



Consumer Factsheet: Looking at installing your own grabrail? Here are some issues to consider

Making decisions about the most appropriate place to install a grabrail is a complex task, and needs to be prescribed by a qualified occupational therapist rather than attempted yourself. However, once the necessity, placement and appropriately sized grabrail have been prescribed by your therapist, you may wish to consider fitting it yourself. If so, issues to be considered include:

1. Which grabrail do I need?
2. Where do I get the grabrail?
3. What do I need to know about the wall?
4. Do I need the homeowner's permission prior to installing the grabrail?
5. Is achieving a contrast between the rail and the wall important?
6. What equipment and tools will I need?
7. Where should the rail be placed?
8. How do I ensuring my safety during installation?

Which grabrail do I need?

An Occupational Therapist (OT) is the best person to advise you as to the most appropriate grabrail for your needs. Rails come in many sizes, lengths, textures and shapes. This can be very confusing if you know nothing about grabrails, or how to choose it. It is also important to make sure that the rail you choose is suitable for the environment where it is being installed, and is the right type of rail for the task at hand. For example, the shape and position of the rail that is most appropriate will change from one user to another, depending on the sort of task that need to be performed, the type of the individual's impairment and the strength and integrity of the major joints used in the required task. For instance, the rail needs to be the right diameter for the person who will be using it. As a guide, grasp the rail with your hand. If your thumb and first finger touch comfortably, then the rail allows optimum grip. For more on orientation and diameter, see the Clearinghouse consumer factsheets on 'grabrail diameter' and 'grabrail orientations' at www.homemods.info



Where do I get the grabrail?

It is very important that you buy a proper grabrail (e.g. towel rails are highly unsuitable as they are structurally not up to the task and rotate in their fittings) in an appropriate diameter and length. Your local hardware store may stock some grabrails – predominantly straight rails. Depending upon the store, you may have limited choice in the type of rails available. Some of the hardware stores that sell grabrails in NSW and the stock typically available are identified in Table 1.

Table 1: Indicative table of stores and routine stock types

Store	Style	Colour	Material	Circumference	Lengths
Mitre 10 www.mitre10.com.au	<ul style="list-style-type: none"> ▪ Straight - with flanges for fixing 	<ul style="list-style-type: none"> ▪ Silver 	<ul style="list-style-type: none"> ▪ Stainless Steel 	<ul style="list-style-type: none"> ▪ 25 mm ▪ 32 mm 	<ul style="list-style-type: none"> ▪ 450 mm ▪ 750 mm ▪ 900 mm
Magnet Mart www.magnetmart.com.au	<ul style="list-style-type: none"> ▪ Straight Rail with flanges for fixing 	<ul style="list-style-type: none"> ▪ Silver ▪ White. 	<ul style="list-style-type: none"> ▪ Stainless Steel ▪ Coated 	<ul style="list-style-type: none"> ▪ 25 mm ▪ 32 mm 	<ul style="list-style-type: none"> ▪ 300 mm, ▪ 600 mm ▪ 900 mm
Bunnings www.bunnings.com.au	<ul style="list-style-type: none"> ▪ Straight Rail with flanges for fixing ▪ Angled, for corners 	<ul style="list-style-type: none"> ▪ Silver ▪ White 	<ul style="list-style-type: none"> ▪ Stainless Steel ▪ Coated 	<ul style="list-style-type: none"> ▪ 25 mm ▪ 32 mm 	<ul style="list-style-type: none"> ▪ 600 mm ▪ 750 m ▪ 900 mm
Home - Timber and Hardware www.homehardware.com.au	<ul style="list-style-type: none"> ▪ Straight Rail with flanges for fixing 	<ul style="list-style-type: none"> ▪ Gold ▪ White 	<ul style="list-style-type: none"> ▪ Stainless steel ▪ Brass 	<ul style="list-style-type: none"> ▪ 25 mm ▪ 32 mm 	<ul style="list-style-type: none"> ▪ 300 mm ▪ 450 mm ▪ 600 mm, ▪ 900 mm

If your needs are for something other than this, you should contact your local Independent Living Centre. They will have information about the full range of rails available and may even have some on display <http://www.ilcnsw.asn.au/>. Although they do not sell rails, it may be possible to get advice on what may be most suitable for you. Sometimes rails must be custom made and in this case a licensed pipe fitter or specialised home modification service will be required.

What do I need to know about the wall?

The wall type determines which fixings are appropriate to use (Paveley, 1999). Also it is critical that you do not drill into an asbestos wall yourself unless you have had the



appropriate training and fully understand current safety practices and standards. So it is important to talk to the salespeople in the store when you purchase your fixings so as to ensure that they suit your wall surface, and are strong enough to hold the force that will be placed upon them. Walls that are clad in tiles present special problems and older ceramic tiles may shatter, so make sure you use a masonry drill bit, if you are drilling into a tiled wall. It may also help to place some masking/builders tape over the spots to be drilled. This will prevent the tiles from shattering, crumbling or cracking as you drill.

Will the wall support the person load to be carried by the rail?

The wall should be able to support the rail and the weight of the user, so it is important to make sure that the rail is fixed such that it is fully supported by load bearing wall materials at all its fixing points. It is also important to spread the load so that it is distributed rather than concentrated at one point (typically a minimum of two fixing points are required). Walls are typically either masonry or clad with metal or wooden support struts and studs to hold them in place.

Masonry wall structures

While masonry structures are generally thought to have good load bearing capacity this depends on their material properties. For instance, non-hollow concrete and clay building bricks are generally thought to be both durable and strong. However the load bearing capacity of masonry can be impaired. This is especially so if bricks are hollow with and/or have horizontal perforations and or if bricks are of the shale or sandstock type. Masonry can also be structurally impaired when grout is aged or in poor repair. If in doubt it is necessary to have a licensed building professional sample and test your masonry for strength.

Wooden wall structures

A wooden wall stud is a vertical member in light timber frame construction and the strut is the horizontal member. Traditionally, studs were made of wood, typically placed 400 mm from each other's centre, but sometimes also 300 mm or 600 mm apart. Steel studs are gaining popularity, especially for non load-bearing walls (i.e. those not originally intended to support heavy structures such as rails, wall hung cisterns, cabinetry etc.). Because the placement of studs can vary so widely it is important to be able to locate them accurately as when maximum strength is desired, the goal is to attach the object to the studs in the wall, as mounting to drywall or plaster is only as secure as the material it is being mounted to. Fixing to studs also prevents tearing holes in the plaster, wallpaper, panelling or other wall covering evident. To locate a stud, a stud finder can be helpful. A stud finder is a small mechanical gadget easily purchased from most hardware stores that can assist in locating studs in most walls, though it does not always work for very thick plaster, or plaster walls built with wire-lath.

Steel wall structures

Cold-formed steel framing, often referred to as light-gauge framing or steel-stud framing, has enjoyed increased use in structural applications during the past decade and while these structures are relatively easy to fix to they require "alignment framing" for heavy loading elements. This means that load elements such as grabrails must bear directly over studs and the support members below. If this is the case in your home you



may need a licensed builder or structural engineer to advise re suitability of wall structures for rail placement.

Will drilling disrupt the waterproofing of your wall surfaces?

If you are fitting a grabrail to a 'wet area' wall, such as in a shower alcove, you may impact the waterproofing in the area. If the waterproofing is compromised, it may be necessary to reseal the drilled sections with a waterproofing material such as acrylic and silicone sealants

(http://www.infolink.com.au/articles/Acrylic-and-silicone-sealants-available-from-HB-Fuller_z77138.htm).

Do I need the homeowner's permission prior to installing the grabrail?

If you are the building owner you have the right to repair, alter, and install into an existing wall unless it is a shared party wall, where you will need your adjoining neighbours permission. A "part wall" is a wall between two adjoining living quarters in a multi-family dwelling. In the instance of wanting to install a grabrail into a party wall it is advisable for both sides to take photos and or arrange mutually agreed inspections of both sides prior to and on completion of the work in order to prevent any potential damage or litigation claims. However, if you are not the building owner you must get the owners permission prior to any work going ahead. However, it would be unlawful and discriminatory under the Disability Discrimination Act (DDA-92) for the building owner to withhold their permission. Nevertheless, the building owner has the right to stipulate that any installation is removed and made good at your expense should your tenancy in the building cease for whatever reason.

Is achieving a contrast between the rail and the wall important?

The degree of colour contrast between grabrails and the background (such as wall tiling) can be critical to functionality. For example, a silver or gold grabrail will be more readily seen on a white tiled wall than a white grabrail which will be less noticeable as it will effectively disappear. The higher the degree of contrast the easier it will be for a user with visual loss or cognitive impairment to locate it when they need it. Manipulation of the degree of colour contrast can also be used to enhance the attractiveness of the environment, for instance, a blue grabrail can reinforce a nautical bathroom theme.

Finish of grabrail

The finish of a grabrail should be also considered for users with a visual impairment as it might affect the degree of colour contrast between the rail and the wall. However, this specific feature is even more important when considering the grip surface grabrails can provide. There are a few types of grabrail finishes available in the market. When shopping for grabrails each of these types of finish should be carefully considered according to the user specific needs or disability.



Polished/ Chrome Finish

Highly polished, chrome finish grabrails can be positioned in many areas around the home. Although they are considered attractive and hard wearing, they can also be quite slippery to grasp, especially when user's hands are wet.

Epoxy/Paint/Plastic Finish

This type of finish is also hard wearing and provides a warmer feel to grabrails. It may be effective in reducing the effects of condensation and is often available in many colours and easy to co-ordination with other bathroom accessories.

Slip Resistant/ Knurled/Ribbed Finish

This finish consists of a moulded/coated textured surface which provides extra grip even when wet but may be uncomfortable to use for those with sensitive hands.

What equipment and tools will I need?

The following tools are required to install a grabrail to an average wall:

- **Grabrail;** appropriately sized and shaped, as prescribed by your occupational therapist.
- **Fixings;** the screws provided with the rail may not be strong enough to support the rail and weight of the user. The Australian Standard for access and mobility part 1 specifies that grabrail fixings need to be able to support a minimum load of 1100 N of force in any direction and should consist of at least two points of fixture at each end of the grabrail. This is based on an average weight for an adult and if the user is heavier than average additional reinforcement and fixings may be necessary. You may have to purchase larger, stronger coach screws for timber framing or dynabolts for masonry. These may require you to drill larger holes in the bracket or flange. A large variety of screws are available, so it is important to talk to your local hardware store if you are unsure about which fixings to use. Make sure that the building professional who provides advice is aware of the wall surface you are drilling into, and the purpose of the screws.
- **Coach screws;** these are a large, square-headed (or hexagonal) screw typically used for wood and are especially good for use with heavy timber framing. They are also sometimes known as lag bolt; lag or a screw. They are much bulkier and heavier than a normal screw but it is the fixings that ensure that the rail will not detach from the wall in usage.



Figure 1: Example of coach screw

- **Dynabolts:** these are often used for anchorage into concrete, and masonry as they can take high loads. They are designed open up as they are screwed into the wall. However they are not good for wirecut bricks with holes in them and in this case it is better to use Plugs and coach screws.



Figure 2: Example of dynabolts

- **Drill and attachments;** make sure you use drill bits and attachments that are appropriate to the wall surface you are drilling into. These will include a masonry drill bit, if drilling into plasterboard or tiles, or a wooden drill bit, if you are drilling into a wooden wall or studs. Using the wrong drill bit may eventuate not only in a broken drill bit, but also, damage to the tile surfaces that you are hoping to drill into. Note also that cordless drills may run out of battery faster on some surfaces.
- **Ruler and/or builders level;** to measure the placement of the rail.
- **Waterproofing agent;** if you damage the tiles in the process of installing the grabrail, you may wish to waterproof the damaged area to prevent rising damp.

Where should the rail be placed?

When the Occupational Therapist comes to your home to do an assessment, ask them to tell you where the grabrail should be installed, and how to measure its placement.

There are a quite number of things to consider:

- Is there enough space between the wall and the grabrail for your fingers to grip, without the risk of your arm getting stuck if you slip or trip?
- Will the placement of soap dishes and other bathroom components interfere with the ability to fully grasp the grabrail?
- Will taps be interfered with by rail placement?
- Will the rail withstand the full weight of the user, or the weight of other, heavier people?
- Which is the most appropriate angle for the placement of the rail? The best angle for the rail will depend on the task. A vertical rail can provide more ground for your



hand to move up and down during the task. Think about injuries that might impact how you use the rail, which design you choose, or how it is installed.

- Can your hand slide comfortably along the top of the rail, without getting caught on the way by supports or jagged edges?
- Does your hand sit comfortably on a handrail, so that your elbow has room to bend slightly when at rest?
- What sort of task are you doing with the rail? Are you sitting to stand (ie: pulling yourself up to standing from a toilet), lowering yourself to sitting, or using the rail to steady yourself? The activity you are doing will alter where you place the rail. The placement must be comfortable and 'natural', where it will best assist the user.



Figure 3: Example of grabrail fitted in the **wrong** angle but with **correct** location of fixing



Figure 4: Example of **wrong** location fixing of grabrail which prevent optimal grip of grabrail

Ensuring that the person for whom the grabrail is intended can place their hand comfortably so that they can get maximum leverage without overstraining existing injuries or overloading weak muscles or joints is critical in order to prevent secondary disability. So remember to keep the user in mind during installation, otherwise the person needing it may find it in the wrong place – or not be able to use it at all!

How do I ensure my safety during installation

There are many safety issues associated with drilling into building structures and for this reason obtaining the services of a qualified building professional is recommended. For instance, hospital treatment for power drill injuries is common and includes lacerations and punctures to fingers, scalping, corneal abrasions, and hand and finger contusions and sprains. Therefore, it is important to ensure that the drill user is familiar with and has read and fully understood the information provided in the operator's manual with particular attention given to descriptions of all safety precautions and procedures.

Earthing of metal grabrails

Installing metal grabrails in wet areas such as the bathroom or toilet may pose a risk of injury from electrical accidents particularly in cases where metal parts such as fixing screws come in contact with electrical cords during installation. In these cases any metal parts of a building which could become live must be earthed to prevent any



contact with a faulty electrical appliance. If a metal grabrail does need earthing, the regulations for electrical installation require to attach an earth cable to the rail and run it to the earth terminal in the main consumer unit. However, some types of metal grabrails do not require earthing (Disabled Living Foundation, 2007):

- Metal grabrails that have a plastic or a non-conductive coating which acts as an insulating layer between the grip surface and the wall-fixing screws;
- Metal grabrails that are installed with screws, are fixed through plastic seats and are sealed by plastic cups which help to isolate the screws from touching the rail;
- Metal grabrails that are fixed to areas that have no conductive parts (e.g. metal pipes) running in it. Brick or timber walls are examples of non-conductive materials that grabrails can be safely fixed to.

Preparation

- Have you inspected the drill and its electrical cord for damage or disrepair? A damaged drill should be repaired or replaced prior to use.
- Have you checked for presence of asbestos in walls or drill surfaces? It is important to know if any walls might have asbestos in them (a fairly common occurrence for homes built or renovated in the period between 1945 and 1985). You should NOT drill into asbestos - the particles can have lasting, damaging health effects. If in doubt or if asbestos is suspected you should contact a licensed building professional who has appropriate industry certification re working with asbestos. For more detailed information about Asbestos and Occupational Health and Safety precautions, see <http://www.nsw.gov.au/fibro/> and <http://www.workcover.nsw.gov.au/OHS/default.htm>.
- Have you checked that there are no services such as plumbing or wiring in the area into which you intend to drill? Electrical wiring and plumbing services are dangerous to drill into – drilling into either can kill you! Electrical cords may run through the wall, either above or below a light switch or power point. Whereas water pipes are commonly found directly above or below taps and faucets.
- Have you got safety glasses or goggles and a dust mask? These are important protective gear to wear during your grabrail installation process.
- Have you removed any loose clothing (e.g. gloves, ties, a watch, rings, or jewelry)?
- Have you tied back or secured long hair under a cap? This is important to so prevent scalping which can result from hair becoming entangled with any moving parts such as the drill bit.

Operating Precautions

- Make sure the power is shut off prior to making any drill bit adjustments or replacement of parts.
- Remove chuck key from the drill chuck before starting the drill.
- Ensure your hands are at least two inches from any moving parts.



- Do not exceed the recommended speeds for the type and size of drill bit being used or composition of the stock being drilled.
- When drilling deep holes, frequently raise the drill bit from the hole to remove cuttings and cool the bit.
- Never stop the rotation of the drill chuck and spindle with your hands or fingers.

Acknowledgements

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