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Home Technology For Home Builders

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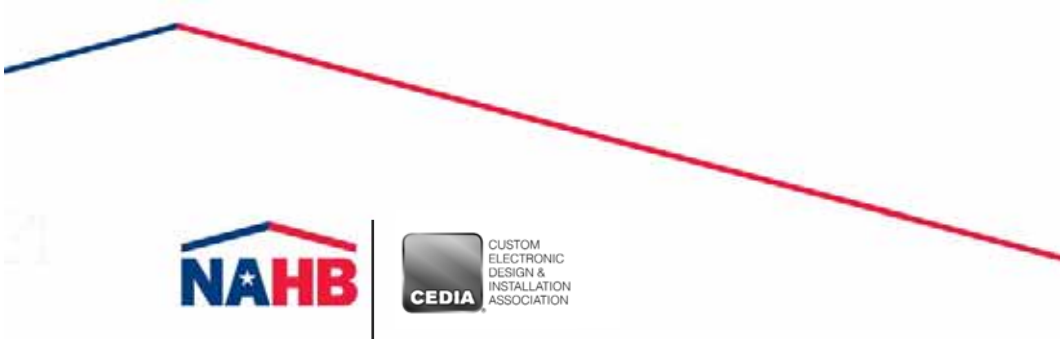
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Comfort at Home: Residential Medical and Health Technology Solutions



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Introduction

This year's Home Technology Alliance builder business guide focuses on home medical and health-care technology. A recent study by research firm Parks Associates suggests the wireless home healthcare industry will grow to \$4.4 billion dollars by 2013.¹ Senior independent living is among the areas identified as potential benefiting from such growth.

With aging comes many decisions, chief among them where you'll live, how easy will it be to care for yourself, and will you need someone to help you? The physical challenges of aging are particularly difficult, especially after a long life of independence. While there is no technology to reverse the aging process, there are those that can help homeowners maintain an appropriate level of freedom, and in the process afford them additional safety and security.

These ideas fall under the topics "aging in place and "universal design." Although different in their respective details, when taken together, these terms explain home design and building processes. They take into account the entire lifespan of a homeowner as well as their lifestyle, and the inevitable changes that come with each phase of life. An integral part of these designs is the home technology making life easier for older homeowners or those with physical challenges.

Builders, remodelers, and electronic systems contractors ought to recognize, and take advantage of, this burgeoning market. This year's Home Technology Alliance builder business guide provides an introduction, explaining the concept of aging in place design and highlighting technology trends and types easily integrated into a residence. Readers will also find a helpful listing of resources for additional information.

¹ "Wireless Healthcare: Analysis and Forecasts", 2009, Parks Associates, available: <http://www.park-sassociates.com>.

This year's guide once again brings together a collection of articles written by professionals in the home-building industry and in home technology industry. Several pieces are reprinted from respected industry publications, and several are original submissions drafted for the HTA. While the guide targets a builder/remodeler audience, staff strove to collect an assortment of viewpoints including non-builders. The installed home technology field is wide and diverse in its professional members, and serves as an invaluable source of education and insight.

This guide is meant to whet your business appetite and encourage you to enter what may be a new area or rethink the way you're already working in it. We encourage you to take the information presented here and build upon it for your company's future success.

*Agustín N. Cruz, Executive Director
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The Home Technology Alliance (HTA) is a partnership supported by founding sponsor Custom Electronic Design & Installation Association (CEDIA). The HTA's mission is to educate builders about the many benefits of installed home technology and working with a certified electronic systems contractor. On the HTA's Web pages, builders, remodelers, and home technology professionals will find useful information and resources. Find out more at www.nahb.org/hta.



Meet Accessibility Needs of All Homeowners with Universal Design

By Ed Lindner

Through the growing trend of universal design, builders and interior designers are working together to create new homes and remodels that answer the needs of an ever-increasing portion of the American population—senior citizens and people with disabilities and limited mobility.

According to the most recent U.S. Census Bureau statistics, about one in five U.S. residents, or 19 percent, reported some level of disability. To put this into perspective, these 54.4 million Americans are roughly equal to the combined total populations of California and Florida. An even larger portion (78.2 million) of the American population—Baby Boomers, those born between 1946 and 1964—are fast approaching retirement age. According to a recent American Association of Retired People (AARP) survey, 90 percent of Americans aged 60 years and older prefer to stay in their own homes as long as they can, or age in place.

The above statistics stress the increasing importance of universal design in today's new and remodeled homes and are

fueling the growing trend. Builders and designers are creating floor plans that make all standard daily living needs easily accessible on the main floor. Appliance manufacturers are also getting involved, designing new home products that address the needs of the wheelchair-bound, sight-impaired, and people who have limited hand movement, such as arthritis sufferers. However, universal design is about much more than meeting the needs of the disabled and senior citizens.

While the idea for universal design grew from recognizing that most features needed by people with disabilities are useful to others, there is justification to make their inclusion common practice. True universal design enables all users, regardless of age or physical and mental abilities. When executed properly, universal design provides solutions in ways that aren't obvious or obscure, but rather ingenious and virtually invisible. Furthermore, principles of universal design are meant to apply to all spaces, features and aspects of houses to create homes that are usable by and market-ready for people of all ages and abilities.

Simplifying Universal Design

The need for universal design in the housing industry is here; yet, designers and builders are not generally trained in building accessible housing. In most cases, they either defer to early institutional standards and codes or seek advice from rehabilitation specialists. Too frequently, this process results in the unnecessary use of expensive assistive technology devices, durable medical equipment—such as stainless steel and chrome grab bars—and cumbersome features—such as ramps—that give houses a clinical or institutional look. Thus, many traditional accessible homes give the genre a negative image and a lower value in the marketplace. Fortunately, incorporating universal design doesn't have to produce results that are cold and institutional. And, it's not even a difficult task.

Making universal design techniques more discreet is often easily done. Sometimes, certain elements can be incorporated to make a major difference in the home. These include basic layout

changes, such as making entries level, moving bedroom suites to the main floor, widening doorways and stacking closets so they can be converted to an elevator. Complementing these elements are building products, fixtures and appliances that, with simple alterations, will have a very positive impact on lifestyle and functionality.

Some universal design features create experiences many people have never had. For example, designing bathrooms with extra floor space to accommodate users of mobility aids can be perceived as luxurious, and homeowners are often excited at the ability to have furniture in the bathroom. Adding a chair, bookcase, towel rack, or étagère can give bathrooms a marketable elegance and utility, and they can be removed if the space is ever needed to accommodate a disabled relative or friend. Larger shower systems are also marketed as a luxury item, but with more floor space, built-in seats, and multiple adjustable height showerheads, they are an excellent example of universal design.

Ergonomics, Visual Acuity and Cognitive Skills

Universal design plays an integral role in making kitchens, baths, fixtures, and appliances more accommodating to everyone. The housing industry is becoming more sophisticated in terms of designing products for usability and functionality. When incorporating universal design elements, fixtures and appliances within the home, there are three areas to consider: ergonomics, visual acuity, and cognitive skills.

Ergonomics

Ergonomic design is best defined as a search for a comfortable interior environment that reduces stress, ensures safety, and maximizes fulfillment of human potential by overcoming physical limitations. Ergonomics involves bringing access or control of household items to people with a limited range of motion, rather than making them reach or strain themselves.

One possible modification is to put the operational features of the home into a zone more accessible to all humans, generously defined as an area 27- to 48-inches above the floor, with a maximum depth of 20-inches. For example, switches and thermostats might be placed no higher than 48-inches above the floor and electrical outlets no lower than 27- inches. For children, and shorter and seated people, consider providing lower storage options, such as drawers and cabinets, no more than 54-inches high. Many under-counter washers and dryers are available to meet this height as well. Also, sink and countertop surfaces should be no more than 34-inches above the finished floor and should include knee space below.

Look for appliances with the handles, buttons and graphics located on the front of the unit, where they're closer to the user. This design change reduces the need to reach. It also reduces the potential for burns from a hot stovetop by eliminating the need to reach over electric or gas burners. In refrigerators and freezers, it is much easier to adjust controls near the front instead of reaching behind groceries.

Hardware in areas of the home, such as the kitchen and bathroom should be easy to use and require little or no strength and flexibility. Consider substituting level or oblong-shaped door handles, push plates, touch latches, or magnetic latches for mechanical keyless locks and loop handle pulls on drawers and cabinet doors.

Visual Acuity

Visual acuity may be different for each person, but as everyone ages, they tend to need additional lighting, larger print, eyeglasses, contact lenses, etc. Accommodations for visual challenges are also easy to incorporate into the home. For example, consider glare-free task lighting to illuminate work areas without too much reflectivity. Also, incorporate a contrasting color or distinct difference in the border treatment of the countertop to help improve visibility of the edges of counters and the different heights to prevent accidental spills. Appliance control locations

should be closer to the user, properly illuminated and their controls or LCD displays should be in the front and be easy to read with larger type and icons so users don't have to strain to read them.

Cognitive Usability

Cognitive usability is a concern when a new technology or user interface is intimidating to a large number of homeowners. As sophisticated technology is increasingly incorporated into designs, manufacturers must take care not to overcomplicate functions or make operations too complex.

For example, many long-time cooks now purchase convection ovens, but sometimes find the programming to be intimidating. Cooks using this advanced cooking technology have to rethink the cooking times and temperatures they've always known. To simplify operation, certain convection ovens feature a conversion system that allows cooks to just enter traditional baking settings as they have historically used or as instructed by a recipe. Then, they simply push a conversion button and the oven does the math.

Front-load washers and dryers also simplify operations, offering a choice between simple intuitive operational and high-tech operational options for those who want total control. Homeowners have the choice of operating the machines with two buttons that predetermine all the settings or a set of several buttons that allow them to determine every aspect of washing/drying, if customization is preferred.

Universal Design: Simple and Helpful

Using the universal design approach to select appliances for homes is one of the best ways to serve today's homeowners. Since major appliances have such a long life, typically ten to fifteen years, consumers are discovering universal design features supplement their own gradual decline in ergonomic, visual, and cognitive ability. These appliances help them to meet their desire to age in place, rather than relocate, a process that becomes increasingly taxing as people age.

Standing out in the marketplace by incorporating universal design doesn't have to be expensive or complicated. Even the simplest changes can make a huge difference in the lives of your clients. And that, of course, makes all the difference.

Ed Lindner, CGP is North Pacific Contract Division Director has been with Whirlpool for 19 years, starting in field sales. In 1997 he served on the task force that launched the Whirlpool Brand in China. Following this worked as a Merchandising Manager at our Whirlpool Corporate offices until 2000. He is currently the Contract Division Director in the North Pacific Division, responsible for sales in California, Oregon, Washington and Alaska. In addition to these duties Ed was recently assigned to represent Whirlpool at NAHB nationally. For more information on universal design, contact Whirlpool Corporation at www.insideadvantage.com or call 800-952-2537.



Bright Ideas for Your Business: Aging in Place Design & Lighting Controls

By Christine Bucks and Erik Anderson, CGA, CGP

The idea of aging in place involves designing homes that will fit the needs of homeowners when they're in their 40s or 50s — and that will still accommodate their changing physical abilities when they are in their 70s, 80s, and beyond. This type of design is becoming more popular as people (think today's Baby Boomers) realize they want to stay in their home as they age. They don't want to sell their home and move elsewhere simply because they can no longer climb stairs, can't reach the top shelf in the laundry room, or see as well as they used to.

Today, more builders and remodelers are taking aging in place design into account during the initial planning stages of each project. Common aging in place design elements include one story living, wide doorways and hallways, ample floor space, no-threshold showers, and adaptable features such as adjustable closet shelving.

What often goes overlooked, however, are technologies that can be incorporated into aging in place design. And one of the most flexible of these is lighting control.

The benefits of lighting control

When it comes to aging in place design, lighting controls are a smart addition to any plan. Whether you're remodeling an existing home or building a new one, lighting control is an easy way to add value to a project.

Lighting controls save energy—reducing electric bills—and do so without any sacrifice on the homeowner's part. They also give the homeowner the ability to create just the right light for any activity, such as reading, hosting a party, or watching TV.

Here's a look at different types of controls and what they can bring to an aging in place design.

Basic dimmers and switches

Many types of basic dimmers and switches are available in styles with large paddles, which make these products easy-to-use if your hands are full, if you have poor hand strength or motor control, or if you have poor vision. Some dimmers also incorporate locator lights so the dimmer is easy to find in the dark. And others contain a delayed off feature, which provides ample time for you to leave the room before the lights turn off.

Occupancy/Vacancy Sensors and Timers

Occupancy/vacancy sensors are a great solution for spaces where lights are often inadvertently left on, such as closets, utility rooms, bathrooms, and hallways.

You can use occupancy sensors to automatically turn the lights on as well as off. Having lights that automatically turn on is useful in areas of your home where you might enter and exit with full hands—such as a laundry room. This technology is also useful in

areas where you'd like to create a safe pathway of light, such as a hallway.

Vacancy-only sensors will turn lights off when you leave a room—but you'll have to manually turn them back on. Some state and local codes mandate the use of vacancy sensors in utility rooms, closets, and bathrooms.

You can also use timers to ensure lights, such as exterior lights, turn off after a certain period of time. In addition, you can use timers on bathroom vent fans so they aren't forgotten and left on too long. This application is especially useful in conjunction with the very quiet, high velocity fans that are being installed into homes.

Wireless controllers

The ability to use remote technology is very important to today's consumer—TV remotes, cordless phones, and wireless networks are just a few of the examples. But with aging in place design, the mobility and remote control that comes with wireless applications changes from a convenience to a necessity.

Wireless controllers are compact, portable, and flexible, making them a simple way to control lights. You can keep a controller by your bedside to turn on select lights in the middle of the night, such as hall lights that lead to a bathroom. Or attach one to your car's visor to turn on entry lights as you pull up to your home in the evening, eliminating the need to enter a dark house.

Some wireless controllers can be easily mounted to a wall to create an additional location for controlling lights in another area of the room or home. For example, the switches for exterior floodlights at the front and rear of a home are often at opposite ends of the home. Using this type of solution provides the ability to control all of the lighting from one location.

Whole home systems

A whole home lighting control system is a great investment because it can evolve as you age. You might use such a system in your 40s and 50s to create various lighting levels—or scenes—in a room or throughout your home, for entertaining or ambiance. As you grow older, your needs will change, and creating lighting scenes may take a backseat to using the system for safety and convenience.

For example, you might use the system to generate pathways of light at night — perhaps from your bedroom to the bathroom or the kitchen. You might also use the system to turn all lights off at the touch of a button from the comfort of your bed. Those things are easy to do with large-button, wireless controllers that you can place on a bedside table.

Automated shades

Lighting control doesn't only include electric light—it also includes daylight, too. You can control daylight with automated shades. Utilizing shades helps save energy by cutting heating and cooling costs, can protect furniture and artwork from damaging UV rays, and reduces glare off of computer and television screens.

While you may not give the ability to open or close shades a second thought now, you might when you're older. And shades that may be currently easy to access, such as behind a piece of furniture or bathtub, may prove cumbersome to reach in your later years.

Incorporating automated shades as stand-alone products in a single room or integrating them into a whole home system solves those issues. You'll gain precision control of daylight at the touch of a button, as you can raise or lower shades from a wall-mounted keypad, a tabletop control, or a hand held controller.

Increase your bottom line

Incorporating lighting controls as a way of creating a home that supports changing needs isn't difficult to do. The payoff for you is a better bottom line—and you'll delight your customers by giving them valuable technology in a home meant for a lifetime.

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What Is "Design for Independent Living," Anyway?

By Dan Bawden, CAPS, CGR, GMB

In response to the huge wave of Baby Boomers starting to retire, all sorts of products and services are popping up catering to the 50-and-over crowd. However, none of them hits as close to home as the nationally acclaimed "CAPS Program."

CAPS stands for Certified Aging in Place Specialist. It is a recent construction credential that has builders, architects, remodelers, designers, and even occupational therapists buzzing. Far beyond using universal design ideas, aging-in-place (aka independent living) principles are sweeping changes designed to custom-fit your home to you and your family as time goes by. CAPS design takes your current and future circumstances into consideration. CAPS design principles focus on elegant, aesthetically enriching, barrier-free environments. These are changes that can actually increase the value of your home, according to some realtors.

What is Aging-in-Place exactly? If you are like the majority of Americans you want to continue living at home in a familiar

environment throughout your maturing years. Aging-in-place means living in your home safely, independently, and comfortably, regardless of age or ability level. It addresses the need to remodel existing homes, and design new homes, so people can age-in-place and not have to move to assisted living facilities as they age. Since the majority of homes we live in are not well designed for this, a new movement in residential construction has sprung up to meet this new consumer demand.

Boomers are catching onto this trend fast—and they are 77 million strong, making up 28 percent of the total U. S. population. The economics of doing aging-in-place modifications are a no-brainer. Moving to a typical assisted living facility can cost upward of \$60,000 per year, as well as moving expenses. The cost to widen the bathroom door to add safety bars and a roll-in shower would typically cost about \$6,000 to \$8,000, but it's a one-time expense, not a yearly drain on your finances. In addition to the economics, consider the psychological impact of and being uprooted from your community, familiar rituals, independence, and privacy. The affordability of aging-in-place remodeling is made enhanced by the fact that medically necessary changes (such as wider doorways or a roll-in shower) are deductible on your taxes, if backed up by a letter from your doctor.

Construction and design professionals are taking advantage of the CAPS training across the nation and here in Houston. This new designation is taught through the National Association of Home Builders (NAHB), in collaboration with AARP. CAPS connects responsible professionals with homeowners who need these services on an ever-increasing basis. CAPS is a nationwide initiative, and it is just beginning.

Look for the CAPS credential as a reliable way to identify professionals to modify your home or build a new one that is designed for a lifespan. CAPS graduates receive training about the technical/construction aspects and learn about the unique aspects of working with older Americans. They must also take

formal business training, maintain their credential through continuing education, and even must subscribe to a code of ethics.

What kind of changes are we talking about? A host of things. The overall goal is to make the home safer, with less maintenance, and more barrier-free. Typical changes include the following:

Getting safely and securely into and out of the house.

- Better outdoor lighting to get you from your car to the door
- Attractive ramps or a zero-step-entrance for the home
- Install a package shelf by front door
- Add handrails at existing steps and porches
- Front door with sidelight for security
- Avoid stairs—build one-story ranch designs for new homes

Changes in the kitchen for easier meal preparation and eating.

- Lever-handle faucets with pull-out spray
- Raised dishwasher to avoid back strain (a good idea for front-loading washers and dryers, too)
- Rolling island that can be placed back under the counter
- Revolving corner shelves and pull-out shelves
- Lower, side-opening oven
- Pull-out cutting board
- Adjustable height sink
- Side-by-side refrigerator with slide-out shelves and a water/ice dispenser
- Cooktop with controls on front
- Larger, friendlier cabinet and drawer pulls

Changes in the bathrooms—the Number One place for accidents in your home.

- Install 2 to 3 attractive looking grab bars in shower
- Lever handles on faucets
- Slide-bar-type hand-held shower, for sitting or standing

- Shampoo nooks into the wall
- Curbless showers — nothing to step over, and can be rolled into if a wheelchair becomes necessary later
- Tub and Shower controls moved closer to entry point
- Anti-scald, temperature and pressure balanced tub shower valves for safer bathing
- Widen entry doors to at least 32"
- 32" to 36" pocket doors
- Higher toilets with non-slam seats and lids

Moving around within the house:

- Improve lighting with recessed fixtures in common areas and hallways.
- Lever handles on doors and windows.
- Lower light switches and thermostats; raise outlets.
- Planning for future elevator, by stacking closets.
- Adding blocking in walls for future chair lift at stairs.
- Wider doors that accommodate wheel chairs and walkers.

These are just a few examples. Virtually all rooms of your house can be improved, even closets and garages.

Dan Bawden, CAPS, CGR, GMB, is President of Legal Eagle Contractors, Co., an award-winning, design-build remodeling company in Houston, Texas. He is best known for founding the CAPS program. He has been a successful remodeler for 37 years. Bawden is a passionate advocate for the aging-in-place/universal design movement. He opened the "Idea Center" for Aging in Place and Universal Design in Bellaire, Texas to demonstrate to clients and students numerous ideas in a working house. Bawden continues to teach the CAPS courses and universal design classes around the country, and contributes to course revisions. He has been voted "Texas Remodeler of the Year" four times and Houston Remodeler of the Year twice. Bawden may be contacted at bawden@legaleaglecontractors.com or 713-723-8850.



Homecare: the Promise of the New Decade

By Harry Wang, Director, Health & Mobile Product Research, Parks Associates

Disease prevention and detection begin with self-care, and one of the best places for people to manage their health is in their home. With broadband penetration and internet access on the rise, consumers and care providers can take homecare to the next level with remote care solutions. The advantages of homecare provide incentives to businesses and entrepreneurs to develop health and medical solutions targeting end users for chronic care and wellness at home. Within the home-building industry, aging in place and universal design are two areas wherein homecare can take firm root. In the past few years, many businesses have started research and development on new tools and applications designed for home use or to give patients and providers more care options.

San Diego-based CardioNet was the first to introduce a mobile cardiac event monitoring device. Patients wear the device during their normal routines, and as soon as the wearable device detects a cardiac event, it notifies the doctor, who can then diagnose whether or not the wearer suffers from arrhythmia, a variation from the normal rhythm of the heartbeat. Most importantly, patients using CardioNet's solution can self-test at home with automated reporting, instead of visiting their doctor after the monitoring period ends.

Several medical device companies, like Waltham, MA-based Inverness Medical Innovations, and global medical giant Roche Diagnostics, are introducing at-home international normalized ratio (INR) monitoring kits to help patients on the anticoagulant Warfarin. Patients have to visit their doctor at the beginning of the Warfarin therapy, and then the physician can adjust the Warfarin dosage based on INR readings forwarded by the patient at fixed intervals. This arrangement saves time for both the doctor and the patient.

Medical technology for home use has also caught the attention of some payers, such as Medicare and private insurance companies. Medicare has expanded its coverage over the last two years to include several in-home diagnostic devices and applications, including at-home sleep apnea testing, home INR testing, and mobile arrhythmia diagnosis. Many private insurers have since followed. A dozen or so private payers have begun to pay for remote home health monitoring technologies as their trust in technology grows and the financial benefits start to affect their bottom line. They are banking on more cost-effective home monitoring and testing to replace either in-patient or outpatient services. It still may take several years for the payer industry to become a full believer in a technology-laden homecare model, but the pace of its conversion has been picking up.

Due to new communication technologies, the homecare market is also integrating into the broader care management service sector. All players in the industry are starting to recognize that

self-care is more about behavioral changes than any other factor; therefore, the latest care management models emphasize patient engagement and compliance to evidence-based medicine. This shift has created demand for new communication tools such as video conferencing, Web visits, mobile text messaging, and instant messaging as well as new devices and applications such as medication monitoring, user-friendly medical self-testing tools like the A1c home test kit, a common test ordered for people with diabetes or people suspected of having diabetes, and biometric monitoring devices.

This trend has pushed businesses toward consolidation. Inverness Medical Innovations acquired Alere Medical in 2007 and Matria Healthcare in 2008. Several large medical device makers have invested in connected care platforms like Medtronic's CareLink and St. Jude Medical's www.Merlin.net. The involvement of device makers in a traditionally fragmented homecare market is a positive sign that the market is close to achieving much-needed scale and higher volumes of business.

Communication service providers are also active in this area as the concept of connected care continues to expand into different sectors of the digital home concept. Although they do not offer medical services directly to patients, their infrastructure and distribution abilities are great assets to their homecare partners who want to engage patients and ensure quality services. For example, Orange in France helps distribute a GPS-enabled senior-tracking device in its stores. In the U.S., Verizon Wireless supports Life Watch's mobile cardiac-monitoring service, and AT&T manages a wireless network for InRange Systems, a remote medication management solution provider.

Finally, the rising senior population and aging baby boomers will redefine homecare based on their needs and wants. Technologies like in-home sensors, fall-detection monitors, and location-tracking devices help them live better and safer and bring peace of mind to their children and loved ones. These technologies have become more reliable and less expensive through standardization and market maturity along the cost curve.

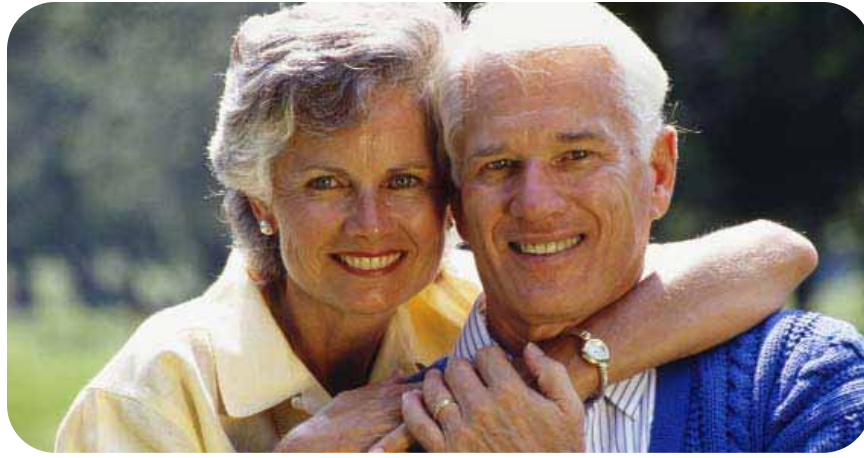
A safe conclusion is that the homecare market is at the convergence of multiple forces to drive and shape its future. The service scope for homecare providers will expand significantly, from traditional nurse home calls and social care services to more disease-focused and lifestyle-centric care management programs. From a demographic perspective, although a large percentage of resources will be devoted to the senior population and hospice care, a growing proportion of homecare users will be younger, less fragile, and more affluent and tech-savvy consumers. Finally, future homecare can be bundled into existing home services and marketed by a new breed of provider—including telecom carriers, home security companies, drug stores, and medical device makers. Even physician groups and hospitals can get more involved as the homecare market evolves, either as partners to these new types of service providers or as direct players offering remote home-visit services as part of the ongoing patient-centered medical home model.

Other exciting developments, which go several steps further than the home-based model, are also on the way. Body-area networks and wireless sensor technology will be revolutionary forces in the homecare sphere in the next decade. Companies like Toumaz, Isis Biopolymer, and Microchips will turn the home into a primary location for receiving care. Large IT and software developers like Microsoft, Google, and McKesson will ensure that care providers are always in the know about their at-home patients, a promise backed up by the advanced communication networks supplied by companies like AT&T, Comcast, and Qualcomm.

For homecare players to be successful, they need to recognize and take advantage of the growing popularity of aging in place and universal design. Homecare will be at the forefront of this groundswell and those who on top of it will remain there.

Harry Wang is the Director, Health & Mobile Product Research for Parks Associates. Wang has followed the healthcare industry and information technology market since 2000. His research

background involves studying US Disease management practices, the PBM industry, the specialty pharmacy sector as well as clinical and genomic information software and applications. Since joining Parks Associates in 2005, Wang has extended his healthcare research into the emerging digital home healthcare technology market and is the leading analyst for Parks' Digital Health syndicated research program. Wang earned his MS degree in marketing research from the University of Texas at Arlington. He also holds an MBA degree in finance from Texas Christian University and a BA degree in international business from Guangdong University of Foreign Studies, P.R. China.



Home Technology: Allowing Seniors to Age in Place

By Lacey Jezioro and Wendy Lamirand

Connected smart homes are here and are not just for the younger consumer. This is a trans-generational movement. Aging baby boomers are beginning to embrace the concept of smart home technology and what it can do for them. The baby boomers are among the healthiest, wealthiest, and best educated older adults than previous generations, along with being more tech-savvy.

Smart homes can be a luxurious convenience for the average consumer, but for seniors or people with disabilities, they can help them live independently. A connected home can be the difference between seniors having to move to some type of assisted living facility or to remain in the comforts of their own home for a much lower cost.

Baby boomers are making decisions earlier than past generations about where to spend their retirement years and many are choosing to remain in their own homes. An AARP survey showed that 83 percent of Americans, currently over the age of 45, say they would like to remain in their current residence for as

long as possible and this concept is known as aging in place. Aging in place can be a better alternative than moving into nursing homes, which are not only costly, but lack the psychosocial value of familiar surroundings and remaining in the community. As baby boomers seek to age in place, they are searching for products that will allow them to stay in their homes at the highest level of independence, even as their circumstances change.

The boomer impact is beginning to affect the home building and consumer product markets. According to a study of consumers 50 and older, 65 percent plan to remodel or improve their homes. AARP has partnered with the National Association of Home Builders (NAHB) and the American Occupational Therapy Association (AOTA) to increase awareness and create initiatives for aging in place.

Together these organizations created a designation to allow builders and professionals to become certified aging in place specialists (CAPS) by instructing them on how to modify homes for seniors. Traditional home modifications have included architectural modifications like adding ramps and widening doorways. Occupational therapists recommend adaptations to specific areas of the home, such as the bathroom, which can include the installation of grab bars and changes to the shower for safety. Connecting numerous technology devices throughout the home is also becoming a more prevalent adaptation for the elderly aging in place. Home modifications and assistive technology allow seniors to continue to perform everyday tasks easier and more independently.

Baby boomers are now looking at smart home technology along with traditional home modifications. A smart home uses a central computer program to integrate its various home automation systems, to allow remote or automatic control of home devices and appliances such as security, health monitoring, and the home environment.

The smart home of the future will have hidden computers and sensors throughout the house. When you enter a room the lights

will gradually come on, increasing in intensity as your eyes adjust, and then dim off as you exit the room. There will be various health monitoring devices throughout the home, especially in the bathroom. Vital signs such as heart rate, blood pressure, and glucose monitoring will be accomplished through sensors in your clothing or in your bathroom without you even knowing that it is being done. Doctors will be able to treat you remotely from their office. You will be able to remotely control and monitor home appliances as you move throughout your home and property. Smart home technologies will also focus on making kitchens and pantries more efficient and usable for all.

Although assistive devices and smart home technologies may have a higher initial investment, experts believe that the benefits of this type of technology far outweigh its cost. Effectiveness of assistive technology and environmental interventions was evaluated in an 18-month study done by the Rehabilitation Engineering Research Center (RERC) on Aging at the University at Buffalo. Control group participants received standard care, while the treatment group received assistive devices and modifications. This study showed that the treatment group spent more on assistive technology devices: initially \$2,620, versus \$443 for the control group. However, the treatment group had significantly less expenditures for ongoing healthcare than the control group; overall total costs of \$14,173 for the treatment group versus \$31,610 for the control group.

More recently, University at Buffalo researchers have studied the cost effectiveness, usage, and impact of smart home technologies with the elderly population. Here the treatment group was provided with a computer and a \$400 X10-based smart home package. These packages included a remote control and modules for lamps and appliances, key chain remote, two-way transceiver module and computer interface that operates and controls the on/off timings of lamps or appliances, and ActiveHome software.

Standalone products included door and window sensors, a motion sensor, a power flash that acts as an interface between the security system and an alarm (chime) and a wall switch for

manual control of lighting, connected to a motion detector. The data revealed that participants in the study who received the smart home technology maintained their physical and cognitive status, in contrast to non-users that showed a significant decline. Researchers found that 80 percent of the smart home technology users remained living in their homes at the end of the two-year study period versus 66 percent of the control group.

The studies mentioned demonstrate how cost effective smart home and assistive technology are, as well as helping seniors to age in place while maintaining their quality of life. Given the aging population, their desire to age in place, and cost effectiveness, there is a need for continued research and development of new smart technology products. For more information about research at the University of Buffalo, refer to the Center on Knowledge Translation for Technology Transfer and the RERC on Universal Design in the Built Environment Web sites: <http://kt4tt.buffalo.edu> and <http://www.ap.buffalo.edu/idea/RERC/lercud.asp>.

Lacey Jezioro and Wendy Lamirand are graduate research assistants at the University at Buffalo Center on Knowledge Translation for Technology Transfer and the Rehabilitation Engineering Research Center on Universal Design in the Built Environment. This article originally appeared in the Summer 2009, Volume 6, Number 2 edition of iHomes & Buildings published by the Continental Automated Building Association and is reprinted with its permission.



The Five Home Healthcare Technology Categories

By Laura Mitchell, Director of Marketing, GrandCare Systems

According to AARP, when baby boomers are asked where they want to live as they age, 90 percent say, “In my home.” They do not want to live with relatives, in a nursing home, or at an assisted care facility. With this popular desire to remain at home comes great financial savings because every month a person stays in their own home as opposed to a an assisted living facility, that person can save \$3,000 to \$5,000 per month. This leaves money available to invest in enabling technologies to keep seniors at home, safe, and independent.

“Two-thirds of all men and women who have lived beyond the age of 65 in the entire history of the world are alive today,” according to Elizabeth Vierck’s Factbook on Aging. This includes 45,000 Americans over 100. In the year 2000, there were 35 million seniors, a figure that is expected to double by 2030. By 2050 there will be more than one million people over 100 years of

age. Americans over 85 are the fastest-growing segment of the population, according to the National Institute on Aging.

Families are assuming old-fashioned personal responsibility for aging family members, and they're going back to the future to do it. Facilities provide living arrangements to mimic family living, but more and more, seniors are actually "aging in place." Senior citizens fear moving into a nursing home and losing their independence more than death, according to a Clarity 2007 "Aging in Place" study. The study also found that among baby boomers, 82 percent fear their parents will be mistreated in a nursing home, and 89 percent worry their parents will be sad.

Two-thirds of baby boomers said that financial problems were not likely to prevent their parents from remaining in their home, and 70 percent are concerned that their parent might be scared to leave their home. While 49 percent of baby boomers are at least somewhat interested in using new technologies to help monitor their parents' safety, 65 percent say they would like to use new technology, and 54 percent would consider sensors to monitor health and safety.

Five Remote Healthcare Technologies

Remote home healthcare technology can be broken into five broad categories:

Patient Monitoring Systems

This category includes Personal Emergency Response (PERS) and activity monitoring systems that utilize broadband to collect and communication information about the resident. The information is posted on a Web portal for viewing, analysis, and treatment/behavior changes. It also encompasses online companionship services that enable continuous social connection with friends, family, community and social service. These systems include wearable monitoring and wireless biometric devices that collect physiological information for analysis and reporting are also part of this product category.

Telehealth/Telemedicine

This category of product includes a central device that is connected with broadband to care providers. Products include glucometers, blood pressure cuffs, electrocardiogram monitors, weight scales, respiratory devices, pulse oximeters, thermometers, and digital cameras.

Medication Compliance Tools

These are devices that provide automated reminders to take prescriptions, as well as offer a portal for purchasing prescription drugs. The portal also spells out information pertaining to the various drugs being prescribed.

A/V Communications Solutions

The poster boy for this product category is a videophone.

Electronic Health Records

This is not really a device, but a recurring revenue tool for an integrator to store medical information for clients, such as allergies, medications, medical history, and doctor information.

Getting Started

New, enabling technologies put dealers in prime position for remote healthcare management. But how do you get started? Home healthcare/remote monitoring is going to be a booming business. But how do you break into that category?

Many of these enabling technologies require some technical know-how, provided by local installers, integrators, and service providers. Sales techniques for the category could involve creating unique partnerships with home health care agencies. Here are five inexpensive ways to position your integration business for success in providing up-and-coming enabling technologies for the aging.

Do Your Research

Integrators and builders need to study their local market and assess the local aging population. To do that, among other things, you should:

- Ask for statistics from the county or state offices on aging.
- Check out local and national aging resources, such as the American Association of Homes and Services for the Aging (AAHSA), the American Association of Retired Persons (now called by its acronym AARP) or the American Society on Aging (ASA).
- Visit area senior centers, assisted living and independent living facilities.
- Attend aging, healthcare and technology-focused trade shows and events
- Know the structure and pricing for available aging tools and resources (assisted living, in-home caregivers, day centers, care managers, etc.).

Assess the Need

Integrators and builders need to find the gaps in the services currently provided to local senior populations by:

- Surveying existing customers about their own aging concerns and about their aging loved ones. Use your company newsletter or make some calls to previous customers to gauge their need.
- Attending caregiver networking and aging consortium meetings.
- Interviewing staff from social services and local clergy.
- Getting acquainted with in-home service providers (from companion services to visiting nurse associations to meals-on-wheels programs).

Study and Understand the Technology

As with any new technology, integrators need to become familiar with the range of technical solutions available, from the basic PERS (personal emergency response system—"I've fallen and I can't get up") to complete communication and monitoring packages.

Here are some simple ways to learn more:

- Attend events and trade shows for demonstrations of available products.
- Research remote monitoring and communication systems. You can check out various Web demos and request literature, or simply ask your security monitoring company if it handles medical alert systems.
- Note differences between systems (protocols of sensors, ability to integrate with existing systems, method of transmitting the information, where sensor data is stored, etc.).
- Be aware of support burdens associated with each system. Ask questions: Will you need to pull the system if there's a problem? Can you access it remotely? Can it be updated remotely? What type of support will dealers receive?

Choose Products to Represent

Just as in the A/V industry, integrators need to determine which home health tech products and technologies enhance the business model.

Among the key considerations are:

- Finding products that provide a solid profit margin for dealers, distributors, and integrators.
- Finding products that can be enhanced with your added value and continuing services. The ability to integrate current solutions into the product is a huge plus.
- Giving preference to products with familiar underlying technologies to reduce support burdens.

- Finding a system that provides a comprehensive and customizable solution so as to avoid too many suppliers and potential technical conflicts or duplications.
- Considering products that offer recurring revenue.
- Finding a system that offers complete system training and supporting materials for education, along with sales and marketing.
- Giving preference to open, flexible, and growing technology, not a closed platform or device that could become obsolete in a few years.

Laura Mitchell is Director of Marketing for GrandCare Systems. The preceding article appeared in different formats on CEPro.com. They were consolidated and redistributed with CEPro.com's permission.

Additional Resources

Custom Electronic Design & Installation Association (cedia.net) - is an international trade association of companies that specialize in designing and installing electronic systems for the home. The association was founded in September, 1989 and has more than 3,500 member companies worldwide. CEDIA members are established and insured businesses with bona fide qualifications and experience in this specialized field.

CEPro Online (www.cepro.com) – CE Pro magazine is a trade publication for professionals involved in the custom electronics business. The publication covers the gamut of electronic systems including: whole-house automation; distributed audio and video; home theater; lighting control; and structured wiring.

Continental Automated Building Association (www.caba.org) - is a not-for-profit industry association dedicated to the advancement of intelligent home and intelligent building technologies in North America. The organization is supported by an international membership of nearly 400 companies involved in the design, manufacture, installation and retailing of products relating to home automation and building automation. Public organizations, including utilities and government are also members. CABA's mandate includes providing its members with networking and market research opportunities. CABA also encourages the development of industry standards and protocols, and leads cross-industry initiatives.

Consumer Electronics Association (www.ce.org) - CEA's mission is to grow the consumer electronics industry. The Consumer Electronics Association (CEA) unites 2,000 companies within the consumer technology industry. Members tap into valuable and innovative members-only resources: unparalleled market research, networking opportunities with business advocates and leaders, up-to-date educational programs and technical training, exposure in extensive promotional programs,

and representation from the voice of the industry, CEA, promoting and advancing member needs and interests. Invest in the Consumer Electronics Association to strengthen your business' future.

The Home Technology Alliance (www.nahb.org/hta) - HTA is a partnership supported by founding sponsor Custom Electronic Design & Installation Association (CEDIA). The HTA's mission is to educate builders about the many benefits of installed home technology and working with a certified electronic systems contractor. On the HTA's Web pages, builders, remodelers, and home technology professionals will find useful information and resources.

NAHB 50+ Housing Council (www.nahb.org/50plus) - The 50+ Housing Council serves the special needs of NAHB members involved in all aspects of 50+ housing, including design, development, finance, ownership, management, and sales and marketing. Browse the resources below to learn more about the 50+ Housing Council.

Parks Associates (www.parksassociates.com) - Parks Associates is a market research and consulting firm focused on all product and service segments that are "digital" or provide connectivity within the home. Its researchers study home networks, digital entertainment, consumer electronics, broadband and Internet services, wireless connectivity, and home systems. Founded in 1986, Parks Associates creates research capital for companies ranging from Fortune 500 to small start-ups through market reports, multiclient studies, consumer research, workshops, and custom-tailored client solutions.

University at Buffalo State University of New York Rehabilitation Engineering Research Center on Universal Design and the Built Environment (<http://www.ap.buffalo.edu/idea/lerc/lercud.asp>) – The Center researches and develops critical tools for advancing the field of universal design and applies those tools to develop exemplary products and places through industry partnerships. Education and dissemination activities increase awareness of the

RERC activities and universal design in general as well as improve capacity in research and practice. All these activities are founded on and guided by a model of "evidence based practice." This Center is funded by grant number H133E050004 from the United States Department of Education through the National Institute on Disability and Rehabilitation Research.

University at Buffalo State University of New York Center for Knowledge Translation for Technology Transfer

(<http://kt4tt.buffalo.edu/index.php>) - The mission of the Knowledge Translation for Technology Transfer Center is to improve both the KT and TT skills of National Institute on Disability and Rehabilitation Research grantees and related stakeholders to achieve the following objectives:

1. To contribute to the knowledge base of KT for TT.
2. To improve knowledge about and practice of KT for the National Institute on Disability Rehabilitation Research and their TT grantees and other Knowledge Users (consumers, manufacturers, researchers, policy makers, and brokers).
3. Increase use of Knowledge Translation methods by researchers, and increase use of research-based knowledge by external stakeholders.

The program intends to increase technology transfer results that improve the quality of life for persons with disabilities through a three-pronged approach:

- Research-based Interventions to implement and test the Knowledge to Action model;
- Development-based applications of Knowledge Translation to accomplish Technology Transfer outcomes;
- Utilization-oriented methods of Dissemination, Training and Technical Assistance to effectively communicate with knowledge producers and knowledge users.



Residential medical and health is fast becoming highly desired by consumers as aging-in-place becomes attainable.

NAHB and CEDIA have developed the Home Technology Alliance (www.nahb.org/hta) to educate the builder membership about the benefits of working with an Electronic Systems Contractor (ESC) – an educated professional that builders can partner with to offer clients electronic systems that enhance and simplify their lifestyles. This guide will offer you an overview to some of the technologies available and the benefits that working with an ESC can yield. From the experiences of seasoned NAHB members, we offer you Comfort at Home: Residential Medical and Health Technology Solutions.

This booklet is one piece of a broader effort NAHB-wide to help the builder navigate through this market.

The Business Management Department offers an array of materials on its BizTools site at www.nahb.org/biztools. There you'll find more articles like the ones contained in this booklet. To help builders get back to basics, members can also access NAHB's newly reorganized toolkit at www.nahb.org/toolkit. This resource is also a collection of informative and timely articles for builders, by builders. This booklet is part of a series produced by NAHB's:

- Business Management & Information Technology Committee
- Home Technology Alliance
- Custom Home Builders Committee
- Single Family Production Builders Committee
- Single Family Small Volume Builders Committee

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