

HOME DESIGN GUIDELINES

Being safe and independent at
home



EMORY
UNIVERSITY

Cognitive Empowerment
Program



Georgia Tech | College of Design
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ABOUT THE CHARLIE AND HARRIET SHAFFER COGNITIVE EMPOWERMENT PROGRAM

This Home Design Guideline is funded by the Charlie and Harriet Shaffer Cognitive Empowerment Program (CEP), a research partnership between Emory Brain Health and the Georgia Institute of Technology, through the generosity of the James M. Cox Foundation.

The CEP provides individuals with Mild Cognitive Impairment (MCI), along with their care partners and families, an opportunity to participate in a year-long comprehensive lifestyle program that promotes joy, purpose, health, and wellness.

The primary goal of the CEP is to offer structured activities that enhance physical, cognitive, and emotional health and wellbeing while promoting independence in individuals' daily functioning. The interventions include physical exercises (i.e., Tai Chi, yoga, weightlifting), functional independence and cognitive training, nutritional education, coping strategies, social engagement, and support groups.

With a growing number of older adults experiencing cognitive decline and limited evidence-based treatment options available, the mission of the CEP is to engage and empower individuals with MCI and their support systems through lifestyle programs, technologies, and physical environments.

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HOW TO USE THE HOME DESIGN GUIDELINES

This guideline is designed to support individuals experiencing cognitive decline so they can safely, independently, and comfortably live at home.

It provides home design strategies based on evidence, best practices, and expert recommendations to inform individuals with MCI and their care partners of effective, user-friendly design suggestions to be implemented in home environments. **These suggestions are classified into different levels of effort, ranging from relatively simple do-it-yourself strategies to major home renovations.**

We have categorized these home design strategies and suggestions by room, including general strategies that can be implemented for the overall home and specific strategies for the living room, kitchen, bedroom, and bathroom areas. Within each (room) section, similar items are grouped around the ideas of lighting, flooring, color contrast, labeling, and spatial navigation. At the end of each room section, self-checklists and note pages are provided for those who want to assess their home and identify areas to focus on.

These guidelines are intended to facilitate a supportive decision-making process by individuals living with MCI in collaboration with their care partner and contractors. **These guidelines intentionally brings together these individuals to facilitate a supportive decision-making process.** We are incredibly hopeful that these guidelines will serve as a practical reference individuals facing MCI, helping them determine and achieve their comfort needs as they age at home.

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WHY

should you improve your home?

Modifying or adapting spaces in your home can increase safety, mobility, autonomy, and, overall wellbeing during home activities for you and your loved ones. This, in turn, improves your quality of life at home. The Goals section outlines what you can achieve by modifying your home, while the Action section provides specific actions you can take to reach the goals.

GOALS

A

MAXIMIZE SAFETY

Prevent falls and create a protective home environment.

B

FACILITATE MOVEMENT AND NAVIGATION

Adapt to mobility and wayfinding difficulties by improving accessibility and clearances in each space.

C

MAXIMIZE AUTONOMY

Maximize independence and reduce the need for assistance at home.

D

IMPROVE MEMORY RELATED TASKS

Increase the ability to find routine/daily items and remember appointments easily and quickly.

E

MAXIMIZE COMFORT AND FAMILIARITY

Increase physical comfort and awareness during home activities to help cope with memory loss.



ACTIONS

01

DECLUTTER

Declutter each space for ease of movement, wayfinding, locating daily use objects, and reducing risks of falling.

02

IMPROVE ACCESSIBILITY

Adapt each space to accommodate the basic requirements of accessibility and clearance suggested for aging in place.

03

USE TECHNOLOGY TO INCREASE SAFETY

Add helpful technology that can increase independence while supporting safety at home.

04

MAXIMIZE CLEAR VISIBILITY

Create a better contrast between floors, walls, and furniture to help with the decline in vision.

05

INCREASE DAYLIGHT AND REDUCE GLARE

Balance increasing exposure to daylight and reducing glare to achieve better visibility.

HOME IN GENERAL

WHAT modifications can improve your **home in general**?

Adapting your home environment is critical for accommodating changing needs and for facilitating challenging tasks.



Image 1.0 – American house with the master bedroom on the main floor

1. Maximize the use of areas with access to natural light, especially when completing longer tasks.
2. Install bright, cool lights for daytime use and warm, low lights for evening use.
3. Install motion sensed amber night lights in key areas that are used during nighttime movement.
4. Choose textured, non-slip flooring materials to reduce the risk of slips, trips, and falls.
5. Maintain floors free of tripping hazards, such as wires, cords, and loose mats and rugs.
6. Avoid using patterns, shiny surfaces, or changes of colors on the flooring.
7. Ensure all doors and entryways are at least 32-36 inches wide.
8. Arrange furniture to allow clearances that provide enough navigation space and are accessible for wheelchairs and walking equipment.
9. Install monitoring devices on exit doors that provide auditory cues each time the door is opened.
10. Select sockets and switch plates with a contrasting color to the wall and consider elevating outlets to 24 inches or higher from the floor for improved access.
11. Place labels on drawers with words and symbols that indicate what is stored inside. Consider open shelving for frequently used items.
12. Add bright yellow or orange tape to frequently used items, such as toothbrushes, hairbrushes, pens, and kitchen utensils.

WHY

are **home** modifications important?

LIGHTING

In the following section, we will explore the benefits of maximizing daylight, examine the use of different tones of lighting, discuss devices that minimize glare, and highlight the advantages of motion-sensored lights.

Why should you maximize daylight in your home, and what are the benefits?

Maintaining an appropriate level of lighting is crucial for a safe home environment (Image 2.1).¹ Low lighting can strain the eyes and reduce clear vision, which can increase the risk of tripping.



Image 2.1 – Natural daylight illuminating a seating area in the home

Why should you have motion-sensor-activated lighting?

Having lights that turn on in response to motion can increase the visibility of walking paths and reduce tripping hazards during nighttime activities. This will help prevent falls and improve overall safety at home.

What tones of lighting would be best during the daytime vs. nighttime?

For leisure areas such as the bedroom or living room, it is recommended to use a combination of “cool” lighting that provides high light levels during the day and “warm” lighting that provides low light levels during the evening. This can be achieved using a tunable lighting system.



Image 2.2 – Tunable lighting system illuminating the bed area with warm tones and the adjacent seating area with cool tones

Tunable lighting systems can promote circadian cycles.² Tunable white light allows users to customize and adjust the color temperature of lighting fixtures. Each light bulb is designed to provide a range of warm to cool tones (Image 2.2). This lighting solution can benefit sleep and circadian rhythms, particularly for individuals with high light sensitivity.³

HOW

can you execute **home** modifications?

What can be done to reduce glare when maximizing daylight?

Instead of using blinds and dark curtains, use overhangs and shading devices, such as pergolas, horizontal louvers, vertical baffles, awnings, fritted and frosted glass, and screens to filter sunlight's accompanying glare without completely blocking out the daylight (Image 3.1).

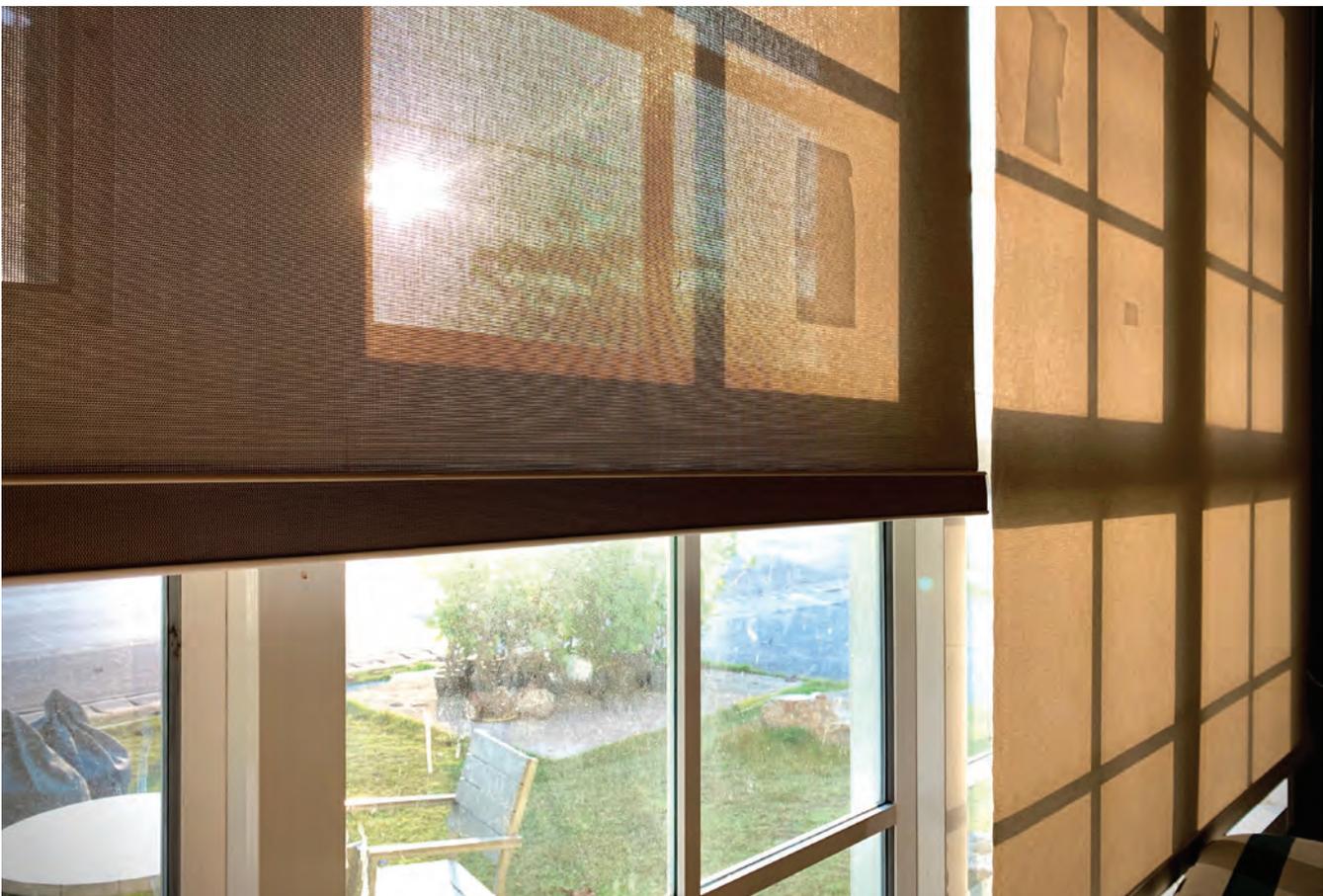


Image 3.1 – Screens covering windows to reduce the glare from the sunlight

HOW

can you execute **home** modifications?

What products should you look for?

a. Motion sensed strip lighting - These are commonly used for decorative purposes in living rooms, bedrooms, and hallways. Strip lighting can be installed along a pathway to the bathroom, or under the bed, providing nighttime navigation with minimal light exposure. Some recommended brands include EcoSmart, Govee, and Sensky (Image 3.2, Image 3.3). These come as battery operated or with a plug.

b. Motion sensed indoor light bulbs – These light bulbs with motion sensors can be used in lamps, overhead fixtures. Various manufacturers offer these bulbs, including Sengled, Torchstar, and GE lighting (Image 3.4, Image 3.5).



Image 3.2 - Ecosmart Motion Sensed Strip Lighting - 3.2 ft. Battery Motion On/Off Strip Light



Image 3.3 - Sensky Motion Sensed LED Strip Light Kit Flexible LED Strip Motion Sensor (Warm White 3000-3500K)



Image 3.4 - Sengled Smart LED with Motion Sensed PAR38 Bulb



Image 3.5 - TORCHSTAR LED Motion Sensed Light Bulb

WHY

are **home** modifications important?

FLOORING AND TRIPPING HAZARDS

Why should you ensure that the floor is free of tripping hazards?

Older adults are particularly susceptible to tripping or falling in their homes which can lead to hospitalization.



Image 4.1 – Loose cords and wires with lack of contrast with the flooring

To reduce the risk of such accidents and promote safety at home, it is important to remove cluttering items, loose mats, and rugs from the floor. Additionally, minimizing level or threshold changes between rooms is recommended. If a cord must cross a walking path, then use a floor cord cover or add an outlet to the surface of the floor to eliminate the need for the cord to cross over a walking path (Image 4.1, 4.2, 4.3).



Image 4.2 – Decluttering wires with the use of floor cord cover

Since the ability to differentiate between colors decreases with age, many older adults require a higher degree of contrast to notice such differences. Studies have shown that 22.6% of the individuals over the age of 85 required ten times as much contrast as young individuals to see large objects in good lighting conditions.⁴ So wires, cords or other obstacles that cannot be removed should have high contrast with the floor so that they can be easily see and avoided.⁵



Image 4.3 – Cords and floor clutter are potential tripping hazards.

What is the relationship between contrasting floors and daylighting?

Individuals living with MCI often face challenges in perceiving contrast and detecting curbs and stairs.⁵ When combined with low lighting levels, low contrast, and glare, this difficulty can further reduce response time and increase the risk of tripping (Image 4.3).

Therefore, it is important to avoid stark changes in lighting levels and poor contrasting floors to ensure safety and minimize the risk of accidents.⁵



Image 4.4 – Color and pattern contrast between the floors, steps, and ascending/descending levels of the steps

HOW

can you execute **home** modifications?

What type of flooring patterns should you opt for?

Avoid patterns, shiny surfaces, and dark/blackish tones on the floor, as these can cause confusion due to glare and shadows. Instead, consider low-pile carpeting, hardwood, or cork flooring, as they offer better visibility (Image 5).



Image 5 – Lightly-toned low-pile carpeting free of floor clutter/tripping hazards

WHY

are **home** modifications important?

CONTRAST

Why should there be a stark contrast between the walls and the sockets at home?

Color contrast helps individuals easily identify the location of sockets, reducing the risk of electricity hazards ⁵ and reducing frustration (Image 6.1).



Image 6.1 – LEVITON Renu switches and sockets creating color contrast with wall color to increase visibility

What are contrasting shades and how do you recognize them?

Contrasting shades are colors that are located opposite each other on the color wheel (Image 6.2). They create a strong color contrast when placed next to each other.

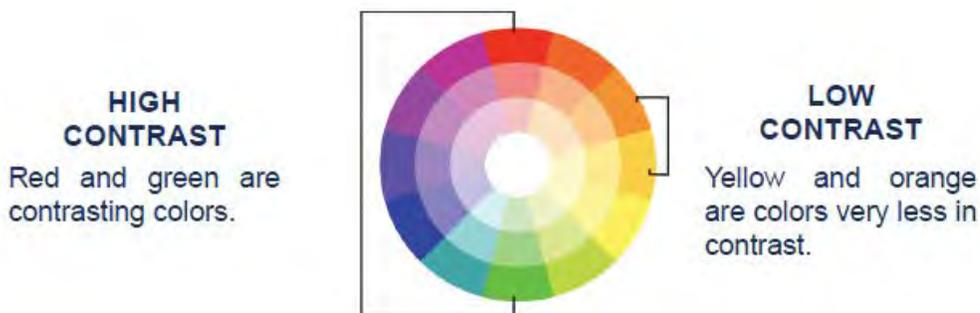


Image 6.2 – Color wheels depicting complementary and contrasting colors

HOW

can you execute **home** modifications?

Tips for selecting colors and patterns for furniture

1. Adjust color intensity/saturation: Color intensity refers to brightness or dullness of a color. Studies show that color impacts cognitive performance so adjusting the color intensity to the appropriate level of brightness or dullness would be best ⁶ (Image 6.2).

2. Consider the function of a room: Take into account the purpose of each room when choosing colors. For example, brighter shades of blue are appropriate for an energizing gym, and softer yellows would be great for a sunroom.

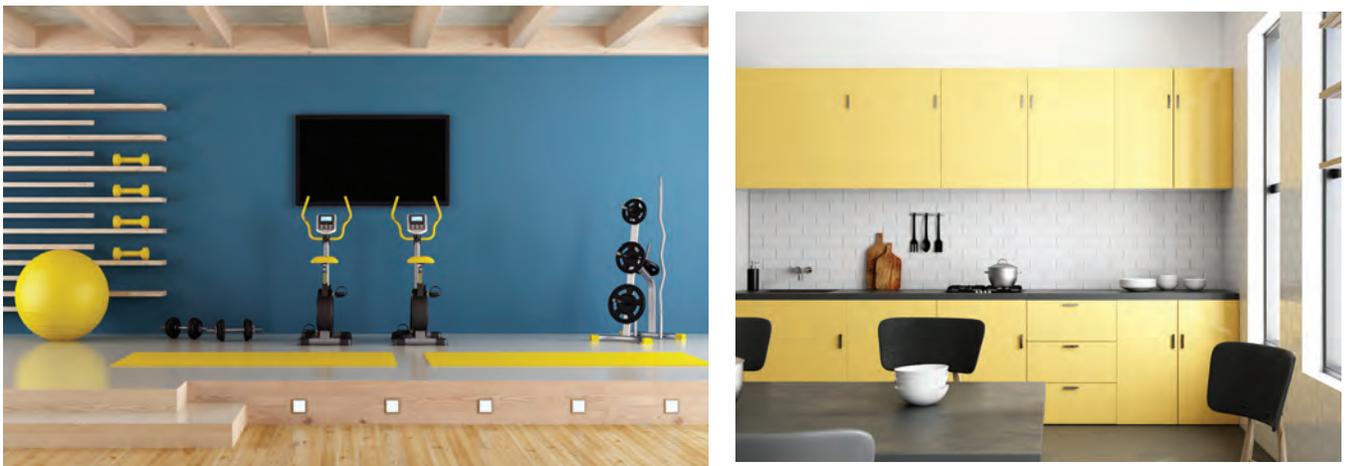


Image 6.3– Color selection in the spaces based on the function of the space

3. Aim for contrast: Aging eyes have more difficulty distinguishing between objects of similar colors. Contrasting colors help distinction between major elements such as furniture, walls, wall railings, drapes, and floors.⁶

WHY

are **home** modifications important?

LABELING

Why should you label drawers and containers to indicate what is stored inside?

Labeling helps in remembering the location of stored items. This is particularly useful for completing multi-step tasks that require retrieving items from multiple places.⁷

Why should you add bright yellow or orange tape to frequently used items?

Finding and managing items can become challenging in cluttered environments. Labeling everyday items helps to easily locate them and reduces anxiety over losing them (Image 7.1).⁷



Image 7.1 - Remote control and toothbrush brightly labeled with its designated storage area

HOW

can you execute **home** modifications?

The following image displays a kitchen cabinet with labelled, transparent containers for ease of access and organization (Image 8).



Image 8- Items in transparent and labelled storage containers

WHY

are **home** modifications important?

ACCESSIBILITY AND NAVIGATION

Why should you move your furniture to provide adequate space for navigation?

Re-arranging your furniture can accommodate the flow of wheelchairs and walkers, making it easier to move around safely and comfortably. This also helps reduce furniture-related injuries.⁷



Image 9 – Clutter-free furniture layout for ease of way finding and circulation

HOW

can you execute **home** modifications?

How can doorways facilitate access and navigation?

Ideally, doorways should be 32 to 36 inches wide to accommodate people in wheelchairs or with other mobility aids⁸ (Image 10). Implementing this design strategy, allows for the size and space to be inclusive of everyone.⁹ The design guideline considers approach, reach, and manipulation for users with different abilities and space needs.¹⁰



Image 10 – Wide door ways with Handiramp threshold ramp for wheelchair access

Why should your doors have monitoring devices that provide auditory cues each time the door is opened?

Caregivers and care partners may not always be aware of their loved ones' movements or have constant supervision.⁷ The auditory cues from the monitoring devices provide alerts whenever a door is opened, allowing them to promptly intervene and prevent wandering.⁷

HOME IN GENERAL - CHECKLIST

- There are places in my home that have good daylighting.
- The lighting in my home complements and aids my vision.
- I have good visibility when navigating my home at night.
- The flooring in my home is not slippery.
- There are no tripping hazards on the floor such as wires and loose rugs.
- There are no patterns or shiny surfaces on the flooring.
- All doors and entryways in my home are wheelchair accessible.
- I have sufficient clearance around my furniture and am able to navigate around the furniture with ease.
- When someone is leaving, the exit door makes a sound to alert others in the home.
- I have no trouble finding electrical sockets or light switches on the wall.
- I have open shelving and do not find it difficult to locate items I use daily.
- I have color contrast labels on items I use daily that help me locate items easily.

LIVING ROOM

WHAT modifications can improve your living room?

The following image displays the design and furniture layout of the living room with callout lines of applicable strategies for items and appliances.



Image 11– Design and furniture layout of living room

1. Choose light bulbs with increased lighting in the living room, and place them so that they illuminate areas where you conduct activities that need good visibility (reading and sewing). Avoid fixtures with exposed bulbs, instead use fixtures with shades or covers that diffuse the light.¹¹
2. Choose seating with armrests and appropriate seating height to minimize effort and facilitate balance when sitting down and standing up.¹² Select a sofa with good back support that is easy to sit down on and get up from.
3. Keep a small C-shaped side table to add convenience and provide support when standing up.¹³
4. Place photographs of important people and past events in locations with easy and frequent visibility.¹⁴
5. Choose contrasting colors and patterns for upholstery, flooring, and walls to help distinguish between them.¹⁵
6. Add visual cues to TV remote control(s), such as adhesive tape in bright colors, and keep them consistently in an easily visible and reachable location.

WHY

are **living room** modifications important?

LIGHTING

Why is better lighting crucial for living rooms?

Better lighting is crucial for living rooms as it promotes safety and well-being by facilitating the ability to see key items during daily tasks.¹¹ Better lighting also promotes a healthy sleep-wake cycle, improves alertness, reduces eye strain, and minimizes glare.¹⁶

What levels of illuminance should you aim for in the living room?

Choose the appropriate number of light fixtures with brightness level of 800 lumens or more, as reported on the Lighting Facts on the packet, and aim for illuminance (lux) level based on the room's size, with a minimum of 200 lux. Place the fixtures strategically to illuminate areas where you conduct activities requiring good visibility like reading.¹⁷

Tunable lighting technology is preferred as it allows users to customize and adjust the color temperature described as Light Appearance on the label¹⁸ (see page 11, Lighting based on the time of day. Alternately, users can place static colored bulbs in areas of the house that are mostly occupied at certain times of the day). Bright cool white lights are recommended for spaces occupied during the day, while dimmer warm lights are suitable for spaces occupied at night.¹¹

HOW

HOW can you execute living room

What tunable lighting products are available in the market?

“Tunable” refers to light bulbs that can produce a range of white light, from a warm yellowish hue to a cool bluish hue. These smart bulbs are readily available in the market and can be installed by yourself.

1. Phillips Hue (Image 12.1)
2. CREE Connected MAX - 60-watt LED (Image 12.2)
3. Lix Mini white light bulb (Image 12.3)
4. EcoSmart LED smart bulb (Image 12.4)



Image 12.1 - Phillips Hue



Image 12.2 - CREE Connected MAX - 60 watt LED



Image 12.3 - Lix Mini white light bulb



Image 12.4 - EcoSmart LED smart bulb

WHY

are **living room** modifications important?

FURNITURE

Why should you opt for a specific furniture type or design?

Choosing a specific furniture design is important to minimize body pain and discomfort while sitting and reduce the risk of injuries and falls when standing up.

Why should you have a C-shaped table in the living room?

Having a small pullover table in the living room adds convenience. It allows individuals to keep daily objects such as electronics, books, and reading glasses within easy reach while seated (Image 13).



Image 13 – Example of a C-shaped side table

HOW

can you execute **living room** modifications?

What type of furniture is ideal?

Avoid deep and cushy sofas that can be difficult to stand up from.¹⁹ Instead, opt for sturdy chairs with armrests or firm sofas that provide easier transitions when getting up and sitting as needed ²⁰ (Image 14.1, 14.2, 14.3).



Image 14.1 – Deep cushioned sofa should be avoided



Image 14.2 – Firm sofa



Image 14.3 – CIMOO chair with arm rest

Why should you opt for foot support?

Foot support can help elevate your legs and provide additional support while seated ²¹ (Image 14.4).



Image 14.4 – Supportive foot rest

WHY

are **living room** modifications important?

MEMORABILIA

Why should you have memorabilia on walls?

Memorabilia helps improve cognitive functioning by stimulating and triggering memories (Image 15). It positively impacts individuals by engaging them with a pleasurable type of reminiscence.²² It also boosts the significance of relationships and improves cognitive function.²³



Image 15 - Example of memorabilia on walls

HOW

can you execute **living room** modifications?

How to add visual cues to improve cognitive function?

You can make simple additions of memorabilia around the house (Image 16). They can be in photo frames on walls or on shelves. These visual cues serve as stimulating reminders of memories.²²



Image 16 - Examples of displaying travel memorabilia on appliances like refrigerator

WHY

are **living room** modifications important?

LABELING

Why should you add bright tape to remote control devices?

Adding tape or visual cues to everyday items can make them easier to find. The colored tape makes it easy to locate and reduces the risk of losing them (Image 17.1).



Image 17.1 – Remote control brightly labeled with its designated storage area

WHY

are **living room** modifications important?

COLOR AND MATERIALS CONTRAST

Why should you use contrasting colors for furniture and finishes?

Using contrasting colors on different surfaces aids in distinguishing between where one element begins and another one ends. An important example is the differing surfaces of the floor vs. the wall. Using assorted colors or a molding that breaks up similar colors makes it easier to notice the difference between the two surfaces and acts as a precautionary safety measure to avoid accidentally bumping into walls ²⁴ (Image 17.2).



Image 17.2– A living room decorated and furnished with bright, bold colors

HOW

can you execute **living room** modifications?

COLOR AND MATERIALS CONTRAST

Tips for selecting colors and patterns for furniture and rooms (see page 18, Contrast)

1. Color intensity/saturation: Color intensity refers to brightness or dullness of a color. The color intensity scale is made up of hues and tones.⁶ Studies show that color impacts cognitive performance so adjusting the color intensity to the appropriate level of brightness or dullness would be best. (Image 18.1).⁶

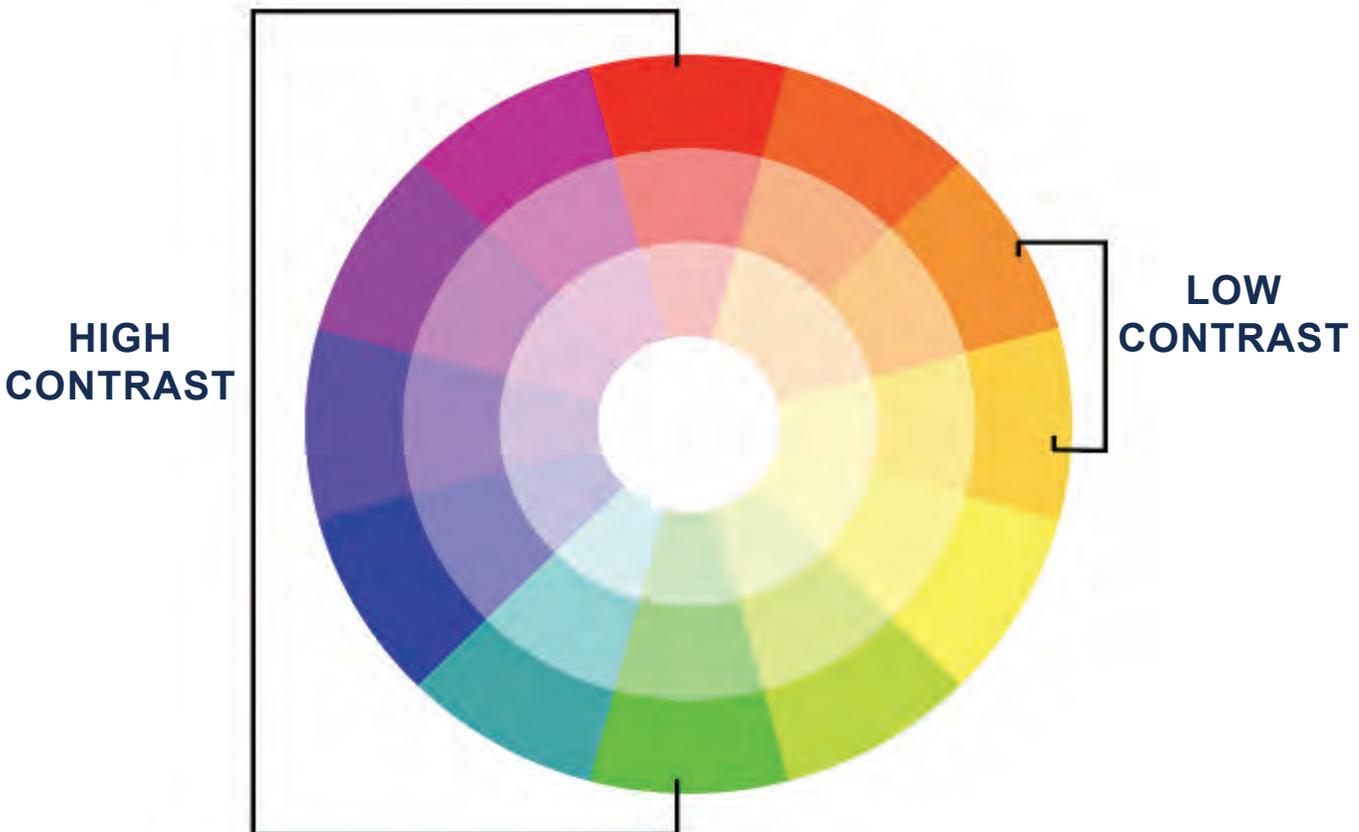


Image 18.1– Color wheels depicting complementary and contrasting colors

2. Consider the function of a room: For example, brighter shades of blue are appropriate for an energizing gym, and softer yellows would be great for a sunroom.

3. Aim for contrast: As our eyes age we have more difficulty distinguishing between similarly colored objects. Contrasting colors help differentiate between major pieces of furniture, walls, wall railings, drapes, and floors.⁶



Image 18.2 – A living room decorated with contrasting, rich colors

LIVING ROOM - CHECKLIST

- The light bulbs in my living room are bright enough, allowing me to read and do activities with good visibility.
- I can sit and stand up with ease from the sofa in my living room.
- I have a foot rest with my sofa.
- I have a C-shaped side table in my living room that aids me while doing certain activities.
- I have sufficient memorabilia placed around my living room that helps me remember people or events from my past.
- I have never tripped or fallen in my home due to an inability to distinguish between the furniture, walls, and flooring.
- I do not have trouble finding the TV remote.

KITCHEN

WHAT modifications can improve your kitchen?

The following image displays design and layout of the kitchen with callout lines of applicable strategies for items and appliances.



Image 19 – Design and layout of kitchen with callout lines of applicable strategies for items and appliances in the space.

1. Use LED lighting to illuminate work and eating areas.
2. Install lights inside the back of cabinets or under cabinets for better visibility.
3. Ensure that flooring materials are non-slip, and remove rugs and clutter from the floor.
4. Choose an open floor plan that provides ample physical and visual connections between social spaces like the kitchen, dining room, and living room areas.
5. Modify the height of kitchen countertops and kitchen appliances to accommodate your current physical needs. (i.e., sink height, microwave height).
6. Use bulletin boards in areas with clear visibility to display daily routines and 'to-do' lists.
7. Use open shelving or cabinets with transparent doors and add customized labels to easily identify items stored on shelves and cabinets when needed.
8. Implement an automated venting system with active fire and smoke alarms to prevent kitchen fire.
9. Install automated safety technology to kitchen appliances to monitor temperature levels in stoves, ovens, microwaves, and toasters.
10. Place video displays (i.e., tablets) containing reminders (i.e., cooking recipes, schedules) in kitchen areas where they can be easily identified during tasks like cooking.

WHY

are **kitchen** modifications important?

LIGHTING

Why is better lighting important for your kitchen?

Like our other senses, vision is affected by age.¹⁶ The changes that occur in the eyes with normal aging and age-related eye diseases create several challenges for cooking and meal prepping.

For example, studies show that a person who is 60 years of age receives only about 40 percent of the light at the retina as a 20-year-old receives.²⁵ Better lighting and lower glare conditions help improve visibility and functional independence for individuals facing diminished visibility.

Why is it advised to have down lighting underneath kitchen cabinets?

Overhead lighting can be blocked by cabinets casting shadows on the countertops where much of the food prep is done (Image 20). Lights underneath the cabinet can increase visibility for tasks performed on the counter top and make it easier to find items.²⁶



Image 20 – Lighting underneath the cabinets illuminating the countertops.

HOW

can you execute **kitchen** modifications?

How can you determine the recommended brightness levels in a kitchen?

The recommended illuminance levels in the kitchen are 300 lumens overall and 500 lumens for countertops where people conduct activities that need good visibility ²⁷ (i.e., cutting on countertops, accessing items from the back of shelves, using electronic appliances). It is best to use cool white color lights in the kitchen since it is a task-oriented space (Image 21).



Image 21 – Natural sunlight and artificial light illuminating the kitchen

How can you figure out how much light is enough?

A general rule of thumb for lighting a kitchen is to aim for 70-80 lumens per square foot. To determine your specific lighting needs, multiply your kitchen's square footage by the target lumens.

Keep in mind that the recommended lighting level is what you should have on the countertop area. The ratings on the bulbs tell you how much light is produced at the bulb – the amount of light (light intensity) diminished as you move further away.

Example: 100 SF x 70 Lumens = 7,000 lumens/sf

This could be achieved with around four lamps, each providing 1,800 lumens (T8 LED TUBE).

Here are some general guidelines to follow:

- To replace a 100-watt (W) incandescent bulb, select a bulb that offers about 1,600 lumens. If you prefer dimmer lighting, go for fewer lumens; if you prefer brighter light, look for higher lumens.²⁸
- Replace a 75W bulb with an LED bulb with a brightness of around 1,100 lumens. For a 60W bulb, look for an energy-saving bulb that offers approximately 800 lumens.

WHY

are **kitchen** modifications important?

FLOORING

Why should you ensure that flooring materials are non-slip?

Removing or reducing slippery surfaces in your home will reduce the possibility of slips, trips, and falls.²⁹ Consider replacing or covering slippery flooring with anti-slip solutions. It is also important to remove throw rugs from the floor to prevent tripping hazards. This precaution is especially important in rooms and areas prone to wet floors, such as kitchens and bathrooms. These rooms are frequently visited and could be the cause of falls when floors are wet and slippery.

What type of anti-slip flooring would be recommended?

There are several options for anti-slip flooring, depending on your budget and specific needs.

HOW

can you execute **kitchen** modifications?

1. If you plan to do it yourself, consider the following :

- a. Anti-slip coatings by companies like Trusty-Step, Slip Doctors, and SlipTec Solutions (Image 22.1)
- b. Anti-fatigue mats (Image 22.2)
- c. Anti-slip floor mats (Image 22.3)



Image 22.1 - Anti-slip coating



Image 22.2 - Anti-fatigue mats



Image 22.3 - Anti-slip floor mats

2. If you plan to hire a contractor, consider the following:

- a. Anti-slip tiling (Image 22.4)
- b. Engineered vinyl planks (Image 22.5)



Image 22.4 - Anti-slip tiling



Image 22.5 - Engineered vinyl planks

WHY

are **kitchen** modifications important?

OPEN FLOOR

Why should you consider an open floor plan?

An open floor plan and layout provide ample physical and visual connections between the kitchen, living room, and dining areas¹⁹, facilitating easy observation and inclusiveness.⁷



Image 23 - Kitchen designed with an open floor plan and adequate lighting to illuminate the entire space

HOW

can you execute **kitchen** modifications?

What should you look for in an open floor plan?

You should opt for an open floor kitchen layout, and add extended lower countertops to separate the kitchen and living room areas while maintaining visual access to both (Image 24).

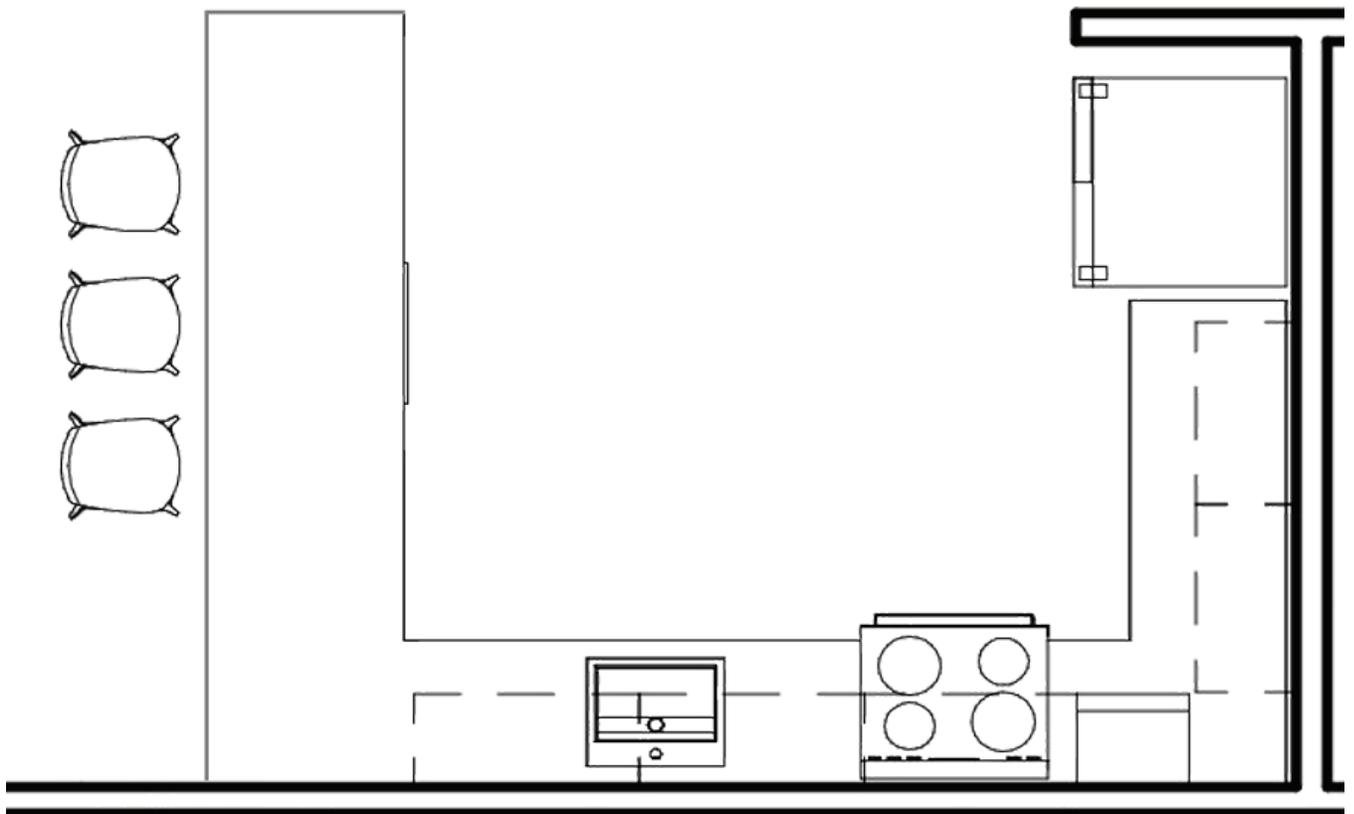


Image 24– Open floor kitchen layout

WHY

are **kitchen** modifications important?

COUNTERTOP HEIGHTS

Why should you change the countertop heights?

Having a countertop with an appropriate height is important to prevent injuries, improve the feasibility of daily kitchen tasks, and facilitate access without requiring excessive reach, effort, or causing discomfort or pain.¹⁰

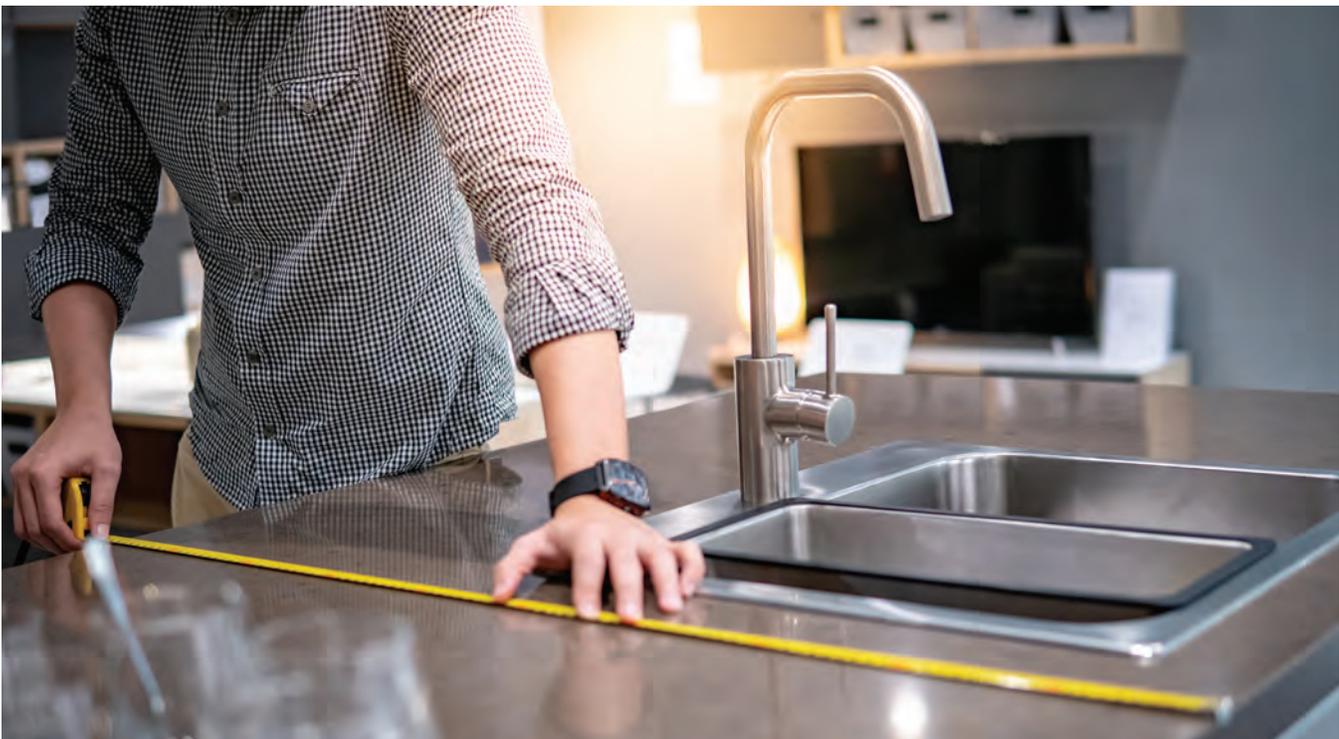


Image 25 – Measuring the length of the kitchen countertop to determine accessibility

HOW

can you execute **kitchen** modifications?

What is the ideal height for countertops?

Aging adults have greater difficulty in adjusting to inappropriately high countertops causing accessibility and visibility issues. ²⁶ For a person on a wheelchair, the kitchen countertop shall be 34 inches maximum above the finish floor or ground ⁴¹ (Image 26). A counter that is adjustable to provide a kitchen work surface at variable heights, 29 inches minimum and 36 inches maximum, shall be permitted. ⁴¹

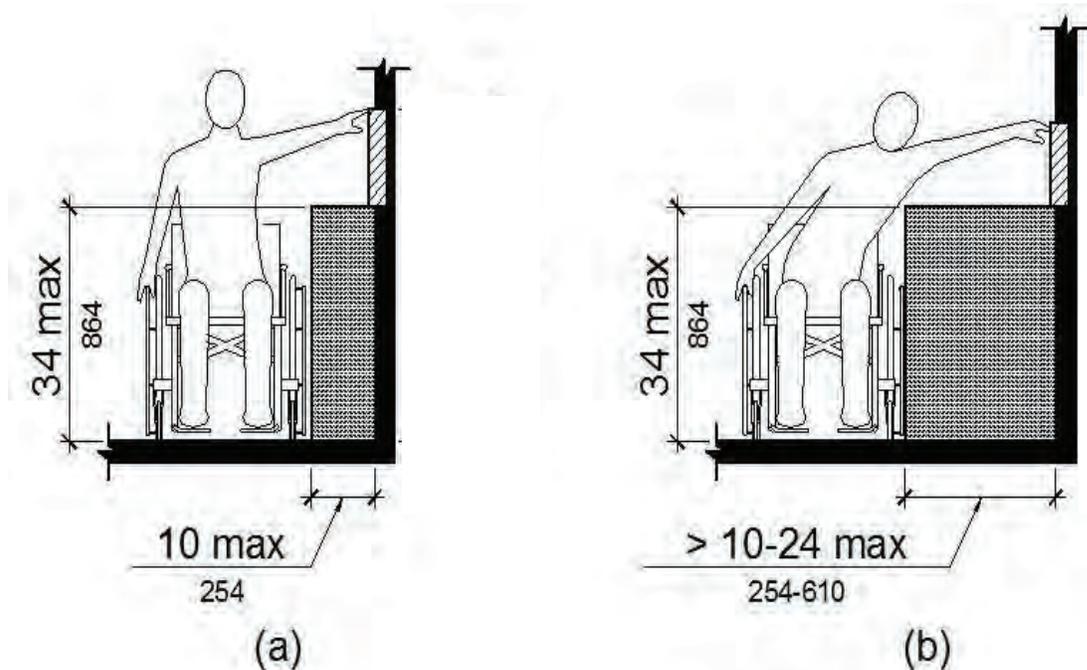


Image 26 - Americans with Disabilities Act (ADA) guidelines for improved accessibility and navigation in the home ²⁵

WHY

are **kitchen** modifications important?

OPEN SHELVING

Why should you opt for open shelving?

Open shelving makes it easier to find kitchen items, such as ingredients, cooking tools, utensils, plates, cutlery, and cutting boards. It allows stored items to be more easily seen and accessed (Image 27).

What equipment would you need to install open shelving yourself?

To install open shelving, you will need the following equipment: shelf brackets (4), measuring tape, heavy-duty anchors, a mallet, a drill, and a wood shelf. You can find all of these tools at a hardware store and the shelving at a home goods store (Image 28).



Image 27 – Open shelving system in the kitchen

HOW

can you execute **kitchen** modifications?

What are the steps to install open shelves in the kitchen?

1. Decide on the location of the shelves on the wall. Ideally, the distance for the first shelf would be 20 inches above the countertop, and the second shelf around 33 inches from the countertop.
2. Mark the studs on the wall where the shelves should sit and install the brackets for the shelves.
3. Make sure to hit studs with your brackets when you can and then use heavy duty anchors to secure the bracket to the wall when you can't hit a stud.
3. Using a drill press, create holes in the wood shelves where the brackets will slide.
4. Slide the wood shelves over the brackets. It should be a very tight, firm hold.



Image 28 – Installing an open shelving system in the kitchen

WHY

are **kitchen** modifications important?

ASSISTIVE TECHNOLOGY

Why should you opt for assistive technology and what are its benefits?

Assistive technology helps to indicate when refrigerators and ovens are being used and/or left open for too long, and whether there are hot surfaces and potentially forgotten items left turned 'on' that should be turned off.³⁰

Electronic devices with visual and auditory alerts make it easier to manage and control appliances. They can automatically shut off devices when extreme temperatures are detected on surfaces or when appliances are mistakenly left open or turned on. (Image 29).

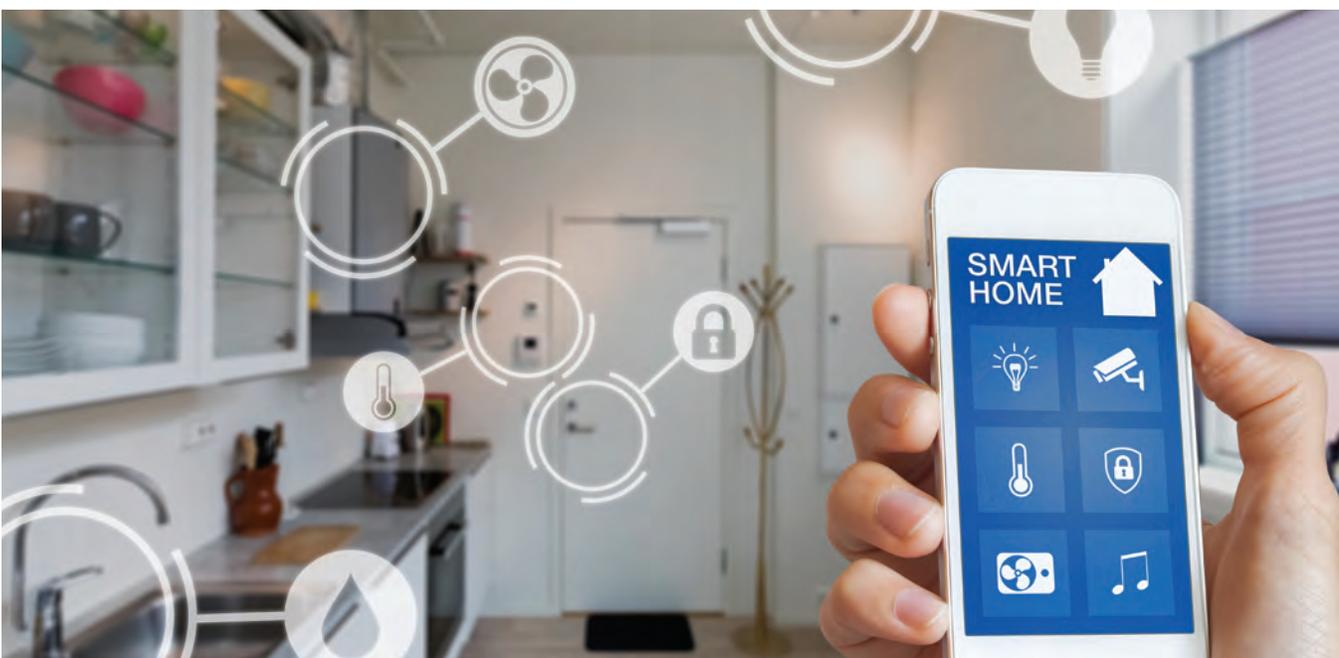


Image 29 – Using assistive technology such as the “Smart Home App” for kitchen related tasks.

HOW

can you execute **kitchen** modifications?

What products are available to purchase?

- a. iGuardStove Smart Automatic Stove Shut Off with 24/7 Activity Tracking (Image 30.1)
- b. Wallflower Smart Monitor for Electric Stoves (Image 30.2)
- c. Fire Avert Electric Auto Stove Shut-off Safety Device Image 30.3)
- d. Simple Touch C30004 Auto Shut-Off Safety Outlet Image 30.4)



Image 30.1 - iGuardStove Smart Automatic Stove Shut Off with 24/7 Activity Tracking



Image 30.2 - Wallflower Smart Monitor for Electric Stoves



Image 30.3 - Fire Avert Electric Auto Stove Shut-off Safety Device



Image 30.4 - Simple Touch C30004 Auto Shut-Off Safety Outlet

KITCHEN - CHECKLIST

- I have adequate lighting and can easily see while cooking and eating.
- It is easy to see what is inside my cabinets.
- I have no risk of falling from slippery floors, rugs, or cluttered floors.
- My home feels open, and I can easily navigate in and out of the kitchen.
- It is easy for me to access countertops and kitchen appliances.
- I have a daily routine and to-do lists to help me throughout the day.
- I can easily find and access objects in shelves and cabinets.
- I have proper venting systems and active smoke alarms to protect me in case of emergency.
- I have automated safety systems in my kitchen appliances to monitor hot temperature levels.
- I have a display of recipes and reminders in the kitchen to help me while I am cooking.

BEDROOM

WHAT modifications can improve your **bedroom**?

The following image displays design and furniture layout of bedroom with callout lines of applicable strategies for items and appliances.



Image 31 – Design and furniture layout of bedroom with callout lines of applicable strategies for items and appliances in the space.

1. Add lighting that is reachable from the bed for nighttime bathroom visits or choose motion sensor night lights.³¹
2. Consider having your bedroom on the main floor of the house for convenience and safety, and avoid using stairs.
3. Maintain an environment that is free of clutter and tripping hazards.³³ Instead of throw rugs, install non-slip floorings like hardwood or carpet.³²
4. Select a bed with an appropriate height, ranging from 20 to 24 inches from the floor to the top of the mattress, to increase ease when getting into and out of bed.
5. Create a clear path from the bed to the bathroom with an easy transition threshold at the doorway.
6. Consider adding a bedside commode or a 3-in-1 commode when you have reduced mobility.
7. Pull-out drawers are recommended over closed cabinets for storage.³³
8. It is best to dedicate the bedroom to sleeping and avoid having a TV in the bedroom.
9. Decorate the bedroom with memorabilia that triggers positive memories, such as photos of family, events, and holidays.³⁴
10. Organize the clothes in your closet sequentially, in the order you would wear them.²²

WHY

are **bedroom** modifications important?

LIGHTING

Why should you have lighting near the bed?

Portable night lights or bedside lamps add convenience, promote safety, and increase visibility ³⁵ (Image 32). The purpose of these lights is to provide sufficient visibility when visiting the bathroom at night. Another option to consider is motion-sensor lights as they eliminate the need to search for a light switch in a dark room, as they automatically illuminate the area when motion is detected.



Image 32 – Multiple lighting fixtures in the bedroom that illuminate the entire space

HOW

can you execute **bedroom** modifications?

What type of lights help implement these strategies?

1. Portable night lights or bedside lamps (Image 33.1)
2. Motion-sensor-activated light (Image 33.2, Image 33.3)



Image 33.1 - LIYADI RGB Handheld LED Light Wand Rechargeable Photography Light Stick



Image 33.3 - Motion-sensor- activated light



Image 33.3 - Motion-sensor- activated light

WHY

are **bedroom** modifications important?

FLOORING

Why should you opt for non-slip flooring options?

Unsecured rugs are a leading cause of tripping and falling; instead, opt for non-slip flooring with no throw rugs³⁶ (Image 34). When picking out non-slip flooring materials like low-pile carpeting or engineered vinyl planks, it is recommended to select lighter shades or colors to create a clear contrast between objects or wires on the floor to reduce the risk of tripping and falling.

You may want to consider replacing or covering slippery flooring with low-pile carpeting or anti-slip applications (see page 49, Flooring).



Image 34 – Open flooring in the bedroom that features low-pile carpeting

HOW

can you execute **bedroom** modifications?

What type of anti-slip flooring would be recommended in your bedroom?

1. Anti-slip coatings by companies like Slip Doctors, Trusty-Step, and SlipTec Solutions (Image 35.1, Image 35.2)
2. Low-pile carpets (Image 35.3)
3. Engineered vinyl planks (Image 35.4)



Image 35.1 - Anti-slip coatings by slip doctors



Image 35.2 - Anti-slip coatings by trusty step



Image 35.3 - Low-pile carpets



Image 35.4 - Engineered vinyl planks used for bedroom floor

WHY

are **bedroom** modifications important?

FURNITURE

How to choose the proper height for your bed?

The recommended bed height for older adults ranges from 20 to 24 inches, including the bed frame and the mattress. Having a bed that is too low or too high can increase the risk of back injuries when getting in and out of bed. These injuries could easily be avoided by choosing a bed that is at the appropriate recommended height.¹⁹

Why should you consider creating a clear path from the bed to the bathroom?

Many older adults experience nocturia or frequent night time urination, and nighttime bathroom visits are one of the leading causes of falls among older adults.³⁷ When waking up in the middle of the night, your vision, cognition, and balance/coordination can be unsteady. To avoid any injuries or falls, it is best to have a clear path from the bed to the toilet. Avoid having large steps and differences in levels on the path to the bathroom.

HOW

can you execute **bedroom** modifications?

Why should you consider a bedside commode or pan?

A bedside commode or a 3/1 commode is portable and has handlebars over the sides of the commode (Image 36). They are easy to install, portable and inexpensive. They are particularly useful for those with back or knee injuries as the arms offer support and stability.



Image 36 – Example of a bedside commode

WHY

are **bedroom** modifications important?

MEMORABILIA

Why should you have memorabilia on walls as visual cues?

Memorabilia helps improve cognitive functioning by stimulating and triggering memories (Image 37.1). Memorabilia can enhance the overall reminiscence experience and engage individuals in pleasurable recollections.³⁴ It boosts the significance of relationships and improves cognitive function.²³



Image 37.1 – Examples of memorabilia in the bedroom

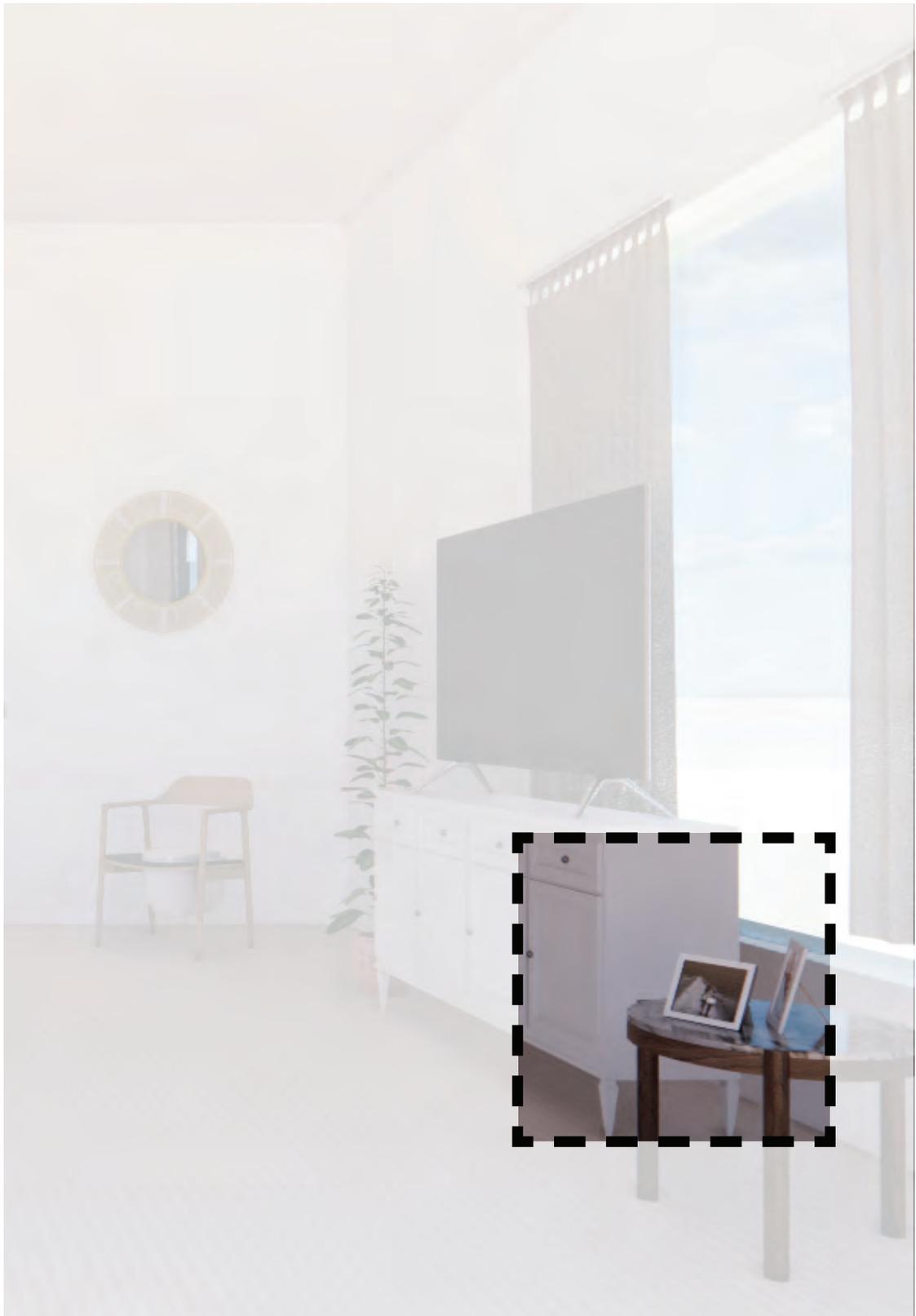


Image 37.2 – Examples of memorabilia in the bedroom

WHY

are **bedroom** modifications important?

CLOSET ORGANIZATION

Why should you opt for pull-out drawers over closed cabinets?

Installing pull-out drawers (also called slide-out or rolling drawers) in lower dressers can greatly improve physical accessibility. Adding pull-out drawers to dressers can reduce the strain of bending over to reach the back of cabinets. These are also great if you want to utilize maximum storage space inside the drawers.



Image 38 – Neatly organized closet to ensure visibility and easy access

HOW

can you execute **bedroom** modifications?

How should you organize clothing in order to preselect clothing?

Organizing your clothing in a sequential manner, from undergarments to footwear, offers benefits for everyday activities. This approach involves categorizing and separating items in your closet based on their types.³⁵ Sequential order and preselection avoid confusion and facilitate autonomy in choosing your own clothing.³⁸



Image 39 - Clothing organised in a sequential manner for preselection avoid confusion and facilitate autonomy.

BEDROOM - CHECKLIST

- I have accessible lighting that aids my nighttime visits to the bathroom.
- I do not have to climb any stairs to get to my bedroom.
- I do not have a rug in my bedroom.
- The floor is easy to navigate and does not have tripping hazards.
- It is easy to sit on and stand up from my bed (Recommended height: 20" - 24").
- There are no hindering thresholds in the path from the bed to the bathroom.
- I have no problems getting up to use the bathroom at night, and/or I have a bedside commode.
- I use pull out drawers for easy accessibility.
- I do not have a TV in my bedroom.
- I have pictures and memorabilia displayed in my bedroom.
- My clothes are arranged so that it is easy for me to get dressed.

BATHROOM

WHAT modifications can improve your bathroom?

The following image displays design and layout of bathroom with callout lines of applicable strategies for items and appliances.

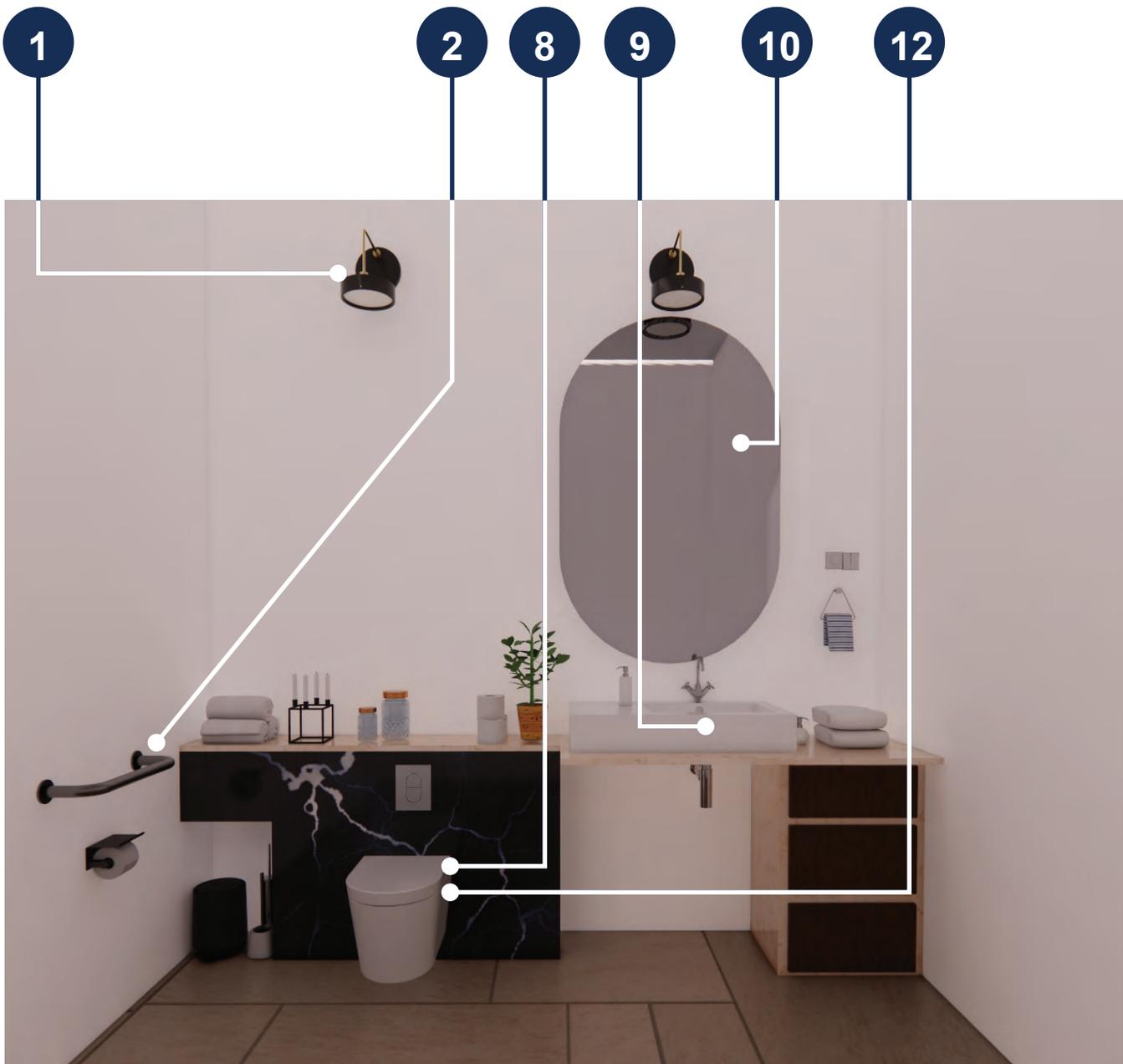


Image 40 – Design and layout of bathroom with callout lines of applicable strategies for items and appliances in the space.

1. Install motion-sensor-activated, warm, ambient night lights for nighttime bathroom visits.
2. Install grab bars next to toilets.
3. Install walk-in showers with seated shower options.
4. Select accessible storage options for towels, robes, and soap holders.
5. Select handheld showerheads to increase ease of use for caregivers.
6. Install lever-style handles on doors.
7. Select non-slip mats to place inside and outside the shower and bathtub.
8. Increase the height of toilets to 17 to 19 inches for comfortable seating and wheelchair access.
9. Install wall-mounted sinks with under counter clearance for wheelchair accessibility.
10. Ensure that the height of the bathroom sinks, mirrors, and surfaces is easy to access when seated in a wheelchair.
11. Add visual cues and markers on handles and faucets as indicators, such as hot and cold or which way to turn for different temperatures.
12. Use a contrasting color to highlight the toilet seat from the floor and walls.

WHAT modifications can improve your bathroom?

The following image displays design of bathroom with callout lines of applicable strategies for items and appliances.



Image 41 – Design and furniture of bathroom with callout lines of applicable strategies for items and appliances in the space.

1. Install motion-sensor-activated, warm, ambient night lights for nighttime bathroom visits.
2. Install grab bars next to toilets.
3. Install walk-in showers with seated shower options.
4. Select accessible options for storage of towels, robes, and soap holders.
5. Select handheld showerheads to increase ease of use for caregivers.
6. Install lever-style handles on doors.
7. Select non-slip mats to place inside and outside the shower and bathtub.
8. Increase the height of toilets to 17 to 19 inches for comfortable seating and wheelchair access.
9. Install wall-mounted sinks with under counter clearance for wheelchair accessibility.
10. Ensure that the height of the bathroom sinks, mirrors, and surfaces is easy to access when seated in a wheelchair.
11. Add visual cues and markers on handles and faucets as indicators, such as hot and cold or which way to turn for different temperatures.
12. Use a contrasting color to highlight the toilet seat from the floor and walls.

WHY

are **bathroom** modifications important?

LIGHTING

Why should you opt for motion-sensored activated amber night lights for night bathroom visits?

Motion-sensor-activated amber lighting adds convenience and safety at night when visiting the bathroom and helps reduce sleep disruption ³⁹ (Image 42.1, Image 42.2). This type of lighting is automatically activated by motion, eliminating the need to search for a light switch in a dark room, which can be challenging. LED night light with auto dusk to dawn sensor can be installed in bathrooms, passages for convenience. It is important to note that these lights should be considered as supplementary to the base lighting requirements in your bathroom, rather than the primary source of illumination.



Image 42.1- MAZ-TEK Plug in Dimmable Led Night Light with Auto Dusk to Dawn Sensor



Image 42.2 - Eufy by Anker, Lumi Stick-On Night Light

HOW

can you execute **bathroom** modifications?

What products should you look for?

When selecting products, consider motion-sensor night lights like Mr. Beams MB726, which is a battery-powered motion-sensing light (Image 43.1). GE Sleep LED Night Light is another option that can be used in bathrooms (Image 43.2).

What colors should you opt for when it comes to switches and sockets?

In terms of colors for switches and sockets, it is recommended to choose contrasting color fittings or install them on black plates to make them stand out. Using a darker shade helps differentiate the switches and sockets from light-colored walls.



Image 43.1- Mr. Beams MB726



Image 43.2 - GE Sleep LED Night Light

WHY

are **bathroom** modifications important?

FLOORING

Why should you place non-slip mats inside and outside the shower or bathtub?

Unlike throw rugs, anti-slip mats provide an additional layer of safety inside and outside the shower or bathtub ⁴⁰ (Image 44, Image 45). They are designed to prevent slips on wet surfaces by providing traction. It is important to choose mats that are of a contrasting color to the flooring.



Image 44 – Example of an anti-slip shower mat outside the shower

HOW

can you execute **bathroom** modifications?

To install anti-skid mats:

- Remove any scum or debris from the bottom of the tub and rinse it thoroughly.
- After draining any excess water, ensure that the bottom of the tub is slightly wet.
- Place the mat in the tub and firmly press down on the suction cups, ensuring they are securely attached across the length of the mat.

Are there other options apart from non-slip mats?

If you have a shower stall, you can opt for anti-skid tiling inside the stall ⁴⁰. If you have a bathtub, you can consider applying an anti-skid coating to the bottom of the tub.



Image 45 – Example of an anti-slip bathtub mat

WHY

are **bathroom** modifications important?

GRAB BARS

Why should you install grab bars next to toilets?

As individuals age, sitting down and getting up from a seated position can become increasingly challenging.⁴⁰ This maneuver can be even more complicated during toileting. Installing grab bars next to the toilet can provide additional stability and support. These bars offer options for slowly lowering yourself onto the seat and using arm strength to return to an upright position, reducing the risk of falling (Image 46, Image 47.1).



Image 46 – Using installed grab bars in the bathroom

HOW

can you execute **bathroom** modifications?

What should you look for when obtaining grab bars?

Grab bars need to be installed properly to ensure sturdiness and firmness. Avoid grab bars with suction cups at the ends, as they may be easier to install initially, but over time the suction cups can fail and detach during use. When purchasing grab bars, make sure that the handrails have a distinct color contrasting with your walls. The higher color contrast makes the grab bars easier to locate and use, enhancing visibility (Image 47.2).

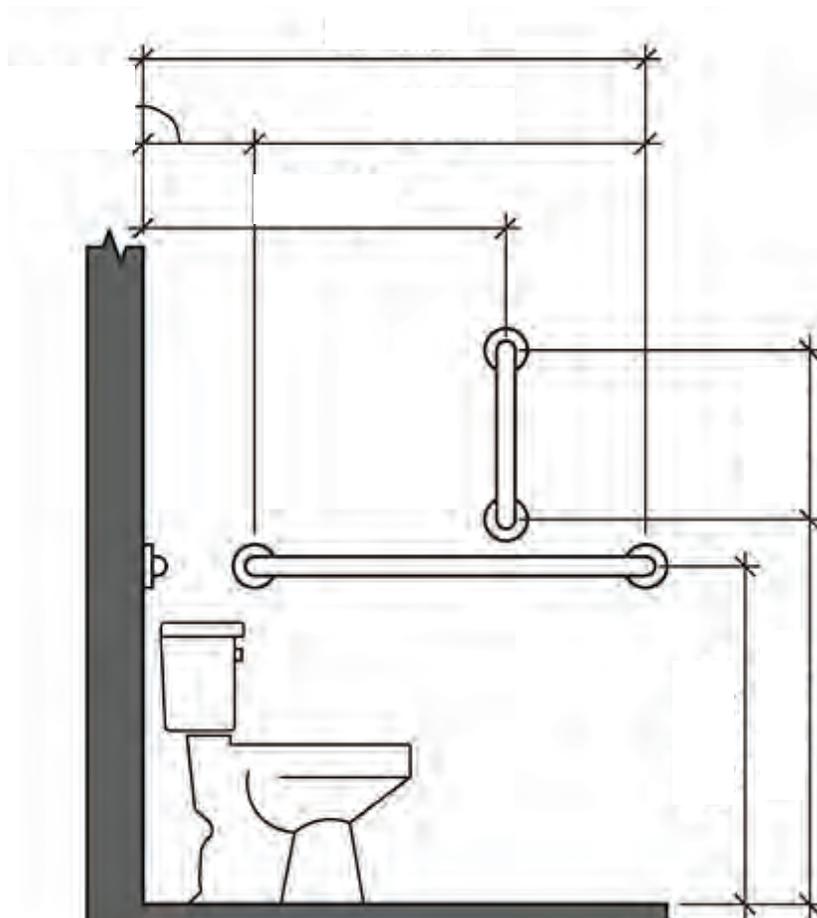


Image 47.1 – Recommended placement of grab bars near the toilet.²⁵



Image 47.2 – Installed grab bars and foldable seat in the shower

What would be the ideal placement for a grab bar?

According to the Americans with Disabilities Act (ADA), grab bars should be installed in specific locations for optimal accessibility and safety.

For the toilet area, a grab bar should be installed on the side wall closest to the toilet (Image 47.3). This placement helps with sitting, standing, and transferring from a wheelchair to the toilet seat. Additionally, these should be a grab bar installed on the wall behind the toilet for added support.⁴¹

In the shower or bathtub area, a vertical entrance bar should be placed near the shower door jamb. Horizontal bars should be installed along the side wall, 34 to 36 inches above the floor.⁴¹ Additionally, a vertical bar should be positioned near the faucet handles for added convenience and support during bathing.

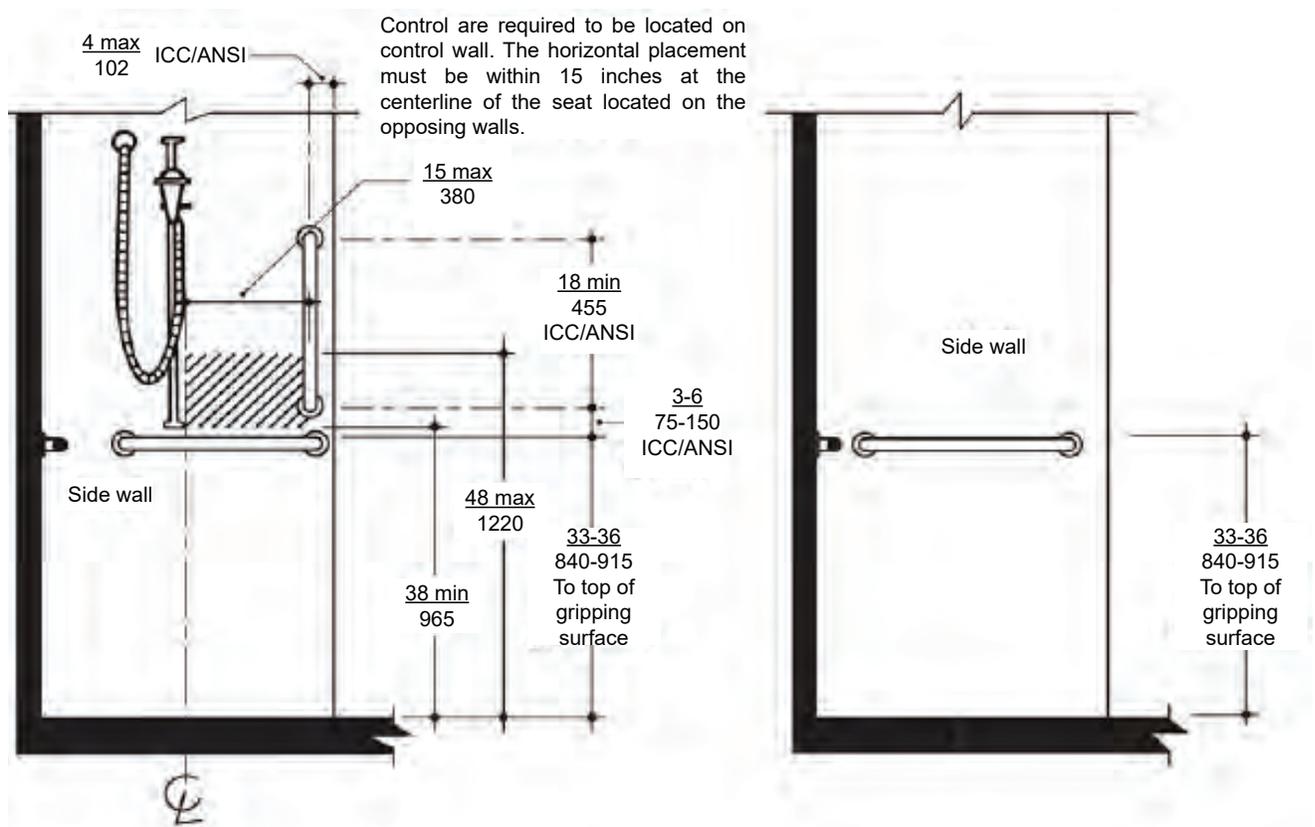


Image 47.3 - Locations for grab bars with dimensions and location ²⁹

WHY

are **bathroom** modifications important?

TOILET

Why should you consider higher toilets?

Some toilets available in stores may have a height lower than the recommended level for optimal accessibility. According to the ADA, the recommended floor-to-bowl rim height, including the seat is 17 to 19 inches ⁴³ (Image 41.1). Choosing a higher toilet promotes accessibility and reduces the challenge of sitting down and getting up. Having the toilet at the proper height can significantly enhance comfort and safety in the bathroom.

Additionally, the minimal clear space on the floor for a wheelchair should be 60 inches (1525 mm) in width and 56 inches (1420 mm) in depth.⁴¹ This is required to be above the required turning/rotating space for the restroom.

Why should the toilet seat color contrast with the floor and walls?

A contrast in color between the toilet seat and the floor can significantly enhance recognition and visibility, particularly for individuals with visual challenges distinguishing between objects.

WHY

are **bathroom** modifications important?

SEATED SHOWERS

Why should you consider seated shower options?

Seated showers promote balance and comfort while showering. Adding a shower seat can relieve the strain experienced with standing for extended periods of time (Image 49). This allows individuals to shower safely and reduce the chances of falling.



Image 49 – Example of shower designed with a seat

HOW

can you execute **bathroom** modifications?

What are your options when it comes to shower seats?

Seats available for purchase in the market offer various features to cater to individual needs. These features may include adjustable legs for accommodating different heights, wall mounted foldable seats for space saving, armrests for added support, swing-away arms for easy transfer, slots for holding washcloth, attachment options for handheld showers, and padded or rigid plastic seats (Image 50.1). When selecting a seat, it is important to consider whether it will be used for independent bathing or in an assisted bathing scenario.



Image 50.1– Example of portable, plastic shower seat

BATHTUBS

What do you do if you have a bathtub instead of a shower?

Tub seats are available to provide convenience for users.¹⁹ These seats are designed to be wheelchair, walker, or cane accessible. While these are accessibility compliant, tub seats may have significant balance issues. Another option are portable ADA-compliant bathtub seats, which are readily available and can be easily moved. However, these tub seats can be expensive compared to other options (Image 50.2).

What are your options for bathtub seats or similar bathing aids based on a budget?

Removable/portable bathtub seats

- 26 ½" x 15" Portable ADA Tub Seat
- 30" x 14" Portable Bathtub Seat – Padded
- Tub Buddy Bath Transfer System
- Walk-in bathtubs (Higher budget example)



Image 50.2 – Example of portable, plastic seat for a bathtub

WHY

are **bathroom** modifications important?

BATHROOM ACCESSORIES

Why should you make the towels, robes, and soap holders accessible?

Frequently used items should be easily accessible to minimize the risk of falling when trying to reach them. One way to achieve this is by adding shower caddies inside the shower area to keep commonly used items within arm's reach. It is important to avoid placing these caddies too high or too low, as it can increase the chances of losing balance while accessing them.

For example, placing a towel holder close to the shower allows individuals to reach the towel without having to step out of the shower, preventing the risk of falls. By strategically placing commonly used items within easy reach, the bathroom can be safer and easier to use (Image 53.1).



Image 53.1 – Bathroom furniture designed to improve accessibility

Why should you add a handheld showerhead to your adjustable shower?

Handheld showerheads provide multiple benefits, making bathing easier, safer, and more convenient for individuals. These showerheads are particularly helpful for caregivers as they reduce the need for bending and awkward postures while providing care (Image 53.2). They also offer convenience to individuals who shower independently while being seated.

An adjustable showerhead adds accessibility to the bathroom, allowing users to customize the water flow and direction according to their needs. When combined with a shower seat, it becomes easier to assist with bathing while increasing safety within a shower cubicle. Some showerheads come with an extra wall mount bracket to hang the shower head during the shower, providing a convenient option when pausing to use soap or shampoo. This eliminates the need to place the showerhead on the ground, reducing the risk of slips and falls.



Image 53.2— Shower with adjustable and handheld showerheads

WHY

are **bathroom** modifications important?

DOOR HANDLES

Why should you consider lever style handles on doors?

The lever design of door handles offers an easier grip and less physical effort when opening doors (Image 54). They are designed to be user-friendly and can be easily installed as replacements for existing doorknobs. Traditional doorknobs can be challenging to grip when hands are wet or soapy, but lever handles provide a more accessible and convenient option.



Image 54– Example of “Lever” style door handle

HOW

can you execute **bathroom** modifications?

What brands carry these lever-style handles?

The major brands that carry lever-style handles: Kwikset, Schlage, Baldwin, and Omnia (Image 55.1 - 55.4).



**Image 55.1 -
Kwikset Security Balboa Satin Nickel Universal
Privacy Door Handle**



**Image 55.2 -
Schlage Solstice Passage Door Lever Set with
Decorative Collins Trim**



**Image 55.3 -
Baldwin Baldwin Reserve Lifetime Brass Reversible
Privacy Door Handle**



**Image 55.4-
Omnia Modern Stainless Steel Lever with Round
Rose Single Dummy Satin Finish**

WHY

are **bathroom** modifications important?

SHOWER HANDLES

Why should you add visual cues or markers on handles or on faucets?

To ensure clarity and promote autonomy in the bathroom, it is recommended to install faucets where the temperature is clearly labelled (Image 56). This signage helps prevent confusion and minimizes the risk of accidents, especially considering that household hot water can reach temperatures as high as 120 degrees Fahrenheit. Additionally, the water heater set point should be lowered to avoid burns.



Image 56 – Faucet indicating which direction streams hot water and which direction streams cold water

BATHROOM - CHECKLIST

- I have light to guide me in the bathroom at night.
- I have accessible grab bars installed on the side wall closest to the toilet.
- I have a walk-in shower with a seated shower option.
- It is easy for me to reach my towel, robe, and soap within the bathroom.
- The handheld showerhead in my shower is easy to use for both myself and any caregivers assisting me.
- I have lever-style door handles that provide an easy grip.
- I have non-slip mats inside my shower and bathtub.
- The height of the toilet in my house is between 17 and 19 inches and accessible while using a wheelchair.
- The sink in my bathroom is mounted on the wall and has sufficient clearance for a wheelchair.
- Both the bathroom sink and mirror are positioned at an accessible height when a wheelchair or seat is placed underneath.
- I have no trouble visually identifying the directions specified on my shower lever for hot or cold water.
- The color of my toilet contrasts with the color of the floor and walls of my bathroom.

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RESOURCES

1. Products to execute home design strategies: <https://efamagazine.com/products/>
2. AARP HomeFit Guide: <https://www.aarp.org/livable-communities/housing/info-2020/homefit-guide.html>
3. NaborForce (connects aging adults to a network of “Nabors” for social engagement and on-demand support with errands, transportation and help around the home.): <https://naborforce.com/our-services/>
4. How to read Lighting Facts label on packaging? : <https://www.bulbs.com/learning/lightingfacts.aspx>



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