Industry Factsheet

Selecting doorbells with hearing impairment

PEER REVIEWED

Purpose

The purpose of this factsheet is to assist service providers and trades people with the selection of visual signalling devices for use as doorbells in the homes of people with severe or profound deafness. It summarises available information about visual signalling devices and the personal, device, and environmental characteristics that appear to be linked to effectiveness. Most of the information summarised is from expert opinions, anecdotal evidence, and laws and regulations. Information from two quasi-experimental, two case, and two observation studies is also included. A complete list of references used to develop this factsheet accompanies **Evidence Based Research Bulletin: Selecting Doorbells for People with Hearing Impairment**.

This factsheet supplements the HMinfo Clearinghouse document **Doorbells: Industry Checklist: Selecting Doorbells for People with Hearing Impairment**. This factsheet highlights critical information about each item on the checklist. It is, however, only a starting point; it does not provide exhaustive detail. An understanding of basic construction principles and building codes and regulations is assumed.

Achieving satisfactory outcomes, as determined by the consumer, service provider, and trades person, is more likely when the safety, dignity, and preferences of consumers are considered at all stages of the project, from conceptualization through post-occupancy.

Background

Conventional auditory doorbells are not suitable for people with severe or profound deafness. The volume and frequency of doorbells often are inaudible to people who are severely or profoundly deaf. Even if audible at the source, home design, background noise and echoes can make the sound inaudible in many home environments.

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Severe and profound deafness cannot be medically treated, so assistive devices are necessary to enable people who are deaf to fully participate. Devices that amplify sound, such as hearing aids, often are not suitable alternatives because they cannot amplify sound enough to be heard and because they also amplify background noise and echoes, which can mask the sound of the doorbell or other desired sounds.

Australian law currently has no specific requirements for visual signalling devices used as alternatives to auditory doorbells. The Building Code of Australia (BCA), however, does require that “in-built communication systems for entry, information, entertainment or for the provision of a service must be suitable for occupants who are hearing impaired.” The BCA does not state how the requirements are to be met or what makes a communication system “suitable for occupants who are hearing impaired.” The search yielded no Australian Standards (AS) corresponding to this section of the BCA. AS 1603.11, section 2.5, contains specific requirements for colour, flash rate, pulse duration, and multiple units, but applies only to devices used in fire detection, warning, control and alarm systems, and not to communication devices (such as a doorbell). Similarly, HB 123-1999 applies only to visual warning devices and includes guidelines for intensity, colour, and placement. The Americans with Disabilities Act Accessibility Guidelines (ADAAG) apply to visual alarms in public buildings in the United States and include requirements for type, colour, pulse duration, intensity and placement.

The following recommendations are based on our review of the AS, the BCA, the ADAAG, and various published reports concerning visual signalling devices including expert opinion, anecdotal evidence, and studies classified as quasi-experimental, observation, or case studies. Because applicable law changes over time, service providers and trades people should check current law before recommending or installing any visual signalling device. Similarly, the recommendations in this factsheet are based on information currently available, most (76%) of which was classified as expert opinion or anecdotal evidence. Continued research and new product development may affect the continuing reliability of the recommendations.

Visual signalling device basics

Like auditory doorbells, visual signalling devices have a transmitter and receiver. Unlike auditory doorbells, they gain attention with light, which may occur with or without sound. Visual signalling devices are either wired or wireless and may be designed to work with an existing auditory doorbell. The most advanced wired visual signalling devices connect the transmitter to the electrical wiring for the household lights and make the household lights flash during the day or dim at night when the transmitter is activated. Receivers in less complicated wired systems are contained in small mountable outlets, which are either battery operated and come with an inbuilt light or plug into house power points. Those that plug into house power points either come with a light or have a connection for a household light, light bulb, or strobe.

Wireless devices transmit signals to remote receivers. A remote receiver is either a battery operated freestanding light or an outlet that plugs into a power point and to which a household lamp, light bulb or strobe is connected. When the transmitter is activated, the attached light flashes. Wireless devices are portable and can be transported to different rooms of the house, or receivers can be placed in various rooms throughout the house. Visual signalling devices also can be installed to be triggered by the sound of the original doorbell. The visual receiver, situated next to the auditory receiver, is activated either through microphones that pick up sound waves or through sensors that detect magnetic pulses released when the auditory doorbell is activated.

Typically, flashing lights signal activation of the doorbell; however, some devices produce a static light signal. Multifunctional visual signalling devices use different flashing patterns to alert occupants to activation of different environmental communication (e.g., doorbell, telephone). The research identified eight devices that had different flash codes to signal activation of different devices.

Type, intensity, colour, pulse duration, and flash rate appear to be linked to effectiveness. The type may be wired or wireless and may emit a flashing light or static light. Some wired systems flash household lights during the day and dim household lights at night to signal that someone has rung the doorbell. In flashing light systems, pulse duration and flash rate appear to be linked to effectiveness. Pulse duration is the amount of time the device is illuminated and is measured in seconds; flash rate is the number of flash cycles per second and is expressed in Hz (1 Hz is one flash cycle per second). Intensity refers to brightness and is measured in candelas. One candela is the amount of light emitted by one candle, measured at the source.

Preconstructions, considerations regarding hard-wired systems are currently the most reliable, although this may change as wireless technology develops. If the home is being constructed for someone who is severely or profoundly deaf, it may be easier to install some wired systems during, rather than after construction.

Ambient light

Visual signals may go undetected in the presence of ambient light. If areas of the home admit a lot of sunlight or are otherwise brightly lit, flashing lights may not gain the occupants' attention. If a single lamp or bulb is used instead of the household lights as the signalling device, it may go undetected if the household lights are on.

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