a good reference point. Small rooms can limit wheelchair function beside the bed and access to storage in addition to increasing safety issues in patient transfers.

IV. Bathroom

The bathroom, like the bedroom, will require specific design modifications such as adequate room size, type of equipment, bathing options, and required assistance that is individualized to the client's specific needs. All of these variables need to be discussed with the client, healthcare providers and probably family members (especially if the client is a child) to develop the bathroom design and safety of function required by the client. The type of bathing and equipment required, such as tilt back shower chair, Shower Trolley (see Photo 1) and specialized care when bathing (i.e., clients who are ventilator dependent), all have an effect on the size and design of the bathroom. Due to convection cooling, a wet client who has reduced ability to regulate body temperature (such as a client with a spinal cord injury) likely will benefit from overhead infrared heat lamps if possible to install. The cost of tilt-back shower chair begins at about \$2,100, and Shower Trolley retails for \$7,995. Below are some additional considerations to be addressed in the bathroom:

- A. Independence, or need for assistance and the level of functional ability, will affect the room dimension requirements. A rule of thumb is the more assistance that is required, the larger the room size. Additionally, the presence and location of specialized equipment for optimum use can dictate room dimensions.
 - B. Grab bars, if needed, will require careful assessment of their locations. Further, most walls will require the installation of backing to properly anchor the bar. The standard grab bars range about \$50-60 and decorative models can cost up to \$300, not including installation. Note that installation costs for most of the entries are not included because every situation is different. For example, a grab bar cannot be bolted to an older plastic tub or shower. Therefore, a rebuild of the tub or shower would be added to the cost of the grab bar.
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C. Toileting Options

1. High rise toilets can be “stand alone” (expect about \$285 plus installation) or specialized products that fit over existing toilets (cost ranges from \$85 to \$200). Also, electric toilet lift seats which help a client rise to a standing position can be helpful to someone who has reduced function (e.g., elderly) and range in cost from \$750 to \$1,800.
2. The amount of space required for the client’s wheelchair to be placed next to the toilet will be determined by method of client transfer. For example, a client with a spinal cord injury at, say, the T-12 level, will likely be able to transfer themselves with the aid of grab bars by placing the wheelchair along side the toilet. A client who needs some personal assistance such as “stand and pivot” to the toilet may need less room, but benefit from at least one grab bar. A client who utilizes a Hoyer or overhead lift will need enough room for two people (also see #3 below).
3. There are specific floor lifts that are designed for assisting caregivers with client toileting. The lift is designed to provide for seated to seated transfers with the function of the lift to raise the individual to a partial standing position. These specialty lifts greatly assist with the removal of garments in toileting and are known as standing aid lifts. The cost, at the low end, is in the neighborhood of \$3,800. The Barrier Free lift is another option and lists for about \$6,800.
4. Open bottom shower chairs have proven popular for double duty as a toileting aid as well as shower assist. Cost begins at \$980.
5. Overhead transfer systems may reduce attendant care requirements (previously mentioned since they can be useful in many areas of the home).

D. Bathing Options

1. A walk-in bathtub with a high built-in seat adds increased safety for elderly persons or those with limited mobility/balance. However, the individual must have enough function to make a 3” step into the unit. Cost is approximately \$6,500 plus installation.
 2. Roll-in showers are popular but the dimensions will depend on the size of the client, required assistance in bathing, and type of shower chair. The minimum size is 4' x 5'. The shower unit by Best Bath is a modular unit that has several full roll-in model sizes available and has a plywood reinforced wall structure to allow for installation of grab bars. Prices vary according to size and style, but could be budgeted beginning at \$4,400 plus installation costs.
 3. If “therapy” bathtubs are recommended, the installation of an overhead transfer system is usually required for safe transfers. The system track design can be developed to allow for direct transfers from bed to therapy tub, thereby providing maximum ease, safety and function.
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4. As mentioned earlier in this article, the newest item for bathing which facilitates client positioning and reduces attendant requirements is the Shower Trolley. This equipment allows care assistants to fully bathe and inspect all areas for skin break down and achieve maximum hygiene for individuals requiring this level of care. Due to the size and function of this unit, special attention is required during the bathroom design process to assure adequate room to maneuver the device with a client in a prone or supine position.
- E. *Additional storage area(s) for personal items, supplies and equipment is a common need for individuals with a disability.*
An additional storage area should be designed for ease of independent usage, as appropriate, or according to the client's or caregiver's capabilities.
- F. *Roll-under Sink and Vanity Area*
The vanity area should have a cultured marble vanity top with a built-in sink to provide a smooth, flat surface to set and reach items as well as a sink location. Cultured marble allows for a specific design and placement of the sink which is an integral part of the product (no seams) and can be fabricated for clearance for roll-under access. The vanity should have full pull-out drawers for easy access and the faucet can be located to the side of the sink if limited reach is an issue. Typically recommended is a single lever faucet or an automatic turn on faucet with a longer spout and angle to direct the water flow toward the center of the sink for easier water flow onto hands. The vanity mirror should be positioned to allow for seated viewing.
- G. *Flooring*
Non-slip floor tile is the ideal surface as tile will generally withstand a wet environment without damage. Vinyl floors typically will develop mold and mildew, as well as other problems, if not properly sealed and maintained.
- H. Minimum bathroom size is 10' x 10', although most bathrooms designed for clients are larger.

V. Kitchen

The kitchen is an area that can be designed to provide for full function or a special function depending on the client's capabilities. The size of the kitchen will vary depending on the client's needs as well as on the adjacent room. If the area is combined with, say, an eat-in kitchen and with open access, the kitchen may not require as much room as one that is in a room that is self-contained. In general, an open space of five feet is needed for maneuverability and access. If the kitchen is self-contained, expect at least a size of 9' x 14'. Areas of consideration for the kitchen are as follows:

1. Roll-under sink for clients who are wheelchair reliant but have enough functional abilities for independence.
 2. Lowered food preparation surfaces so that clients can perform tasks from a seated position.
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3. Roll-under electric cook top is preferred. For safety reasons, a gas stove is not recommended for use by individuals with a disability or mobility impairment. The style of cook top that is recommended by the first author is one by Fisher Paykel which will contain a spill of a half-gallon of liquid over the surface. This is an obvious major safety feature when cooking. Also, for clients who are able to cook, the controls must be located on the side so the person does not have to reach over the burners to operate the stove. The cost for Fisher Paykel cook top is about \$1,300.
4. A raised dishwasher for easier function or the Fisher Paykel dish drawer unit which pulls out like a drawer is recommended. The cost for a single drawer model is about \$1,100 and the two drawer model is about \$1,600.
5. Built-in oven with a side-opening door that is located at proper seated height (rather than a standard pull down oven door) may be indicated depending on the client's abilities. Expect to pay about \$850.
6. Base cabinets with full pull-out extension drawers with taller than typical sides provide ease of access for clients. These are designed for dish and cooking utensil storage and pantry items and often have built-in guides for organizing utensils and dishes.
7. Switch controls for garbage disposal, lights, etc. at front of cabinet for seated height may be indicated.
8. Solid surface counter tops for movement of items such as heated items and water may be required.
9. Adequate floor space and movement radius is critical and is dependent on client size, functional needs and other factors.

VI. Laundry Room

This area can be designed for wheelchair function, care attendant function or left as standard. Type of possible modifications:

1. Raised front loading washer and dryer units have become mainstream and several models and features are available. Expect to pay about \$2,000 or more for a pair, not including delivery. Pedestal style may be extra.
 2. Lowered roll-under folding surface to allow client to sort and fold clothes from a seated position may be indicated.
 3. Wheelchair accessible hanging rack so client can reach and hang clothes to dry.
 4. Accessible storage area for cleaning items.
 5. Adequate floor space for ease of movement.
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VII. Assistive Technology

The utilization of technology based items can give independence back to individuals for specific functions that would otherwise not be possible (for more information on this topic visit the Center for Assistive Technology and Environmental Access at www.catea.org/). Environmental control units (ECUs), sometimes referred to as electronic aids for daily living (EADLs), are designed to allow individuals to perform daily routines and operate various household items in their home via technology based products (Gilman, 2007). The technology, when incorporated with a computer system, can allow for complete home automation. Available computer system software packages can accommodate individual function including voice activation and automation, character recognition, control of household items and much more. Some examples of independence through technology that can be achieved include turning on and off lights, dialing and answering the telephone, typing letters or other documents, sending a fax, taking care of personal finances, controlling the TV/DVD/CD player/stereo, opening outside doors, and adjusting the bed. By utilizing assistive technology, the client's level of independence not only reduces attendant care needs but also increases the client's sense of self-worth and self-esteem as a major benefits. Costs range from a few hundred dollars to more than \$13,000 for the Multimedia Max system with all available options (<http://www.abilityhub.com/ecu/index.htm>).

Conclusion

The proper design of a client's living environment is critical for independence, function, safety, hygiene, care attendance as well as general enjoyment and quality of life. Sometimes an existing home will not accommodate the required modifications or the expense for renovations will be unreasonable when considering demolition expenses or the house value after modification in relation to other homes in the neighborhood. On those occasions, the design of a new home will be more cost effective and will provide for a much better level of safety and function. The new or modified home, depending on the client's specific factors and requirements, may be the home in which they reside to old age, and the areas listed in this article may have the additional need to be designed to allow for the client's aging and deteriorating functional abilities.

In addition to aging considerations, the client's home, especially for one who has significant limitations, likely will be the environment in which most of their time will be spent. For this reason alone, safety, function, and comfort are of paramount concern. Adequate assessment not only provides the foundation to improve or modify the client's environment to meet essential needs, but can reduce the cost of care, decrease complications, provide safer surroundings, and improve one's quality of life and wellbeing, even as the client ages. This article was intended to familiarize the life care planner on the importance of utilizing an appropriately certified or qualified home assessment consultant who will consider and incorporate, as part of a comprehensive assessment, the topics and issues presented in this paper.

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