

Industry Factsheet

Designing home environments for people with problems with cognition who display aggressive or self-injurious behaviour, Ed. 2

**PEER
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The aim of this factsheet is to assist service providers and carers to select appropriate elements and systems for the homes of people presenting self-injurious and/or aggressive behaviour. Under the Specialist Disability Accommodation (SDA) guidelines these solutions are sometimes referred to as 'robust' housing design. This Factsheet can be used in conjunction with these guidelines, as it provides more specific information to enable choice about materials and systems for the homes of people with challenging behaviour. Home modifications of this type include structural or non-structural changes to the home that are designed to resist damage, reduce individual behavioural triggers, provide an alternative to restraint and improve safety outcomes.

The properties and characteristics of any home environment need to be adjusted to the individual needs and behaviours of the residents and any modification recommendations should be implemented as part of a positive behaviour support plan. The information in this factsheet is intended to assist industry professionals to better understand the value of specialised spatial, material, lighting, egress and other home modification interventions designed to improve the safety and dignity of people with self-injurious and/or aggressive behaviour. By reducing the risk of injury, minimising neighbourhood disturbances and reducing maintenance and repair costs associated with heavy or unusual activity patterns, the wellbeing of residents and their community can be improved.

Self-injurious and aggressive behaviours and the home environment

Some conditions that impact upon sensory and/or cognitive functioning are correlated with incidences of aggressive or self-injurious behaviours. Self-injurious behaviour involves repetitive motoric movements that result in either tissue damage or the potential for self-inflicted tissue damage. Common manifestations include headbanging, face slapping and hand biting. Aggressive behaviours could be expressed towards objects and furniture (door slamming, breaking of furniture, etc), or people (hitting, throwing things, etc).

Best-practice considerations in the built environment

The importance of well-designed environments for people who experience problems with cognition has been highlighted in the literature. The main parameters that should be addressed when designing a home for people with “challenging behaviours”, are:

- The reduction of known stressors;
- The balance between over-stimulation and under-stimulation;
- Facilitating the use of preventive and reactive support strategies;
- The environment must be flexible and afford opportunities for choice and control;
- The environment and the various features must be safe and durable;
- Staff/family support should be accommodated;
- The design needs to be home-like and to blend in with the community.

Some techniques and systems that might be considered by carers and/or service providers and could be implemented as part of a positive behaviour support plan, are described in the following paragraphs.

Strategies and systems for safe and durable home environments

The strategies and systems that can be implemented to a residential environment to make it safer for the people using it as well as more resistant to potential damage attempts belong to three main categories:

- Strategies to reduce potential triggers;
- Strategies to reduce the risk of property damage, and
- Strategies to reduce the risk of harm for people that present challenging behaviours and their families and/or carers.

Strategies that reduce potential triggers

Interior temperature

Thermal discomfort in the home environment may be a source of frustration for all residents. The windows and walls should be appropriately oriented and thermally insulated and/or shaded, to contribute to the thermal comfort of the users of the building. Heating and cooling systems should be installed to provide stable and comfortable conditions. Reverse cycle cooling and heating with ceiling mounted outlets is a consideration. Grilles that are easily reached and have not been secured with tamper-resistant screws may be removed and used for self-harm and should be avoided.

Noise

Many people with cognitive impairments may find some sounds or noises hard to tolerate and might get frustrated or over-stimulated. Since it can be difficult or unrealistic to reduce neighbourhood noise, such as noise from alarms, pets, etc. after a house is built or purchased, it is always wise to consider any existing potential noise problems in advance. Some solutions for reducing external noises include use of solid masonry or earth berms in conjunction with plant noise blockers and reorientation of openings such as doors and windows. Other options include double glazing, laminated glass, well-sealed window frames all of which are effective at reducing street noise and can also limit the noises exiting the house.

Ventilation and cooling/heating units must comply with any relevant local government ordinances and should recycle and provide air as silently as possible. The noise from residential air conditioning systems can be reflected from hard surfaces onto neighbouring properties. It is important to avoid locating the outdoor air conditioner units near reflective surfaces and any acoustic barriers must be constructed in accordance with manufacturer specifications for ventilation to avoid damage to the outdoor unit.

Some electronic devices inside the home eg, lighting, vacuum cleaners, televisions and radios, washing machines, as well as ventilation, heating and cooling systems can all trigger a person who is sensitive to them. The use and layout of spaces in a house is critical in reducing the impact of any internal noise sources. Rooms with noisy appliances or devices, such as laundries, bathrooms or living rooms, should be positioned far away from bedrooms. Noisy appliances could also be mounted on sound absorbing pads. Soft interior surfaces, like carpets and sound absorbing panels for ceilings could also be used in large spaces to reduce noise. Use of electronic ballasts for fluorescent lamps as well as the right drivers for LEDs can eliminate humming of the lighting systems. Also, when lighting is controlled by dimmers, the appropriate lamps should be used (for example, most compact fluorescent lamps cannot be dimmed).

Lighting

Availability of natural light is important in all home environments, as it helps the regulation of the circadian rhythms, including numerous bodily functions as well as mood. Too bright or dim lighting, as well as glare sources can affect how people feel and in turn, their behaviour.

Windows and glass doors should have some type of shading, for privacy reasons and to reduce glare, preferably positioned between layers of safety glass or externally. Electronic controls of the shading elements should be silent. Dimmers, adjusting lighting to the desired levels, can be installed in bedrooms and/or other rooms of people with sensitivity to light. Very glossy and light-coloured interior surfaces should also be avoided in areas where sunlight may be reflected from, as they can be secondary sources of glare.

The lighting unit system, which includes lamps, light fixtures and ballast or driver (where applicable) should be recessed into the ceilings and walls and should not have glass elements that people might reach, break and use for harm. Fluorescent and compact fluorescent lamps should be out of reach, as they contain mercury which people can touch if the lamps break.

Light levels during the night should be low, however, night lights with motion sensors can be used to ensure safe access to bathrooms or other areas of the house.

Strategies to reduce the risk of property damage

Walls, doors and windows

Impact-resistant wall linings and wall protection sheets might occasionally be needed when people have the habit of scuffing or hitting doors, floors, ceilings or walls in the house.

Reinforced plasterboard and with high impact resistance and noise control are available for households and rigid vinyl, plastic or metal sheeting can be used to preserve door frames, skirting and other wall surfaces.

Windows provide a view outside, and access to daylight and natural ventilation. In cases where windows might be vandalised or used to cause self-harm, aluminium frames with restrictors that permit 100mm maximum opening are recommended.

Steel door frames built into walls and solid-core doors with tamper-proof screws are safe options, when extensive abuse might be an issue, as they can withstand heavy use. Damage to the doors' surface can be partially avoided with the addition of kickplates, door edges, and other add-on devices. By using plastic add-on elements in interesting colours instead of stainless-steel ones, the institutional feel can be reduced.

Glass and mirrors

Non-safety mirrors as well as other glass elements, such as picture frames with glass and windowpanes, might present health risks for people with aggressive or self-injurious behaviour. Glass breaks in small or larger pieces that are sharp, with the potential to be used to cause harm to oneself or to others. The alternatives to glass and mirror glass that are impact resistant, include:

1. Heat-strengthened glass: Heat-strengthened glass is not considered safety glass as it does not have high impact resistance. However, when broken, the pieces tend to stay in the opening longer than those of fully-tempered glass, thus preventing injury from broken glass falling on people. Distortion may occur due to the heat-treatment of the glass.
2. Tempered glass: Usually referred to as safety glazing, tempered glass breaks into relatively small pieces, thus reducing the likelihood of serious injuries, compared to ordinary glass. However, the small pieces fall easily from the frame and this is a risk parameter that needs to be considered. Distortion may occur due to the heat-treatment of the glass.
3. Laminated glass: Is produced by combining two or more sheets of float/tempered glass with one or more interlayers, usually Polyvinyl butyral (PVB). Due to the adhesion of PVB glue film, even when laminated glass breaks, the pieces remain bound to the thin film and the surface of the fragmented glass remains clean and smooth, ensuring the safety of people. Laminated glass has good transparency, and high impact resistance.
4. Glass-clad polycarbonate glazing: Systems comprising of panes of glass joined with a layer of polycarbonate and other materials. This transparent system keeps the fragments of the broken glass within the laminated surfaces, reducing the likelihood of injuries.
5. Polycarbonate: Polycarbonate is much stronger than glass, with high impact resistance. It is much lighter than glass and can transmit the same amounts of light with few distortions. Polycarbonate is vulnerable to scratching which can mean that the surfaces can lose their transparency, or can be vulnerable to graffiti or wilful damage.
6. Glass mirrors can also be dangerous for use in home environments of people with challenging behaviours. Glass-laminated polycarbonate mirrors are safe and scratch resistant. Acrylic mirrors, which are more resistant to breaking are available. Their lower cost means that replacement is more likely to fit within budgets than other options. Self-adhesive wall sticker mirrors can be a good and cheap solution for homes where residents might use the fragments of glass or acrylic mirrors to cause harm to themselves or others.

Glass on wall art and pictures should also be avoided. Clear sealants can be applied to protect artwork and images. Murals on wall vinyl and wall protection materials are a practical option that

with withstand heavy use and can be an effective way to add visual interest to the spaces.

Furniture

Home-like, warm and friendly environments are important for people's emotional wellbeing and furniture is an important element to achieve this goal. Furniture should be able to be easily cleaned, and all surfaces and upholstery should have improved flammability performance, without having an institutional look. Although colour and pattern add interest when used well, it is important to be mindful that complex patterns and a great variety of colours might cause sensory over-stimulation or agitation.

The risk of harm from furniture:

- Furniture, such as chairs, tables, drawers, etc, may present safety risks for people with challenging behaviours. Furniture with sharp edges or corners can be used as self-harming elements, thus furniture with round corners and edges should be chosen where possible.
- Furniture that can be moved and/or picked up can be thrown at carers or used as barricading or for climbing onto and escaping from a home or garden. Built-in furniture and appliances are excellent solutions for safety in private dwellings. Furniture could be anchored to the floor and wall art could be securely fixed to the walls to avoid removal. Another design solution is to have furniture of larger dimensions (for example benches instead of chairs) or made from heavy materials (concrete) that cannot be easily lifted and thrown. Drawers should be also avoided as they can be used to hit with or cause harm.
- Televisions and screens can be placed in built-in joinery units with polycarbonate, damage-resistant covers.
- Doors with glass elements for kitchen cabinets should be avoided. Whatever the material of the cabinet, the exterior surface should be made by a material that is scratch resistant, easy to clean and cost-effective.
- In some cases, locking of spaces and/or cupboards and drawers may be needed. However, it is important to consider that the installation of locks is an environmental restriction that needs to be approved and reported, according to NDIS Disability Restrictive Practices and behaviour Support Rules.

Tamper-resistant elements

If located at heights or locations that are easily accessible to everyone in the household, elements such as electrical device cover plates (for switches, receptacles, etc.), electrical

outlets, luminaires (light fixtures), HVAC grilles and equipment, picture frames, toilet accessories and fixtures (soap dispensers, taps, etc), etc, should be tamper-resistant, as they are often destroyed or used for harm.

Strategies to reduce the risk of harm for people

All the previously mentioned, strategies and systems are meant to ensure the residents' safety and wellbeing. However, some techniques directly associated with the safety of people with challenging behaviours and their carers, should incidents escalate, are:

- **Efficient egress provision:** The users of a house should be able to exit easily in case of an emergency or when they feel threatened. The building should always comply with the National Construction Code and/or other local egress regulations; however, additional exit points might be required when people with challenging behaviours live in it.
- **Surveillance and communication:** Carers of a person who presents challenging behaviours may need to be able to monitor or control the access and activity in specific areas of the house, through monitors or viewing panels. They might also need reliable communication devices to maintain contact with their employer or another person who can aid. Personal duress alarms are a common safety measure for professionals working in other people's homes. Any use of optical or other surveillance must comply with local regulations and the Australian Laws.

Elements and techniques that can be used to soften an “institutional appearance”

A home environment is ideally a place where people feel comfortable and safe, and a that reflects and expression of self. However, when a home is designed or modified to host people with self-injurious and/or aggressive behaviours, the reflection of *self* in the environment can be absent. Also, because some elements need to be more robust and able to withstand heavy use, the warmth and comfort can be lacking. These ‘robust’ elements have the potential to add an institutional appearance to the home that can negatively impact people's wellbeing. Here are some simple considerations that mean that the person living in the space is a participant in the design, and that design choices feel more domestic rather than institutional:

- Have the person with the challenging behaviour decorate his/her own personal space or give them choice on new items and furniture;
- Use lamps that emit warm, instead of natural or cool light;
- Use interesting furniture and wall colours, without creating busy patterns or extreme contrasts;

- Replace worn-out and broken equipment and furniture;
- Use “warm” materials, such as wood, carpet, etc, where possible;
- Control the environmental parameters (temperature, lighting, noise, smells, etc) to achieve the individual’s comfort levels.

Where can I find more information?

The HMinfo Evidence Based Practice Review: Designing home environments for people who experience problems with cognition and who display aggressive or self-injurious behaviour available from the www.homemods.info website

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***This information was correct at time of printing.*