

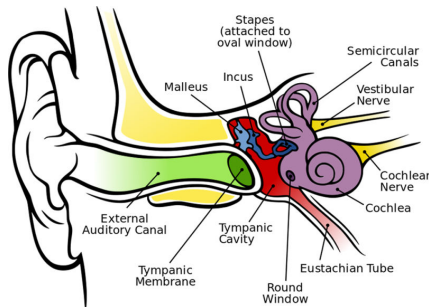


# Hearing Health

SPRING 2017

## Ears and Altitude

Ear problems are the most common medical complaint of airplane travelers, and while they are usually simple, minor annoyances, they may result in temporary pain and hearing loss. Make air travel comfortable by learning how to equalize the pressure in the ears instead of suffering from an uncomfortable feeling of fullness or pressure.



### Why do ears pop?

Normally, swallowing causes a popping sound in the ear. This occurs because a small bubble of air has entered the middle ear, up from the back of the nose. It passes through the Eustachian tube, a membrane-lined tube about the size of a pencil lead that connects the back of the nose to the middle ear. In this manner, air pressure on both sides of the eardrum stays about equal. If, and when, the air pressure is not equal the ear feels blocked.

The Eustachian tube can be blocked, or obstructed, for a variety of reasons. When that occurs, the middle ear pressure cannot be equalized. The air already there is absorbed and a vacuum occurs, sucking the eardrum inward and stretching it. Such an eardrum cannot vibrate naturally, so sounds are muffled or blocked, and the stretching can be painful. A stuffy nose, which often occurs with sinus infections or allergies, leads to stuffy ears because the swollen membranes block the opening of the Eustachian tube.

### Unblocking ears During Air Travel

Air travel is sometimes associated with rapid changes in air pressure. To maintain comfort, the Eustachian tube must open frequently and wide enough to equalize the changes in pressure. This is especially true when the airplane is landing, going from low atmospheric pressure down closer to earth where the air pressure is higher. Swallowing activates the muscles that open the Eustachian tube. Swallowing occurs more often when chewing gum or when sucking on hard candies. These are good air travel practices, especially just before take-off and during descent.

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## Ears and Altitude

Yawning is even better. Avoid sleeping during descent because swallowing may not occur often enough to keep up with the pressure changes.

During descent, if yawning and swallowing are not effective, pinch the nostrils shut, take a mouthful of air, and direct the air into the back of the nose as if trying to blow the nose gently, you should feel a pressure buildup but do not let the air out your mouth. The ears have been successfully unblocked when a pop is heard. This may have to be repeated several times during descent.



Many experienced air travelers use a decongestant pill or an over the counter nasal spray an hour or so before descent. This will shrink the membranes and help the ears pop more easily. Travelers with allergy problems should take their medication at the beginning of the flight for the same reason. Other tips...

- ✓ Postpone an airplane trip if a cold, sinus infection, or an allergy attack is present.
- ✓ Patients in good health can take a decongestant pill or nose spray approximately an hour before descent to help the ears pop more easily.
- ✓ Avoid sleeping during descent.
- ✓ Chew gum or suck on a hard candy just before take-off and during descent.

## It's about more than hearing

Advanced hearing loss is also associated with a variety of serious medical conditions including:

Heart and cardiovascular disease: The negative influence of impaired cardiovascular health on both the peripheral and central auditory system has the potential to affect an individual's capacity to hear.

Diabetes: Hearing loss is about twice as common in adults with diabetes.

Cognitive function, dementia, and Alzheimer's disease: Studies show that older people with hearing loss are more likely to develop dementia, and that hearing loss is associated with a faster rate of cognitive decline.

Depression and anxiety: Hearing loss can lead to isolation and other emotional conditions that can affect both quality of life and mental health.

Chronic kidney disease: Research has shown that people with moderate chronic kidney disease have a higher prevalence of hearing loss.





## Listening Effort

If you're like most people, you're used to thinking of hearing as something that happens in your ears. But that's not the case. Hearing actually happens between your ears, in the hearing part of your brain. That's where sound becomes information that has meaning.

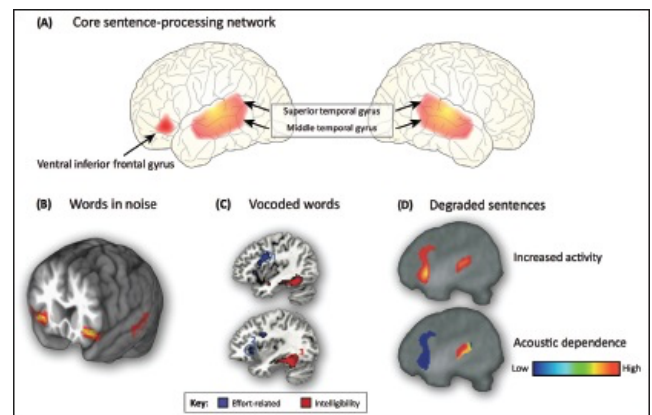
When you listen to a conversation, your ears and your brain work together as a system. And it's your brain that does the heavy lifting. Your brain uses the information from your two ears to orient you by figuring out which direction the sound is coming from. Inside your brain, sound waves become sounds that you recognize. And while you're listening, your brain is what helps you focus in on a conversation and separate out unwanted noise. Right now, all four of these tasks — orient, recognize, focus, and separate — are happening inside your brain.

The effort it takes to listen – listening effort – is a common complaint among people with hearing loss. When listening is compromised by hearing loss, you have to work hard to understand what is said. When your brain works hard to hear, you use up cognitive energy.

In a recent study, many of the physiological changes associated with age-related hearing loss (Trends Neurosci. 2016;39:4T6). Of particular interest is how hearing loss is reflected in complex, high-level cognitive behaviors: hearing loss is associated with poorer memory for speech, longer response times when making decisions about sentences, and increased brain activity in distinct regions of frontal cortex associated with attention and working memory. Thus, there is clear evidence from multiple sources that demonstrate increased cognitive demand when listeners with hearing loss attend to speech.



The important take-home message is that the effects of age-related hearing loss are not confined to the auditory system; they reverberate through other brain functions and thus everyday behavior. Hearing aids are tools that help to reduce the cognitive burden faced by listeners. By improving your hearing, it frees your brain to focus on other things.



Functional brain imaging reveals how acoustic challenges during speech perception alter the brain regions that listeners use to understand what they are hearing.

(Reproduced with permission: Trends Neurosci. 2016;39:486 <http://bit.ly/2dxV4T6> ).  
The Hearing Journal. 69(11):10,12, November 2016.



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Dr. Seshul



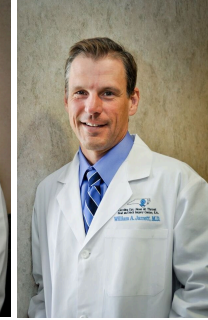
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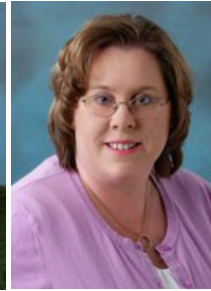
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