

## Motion sickness

Motion sickness is the unpleasant sensation of nausea and dizziness that some people experience when riding in a moving vehicle. Motion sickness can be brought on by travelling in cars, boats, submarines, aeroplanes, trains, by riding amusement rides that spin, and even when using a swing at a playground. Astronauts in zero-gravity space can also suffer from a form of motion sickness, called 'space adaptation syndrome'.

Children between the ages of four and 12 years are particularly prone to motion sickness. Symptoms can range from mild to serious. Frequent vomiting can lead to dehydration and low blood pressure, so it is important to seek prompt medical attention if you are severely affected. Motion sickness is also known as travel sickness. Other popular terms depend on the mode of transport: for example, airsickness, carsickness or seasickness.

### Unpleasant symptoms

Symptoms of motion sickness can include:

- Generally feeling unwell
- Excessive production of saliva
- Headache
- Nausea
- Dizziness
- Hyperventilating
- Heavy sweating
- Weakness
- Losing colour in the face or turning red
- Vomiting.

### Our sense of balance is inside the ear

Inside the inner ear is a series of canals filled with fluid, called the labyrinth, which includes the semicircular canals. The three semicircular canals are at different angles. When the head is moved, the rolling of the fluid inside these canals tells the brain exactly how far, how fast and in what direction the head is moving.

Information from these canals is passed along to the brain via the vestibular nerve, which lies next to the cochlear nerve. If the brain knows the position of the head, it can work out the position of the rest of the body. The brain also relies on information from the eyes and from the muscles themselves (called 'muscle sense' or kinaesthesia). The brain uses the inner ear, the eyes and muscles to pinpoint the position of the body at all times.

### Conflicting information

Suppose you are a passenger in a car, reading a map while being driven along a winding road. Your inner ear tells your brain (via the vestibular nerve) that your body is moving but, according to your eyes which are focused on the stationary map, your body is still. At sea, the eye views the static horizon or the unmoving interior of the boat while the body feels the rolling of the waves.

The clash of sensory information is passed along to a portion of the brain known as the area postrema, which lies close to the brain area responsible for vomiting. It appears that motion sickness can only occur if the vestibular system is intact, because people with damaged vestibular nerves don't experience motion sickness.

One theory suggests that the vomiting response is caused by the brain's futile attempt to rid the body of a perceived poison. (Laboratory animals whose labyrinths are surgically removed are less likely to vomit when they have eaten poison.)

## **Anxiety contributes to motion sickness**

A person who has experienced motion sickness before may make their symptoms worse on future trips by expecting to feel sick. They may even feel nauseous before the actual ride. This psychological input is called 'conditioned reflex'.

## **Long term exposure**

If a person with motion sickness doesn't stop moving, they will start vomiting. Eventually, dehydration, exhaustion and a dangerous drop in blood pressure can occur. However, if a person is exposed to motion for an extended period - for example, during a long journey by sea - their body and brain will adapt in time to the constant motion and will no longer trigger episodes of sickness.

## **Reducing the risk of motion sickness**

There are different things you can try to prevent motion sickness or at least reduce its effects including:

- Watch the scenery going by, so that your eyes confirm the sensation of motion picked up by your inner ear. This may mean, for example, being out on deck at sea. However, don't fix your gaze on individually moving objects, such as each rolling wave - just scan generally.
- Position yourself where you will experience the least motion: for example, over the wings in an aeroplane or in the dead centre of a ship.
- If possible, drive the vehicle. Passengers in moving cars are more likely to experience motion sickness than drivers.
- The larger the vehicle, the less susceptible it is to motion so, if possible, try to travel on a ship rather than a small boat, for instance.
- Keep your head still. Moving your head around will 'swirl' the fluid in your canals and add to the sensory confusion.
- Some people find that closing their eyes is the best way to eliminate sensory confusion.
- Lying down on your back allows the fluid in the ear canals to pool, rather than swirl around.
- Cut back on, or eliminate, alcoholic drinks and don't have any alcohol for 24 hours before travelling.
- Make sure you have plenty of fresh air. Fumes or smoke can exacerbate symptoms.
- On brief journeys, try not to eat or drink anything.
- On long journeys, eat and drink sparingly and often.
- Anxiety worsens symptoms. Use relaxation techniques such as abdominal breathing or an absorbing book or hobby to counteract the effect of worrying. If your anxiety is severe, you could consider professional counselling.

## **Medications are preventative, not curative**

Medications either calm the nerves of the inner ear or soothe the brain's vomiting centre. However, most motion sickness pills are only effective if they are taken before you feel sick. In many cases, motion sickness pills can induce drowsiness as a side effect. You may need to experiment with the different drugs available to find which one works best for you. Ask your doctor or chemist for further information.

Research suggests that ginger can help to ease the symptoms of motion sickness. You could chew on raw ginger or make a quick tea by adding minced ginger to boiling water.

## **Where to get help**

- Your doctor
- Chemist
- Psychologist

## **Things to remember**

- Our primary sense of balance is a series of fluid-filled canals inside the inner ear.
- Conflicting sensory information can trigger motion sickness.
- Symptoms include nausea, dizziness, sweating, pallor and vomiting.

**This page has been produced in consultation with, and approved by:**

Royal Victorian Eye and Ear Hospital (RVEEH)

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