

The Built Environment

People with balance disorders of the inner ear are often affected by the built environment. The body's balance system works by coordinating information from the balance organ in the inner ear, eyes and sensors in the body. People suffering from a vestibular disorder rely more heavily on the information from their eyes and sensors in the body and so certain environments may cause them to feel dizzy.

Complex, repetitive patterns such as the long, high and narrow aisles in supermarkets and DIY stores can restrict your wider field of vision. The aisles are filled with lots of shelves that are stacked high with many shapes and colours. The floor may also be patterned, shiny or reflective and the metal bars on the baskets and trolleys also create a striped pattern. Together, these provide a very complex visual environment, which can overload your balance system. Corridors and looking down from a height have a similar effect. Your balance system works best when it can take visual cues from things close by, but in these situations you are using your depth perception more than usual.

Dizziness can also result from looking at a busy and moving environment. Supermarkets are usually crowded places with people continuously moving across your field of vision at varying speeds and, when you get to the checkouts, the conveyor belts also move. All this rapidly changing intense visual information makes your balance system work harder as it has to keep integrating the new information from your eyes.

Patterns on floors and walls can overload your balance system if you are not used to them. Mirrored, glass or reflective walls can distort and multiply patterns. Herringbone paving, black and white tiles, and coloured zig-zags, stripes or swirls on a carpet are all examples of complex and repetitive patterns that can overload your balance system. The effect of this on your balance can be made worse if the floor is sloping and walls that are leaning can confuse your balance system.

Stable lighting is important for your balance system. Just as darkness or dim lighting prevents your eyes from getting enough information about your environment, lighting that flickers also means that your eyes are not getting reliable information about your visual environment. Because your brain has a limited capacity for what it can attend to at any one time, concentrating on the change in lighting means that your brain has less capacity to co-ordinate your balance, resulting in dizziness and unsteadiness. Other environments that involve flickering lighting include travelling in a car when the sun is shining through the trees or at night when the oncoming car headlights are flickering, and shops or other places that use fluorescent lighting. Programmes on television and older types of computer screens can also flicker (but so fast that you may not be aware of it).

If you suffer from hearing loss you have to concentrate to make sense of the remaining sounds you can hear. Having to concentrate to make sense of sounds can also limit the capacity of your brain to co-ordinate your balance. This is much harder in busy environments where there is lots of background noise or music. Additional discomfort can be caused by unexpected loud noises, such as a staff announcement in a shop, especially if you wear a hearing aid. The damage to the hearing organ may cause some people with Ménière's disease to become over-sensitive to certain sounds and sounds which don't seem to bother others may seem unpleasantly loud to you and difficult to tolerate; known as hyperacusis.

Stairs escalators and lifts can result in unsteadiness and dizziness for several reasons. Rows of stairs are a complex and repetitive pattern (especially if the stairs are covered in patterned carpet or have the edges painted or marked for safety reasons) and open-faced or glass steps add an extra dimension to this because you can also see between the steps. Spiral stairs add further complications because the steps are wide at one end and narrow at the other you often have to concentrate more than usual to make sure you are putting your feet on the wider side of the step. Stairways can also often be long corridors and, because the purpose of stairs is to move you upwards or downwards, you are moving your head upwards or downwards. Stairs that require you to turn to get to the next flight of steps also make you move your head from side to side. These movements activate the balance organ in your inner ear, which can make you dizzy and unsteady if you are not used to them.

Escalators can be particularly challenging, as your balance system has to deal with conflicting information. The balance organ in your inner ear can sense that you are moving forwards and vertically (up or down), but the sensors in your legs and feet are telling your balance system that you are not walking. The sensors in your legs and feet can, however, tell that you are on a wobbly surface, and sends information to your balance system that this is an unreliable surface. Escalators can also have all the same effects as stairs, but in addition to this, the grid and lined pattern on each metal step creates an even more complex and repetitive pattern. Posters and advertisements at the sides of your vision on the walls above escalators also create a strong stimulus for movement. Your balance system has to cope with the information from your eyes about everything that is moving slowly past you.

Lifts affect your balance system differently to escalators. In closed lifts that you cannot see out of, your eyes and sensors in your body are telling your balance system that you are not moving, but the balance organ in your inner ear can detect that you are moving. Your brain has to deal with this conflicting information between your balance senses, which can result in dizziness and unsteadiness This is similar to when you sit on a stationary train and the train next to you begins to move. In this case your balance organ and body tell your brain you are still, but your eyes tell your brain you are moving. In open glass lifts, this conflict between your balance senses is still present, and being able to see out can mean that your balance system is being overloaded with unreliable visual information as well.

(Source: Meniere's UK Org)