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# Aging in Place: Universal Design & Accessible Baths

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Presented By: Aquatic Headquarters  
8101 E. Kaiser Blvd. Suite 200  
Anaheim, CA 92808

Description: Provides an overview of the aging effects on health, the principles of universal design, as well as a discussion of applying universal design to bathroom environments.

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# Purpose and Learning Objectives

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**Purpose:** Provides an overview of the aging effects on health, the principles of universal design, as well as a discussion of applying universal design to bathroom environments.

## **Learning Objectives:**

At the end of this program, participants will be able to:

- discuss aging-related demographic trends and the effects aging has on health and everyday life
- state the differences between universal and accessible design, and the factors driving demand for each
- list and describe the seven principles of universal design, and
- identify the key elements that can be used when applying universal design to bathing fixtures.



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## Age-Related Demographic Trends

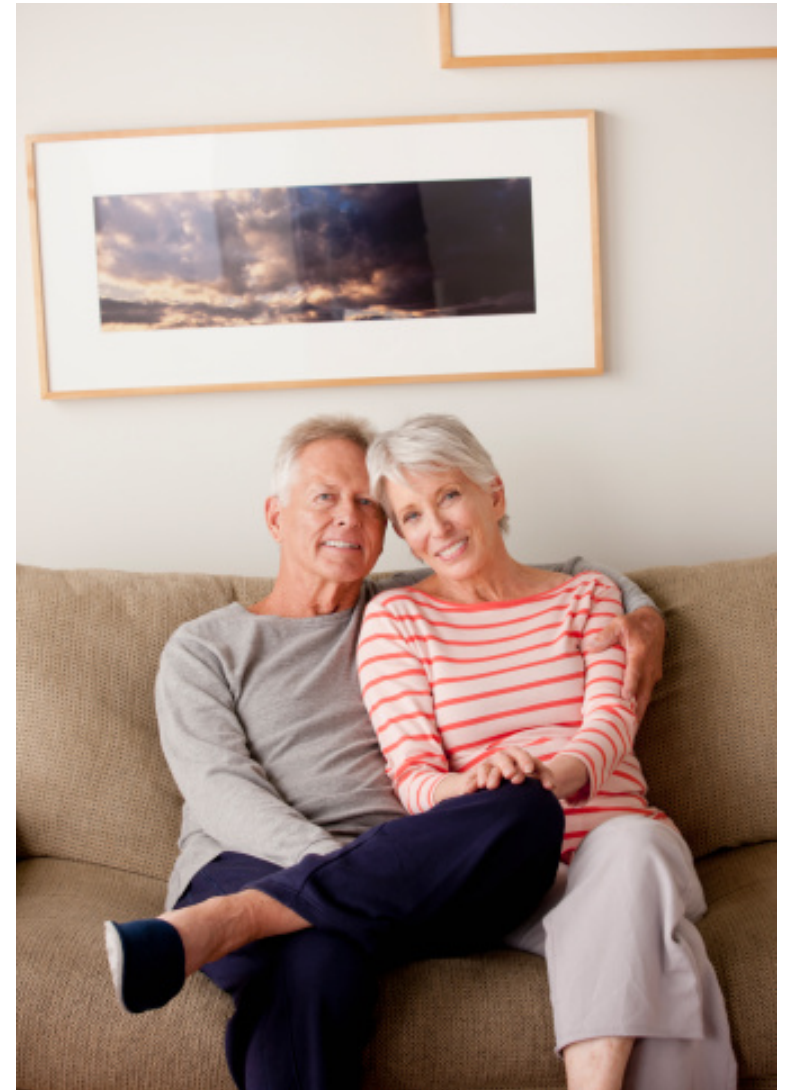


# Baby Boomer

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A Baby Boomer is defined by the U.S. Census Bureau as a person who was born during the demographic Post-World War II baby boom between the years of 1946–1964.

The Baby Boomer generation makes up 26% of the U.S. population, about 78 million people.



# Growth of the Boomer Generation

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By 2030, persons age 65 will reach 71 million people with the number expected to grow.

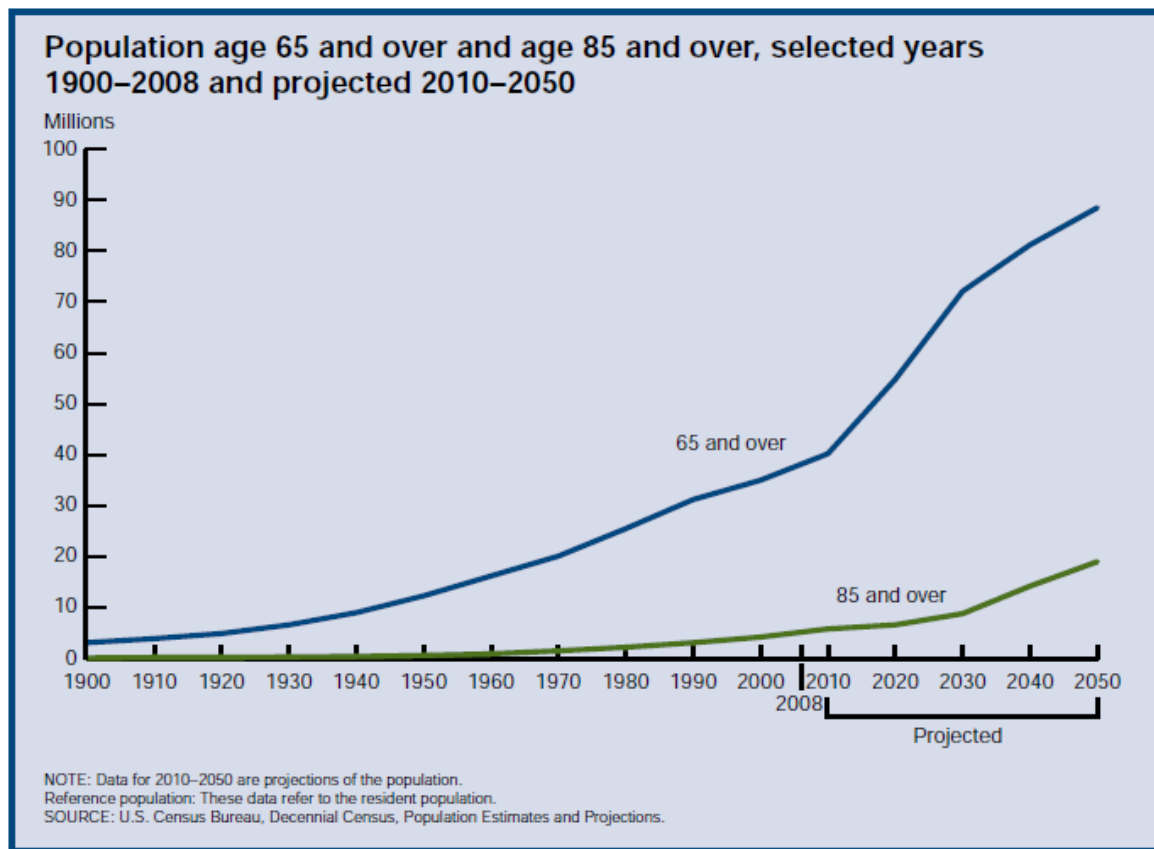
- 10,000 Americans turn 65 daily for the next 18 years.
- 80% of population growth is people over 50.
- Boomer generation is living longer.

People are living longer today than ever before due to healthier living, better medicine, vaccines and sanitation that have nearly eliminated killer diseases.



# Life Expectancies

Life expectancies at both 65 and 86 have increased; people who survive to age 65 can expect to live an average of 18.5 additional years, and those who survive to age 85 can anticipate living an average of six more years.



# Wealth in the Boomer Generation

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The Boomer generation is more educated and financially secure than at any other time in history.

- 75% of Americans age 45–54 are homeowners.
- 80% of Americans age 55–75 own their own homes.
- One in four Boomer households has a net worth over \$500,000 or more; 97% of these are homeowners.
- Boomers have \$2.3 trillion in spending power.
- Boomers control 50% of discretionary income.



# Aging Effects on Health

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As we know, older adults often experience decrease in stamina and strength and are more prone to accidents and injuries as they age. In fact, according to the Centers for Disease Control, one in three seniors over the age of 65 will experience at least one fall annually.

As well, aging often leads to reduced sensory perception, cognition and mobility, and to chronic conditions, which can lead to functional limitations of activities of daily living (ADL).

- 40% of Boomers have problems with at least one basic physical function.
- 80% of older adults have at least one chronic condition.

The most common and costly chronic conditions are: heart disease, stroke, cancer and diabetes. This results in a larger number of people living with disability. These impairments can negatively affect quality of life, contributing to declines in functioning and ability to live independently.

# Aging Effects on Health

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As people age, needs and demands begin to change and performing everyday tasks of daily living often become a struggle. Something as simple as stepping in and out of a shower can quickly become dangerous due to lack of mobility.

As well, because older people may have reduced strength or fine motor skills, or dexterity issues, operable parts must be easily maneuverable.



# Independent Living: Selecting Products & Designs

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A decrease in mobility, stamina and strength deeply affects design and product selection for independent living.

When selecting products and designs, consider:

1. size and space for approach and use
2. products that require minimal physical effort
3. products that are easy to use and understand, and
4. designs that are useful to people with diverse abilities.

Careful planning for usable and functional design will determine successful aging in place. Before one can fully understand what functional and usable design means, we must first understand universal design and what it means to cognition, vision, hearing and mobility.





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## Universal & Accessible Design



# What Is Universal Design?

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The Center for Universal Design defines universal design as the design of products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design—in other words, designing products and buildings so everyone can use them, from light fixtures to shower stalls and public buildings. Universal design targets people of all ages, sizes, and ability and is applied towards all buildings.



THE CENTER FOR  
**UNIVERSAL DESIGN**  
Environments and Products for All People

# Realities of Universal Design

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The misunderstanding exists that universal design is for people with physical disabilities or for aging in place when in reality, universal design is human-centered design. The inclusive design of spaces and products will benefit people of all ages and abilities. Universally designed products can be both beautiful and accessible.



# Universal Design: Important Areas

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Areas where universal design is most important:

- Bathrooms
- Kitchens
- Hallways
- Entrances/Exits
- Living Rooms

Kitchen and bathrooms, the most utilized rooms, represent the most important renovations in homes.



# Driving Factors for Universal Design

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The two driving factors for universal design are:

1. multigenerational households, and
2. the Boomer generation's desire to age in place.

The U.S. Census Bureau defines multigenerational households as those that have more than one generation under the same roof. More than 51.4 million Americans currently live in multigenerational households, with each generation having different needs.



# Multigenerational Households

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People live in multigenerational households for many reasons, whether it's taking in an elderly family member to care for, or a member experiencing economic stress.

Due to the recession and current economy, there has been an increase in multigenerational households. Since the Great Recession in 2007, there has been a 10% increase in the number of Americans living in multigenerational households. Additionally, the high cost of senior care living has been a factor in this trend.



# Aging in Place

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The Centers for Disease Control define aging in place as the ability to live in one's own home and community safely, independently, and comfortably, regardless of age, income, or ability level.

At the beginning of the 20th century, when older people had difficulty living on their own, they would simply move in with family or live in a nursing home. This is no longer true. As the U.S. population ages, seniors want to live independently for as long as possible. Consequently, aging America will shape the demands and needs of persons who want to live autonomously. Although Americans of all ages value their ability to live independently, without a plan, it can be problematic.



# Remodeling Trends

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In 2011, the Remodeling Market Index rose to its highest, increasing from 41.7% to 46.6% in the fourth quarter (NAHB).

Even though 68% of remodelers are performing aging-in-place remodeling, the concept of universal design can be a tough sell. According to the National Association of Home Builders (NAHB), 95% of home builders report that buyers age 55 or older can be resistant to purchasing a home with universally designed features. Two-thirds of those buyers indicate that they plan to stay in their own homes after retirement. Either way, universal design implementation in homes is expected to increase along with the aging of the Boomer generation.



# Misconceptions of Universal Design

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The biggest challenge of selling universal design to consumers is overcoming its many misconceptions.

Misconceptions about universal design include the belief that:<sup>1</sup>

1. universal design is unattractive and institutional
2. universal design will decrease the sale value of a home, and
3. universal design is costly.

<sup>1</sup> - Misconceptions about Universal Design (Rosemarie Rosettie, PH.D.)



# Universal Design: Aesthetics

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Although there is a misconception that universal design is unattractive and institutional, in reality, there are many beautiful and contemporary-looking universally designed products that are available in aesthetically-pleasing finishes.

Examples include:

- spacious showers
- adjustable or customized cabinets
- wall-mounted sinks
- lever handles on faucets
- hanging toilets
- lighting
- slip-resistant floors, and
- accessories (i.e. grab bars, shower seats).



# Universal Design: Return on Investment

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Though there is a misconception that universal design will decrease sale value of a home, buyers want to invest in a home that is adaptable to people of all ages and ability, without compromising aesthetics.

In fact, universal design improvements in homes will provide 60–70% return on investment.

Universally designed restrooms will add more value and expand your market. Baby Boomers who are purchasing new homes (second homes) are looking for these features to help them age in place.



# Universal Design: Affordability

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To address the misunderstanding that universal design is more expensive, note that there are many affordable options when selecting products for universal design.

As a general rule, universal design does not cost a great deal more. In terms of a new 6x8-foot bathroom, one will pay an additional \$1,000 to \$2,500 for universally designed features.

Not only is universal design affordable, but it provides safety and adds value to a home.



# Driving Factor for Accessible Design

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## ADA – Americans with Disabilities Act

The Standards for Accessible Design set minimum requirements, both scoping and technical, for newly designed and constructed or altered state and local government facilities, public accommodations, and commercial facilities to be readily accessible to and usable by individuals with disabilities.



The Americans with Disabilities Act of 1991, 28 CFR, Part 36 is the section in the Federal Register that is called ADAAG or Americans with Disabilities Act Accessibility Guidelines. In 1991 ADA adopted ANSI accessibility guidelines into civil law, providing accessibility to all public facilities. ADAAG interprets the ADA.

# Accessible Design

Accessible designs are specified by codes and standards for buildings and apply to the following:

- Toilet facilities and bathing facilities
- Kitchens, kitchenettes, and sinks
- Reach ranges
- Ramps, curb ramps
- Doors, doorways
- Grab bars
- Shower compartments



# Universal Design vs. Accessible Design

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## **Universal Design:**

1. Not required by law
2. Create best practices by incorporating choice for all people in every aspect
3. Targets people of all ages, size and ability
4. Functionality and aesthetics

## **Accessible Design:**

1. Design requirements by law to meet codes and standards
2. Commonly used in public buildings and environments
3. Targets elderly and disabled
4. More focused on functionality and meeting codes



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## Seven Principles of Universal Design

# Principle 1: Equitable Use

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**The design is useful and marketable to people with diverse abilities.**

- Provide the same means of use for all users—identical whenever possible, equivalent when not.
- Avoid segregating or stigmatizing any users.
- Make provisions for privacy, security, and safety equally available to all users.
- Make the design appealing to all users.



# Principle 1: Equitable Use

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Pictured at right is an example of a bottomless vanity that provides ample knee space and accommodates both seated or standing users.

Using universally designed products with modern and sleek designs can help enhance the look of a bathroom.



# Principle 2: Flexibility in Use

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**The design accommodates a wide range of individual preferences and abilities.**

- Provide choice in methods of use.
- Accommodate right- or left-handed access and use.
- Facilitate the user's accuracy and precision.
- Provide adaptability to the user's pace.

## Principle 2: Flexibility in Use

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French doors will allow use of right-hand or left-hand entry and are equipped with double-leaf vertical grab bars for easy grip.



# Principle 3: Simple & Intuitive Use

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**Use of the design is easy to understand, regardless of the user's experience, knowledge, language, skills, or current concentration level.**

- Eliminate unnecessary complexity.
- Be consistent with user expectations and intuition.
- Accommodate a wide range of literacy and language skills.
- Arrange information consistent with its importance.
- Provide effective prompting and feedback during and after task completion.

# Principle 3: Simple & Intuitive Use

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An example of this principle is a pressure balancing valve that can be easily operated with a closed fist.

- Provide easy-to-read labels: blue “C” sign for cold and red “H” sign for hot.
- Turn lever with “On” and “Off” labels.



# Principle 4: Perceptible Information

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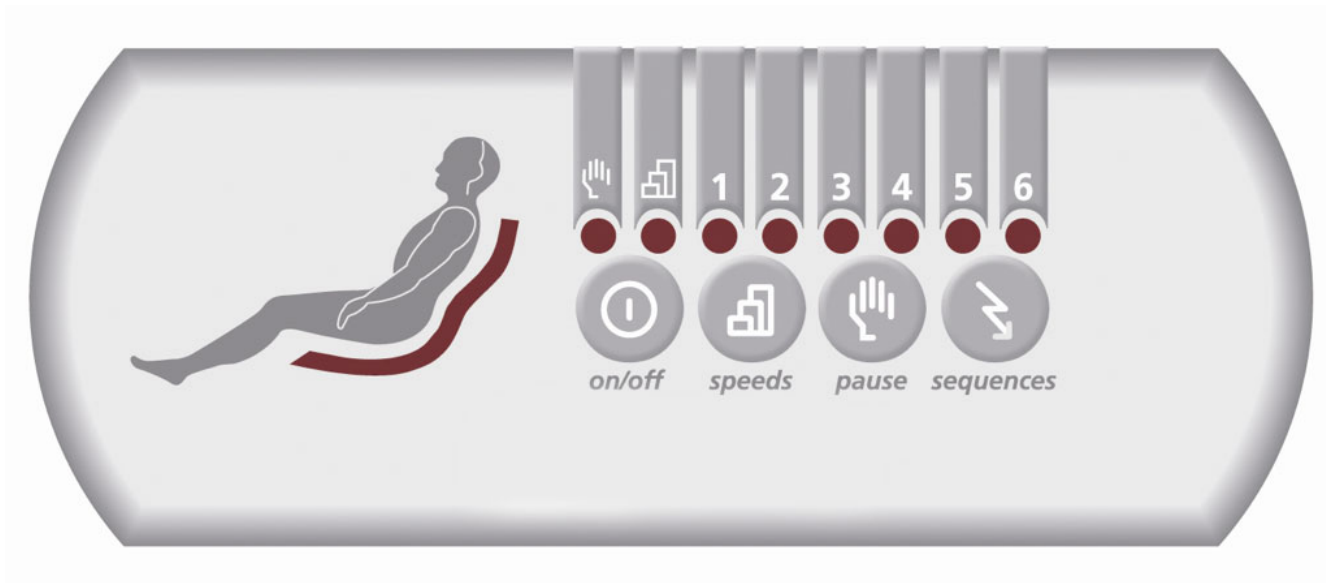
**The design communicates necessary information effectively to the user, regardless of ambient conditions or the user's sensory abilities.**

- Use different modes (pictorial, verbal, tactile) for redundant presentation of essential information.
- Maximize “legibility” of essential information.
- Differentiate elements in ways that can be described (i.e., make it easy to give instructions or directions).
- Provide compatibility with a variety of techniques or devices used by people with sensory limitations.

# Principle 4: Perceptible Information

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Icon labels are used in a control panel to adjust speed or pause the jets in a hydrotherapy system.



# Principle 5: Tolerance of Error

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**The design minimizes hazards and the adverse consequences of accidental or unintended actions.**

- Arrange elements to minimize hazards and errors—most used elements, most accessible; hazardous elements eliminated, isolated, or shielded.
- Provide warning for hazards and errors.
- Provide fail-safe features.
- Discourage unconscious action in tasks that require vigilance.

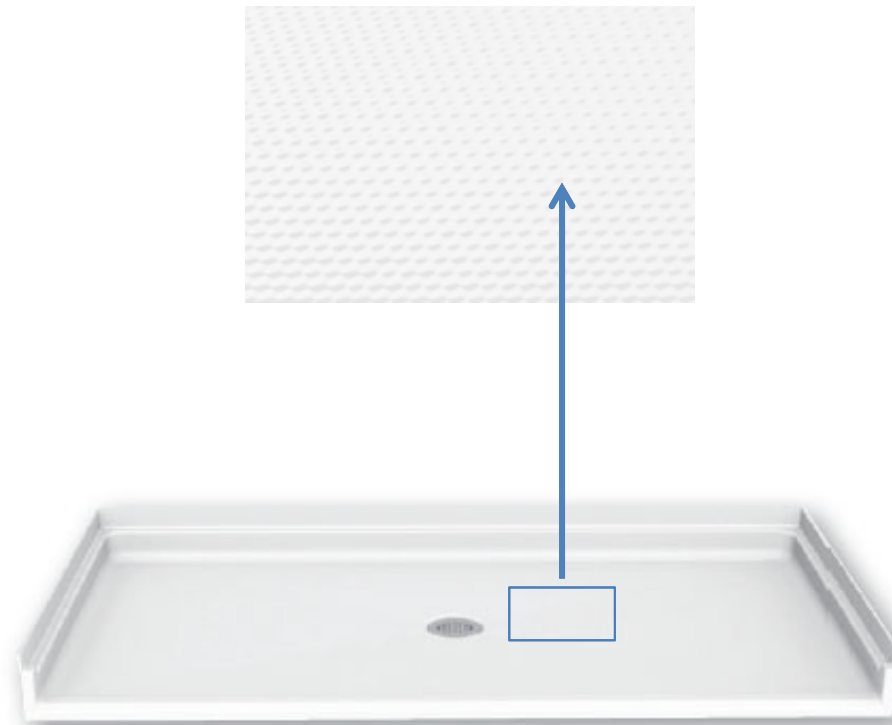


# Principle 5: Tolerance of Error

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Examples of this principle:

- Slip-resistant and textured bottom shower pans can help reduce chances of slipping.
- Advanced safety suction systems on whirlpool tubs will automatically break the vacuum at the suction if it is blocked.



# Principle 6: Low Physical Effort

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**The design can be used efficiently and comfortably with a minimum of fatigue.**

- Allow user to maintain a neutral body position.
- Use reasonable operating forces.
- Minimize repetitive actions.
- Minimize sustained physical effort.

# Principle 6: Low Physical Effort

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Motion sensing faucets are a good example of universally designed products that require low physical effort.



Image Source: Bath Select Warehouse

# Principle 7: Size & Space for Approach & Use

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**Appropriate size and space is provided for approach, reach, manipulation, and use regardless of user's body size, posture, or mobility.**

- Provide a clear line of sight to important elements for any seated or standing user.
- Make reach to all components comfortable for any seated or standing user.
- Accommodate variations in hand and grip size.
- Provide adequate space for the use of assistive devices or personal assistance.

# Principle 7: Size & Space for Approach & Use

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Wider entries are important for adequate maneuvering space.

A 30"- or 32"-wide interior door is considered standard, but universal access requires 32" of clear space when the door is open, which usually means specifying a 36"-wide door. It is important to keep in mind that bathroom doors should swing outward.

Wider 60" showers provide easy access and space for maneuvering; barrier-free and roll-in showers accommodate a wheelchair or other mobility device.





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## Applying Universal Design to Bath Fixtures

# Universal Design: Bathroom

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The bathroom is one space in the home where safety is of the utmost importance. From the bathware to the accessories, there are adaptations and products to help keep the bathroom a safe place for all.

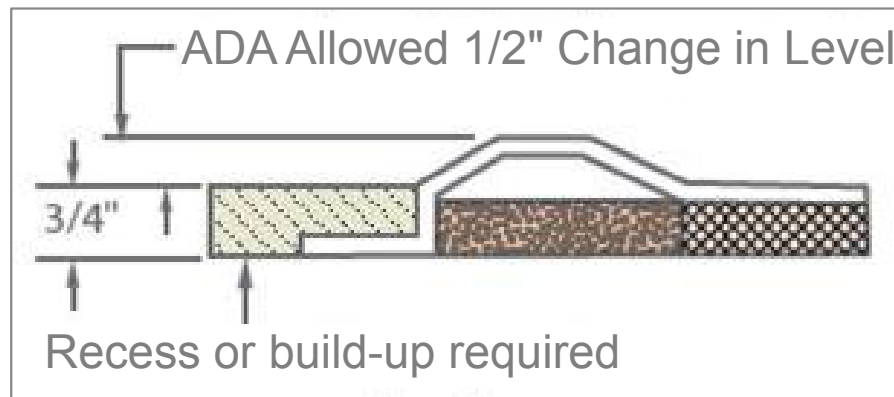
As people advance in the aging process and experience the natural changes that ensue, the benefits of products that make tasks simpler or safer are more recognizable. Most universally designed bathrooms are simple modifications of products and design specifications.

In this section of the course, a review of universally designed bathroom products is presented, beginning with bathware.

# Universal Design: Bathware

## Features of Universally Designed Bathware:

- Tub or shower with integral seat, slip-resistant floor
- Recommended shower lip of  $\frac{1}{2}$ "–3"
- Wider entries for adequate maneuvering space



Dam Profile





# Bathware: Barrier-Free Showers

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A curbless or barrier-free shower does not have a lip at the floor and can be accessed by those using a wheelchair or other mobility device. This provides ease and space for maneuvering and transfers to and from the shower.

Barrier-free showers are available with options for seat integration.

A swing-out door or a shower curtain keeps water contained.

From a design standpoint, the minimalist lines fit seamlessly into a contemporary spa-style bathroom.



# Bathware: Barrier-Free Showers

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A curbless shower requires that the shower pan or drain be slightly lower than the surrounding flooring. Typically, the building contractor lowers the shower floor area by trimming the tops of the floor joists (and strengthening them, if necessary), then installing a concrete shower floor (if tiling) or a curbless shower pan.

Installing a curbless shower costs about the same as installing a “regular” fully tiled shower stall. However, one can expect to pay an additional \$200 to \$300 in labor for modifying the floor joists.

# Bathware: Shower Bases

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When the family bathtub becomes more hazardous than helpful, an accessible shower base is a smart replacement. With tub-height walls, a 4" threshold, integral seat and end drain, the seated tub-height shower base is perfectly configured to transform a potentially unsafe bath area into a comfortable oasis.



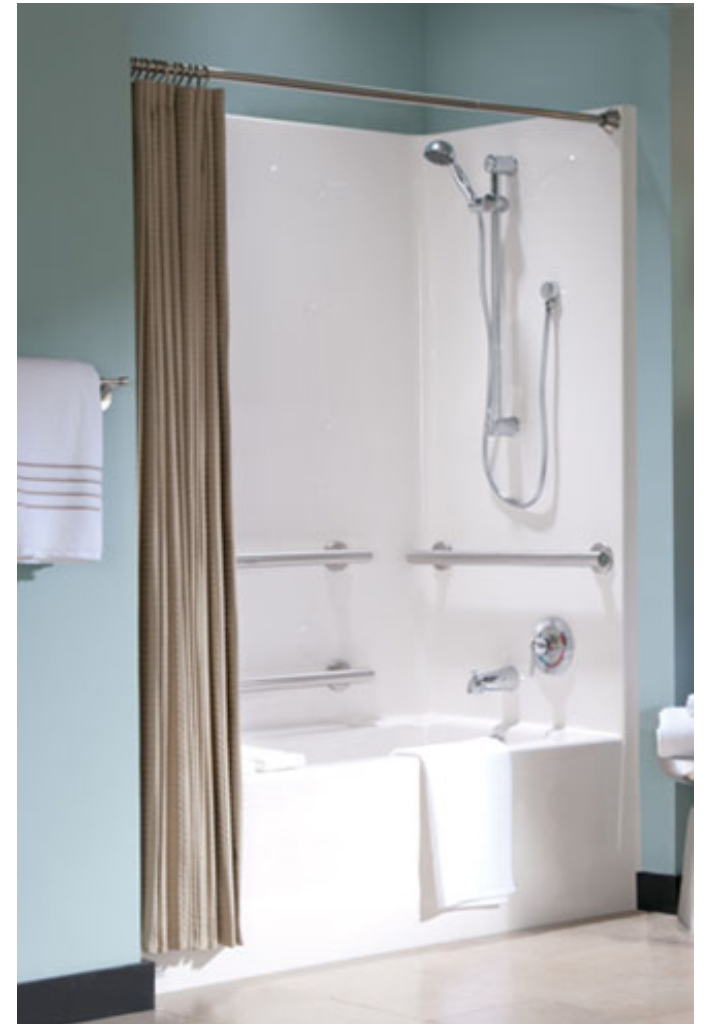
# Bathware: Tub-Showers

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Universally designed tub-showers incorporate anti-scald and pressure balanced tub-shower valves for safer bathing.

Other features include:

- grab bars
- low skirt height
- handheld shower
- easy transfer
- optional seat, and
- tri-fold removable seat.



# Wall-Mounted Sinks

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Wall-mounted sinks accommodate both seated and standing users. They provide space beneath a bathroom lavatory for wheelchairs or other mobility devices.

Wall-mounted sinks have no vanity cabinet or supporting legs underneath, yet they are designed for strength and durability.

Depending on the style, some have shrouds that conceal drain traps and water supply tubes under the sink.

Costs for wall-mounted sinks range from \$200 to \$1,000+.



# Hanging Toilets

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Hanging toilets combine modern aesthetics with more maneuvering space than conventional toilets.



# Accessories

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There are many “everyday” accessory products available that fit universal design principles.

1. Grab bars
2. Seats
3. Mixing valves and handheld showers
4. Faucets/levers
5. Door handles



# Accessories: Grab Bars

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Grab bars are especially important in a restroom and can be placed for showers, tubs, and toilets. Typically, two to three grab bars are installed in a shower system. One can consult a Certified Aging in Place Specialist (CAPS)-certified builder concerning how many grab bars are required for a particular application, what sizes they should be, and where they should be located. When specifying grab bars, it is recommended they have a non-slip surface, comfortable grip size (1 ¼"–1 ½") and a color that contrasts with the wall color. Note that the gap between the wall and bar should not exceed 1 ½". Many shower systems require reinforcement for grab-bar placement. As illustrated on the following slide, grab bars are available in a wide range of colors, finishes, and shapes.





# Accessories: Grab Bars

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U-Shaped



Straight



L-Shaped



Horizontal L-Shaped



Brushed Nickel



Chrome



Oil-Rubbed Bronze



Polished Brass



White



Off-White

# Accessories: Seats

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Seats can be placed in showers or tub-showers for people who prefer to sit while showering.

Choosing an acrylic shower surround with a built-in bench costs no more than a plain stall, and adding a built-in corner bench to a tiled shower costs roughly \$150. A folding, waterproof shower seat that attaches to the wall ranges in cost from \$150 to \$500.

When selecting a seat for a universally designed shower and/or tub-shower, consider choosing a side-mounted model in a color that contrasts with the wall.

Shower and tub-shower seats are offered in a variety of shapes, sizes, colors and styles.

 Please remember the **exam password ACCESSIBILITY**. You will be required to enter it in order to proceed with the on-line examination.

# Accessories: Seats

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Examples of universally designed seats are pictured at right.

- L-shaped seat
- Rectangular seat
- Single seat
- Fold-up seat
- Tri-fold removable seat



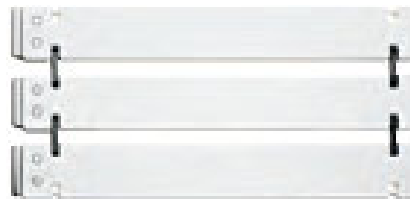
L-Shaped Seat



Rectangular Seat



Single Seat



Tri-Fold Removable Seat



Fold-Up Seat

# Accessories: Mixing Valves & Handheld Showers

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Handheld showers allow for easy access from outside the tub-shower, reducing reaching and bending. These versatile shower heads attach to a flexible hose that facilitates use while sitting. Handheld showers can be adjusted to the height of each user and may be used for back massage, rinsing hair, and more. Handheld showers are great for cleaning the tub or shower and have control settings that conserve water while hair washing or shaving. In addition, handheld units are no more expensive than fixed shower heads.



# Accessories: Mixing Valves & Handheld Showers

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Some of the important features of mixing valves and handheld showers:

- Adjustable temperature levels
- Easy-to-grip handle
- Handheld shower with pause button on hand unit
- Offset control mounting
- Easy to distinguish hot from cold with letters and colors
- Temperature display
- Anti-scald features: mixing valve prevents scalding
- Pressure balanced
- Pre-set temperature settings
- 59" minimum hand shower hose length
- Recommended maximum temperature of water is 120°F

# Accessories: Single Lever Faucets

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Single lever faucets provide easy control of flow rate and temperature.

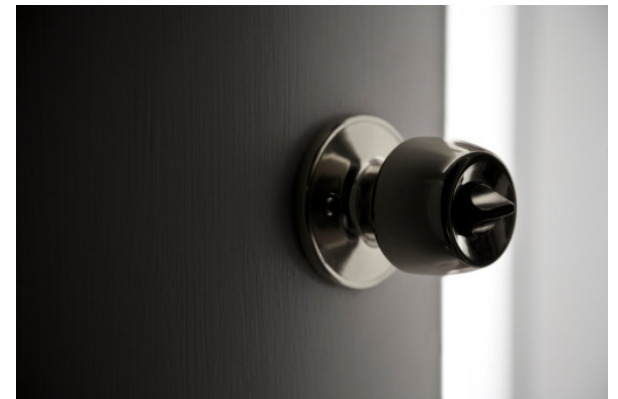


# Accessories: Door Handles

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Universally designed products can mean the difference in the design of door handles.

Lever-type handles are easier to use than twist-type knobs or handles, and they are especially convenient for those with arthritis or with limited dexterity in their hands. Additionally, they are available in as many styles and finishes as other faucets and handles, at comparable prices.





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## Summary



# Summary

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- People today are living longer and want to live independently for as long as possible. In order to live independently, individuals must take into consideration the design and functionality of a home.
- For the Boomer generation, universally designed environments and products should impose less demand on physical, sensory and cognitive abilities.
- The concept of universal design is the implementation of designs and products that are both usable and beautiful.
- The biggest misconception of universal design is that it's ugly, institutional, costly, and only for people with disabilities; in reality, everyone, despite ability and age, can benefit from universally designed products and environments.
- The principles of universal design serve as a guideline to help evaluate existing products and environments, guide the design process, and help identify the characteristics of usable designs.
- Overall, universal design can eliminate or reduce the need for changes later in life.

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# Conclusion

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