

## Doctor, Please Explain Dizziness and Motion Sickness

### Insight into causes and treatment options

- What is the difference between dizziness, vertigo, and motion sickness?
- How does the body maintain its equilibrium?
- How can I reduce dizzy spells?

Yearly more than **two million** people visit a doctor for dizziness, and an untold number suffer from motion sickness. Although patients complain of similar symptoms, there are different treatments available. An otolaryngologist will explore the causes behind the balance discomfort by examining the ears, nose, and throat to make a diagnosis. Often times, cases of dizziness and motion sickness are mild and self-treatable disorders, but severe cases deserve medical attention.

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### What is the difference between dizziness, vertigo, and motion sickness?

Some people describe a balance problem by saying they feel dizzy, lightheaded, unsteady, or giddy. This feeling of imbalance or disequilibrium is sometimes caused by an inner ear problem. Others describe their balance problem by using the word vertigo, which comes from the Latin verb "to turn". They often say that they or their surroundings are turning or spinning. Vertigo can also be triggered by problems in the inner ear.

Motion sickness is a common medical problem associated with travel. Some people experience nausea and even vomiting when riding in an airplane, automobile, boat, or amusement park ride. Motion sickness is usually just a minor annoyance and does not signify any serious medical illness, but some travelers are incapacitated by it. A few even suffer symptoms for a few days after the trip.

### How does the body maintain its equilibrium?

Dizziness, vertigo, and motion sickness all relate to the sense of balance and equilibrium. Researchers in space and aeronautical medicine call this sense spatial orientation, because it tells the brain where the body is "in space:" what direction it is pointing, what direction it is moving, and if it is turning or standing still.

Your sense of balance is maintained by a complex interaction of the following parts of the nervous system:

- The **inner ears** (also called the labyrinth), which monitor the directions of motion, such as turning, or forward-backward, side-to-side, and up-and-down motions.
- The **eyes**, which monitor where the body is in space (i.e. upside down, rightside up, etc.) and also directions of motion.
- The **skin pressure receptors** such as in the joints and spine, which tell what part of the body is down and touching the ground.
- The **muscle and joint sensory receptors**, which tell what parts of the body are moving.

- The **central nervous system** (the brain and spinal cord), which processes all the bits of information from the four other systems to make some coordinated sense out of it all.

The symptoms of motion sickness and dizziness appear when the central nervous system receives conflicting messages from the other four systems. For example, suppose you are riding through a storm, and your airplane is being tossed about by air turbulence. But your eyes do not detect all this motion because all you see is the inside of the airplane. Then your brain receives messages that do not match with each other. You might become "air sick." Or, to use a true medical condition as an example, suppose you suffer inner ear damage on only one side from a head injury or an infection. The damaged inner ear does not send the same signals as the healthy ear. This gives conflicting signals to the brain about the sensation of rotation, and you could suffer a sense of spinning, vertigo, and nausea.

## What medical conditions cause dizziness?

**Circulation**— If your brain does not get enough blood flow, you feel light headed. Almost everyone has experienced this on occasion when standing up quickly from a lying down position. But some people have light headedness from poor circulation on a frequent or chronic basis. This could be caused by arteriosclerosis or hardening of the arteries, and it is commonly seen in patients who have high blood pressure, diabetes, or high levels of blood fats (cholesterol). It is sometimes seen in patients with inadequate cardiac (heart) function or with anemia.

Certain drugs also decrease the blood flow to the brain, especially stimulants such as nicotine and caffeine. Excess salt in the diet also leads to poor circulation. Sometimes circulation is impaired by spasms in the arteries caused by emotional stress, anxiety, and tension.

If the inner ear fails to receive enough blood flow, the more specific type of dizziness occurs—that is—vertigo. The inner ear is very sensitive to minor alterations of blood flow and all of the causes mentioned for poor circulation to the brain also apply specifically to the inner ear.

**Injury**— A skull fracture that damages the inner ear produces a profound and incapacitating vertigo with nausea and hearing loss. The dizziness will last for several weeks, then slowly improve as the normal (other) side takes over

**Infection:** Viruses, such as those causing the common "cold" or "flu," can attack the inner ear and its nerve connections to the brain. This can result in severe vertigo, but hearing is usually spared. However, a bacterial infection such as mastoiditis that extends into the inner ear will completely destroy both the hearing and the equilibrium function of that ear. The severity of dizziness and recovery time will be similar to that of skull fracture.

**Allergy**— Some people experience dizziness and/or vertigo attacks when they are exposed to foods or airborne particles (such as dust, molds, pollens, danders, etc.) to which they are allergic.

**Neurological diseases**— A number of diseases of the nerves can affect balance, such as multiple sclerosis, syphilis, tumors, etc. These are uncommon causes, but your physician will think about them during the examination.

### **What kind of a medical examination can I expect?**

The doctor will ask you to describe your symptoms, whether it is light headedness or a sensation of motion, how long and how often the dizziness has troubled you, how long a dizzy episode lasts, and whether it is associated with hearing loss or nausea and vomiting. You might be asked to cite specific circumstances that induce a dizzy spell. You will also be questioned about your general health, medicines you are taking, head injuries, recent infections, etc.

The physician will examine your ears, nose, and throat and do tests of nerve and balance function. Because the inner ear controls both balance and hearing, disorders of balance often affect hearing and vice versa. Therefore, your physician might recommend hearing tests or audiograms. Depending on your diagnosis, the physician might order skull X rays, a CT or MRI scan of your head, or special tests of eye motion after warm or cold water is used to stimulate the inner ear (ENG - electronystagmography). In some cases, blood tests or a heart evaluation might be recommended.

### **Tips to reduce dizzy spells**

- **Avoid rapid changes in position**, especially from lying down to standing up or turning around from one side to the other.
- **Avoid extremes of head motion** (especially looking up) or rapid head motion (especially turning or twisting).
- **Eliminate or decrease use of products that impair circulation**, e.g. nicotine, caffeine, and salt.
- **Minimize your exposure to circumstances that precipitate your dizziness**, such as stress and anxiety or substances to which you are allergic.
- **Avoid hazardous activities** when you are dizzy, such as driving an automobile or operating dangerous equipment, or climbing a step ladder, etc.

### **Tips to alleviate motion sickness**

- **Always ride where your eyes will see the same motion that your body and inner ears feel**, e.g. sit in the front seat of the car and look at the distant scenery; go up on the deck of the ship and watch the horizon; sit by the window of the airplane and look outside. In an airplane, choose a seat over the wings where the motion is the least.
- **Do not read while traveling** if you are subject to motion sickness, and do not sit in a seat facing backward.
- **Do not watch or talk to another traveler who is having motion sickness.**
- **Avoid strong odors and spicy or greasy foods** immediately before and during your travel. Medical research has not yet investigated the effectiveness of popular folk remedies such as soda crackers and & Seven Up® or cola syrup over ice.

- **Take one of the varieties of motion sickness medicines** before your travel begins, as recommended by your physician. Some of these medications can be purchased without a prescription (i.e., Dramamine®, Bonine®, Marezine®, etc.) Stronger medicines such as tranquilizers and nervous system depressants will require a prescription from your physician. Some are used in pill or suppository form.