



Home and Vehicle Modifications

August 4, 2021 | 2:00-3:00 p.m. ET

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Presenters



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Clinical Review Nurse



Dr. Robert Hall
Medical Director

Learning objectives

- Describe home accessibility and the approaches to consider when making a home accessible.
- Discuss the necessary components of home modification.
- Review potential home and vehicle modifications based on specific types of injuries and illnesses.

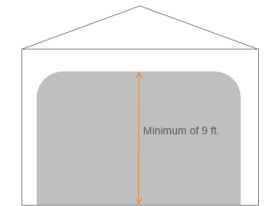
Reference guide included at the end of the presentation

HOME AND VEHICLE MODIFICATIONS REFERENCE GUIDE



Garage and carport

- Should be larger than standard garages and carports
- Parking area is based on:
 - Vehicle dimension
 - Number of vehicles to be parked
 - **Access aisle width of five feet**
- Overhead clearance
 - Assess the height of the garage door opening when raised
 - The height of the garage door opening should be nine feet or more
 - Full-sized vans and some mini vans with raised roofs will often times not fit a standard overhead clearance
 - Allow at least six inches clearance from the top of the van
- Handicapped parking spaces should be at least 12' x 6' wide and have at least 48" of clearance on one side for loading and unloading wheelchairs.



Concrete garage slabs can be modified

- Ramp access into the home
- Garage floor gradually slopes to the entrance
- Some building codes require garage floor levels be several inches below the house floor level where it is attached

ONE-VEHICLE GARAGE		TWO-VEHICLE GARAGE	
Door clearance height	9 ft +	Door clearance height	9 ft +
Door opening width	9 ft	Door opening width	22 ft
Access aisle	5-8 ft	Access aisle	6 ft
Total garage width	9 ft +	Total garage width	28 ft

Kitchen Modifications for Accessibility

CABINETS	COUNTERTOPS & SINKS	APPLIANCES	OTHER
<ul style="list-style-type: none"> • The lowest shelves of the upper cabinets should be no higher than 48". • The upper cabinets should be mounted 15" above the countertop. • The lower cabinets should have full-extension drawers and fixed shelves (no doors). 	<ul style="list-style-type: none"> • Include leg room under countertops and sink for wheelchair accessibility. • L- or U-shaped countertops work best because they're easy to maneuver around. • There should be 30" of counter space around the cooktop and sink. • The kitchen faucet should be single lever and high-arc with a pull-out spray head. • Include pullout cutting boards in the lower cabinets. 	<ul style="list-style-type: none"> • The appliances and sink should be operable from chair height. • The dishwasher should be mounted at least 6" from the floor. • The dishwasher should have a pull-out drawer-style opening, rather than a hinged door. • Microwaves should be installed below countertop height for wheelchair accessibility. • Wall-mounted ovens should be installed so that the controls are around 48" from the floor. • Wall switches and wall outlets must be 32-36" from the finished floor. 	<ul style="list-style-type: none"> • Keep knob turners, push-pullers, and tongs handy for easy access. • Mount the kitchen exhaust fan control switch at the front of the counter.



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United Disabilities Services: <https://udservices.org/blog/home-accessibility-checklist/>

What can be done to make a home accessible?



BATHROOM

THRESHOLDS

RAMPS

FLOORING

KITCHEN

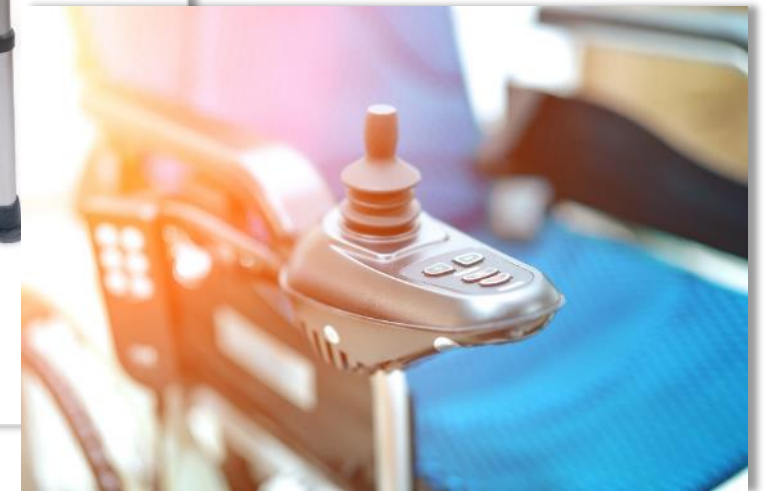
DME

BEDROOM

GARAGE

Durable medical equipment

- Walker
- Power mobility device
- Prosthetic limb
- Lift system
- Activities of daily living (ADL) devices
 - Bedside commode
 - Shower bench
 - Grab bars
 - Hospital bed



<https://www.caregiverproducts.com/utensil-hand-clip.html>

Modification program objectives

- Improve independence and aid to activities of daily living (ADL) skills
- Remove architectural and mobility barriers
- Improve quality of life
- Provide comprehensive and cost effective solutions for barrier removal
- Eliminate risk and liability exposure with only reasonable and necessary modifications



Accessible design

Accessible design generally refers to houses or dwellings that meet specific requirements for the accessibility of the disabled. These requirements are found in state, local, and building codes and regulations

Accessibility of public buildings and facility standards are regulated by the Americans with Disabilities Act (ADA)

A home modification to meet an injured person's medical, physical or cognitive needs as it related to the workers' comp. injury does not mean building an elaborate home costing thousands of dollars.

It does mean providing a home where the injured person can be as independent as possible and function safely to the best of his or her physical ability.



- Fair Housing Amendment of 1988
- American National Standards Institute (ANSI) - Standards A117.1-1986
- Uniform Federal Accessibility Standards (UFAS)

Seven components of home modification

1



Prescription / Letter of medical necessity

2



Team organization and preparation

3



Assessment and recommendations

4



Goal clarification

5



Plan development

6



Authorizations from payer source

7



Project activity, completion, inspection and invoicing

Team members and their responsibilities



FIRST STEP

- Injured person
- Family
- Doctor
- Case manager
- Adjuster
- Physical or Occupational therapist
- General contractor



RESPONSIBILITIES

- Define the disabilities and abilities of the injured person
- Identify current and future medical needs
- List the durable medical equipment used and needed
- Determine the other residents of the home
- Discuss plans for necessary modifications

Assessment and recommendations



INJURED PERSON

- Physical, cognitive and emotional status
- Evaluate current, temporary, and long-term needs



HOME

- What can be done to make the home accessible?
- What can be modified to improve independence?
- What is the age and condition of the home?
- Does the injured person own or rent the home?
- Who should the evaluation involve?



MEET JOE

Meet Joe

Joe is a 44-year-old high school teacher who fell and sustained a traumatic brain injury, which resulted in:

- Right-sided weakness
- Decrease balance and coordination
- Cognitive deficits



Joe's Team

- Joe
- Spouse
- Physician
- Nurse case manager
- Claims examiner
- Physical and occupational therapists
- General contractor



Joe's treatments and DME

PHYSICIAN ORDERS FOR:

- Home health aide
- Physical, occupational, and speech therapy.
- A wheelchair, grab bars, shower chair, hand-held shower, reacher
- Front door ramp

HOME THERAPY TREATMENTS WILL FOCUS ON:

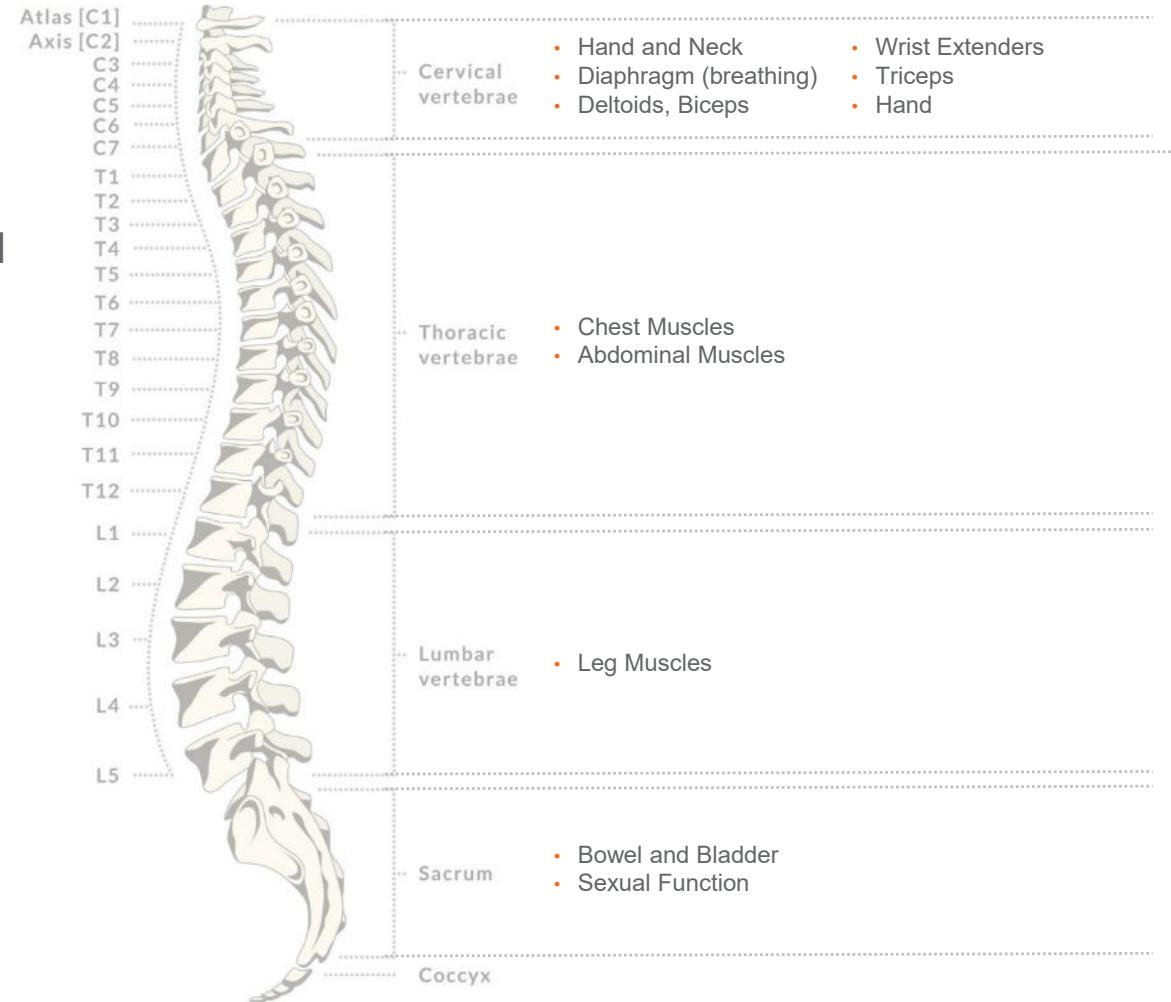
- Therapeutic exercises
- Range of motion/strength/flexibility
- Self-care/home management
- Safety awareness and fall prevention
- Modalities and education on a home exercise program
- Cognitive and organizational training



INJURY TYPES

Spinal cord injury

- Injury to the spinal cord that results in deficits below the level of the injury, including weakness, sensory loss, and bowel/bladder/sexual dysfunction
- Modifications will depend on the level of the injury and remaining function
- Higher level spinal cord injuries (i.e., cervical spine) can lead to more DME and modifications



Possible, clinically-appropriate modifications

HOME MODIFICATIONS

- Ramp access
- Doorframe widening
- Additional space for wheelchair turning
- Raised sinks and countertops
- Lift system
- Generator (if mechanical ventilator)

VEHICLE MODIFICATIONS

- Wheelchair accessibility
- Lift or ramp
- Hand controls
- Automatic doors
- Seat modifications

Traumatic brain injury

- Most common causes of traumatic brain injury are falls, motor vehicle accidents and assaults
- Possible deficits may include:
 - Cognitive impairment
 - Weakness
 - Decreased balance and coordination
 - Bowel and/or bladder dysfunction
- Modifications will depend on the degree of physical and cognitive deficits



Possible, clinically-appropriate modifications

HOME MODIFICATIONS

- Wheelchair-related modifications
- Fall prevention (e.g., flooring, lighting, handrails)
- Grab bars
- Alarms, warnings and reminders

VEHICLE MODIFICATIONS

- Driver safety evaluation (occupational therapist)
- Lift system
- Hand controls
- Accelerator for left foot
- Spinner knobs

Amputation

- Level of amputation is determined by the location of the limb injury
- Surgeons attempt to preserve limb length for improved function
- Modifications will depend on function and mobility achieved with a prosthesis



Possible, clinically-appropriate modifications

HOME MODIFICATIONS

- Mobility device-dependent (i.e., prosthesis, wheelchair, walker, etc.)
- Ramp
- Handrails
- Lighting
- Door knob extenders
- Electrical outlets

VEHICLE MODIFICATIONS

- Accessibility
- Hand controls
- Left foot accelerator
- Spinner knob
- Lower limb steering system

Respiratory

- COPD
- Asthma
- Interstitial lung disease
- COVID-19



Possible, clinically-appropriate modifications

HOME MODIFICATIONS

- Respiratory devices (i.e., CPAP, BiPAP, ventilator)
- Electrical outlets
- Generator
- Energy conservation (first-level floor plan)

VEHICLE MODIFICATIONS

- Risks vs. benefits
- State laws, rules, and guidelines
- Travel oxygen concentrator
- Energy conservation

Other injury types and their concerns

Heart disease



Energy conservation

Osteoarthritis



- Mobility
- Shorter distances
- First-floor vs. stair lift

Kidney failure



- Fall risk
- Home dialysis

Depression and anxiety



- Pain
- Fear
- Isolation

Summary

- Evaluation by multidisciplinary team early in the process to assess injured person's needs
- Discuss with injured person/significant other and insurance representative
- Planning for homecoming
- Determine if caregiver training or other support is needed
- Referrals to home health care agency, physical therapy and occupational therapy
- Arrange all durable medical equipment, supplies, specialty items, home evaluations, home/vehicle modifications, transportation, education, etc.

Thank you!

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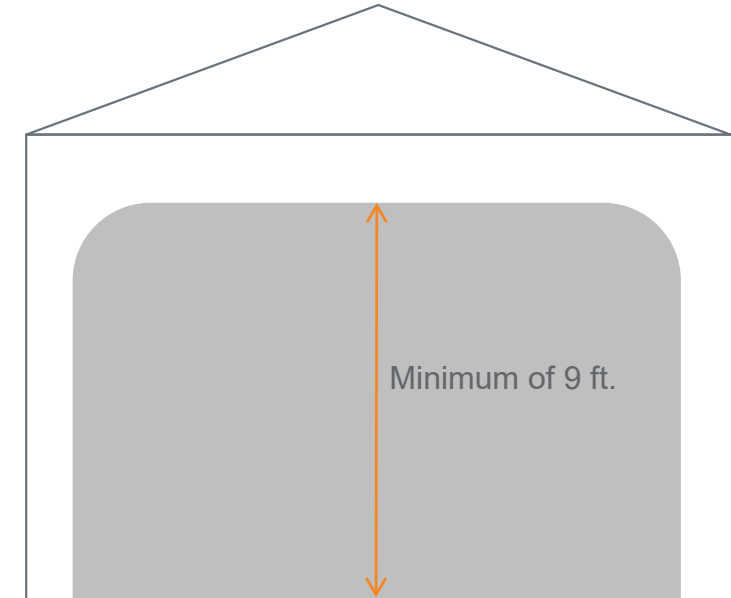


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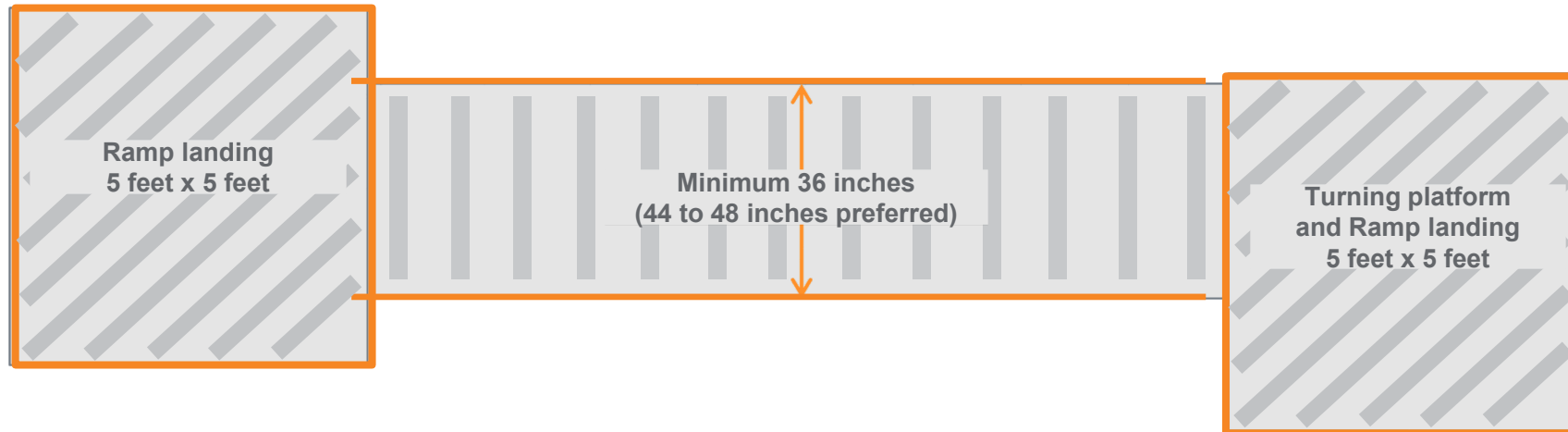
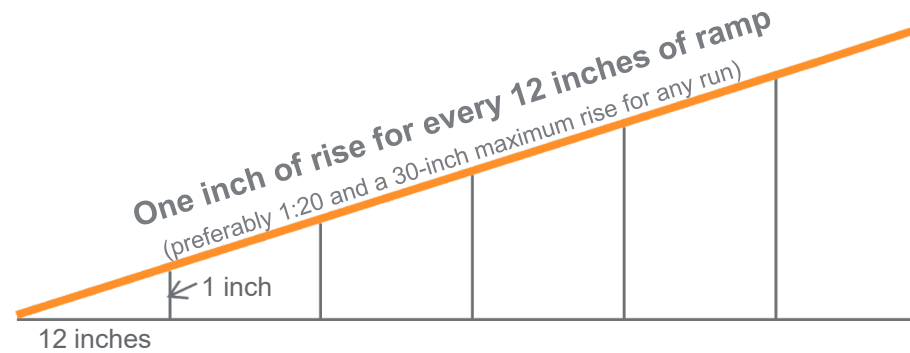
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Ramp specifications



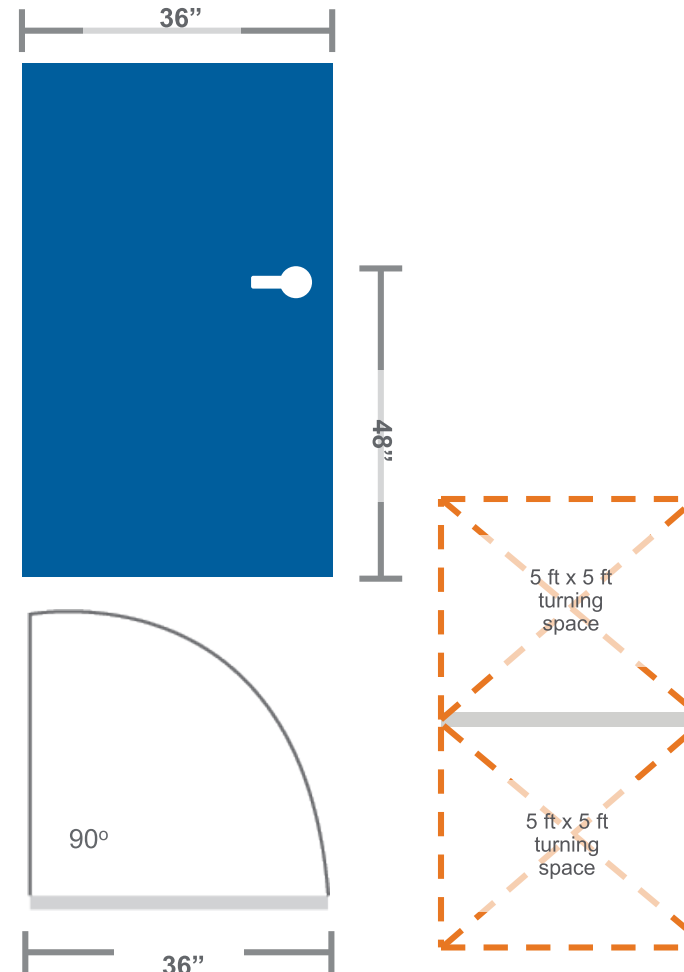
- The walkways between your front door and parking areas / garages should be 48" wide
- Ramp length or run should **not exceed 30 feet without landings**, and use the least slope possible.
- **Wood ramps** are easier and faster to construct, are inexpensive, but require maintenance, while only lasting a few years.
- **Concrete is the preferred material**, as it has greater longevity and requires little or no maintenance.
- All ramps must have a slip resistant surface.
- All ramps and porches must have secure handrails.
- Weather protection strongly suggested

Entrances, doors and doorways

- Width 36 inches (minimum 32 inches)
- Lever door handle at 48 inch max. height
- ¼ to ½ inch max. threshold height
- Doors open to 90 degrees
- External doors require a covering
- Entry – Automatic, Push Button, Key Lock
- 5 – 8 pound max force to open
- Clearance 1 foot 6 inches on the latch side (allows for the door to swing away from the user)
- Turning Space
 - Level surface
 - Inside and outside each entrance
 - Surface area – 5 feet X 5 feet

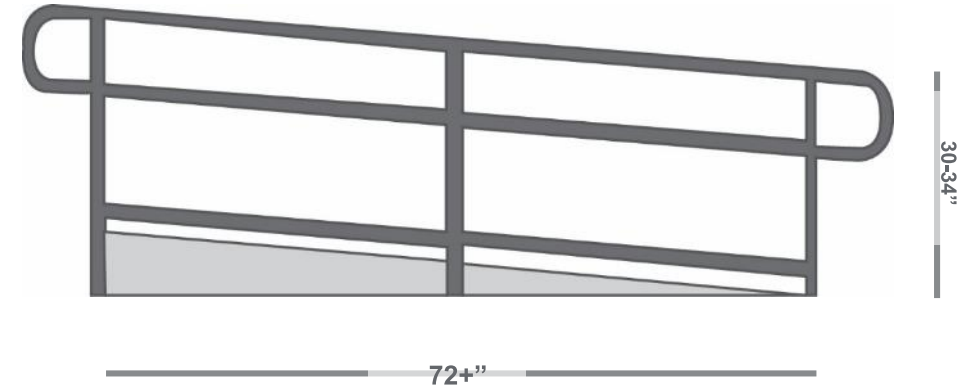
Doorbell and Mailbox

- The doorbell should be chair height, which is 48”.
- The doorbell should be loud enough to be heard throughout your home.
- Install LED flashing lights (in addition to doorbells) for the hearing impaired.
- The mailbox or mail slot should be chair height.



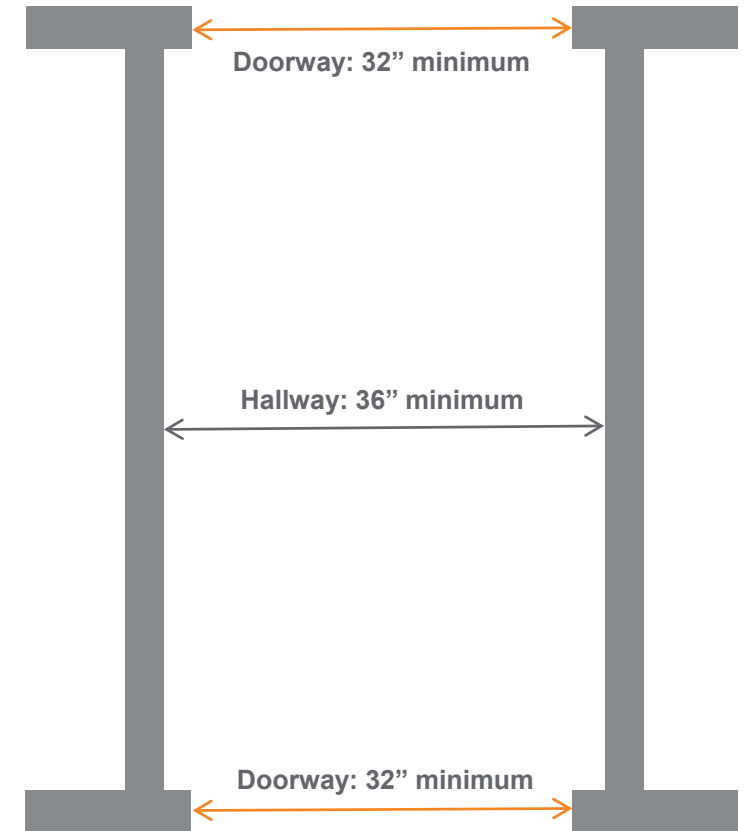
Handrails

- Needed for ramps rise greater than six inches
- Horizontal projection greater than 72 inches
- Placed on both sides of the ramp
- Height 30 inches to 34 inches above the ramp
- Extend one foot beyond the top and bottom of the ramp
- Shape must be continuous surface for easy gripping



Hallways – Wheelchair access and passage

- Doorways minimum 32 inches wide
- Hallways minimum 36 inches wide
 - Preferably 48 inches
- 18 – 24 inches on the side of the door near the door handle
- Narrow interior doorways
 - Install pocket doors
 - Take the door off
 - Replace hinges with swing clear hinges (these hinges can make the doorway 1 ½ inches to 1 ¾ inches wider)



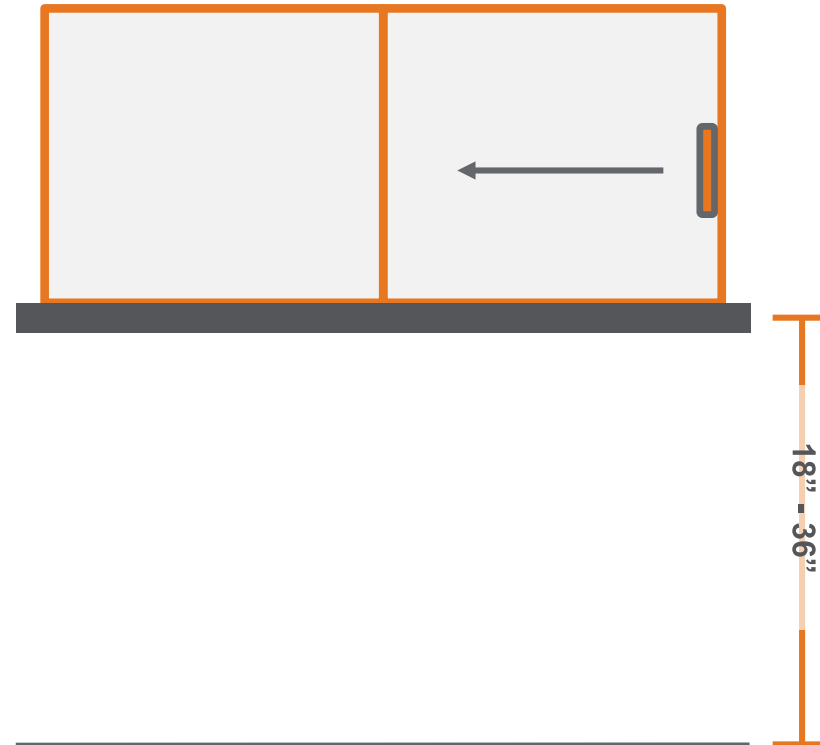
Windows

- Clear floor space
 - Wheelchair users 2 feet 6 inches x 4 feet
 - Perpendicular or parallel to the window
- Window lock
- Height of 18 inches to 36 inches above floor

Ease of Operation:

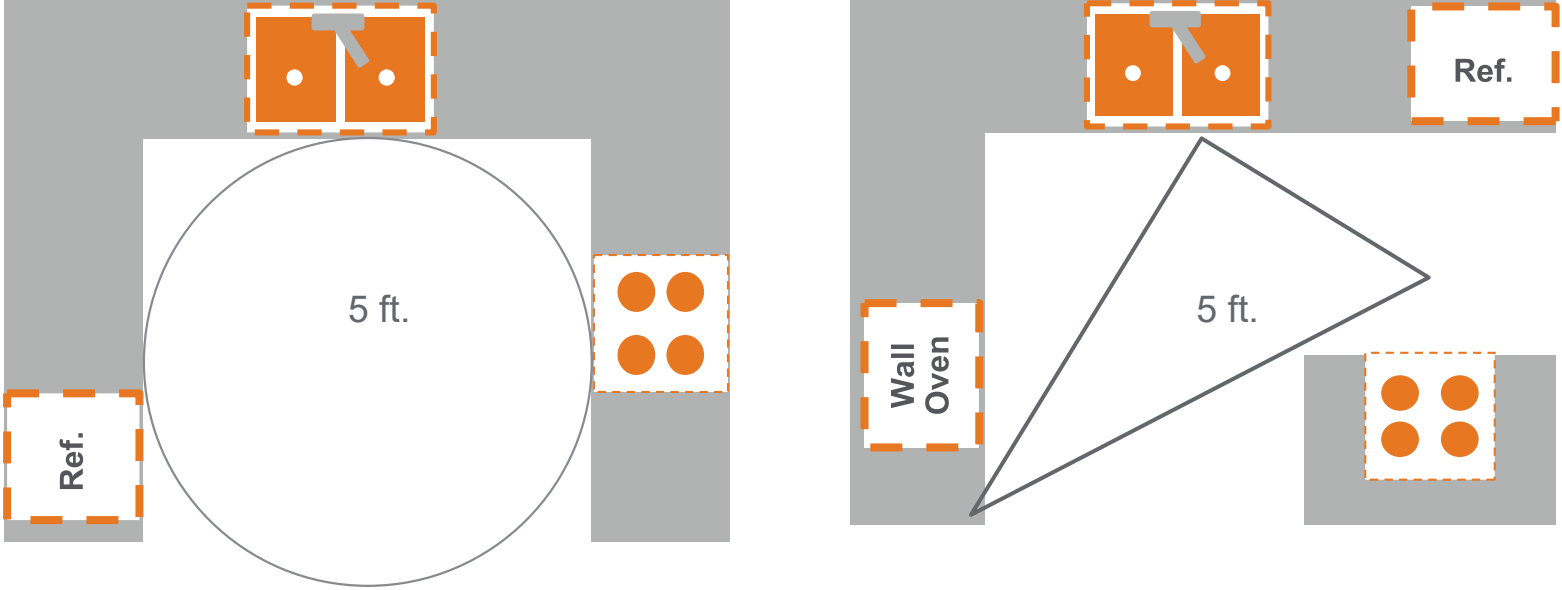
- One hand
- Handle within reach
- Lock within reach
- No more than five pounds of force to operate
- Sliding and casement windows are easiest
- Power operators available for casement and awning windows

Sliding windows



Kitchen - Define the work pattern

A 5-foot diameter is required to provide a 360-degree turning radius



Kitchen Modifications for Accessibility

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Bedroom modifications

- The bedroom door at least 32” wide.
- The bedroom door handle: easy-to-grasp, single lever, and operable with one hand.
- There should be a 36” pathway on each side of the bed and at the foot of the bed.
- The mattress should be no higher than 22” from the floor.
- The ceilings should be reinforced to accommodate pulleys for lifting mechanisms (if applicable).
- All thermostats, drapery wands, and lamp controls should be within 48” of the floor.

Closet

- Use slide doors or bi-fold doors with a minimum front clearance of 48” of clear space from the opened door’s edge.
- Swing or bi-fold doors require a maneuvering space that’s the same width as the door opening when extended 48” minimum perpendicular to the doorway.
- The closet rods and shelving should be within 48” of the floor.
- The closet shelves should be no more than 18” deep.
- The closet doors should be bi-fold or slide models for easy opening.

	Minimum Space Required	Preferred Space Needed
Maneuverability	3 ft between walls and furniture	90° turn requires 3 ft 6 in space
Lateral Transfer Space	Clear floor space of 3 ft accessible	3 ft 6 in
Forward Transfer Space	3 ft x 4 ft floor space	4 ft x 4 ft or 5 ft x 5 ft floor space

Bathroom modification options

- The bathroom door should be at least 32” wide.
- The bathroom door handle should be easy-to-grasp, single lever, and operable with one hand.
- The bathroom walls should be reinforced to accommodate grab bars and wall-mounted shower seats.
- All grab bars should be able to support at least 250 pounds.

TOILET	SINK	SHOWER	BATHTUB
<ul style="list-style-type: none"> • The toilet should be mounted 33-36” from the floor. • The toilet seat should be 17-19” from the floor. • The path to the toilet should be at least 36” wide. • The grab bar behind the toilet should be 24” long. • The grab bar beside the toilet should be 32” long. 	<ul style="list-style-type: none"> • The toilet should be mounted 33-36” from the floor. • The toilet seat should be 17-19” from the floor. • The path to the toilet should be at least 36” wide. • The grab bar behind the toilet should be 24” long. • The grab bar beside the toilet should be 32” long. 	<ul style="list-style-type: none"> • The shower seat should be 17-19” from the floor for roll-in showers. • Roll-in showers should be free of doors, curbs, or lips at their entrance. • The handheld shower spray unit should have a hose that’s at least 60” long. • The faucet controls and handheld spray unit should be on the wall next to the shower seat. • All shower stall units must have 32” clearance at their entry 	<ul style="list-style-type: none"> • The faucet and controls should be centered on the longest side of the bathtub. • Each side of the bathtub should have horizontal grab bars that are at least 24” long.

Miscellaneous modifications

- If home is on more than one level, consider investing in a stair lift.
- All doorway thresholds should be no higher than ½”.
- Avoid carpet wherever possible. If you do have carpet, it should be low pile and backed by a ¼” pad.
- All door handles should be mounted at 36” high.
- All interior doors should open easily with no more than five pounds of force.
- All interior hallways should be at least 42” wide.
- All window sills should be no more than 30” from the floor.
- All window controls should be no more than 24” from the floor.
- All electrical outlets should be grounded and mounted 12-16” from the floor.
- All light switches should be illuminated, rocker style, and mounted 42” from the floor.

Lifts

TYPES	CONSIDERATIONS
<ul style="list-style-type: none">• Platform – vertical• Elevator• Incline – platform lift• Stair lift• Ceiling:<ul style="list-style-type: none">– Portable– Fixed– Track• Transfer devices	<ul style="list-style-type: none">• Ease of operation• Lift height• Weight capacity (wheelchair plus user)• Emergency power source (manual/battery)• Tamperproof switch

Additional home modification considerations

SAFETY	COMMUNICATION AND CONTROL SYSTEMS	EQUIPMENT AND POWER
<ul style="list-style-type: none"> • Temperature regulator for water faucets • Smoke Alarms • Carbon Monoxide Sensors • Fire Extinguishers • Hardware • Flooring • Generators 	<ul style="list-style-type: none"> • Telephone • Light Switches • Emergency Call Button • Environmental Aids to Assist Activities of Daily Living (EADLs) 	<ul style="list-style-type: none"> • Electrical Outlets <ul style="list-style-type: none"> – Height of 18” from the floor – Installed at the head and side of the bed • Power Wheelchair or Scooter • Power Lifts • Adjustable Beds • Therapeutic Mattresses • Oxygen Concentrators • EADLs • Clocks, Lamps, Radios



Vehicle Modification Program

MODIFICATION OPTIONS

- Steering devices (Knobs, cuffs, grips)
- Hand/Foot controls
- Drop floors
- Raised roofs
- Ramps, remote entry
- Vehicle lifts
- Turning automobile seats

DRIVING ASSESSMENT BY QUALIFIED REHABILITATION SPECIALIST

- Clinical evaluation of physical functioning
- Visual, perceptive and cognitive screening
- Wheelchair and seating assessment
- On-the-road driving evaluation using adaptive equipment
- Total fitting and operational assessment



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