Reference of TCM Otorhinolaryngology

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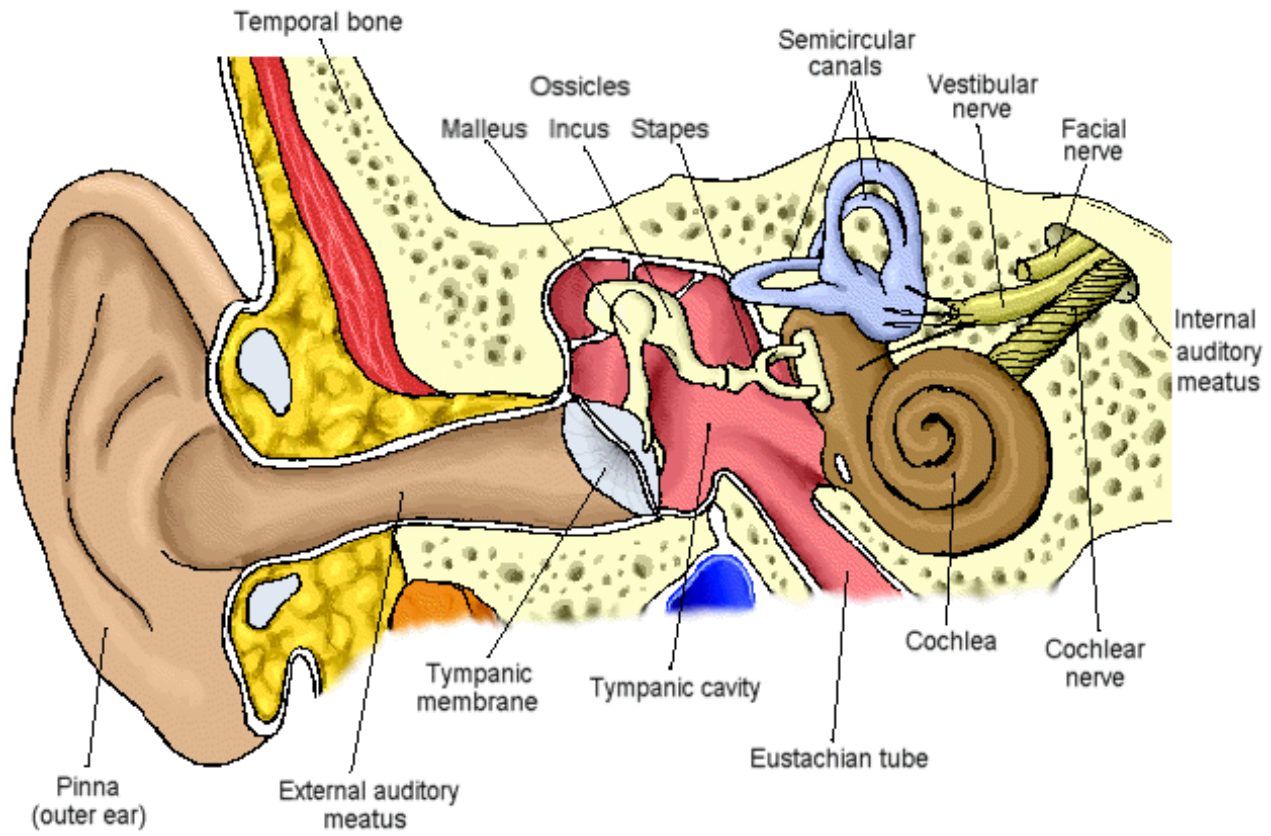
Contents

1. Ménière's Disease



Ménière's Disease is an abnormality of the inner ear causing a host of symptoms, including vertigo or severe dizziness, tinnitus or a roaring sound in the ears, fluctuating hearing loss, and the sensation of pressure or pain in the affected ear. The disorder usually affects only one ear and is a common cause of hearing loss. It is named after French physician Prosper Ménière who first described the syndrome in 1861.

Causes

The symptoms of Ménière's disease are associated with a change in fluid volume within a portion of the inner ear known as the labyrinth. The labyrinth has two parts: the **bony labyrinth** and the **membranous labyrinth**. The membranous labyrinth, which is encased by bone, is necessary for hearing and balance and is filled with a fluid called **endolymph**. When head moves, endolymph moves, causing nerve receptors in the membranous labyrinth to send signals to the brain about the body's motion. An increase in endolymph, however, can cause the membranous labyrinth to balloon or dilate, a condition known as **endolymphatic hydropsy**.

Many experts on Ménière's disease think that a rupture of the membranous labyrinth allows the endolymph to mix with **perilymph**, another inner ear fluid that occupies the space between the membranous labyrinth and the bony inner ear. This mixing can cause the symptoms of Ménière's disease. Scientists are investigating several possible causes of the disease, including environmental factors, such as noise pollution and viral infections, as well as biological factors.

Symptoms

The symptoms of Ménière's disease occur suddenly and can arise daily or as infrequently as once a year. **Vertigo**, often the most debilitating symptom of Ménière's disease, typically involves a whirling dizziness that forces the sufferer to lie down. Vertigo attacks can lead to severe nausea, vomiting, and sweating and often come with little or no warning.

Some individuals with Ménière's disease have attacks that start with **tinnitus** (ear noises), a **loss of hearing, or a full feeling or pressure in the affected ear**. It is important to remember that all of these symptoms are unpredictable. Typically, the attack is characterized by a combination of vertigo, tinnitus, and hearing loss lasting several hours. People experience these discomforts at varying frequencies, durations, and intensities. Some may feel slight vertigo a few times a year. Others may be occasionally disturbed by intense, uncontrollable tinnitus while sleeping. Ménière's disease sufferers may also notice a hearing loss and feel unsteady all day long for prolonged periods. Other occasional symptoms of Ménière's disease include headaches, abdominal discomfort, and diarrhea. A person's hearing tends to recover between attacks but over time becomes worse.

Diagnosis

Based on a recent study, NIDCD estimates that there are currently approximately 615,000 individuals with diagnosed Ménière's disease in the United States and 45,500 newly diagnosed cases each year. Proper diagnosis of Ménière's disease entails several procedures, including a medical history interview and a physical examination by a physician, hearing and balance tests, and medical imaging with magnetic resonance imaging (MRI). Accurate measurement and characterization of hearing loss are of critical importance in the diagnosis of Ménière's disease.

Through the use of several types of hearing tests, physicians can characterize hearing loss as being sensory, arising from the inner ear, or neural, arising from the hearing nerve. Recording the auditory brain stem response, which measures electrical activity in the hearing nerve and brain stem, is useful in differentiating between these two types of hearing loss. Electrocochleography, recording the electrical activity of the inner ear in response to sound, helps confirm the diagnosis.

To test the vestibular or balance system, physicians irrigate the ears with warm and cool water or air. This procedure, known as caloric testing, results in nystagmus, rapid eye movements that can help a physician analyze a balance disorder. Since tumor growth can produce symptoms similar to Ménière's disease, an MRI is a useful test to determine whether a tumor is causing the patient's vertigo and hearing loss.

Treatment

There is no cure for Ménière's disease. However, the symptoms of the disease are often controlled successfully by reducing the body retention of fluids through dietary changes (such as a low-salt or salt-free diet and no caffeine or alcohol) or medication. Changes in medications that either control allergies or improve blood circulation in the inner ear may help. Eliminating tobacco use and reducing stress levels are more ways some people can lessen the severity of their symptoms.

Different surgical procedures have been advocated for patients with persistent, debilitating vertigo from Ménière's disease. Labyrinthectomy (removal of the inner ear sense organ) can effectively control vertigo, but sacrifices hearing and is reserved for patients with nonfunctional hearing in the affected ear. Vestibular neurectomy, selectively severing a nerve from the affected inner ear organ, usually controls the vertigo while preserving hearing, but carries surgical risks. Recently, the administration of the ototoxic antibiotic, gentamycin directly into the middle ear space has gained popularity worldwide for the control of the vertigo of Ménière's disease.

2. Hearing loss and deafness

Hearing loss is deterioration in hearing; **deafness** is profound hearing loss.

More than 28 million people in the United States are deaf or have hearing loss. Older people are the most affected: 30 to 40% of people aged 65 and older have significant hearing loss. Children also develop hearing loss, which can be detrimental to language and social development. Every year, about 1 of 5,000 people develops sudden deafness. Sudden deafness is severe hearing loss, usually in only one ear, that develops over a period of a few hours or less.

Causes

Hearing loss has many causes. It may be caused by a mechanical problem in the external ear canal or middle ear that blocks the conduction of sound (conductive hearing loss). Blockage of the external ear canal can be due to something as mundane as an accumulation of wax or something as uncommon as a tumor. The most common cause of conductive hearing loss in the middle ear, especially in children, is an accumulation of fluid. Fluid can accumulate in the middle ear as a result of ear infections or conditions, such as allergies or tumors that block the eustachian tube, which drains the middle ear.

Hearing loss also may be due to damage to the sensory structures (hair cells) of the inner ear, auditory nerve, or auditory nerve pathways in the brain (sensorineural hearing loss). These sensory structures may be damaged by drugs, infections, tumors, and skull injuries. Hearing loss is often a mixture of a conductive and sensorineural loss.

Causes of Hearing Loss

1. Conductive hearing loss

Cholesteatoma (noncancerous tumor caused by an ear infection)

Chronic middle ear fluid (otitis media with effusion)

Middle ear infection (otitis media)

Obstruction of external ear canal (with wax, a tumor, or pus from an infection)

Otosclerosis (bony overgrowth of the ossicles)

Perforated eardrum

2. Sensorineural hearing loss

Aging

Brain tumors

Certain drugs

Childhood infections (mumps, meningitis)

Congenital infection (toxoplasmosis, rubella, cytomegalovirus, herpes, syphilis)

Congenital abnormality

Demyelinating diseases (diseases that destroy the myelin sheath covering nerves)

Genetic

Loud noise

Meniere's disease

Sudden pressure changes from flying, diving, and strenuous exercise

Viral infection of the inner ear (labyrinthitis)

***Age*：** Age-related hearing loss is called **presbycusis**. As some people age, structures of the ear become less elastic and undergo other changes that make them less able to respond to sound waves, contributing to hearing loss. In many people, exposure to noise over many years worsens the changes caused by aging. Age-related hearing loss begins early, starting some time after age 20. However, it progresses very slowly, and most people do not notice any changes until well after age 50.

Age-related hearing loss first affects the highest pitches (frequencies) and only later affects lower pitches. Loss of the ability to hear high-pitched sounds often makes it more difficult to understand speech. Although the loudness of speech appears normal to the person, certain consonant sounds—such as the sound of letters C, D, K, P, S, and T—become hard to hear, so that many people with hearing loss think the speaker is mumbling. Indeed, some people complain more that others are not speaking clearly than that they cannot hear well. Women and children, whose voices tend to be higher in pitch than those of men, are particularly difficult to understand. Many people also notice a change in the vibrancy of certain musical sounds, such as those of violins and flutes.

Otosclerosis In otosclerosis, a hereditary disorder, the bone surrounding the middle and inner ear grows excessively. This exuberant growth immobilizes the stirrup (the ear bone attached to the inner ear) so that it cannot transmit sounds properly. Sometimes the bone's growth also pinches and damages the nerves connecting the inner ear with the brain. Otosclerosis tends to run in families and may develop in someone who had a childhood measles infection. Hearing loss first becomes evident in late adolescence or early adulthood. About 10% of adults have some evidence of otosclerosis, but only about 1% develops hearing loss as a result.

Noise About 30 million people in the United States are exposed to levels of noise that can cause hearing loss. Noise destroys the hair cells in the inner ear. Although people vary greatly in their sensitivity to loud noise, everyone loses some hearing if exposed to sufficiently loud noise long enough.

Both the loudness and duration of exposure are important—the louder the noise, the less time it takes to produce hearing loss. Extremely loud noise can cause hearing loss with even a single, brief exposure. Although brief exposure to loud noise usually produces only temporary hearing loss lasting a few hours to a day or so (called a temporary threshold shift), loss can be permanent, especially when the person is exposed many times. The person may have high-pitched ringing in the

ears (tinnitus) and problems comprehending speech. When a person experiences these symptoms, it is a warning that a sound is too loud and must be avoided.

Common sources of potentially damaging noise include highly amplified music, power tools, heavy machinery, and many types of powered vehicles, such as snowmobiles. Many people are exposed to injurious levels of noise during the course of their jobs, and hearing loss is a significant occupational hazard for many people. Explosions and gunfire also damage hearing.

Ear Infections Young children commonly have some degree of conductive hearing loss after an ear infection (otitis media), because infection may lead to accumulation of fluid (effusion) in the middle ear. Most children regain normal hearing in 3 to 4 weeks after the infection resolves, but a few have persistent hearing loss. Chronic, long-standing infections of the middle ear often result in both conductive and sensorineural losses. Hearing loss is more likely in children who have recurring ear infections.

Autoimmune Disorders Autoimmune disorders are sometimes a cause of hearing loss. The hearing loss may occur in people who have rheumatoid arthritis, systemic lupus erythematosus, Paget's disease, and polyarteritis nodosa. A fluctuating hearing loss, which may be progressive, occurs in both ears. The cause is an attack by the immune system on the cells of the cochlea.

Drugs Drugs sometimes cause hearing loss. The aminoglycoside family of intravenous antibiotics is the drugs most commonly implicated, particularly when given in high doses. Some people have a rare hereditary disorder that makes them extremely susceptible to hearing loss due to aminoglycosides. Other drugs include vancomycin, quinine, and the cancer chemotherapy drugs cisplatin and nitrogen mustard. Hearing loss can be caused by aspirin (salicylate), but the hearing can come back when the drug is discontinued.

Diagnosis

All hearing loss needs to be evaluated by an **otolaryngologist**—a doctor who specializes in the care of the ear. An audiologist is a trained professional who tests hearing and performs hearing evaluation tests that measure the degree of hearing loss and the particular sound frequencies that are impaired. If hearing loss is present, other tests help determine how much the hearing loss affects the person's ability to understand speech and whether the hearing loss is sensorineural, conductive, or mixed. Some hearing tests also help identify possible causes of hearing loss. Although many hearing tests require the person's active participation, some do not.

Measurement of Loudness

Loudness is measured on a logarithmic scale. This means that an increase of 10 decibels (dB) represents a 10-fold increase in sound intensity, and a doubling of the perceived loudness. Thus, 20 dB is 100 times the intensity of 0 dB and appears 4 times as loud; 30 dB is 1000 times the intensity of 0 dB and appears 8 times as loud.

Decibels	Example
0	Faintest sound heard by human ear

30	Whisper, quiet library
60	Normal conversation, sewing machine, typewriter
90	Lawnmower, shop tools, truck traffic (8 hours per day is the maximum exposure without protection*)
100	Chainsaw, pneumatic drill, snowmobile (2 hours per day is the maximum exposure without protection)
115	Sandblasting, loud rock concert, automobile horn (15 minutes per day is the maximum exposure without protection)
140	Gun muzzle blast, jet engine (Noise causes pain and even brief exposure injures unprotected ears; injury may occur even with hearing protectors)
180	Rocket launching pad

*Mandatory federal standard, but protection is recommended for sound levels above 85 decibels.

Audiometry is the first step in hearing testing. In this test, a person wears headphones that play tones of different frequency (pitch) and loudness into one ear or the other. The person signal when he hears a tone, usually by raising his hand on the side the tone was heard. For each pitch, the test identifies the quietest tone the person can hear in each ear. The results are presented in comparison to what is considered normal hearing. Because loud tones presented to one ear may also be heard by the other ear, a sound other than the test tone (usually noise) is presented to the ear not being tested.

Speech threshold audiometry measures how loudly words have to be spoken to be understood. A person listens to a series of two-syllable, equally accented words (spondees), such as “railroad,” “stairway,” and “baseball”; presented at different volumes. The volume at which the person can correctly repeat half of the words (spondee threshold) is recorded.

Discrimination, the ability to hear differences between words that sound similar, is tested by presenting pairs of similar one-syllable words. The percentage of words correctly repeated is the discrimination score. People with a conductive hearing loss usually have a normal discrimination score, although at a higher volume. People with sensorineural loss often have abnormal discrimination at all volumes.

Tympanometry tests how well sound can pass through the eardrum and middle ear. This procedure does not require the active participation of the person being tested and is commonly used in children. A device containing a microphone and a sound source is placed snugly in the ear canal, and sound waves are bounced off the eardrum as the device varies the pressure in the ear canal. Abnormal tympanometry results suggest a conductive type of hearing loss.

Rinne tuning fork test is a screening test that helps distinguish between conductive and sensorineural hearing loss. This test compares how well a person hears sounds conducted by air with how well the person hears sounds conducted by the skull bones. To test hearing by air conduction, the tuning fork is placed near the ear. To test hearing by bone conduction, the base of a vibrating tuning fork is placed against the head so the sound bypasses the middle ear and goes directly to the nerve cells of the inner ear. If hearing by air conduction is reduced but hearing by bone conduction is normal, the hearing loss is conductive. If both air and bone conduction hearing are reduced, the hearing loss is sensorineural or mixed. People with sensorineural hearing loss may need further evaluation to look for other conditions, such as Meniere's disease or brain tumors.

Auditory brain stem response is a test that measures nerve impulses in the brain stem resulting from sound signals in the ears. The information helps determine what kind of signals the brain is receiving from the ears. Test results are abnormal in people with some sensorineural types of hearing loss and in people with many types of brain tumors. Auditory brain stem response is used to test infants and also can be used to monitor certain brain functions in people who are comatose or undergoing brain surgery.

Electrocochleography measures the activity of the cochlea and the auditory nerve by means of an electrode placed on, or through, the eardrum. This test and the auditory brain stem response can be used to measure hearing in people who cannot or will not respond voluntarily to sound. For example, these tests are used to find out whether infants and very young children have profound hearing loss (deafness) and whether a person is faking or exaggerating hearing loss (psychogenic hypoacusis).

Otoacoustic emissions test uses sound to stimulate the inner ear (cochlea). The ear itself then generates a very low intensity sound that matches the stimulus. These cochlear emissions are recorded using sophisticated electronics and are used routinely in many newborn nurseries to screen newborns for congenital hearing loss. This test is also used in adults to help determine the reason for a hearing loss.

Other tests can measure the ability to interpret and understand distorted speech, understand a message presented to one ear when a competing message is presented to the other ear, fuse incomplete messages to each ear into a meaningful message, and determine where a sound is coming from when it is presented to both ears at the same time. Depending on the person's symptoms and the results of the hearing tests, some people need computed tomography (CT) or magnetic resonance imaging (MRI) to look for tumors invading structures of the ear or blocking the eustachian tube.

Prevention and Treatment

Age-related hearing loss and most other causes of hearing loss are not preventable. However, many measures can be taken to help prevent noise-induced hearing loss, such as limiting exposure to loud noise, reducing noise levels whenever possible, and staying away from the source of the noise. The volume of music played through headphones should always be kept at a reasonable level. The louder the noise, the less time a person should spend near it. For occupational or firearm exposure, the use of hearing protectors, such as plastic or foam rubber plugs in the ear canals or glycerin-filled muffs over the ears, is essential. Plastic plugs can also be used in other loud environments.

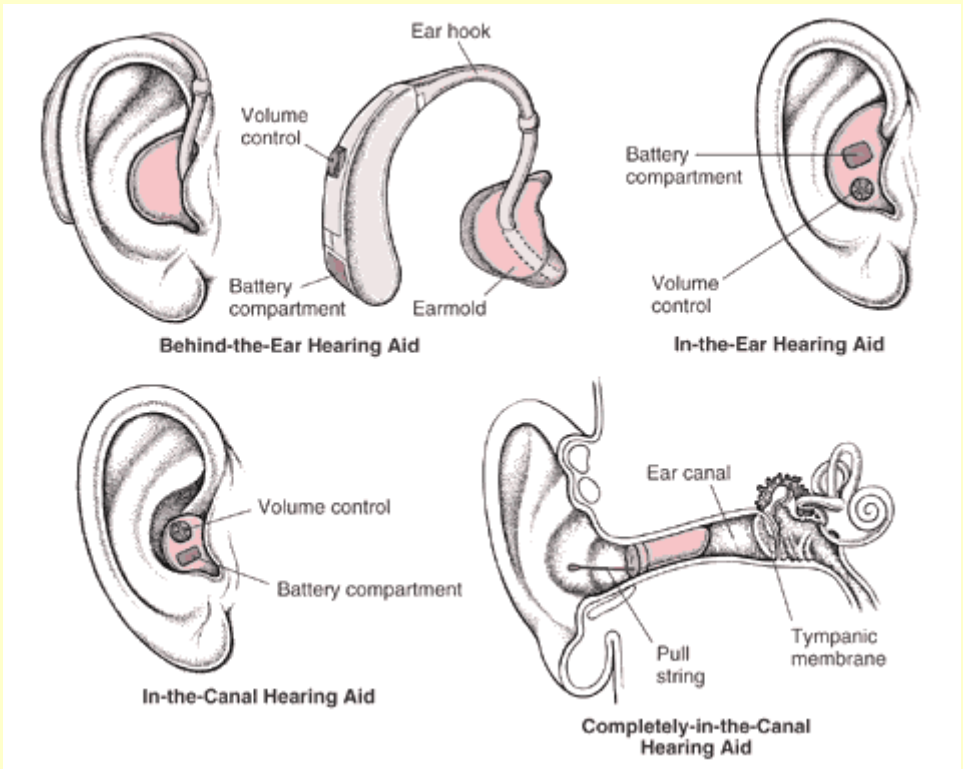
Treatment of hearing loss depends on the cause. When the cause is fluid in the middle ear, children and adults may need to have a small tube placed in the eardrum (tympanostomy). The tube helps prevent fluid from accumulating. Some children also need to have their adenoids removed (adenoidectomy), which helps keep the eustachian tube open. Tumors blocking the eustachian tube are removed. Hearing loss caused by autoimmune disorders is treated with corticosteroids, such as prednisone (SOME TRADE NAMES DELTASONE METICORTEN).

Damage to the eardrums or the bones in the middle ear may require reconstructive surgery. For some people with otosclerosis, hearing may be restored by removing the stirrup surgically and replacing it with an artificial one. Brain tumors causing hearing loss may, in some cases, be removed and the hearing preserved.

Most other causes of hearing loss have no cure. In these cases, treatment involves compensating for the hearing loss as much as possible. Most people with moderate to severe loss use hearing aids. Those with severe to profound loss are greatly helped by a cochlear implant.

Hearing Aids Sound amplification with a hearing aid helps people who have either conductive or sensorineural hearing loss. Unfortunately, a hearing aid does not restore hearing to normal. A hearing aid should, however, significantly improve a person's ability to communicate and enjoy sounds.

Hearing Aids: Amplifying the Sound



The behind-the-ear hearing aid is the most powerful but least attractive hearing aid. The in-the-ear hearing aid is the best choice for severe hearing loss. It is easy to adjust but is difficult to use with telephones. The in-the-canal hearing aid is used for mild to moderate hearing loss. This aid is relatively inconspicuous but is difficult to use with telephones. The completely-in-the-canal hearing aid is used for mild to moderate hearing loss. This aid has good sound, is nearly invisible, and can be easily used with telephones. It is

removed by pulling on a small string. However, it is the most expensive and hard to adjust.

All hearing aids have a microphone to pick up sounds, a battery-powered amplifier to increase their volume, and a means of transmitting the sound to the person. Most hearing aids transmit the sounds through a small speaker placed in the ear canal. Other hearing aids, which require surgical implantation, transmit sounds directly to the bones of the middle ear (ossicles) or the skull instead of through a speaker. Hearing aids differ in how big the components are and where they are located. As a general rule, larger hearing aids are more noticeable and less attractive but are easier to adjust. Larger aids can often accommodate features that are not available in small ones.

Hearing aids have different electronic characteristics that are chosen to suit the person's particular type of hearing loss. For example, people whose hearing loss affects mainly higher frequencies do not benefit from simple amplification, which merely makes the mumbled speech they hear sound louder. Hearing aids that selectively amplify the high frequencies markedly improve speech recognition. Other hearing aids contain vents in the ear mold, which facilitate the passage of high-frequency sound waves into the ear. Many hearing aids use digital sound processing with multiple frequency channels so that the amplification can even more precisely match the person's hearing loss. People who cannot tolerate loud sounds may need hearing aids with special electronic circuitry, which keeps the maximum volume of sound at a tolerable level.

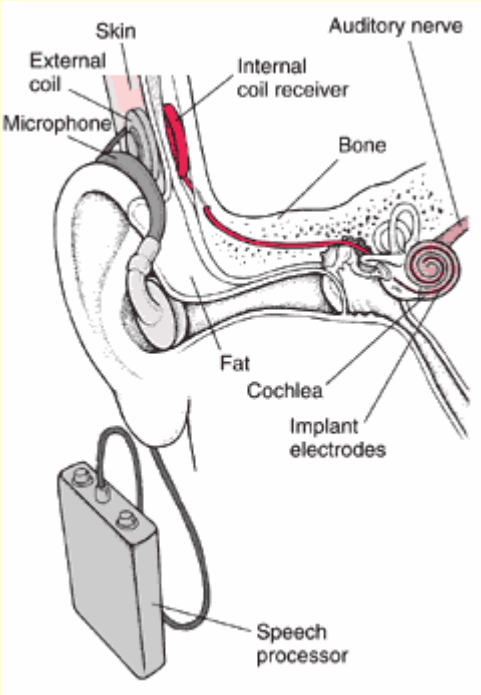
Telephone use can be difficult for people with hearing aids. With typical hearing aids, placing the ear next to the phone handle causes squealing. Some hearing aids have a phone coil: With the flip of a switch the microphone is turned off, and the phone coil links electromagnetically to the magnet in the phone handle. As long as the hearing aid has the proper features, this setup can be arranged by the phone company with simple changes to the phone. Hearing aids with complex features tend to be the most expensive but are often essential to meet hearing needs.

Cochlear Implants Most profoundly deaf people who cannot hear sounds even with a hearing aid benefit from a cochlear implant. Cochlear implants provide electrical signals directly into the auditory nerve by means of multiple electrodes inserted into the cochlea, the inner ear structure containing the auditory nerve. An external microphone and processor pick up sound signals and convert them to electrical impulses. The impulses are transmitted electromagnetically by an external coil through the skin to an internal coil, which connects to the electrodes. The electrodes stimulate the auditory nerve.

A cochlear implant does not transmit sounds as well as a normal cochlea but provides different benefits to different people. It helps some people read lips. Others can distinguish some words without reading lips. Some people can hear on the telephone.

A cochlear implant also helps deaf people hear and distinguish environmental and warning signals, such as doorbells, telephones, and alarms. It helps them modulate their own voices to make their speech easier for others to understand. A cochlear implant is more effective in a person whose hearing loss is recent or who had successfully used a hearing aid before the implant.

Cochlear Implant: Aid for the Profoundly Deaf



A cochlear implant, a type of hearing aid for profoundly deaf people, consists of an internal coil, electrodes, an external coil, a speech processor, and a microphone. The internal coil is surgically implanted in the skull behind and above the ear, and the electrodes are implanted in the cochlea. The external coil is held in place by magnets on the skin over the internal coil. The speech processor, connected to the external coil by a wire, may be worn in a pocket or special holster. The microphone is placed in a hearing aid worn behind the ear.

Other Means of Coping With Hearing Loss Several other types of devices are available for people who have significant hearing loss. Light alerting systems enable these people to know when the doorbell is ringing or a baby is crying. Special sound systems help people hear in theaters, churches, or other places where there is competing noise. Many television programs carry closed captioning, with the dialog shown as visible text. Telephone communication devices are also available.

Lip reading (speech reading) is an important skill for people who have decreased hearing. It is particularly important for people who can hear but have trouble discriminating sounds, typically those with age-related hearing loss. Observing the position of a speaker's lips allows people to recognize which consonant is being spoken. Because people whose hearing loss affects high frequencies are unable to understand consonant sounds, lip reading can significantly improve the comprehension of speech.

Lip reading and other strategies for coping with hearing loss are sometimes taught by hearing professionals in a program called aural rehabilitation (see Rehabilitation: Hearing Loss). In addition to training in lip reading, people are taught to gain control over their listening environment by learning to anticipate difficult communication situations and modifying or avoiding them. For example, people can visit a restaurant during off-peak hours, when it is quieter. They can ask for a booth, which blocks out some extraneous sounds. They can request that "specials of the day" be written rather than spoken. In direct conversations, people may ask the speaker to face them. At the beginning of a telephone conversation, people can identify themselves as being hearing-impaired.

People with profound hearing loss often communicate using sign language. American Sign Language (ASL) is the version most widely used in the United States. Other forms include Signed English, Signing Exact English, and Cued Speech.

3. External Otitis

Infection of the ear canal.

External otitis may be localized (furuncle) or diffuse; affecting the entire canal (generalized or diffuses external otitis). It is more common during the summer swimming season and is often called **swimmer's ear.**

Etiology

Diffuse external otitis may be caused by a gram-negative rod, such as *Escherichia coli*, *Pseudomonas aeruginosa,* or *Proteus vulgaris;* by *Staphylococcus aureus;* or, rarely, by a fungus. Furuncles are usually due to *S. aureus.* Certain persons (eg, those with allergies, psoriasis, eczema, or seborrheic dermatitis) are particularly prone to external otitis. Predisposing factors include getting water or various irritants (eg, hair spray, hair dye) in the ear canal and injuring the canal while cleaning it. The ear canal cleanses itself by moving desquamated epithelium, as on a conveyor belt, from the tympanic membrane outward. The patient's attempts to clean the canal with cotton applicators interrupt the self-cleansing mechanism and promote accumulation of debris by pushing it in the direction opposite the movement of the desquamated epithelium. Debris and cerumen tend to trap water allowed into the canal; the resulting skin maceration sets the stage for invasion of pathogenic bacteria.

Symptoms and Signs

Patients with diffuse external otitis complain of **itching, pain, a foul-smelling discharge, and hearing loss if the canal becomes swollen or filled with purulent debris**. Tenderness on traction of the pinna and on pressure over the tragus tends to distinguish external otitis from otitis media. The skin of the ear canal is red, swollen, and littered with moist, purulent debris.

Furuncles cause severe pain and, when draining, brief sanguineous purulent otorrhea.

Treatment

Swimmer's ear can often be prevented by irrigating the ears with a 1:1 mixture of rubbing alcohol and vinegar immediately after swimming. The alcohol helps remove water, and the vinegar alters the pH of the canal. Systemic antibiotics are seldom necessary unless there is a spreading cellulitis or other evidence of infection spreading outside the canal skin.

In **diffuse external otitis,** topical antibiotics and corticosteroids are effective. First, the infected debris is gently and thoroughly removed from the canal with suction or dry cotton wipes. A solution or suspension containing neomycin sulfate 0.5% and polymyxin B sulfate 10,000 U/mL is effective against the usual gram-negative rods. The addition of a topical corticosteroid, such as 1% hydrocortisone, reduces the swelling and allows the antibiotic to penetrate deep in the canal; 5 drops are instilled tid for 7 days. External otitis also responds to alteration of the canal's pH with topical 2% acetic acid 5 drops tid for 7 days; the addition of 1% hydrocortisone reduces swelling and enhances the effectiveness of the acetic acid. An analgesic, such as codeine 30 mg po q 4 h, is usually necessary for the first 24 to 48 h. If cellulitis is present and extends beyond the ear canal, penicillin V 500 mg po q 6 h for 7 days is indicated. If the patient is allergic to penicillin, erythromycin in the same dose can be used.

Furuncles should be allowed to drain spontaneously, because incision may lead to spreading perichondritis of the pinna. Oral antistaphylococcal antibiotics are used. Topical antibiotics are ineffective. Analgesics, such as codeine 30 mg po q 4 h, are necessary to relieve the pain. Dry heat also helps relieve pain and hastens resolution.

4. Tinnitus

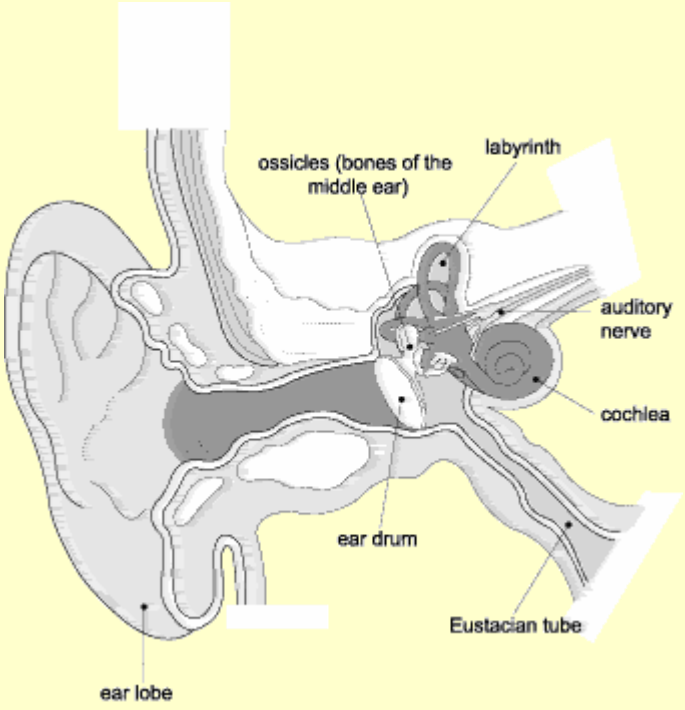
Tinnitus is the sensation of a sound in the ear or head that is not being produced by an external source. The sound can be of any pitch or type, continuous or intermittent. There are many different disorders that can produce such symptoms.

It is quite common to have mild tinnitus, and around one in five people report they are occasionally affected. Around one in 200 people has tinnitus so badly that it affects their ability to lead a normal life.

Symptoms of tinnitus

The sensation of tinnitus is the sound of high-pitched whistling or buzzing, ringing or hissing. It can also be a quite complex sound, like the roar of an ocean. The sounds may be constant or come and go.

Whatever the cause of the tinnitus, it is almost always made worse by stress, which can be physical, emotional or psychological. Some people can clearly hear the sound of their tinnitus and are able to live with it quite happily. In others, the sound is terribly annoying and can often drive them to distraction. The sound can be in one or both ears, or perceived elsewhere in the head. It is equally common in men and women and can be associated with almost any disorder of the ear.



Cross section of the ear

Causes and risk factors for tinnitus

Most tinnitus is caused by a problem with the "sensorineural" system, which is involved in transmitting signals from the inner ear to the brain. Tinnitus is often associated with hearing loss. For this reason it is more common in older people who have age-related hearing loss.

Exposure to loud noise at work may also be responsible. For instance, operators of pneumatic drills, workers in noisy factories, musicians and DJs may be at particular risk. Other possible causes of tinnitus are listed below.

Meniere's disease, which results from an increased pressure in the inner ear and also causes deafness and vertigo
otosclerosis, a condition in which the small bones of the middle ear become immobile
ear infections and inflammation
wax in the ear
otitis media with effusion (an ear infection often known as 'glue ear' in children)
acoustic neuroma, a benign (non-cancerous) tumour of the auditory nerve, which carries signals from the inner ear to the brain
high doses of drugs including aspirin, quinine and some antibiotics
anaemia
head injury
low thyroid hormone levels (hypothyroidism)
disorders of the heart and blood vessels, particularly in the head
high blood pressure
an autoimmune disorder, such as lupus (systemic lupus erythematosus)
problems with the temporomandibular joint (TMJ) - the joint between the jaws, which can also lead to pain in the head or face
an abnormality of the Eustachian tube, that can result in a wooshing sound

Diagnosis

The type of sound heard with the tinnitus does not necessarily indicate what the underlying cause might be, nor whether the cause is serious or trivial. You will be carefully examined by a specialist, usually an ENT (ear, nose and throat) surgeon or an audiological physician (doctor specialising in hearing).

He or she will take account of your symptoms and may perform a number of tests, which include hearing tests, balance tests and blood tests.

If the doctor feels that a further investigation of the inner parts of the ear is required, a magnetic resonance imaging (MRI) scan of your head may be organised.

Treatment

Any underlying disorder, such as an ear infection, acoustic neuroma or Ménière's disease, must be treated appropriately.

People with chronic tinnitus without an easily treatable cause, are encouraged not to listen for their tinnitus and aim to concentrate on other things.

If the hearing is impaired, wearing a hearing aid often helps by "masking out" the problem sound with the amplified external signal. In much the same way, special devices (that look like hearing aids) are used as part of tinnitus retraining treatment. These produce particular sounds to mask out the noise of the tinnitus which is accompanied with training to help block out the annoying aspects of tinnitus.

The psychological attitude that you have towards your tinnitus is crucial and people with a positive attitude to dealing with it tend to find it more manageable.

Depression or anxiety can make tinnitus more of a problem and treatment of these conditions may help bring some relief. A range of other treatments including dietary supplements, electromagnetic stimulation and medicines (including antiepileptics and anti-sickness drugs) have been tried, but their effectiveness has not been proven.

Complementary therapy

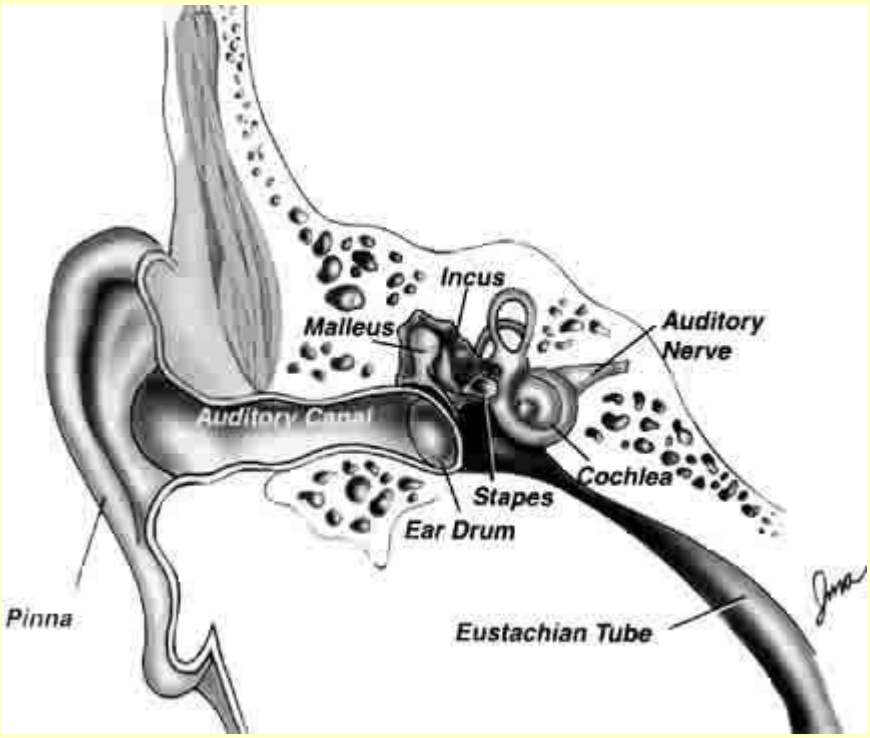
Any therapy that promotes relaxation and a sense of wellbeing may be useful in relieving tinnitus or the distress it causes. Techniques include yoga, the Alexander technique, meditation, hypnosis and acupuncture. The herbal remedy ginkgo biloba is promoted as a cure for tinnitus but good-quality scientific studies have shown it does not work any better than a placebo (dummy treatment).

5. Otitis media

What is otitis media?

Otitis media is *an infection or inflammation of the middle ear*. This inflammation often begins when infections that cause sore throats, colds, or other respiratory or breathing problems spread to the middle ear. These can be viral or bacterial infections. Seventy-five percent of children experience at least one episode of otitis media by their third birthday. Almost half of these children will have three or more ear infections during their first 3 years. It is estimated that medical costs and lost wages because of otitis media amount to $5 billion* a year in the United States. Although otitis media is primarily a disease of infants and young children, it can also affect adults.

*Gates GA. Cost-effectiveness considerations in otitis media treatment. *Otolaryngol Head Neck Sur*. April 1996. 114 (4): 525-530.



How do we hear?

The ear consists of three major parts: the outer ear, the middle ear, and the inner ear. The outer ear includes the pinna—the visible part of the ear—and the ear canal. The outer ear extends to the tympanic membrane or eardrum, which separates the outer ear from the middle ear. The middle ear is an air-filled space that is located behind the eardrum. The middle ear contains three tiny bones, the malleus, incus, and stapes, which transmit sound from the eardrum to the inner ear. The inner ear contains the hearing and balance organs. The cochlea contains the hearing organ which converts sound into electrical signals which are associated with the origin of impulses carried by nerves to the brain where their meanings are appreciated.

Why are more children affected by otitis media than adults?

There are many reasons why children are more likely to suffer from otitis media than adults. First, children have more trouble fighting infections. This is because their immune systems are still developing. Another reason has to do with the child's **eustachian tube**. The eustachian tube is a small passageway that connects the upper part of the throat to the middle ear. It is shorter and straighter in the child than in the adult. It can contribute to otitis media in several ways.+

The eustachian tube is usually closed but opens regularly to ventilate or replenish the air in the middle ear. This tube also equalizes middle ear air pressure in response to air pressure changes in the environment. However, a eustachian tube that is blocked by swelling of its lining or plugged with mucus from a cold or for some other reason cannot open to ventilate the middle ear. The lack of ventilation may allow fluid from the tissue that lines the middle ear to accumulate. If the eustachian tube remains plugged, the fluid cannot drain and begins to collect in the normally air-filled middle ear.

One more factor that makes children more susceptible to otitis media is that adenoids in children are larger than they are in adults. Adenoids are composed largely of cells (lymphocytes) that help fight infections. They are positioned in the back of the upper part of the throat near the eustachian tubes. Enlarged adenoids can, because of their size, interfere with the eustachian tube opening. In addition, adenoids may themselves become infected, and the infection may spread into the eustachian tubes.

Bacteria reach the middle ear through the lining or the passageway of the eustachian tube and can then produce infection, which causes swelling of the lining of the middle ear, blocking of the eustachian tube, and migration of white cells from the bloodstream to help fight the infection. In this process the white cells accumulate, often killing bacteria and dying themselves, leading to the formation of pus, a thick yellowish-white fluid in the middle ear. As the fluid increases, the child may have trouble hearing because the eardrum and middle ear bones are unable to move as freely as they should. As the infection worsens, many children also experience severe ear pain. Too much fluid in the ear can put pressure on the eardrum and eventually tear it.

What are the effects of otitis media?

Otitis media not only causes severe pain but may result in serious complications if it is not treated. An untreated infection can travel from the middle ear to the nearby parts of the head, including the brain. Although the hearing loss caused by otitis media is usually temporary, untreated otitis media may lead to permanent hearing impairment. Persistent fluid in the middle ear and chronic otitis media can reduce a child's hearing at a time that is critical for speech and language development. Children who have early hearing impairment from frequent ear infections are likely to have speech and language disabilities.

How can someone tell if a child has otitis media?

Otitis media is often difficult to detect because most children affected by this disorder do not yet have sufficient speech and language skills to tell someone what is bothering them. Common signs to look for are

unusual irritability
difficulty sleeping
tugging or pulling at one or both ears
fever
fluid draining from the ear
loss of balance
unresponsiveness to quiet sounds or other signs of hearing difficulty such as sitting too close to the television or being inattentive

Can anything be done to prevent otitis media?

Specific prevention strategies applicable to all infants and children such as immunization against viral respiratory infections or specifically against the bacteria that cause otitis media are not currently available. Nevertheless, it is known that children who are cared for in group settings, as well as children who live with adults who smoke cigarettes, have more ear infections. Therefore, a child who

is prone to otitis media should avoid contact with sick playmates and environmental tobacco smoke. Infants who nurse from a bottle while lying down also appear to develop otitis media more frequently. Children who have been breast-fed often have fewer episodes of otitis media. Research has shown that cold and allergy medications such as antihistamines and decongestants are not helpful in preventing ear infections. The best hope for avoiding ear infections is the development of vaccines against the bacteria that most often cause otitis media. Scientists are currently developing vaccines that show promise in preventing otitis media. Additional clinical research must be completed to ensure their effectiveness and safety.

How does a child's physician diagnose otitis media?

The simplest way to detect an active infection in the middle ear is to look in the child's ear with an otoscope, a lightinstrument that allows the physician to examine the outer earand the eardrum. Inflammation of the eardrum indicates aninfection. There are several ways that a physician checks for middle ear fluid. The use of a special type of otoscopecalled a pneumatic otoscope allows the physician to blow a puff of air onto the eardrum to test eardrum movement. (An eardrum with fluid behind it does not move as well as an eardrum with air behind it.)

A useful test of middle ear function is called tympanometry. This test requires insertion of a small soft plug into the opening of the child's ear canal. The plug contains a speaker, a microphone, and a device that is able to change the air pressure in the ear canal, allowing for several measures of the middle ear. The child feels air pressure changes in the ear or hears a few brief tones. While this test provides information on the condition of the middle ear, it does not determine how well the child hears. A physician may suggest a hearing test for a child who has frequent ear infections to determine the extent of hearing loss. The hearing test is usually performed by an audiologist, a person who is specially trained to measure hearing.

How is otitis media treated?

Many physicians recommend the use of an antibiotic (a drug that kills bacteria) when there is an active middle ear infection. If a child is experiencing pain, the physician may also recommend a pain reliever. Following the physician's instructions is very important. Once started, the antibiotic should be taken until it is finished. Most physicians will have the child return for a followup examination to see if the infection has cleared.

Unfortunately, there are many bacteria that can cause otitis media, and some have become resistant to some antibiotics. This happens when antibiotics are given for coughs, colds, flu, or viral infections where antibiotic treatment is not useful. When bacteria become resistant to antibiotics, those treatments are then less effective against infections. This means that several different antibiotics may have to be tried before an ear infection clears. Antibiotics may also produce unwanted side effects such as nausea, diarrhea, and rashes.**

Once the infection clears, fluid may remain in the middle ear for several months. Middle ear fluid that is not infected often disappears after 3 to 6 weeks. Neither antihistamines nor decongestants are recommended as helpful in the treatment of otitis media at any stage in the disease process. Sometimes physicians will treat the child with an antibiotic to hasten the elimination of the fluid. If the fluid persists for more than 3 months and is associated with a loss of hearing, many physicians

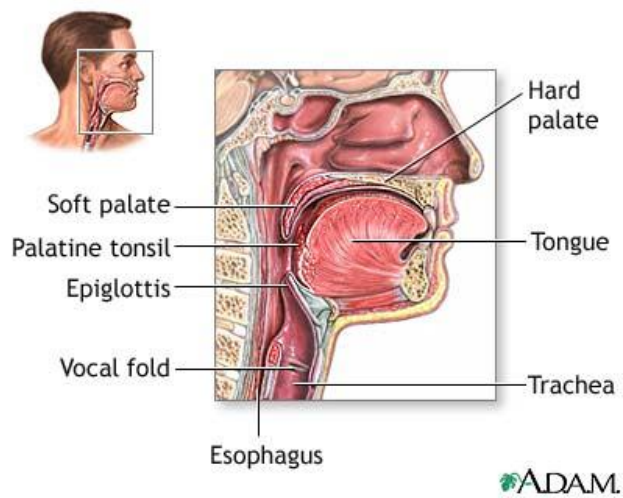
suggest the insertion of "tubes" in the affected ears. This operation, called a myringotomy, can usually be done on an outpatient basis by a surgeon, who is usually an otolaryngologist (a physician who specializes in the ears, nose, and throat). While the child is asleep under general anesthesia, the surgeon makes a small opening in the child's eardrum. A small metal or plastic tube is placed into the opening in the eardrum. The tube ventilates the middle ear and helps keep the air pressure in the middle ear equal to the air pressure in the environment. The tube normally stays in the eardrum for 6 to 12 months, after which time it usually comes out spontaneously. If a child has enlarged or infected adenoids, the surgeon may recommend removal of the adenoids at the same time the ear tubes are inserted. Removal of the adenoids has been shown to reduce episodes of otitis media in some children, but not those who are under 4 years of age. Research, however, has shown that removal of a child's tonsils does not reduce occurrences of otitis media. Tonsillotomy and adenoidectomy may be appropriate for reasons other than middle ear fluid.

Hearing should be fully restored once the fluid is removed. Some children may need to have the operation again if the otitis media returns after the tubes come out. While the tubes are in place, water should be kept out of the ears. Many physicians recommend that a child with tubes wear special ear plugs while swimming or bathing so that water does not enter the middle ear.

What research is being done on otitis media?

Several avenues of research are being explored to further improve the prevention, diagnosis, and treatment of otitismedia. For example, research is better defining those children who are at high risk for developing otitis media and conditions that predispose certain individuals to middle ear infections. Emphasis is being placed on discovering the reasons why some children have more ear infections than other children. The effects of otitis media on children's speech and language development are important areas of study, as is research to develop more accurate methods to help physicians detect middle ear infections. How the defense molecules and cells involved with immunity respond to bacteria and viruses that often lead to otitis media is also under investigation. Scientists are evaluating the success of certain drugs currently being used for the treatment of otitis media and are examining new drugs that may be more effective, easier to administer, and better at preventing new infections. Most important, research is leading to the availability of vaccines that will prevent otitis media.

6. Laryngitis



Overview, Causes, & Risk Factors

The voice box (larynx) is located at the top of the airway to the lungs (windpipe, trachea) and contains the vocal cords. When the vocal cords become inflamed or infected, they swell. This can cause hoarseness, and may occasionally cause obstruction of the airway.

The most common form of laryngitis is an infectious illness usually caused by a virus which results in hoarseness. It may also be part of a bacterial infection or part of a common cold, bronchitis, flu, or pneumonia.

Laryngitis often follows or occurs during an upper respiratory infection and is a self-limiting condition (it goes away by itself). Common laryngitis is not normally associated with any breathing difficulty (respiratory distress).

Several forms of laryngitis occur in children and can lead to significant or fatal respiratory obstruction. These are croup and epiglottitis (discussed under their respective headings).

Other causes of laryngitis include allergies and trauma.

Symptoms & Signs

- Recent or current upper respiratory infection
- Hoarseness
- Fever
- Swollen lymph nodes or glands in the neck

Prevention

Avoidance of upper respiratory infections during cold and flu season may help. Using good hygienic practices such as hand washing, avoiding people with infectious respiratory illnesses, and avoiding crowded, close quarters (theaters and so on) may also help.

Smoking cessation can help prevent malignancies of the head and neck, and of the lungs, which may lead to laryngitis.

Diagnosis & Tests

Physical examination is usually all that is necessary for the patient with self-limiting hoarseness associated with a respiratory tract infection.

Patients (particularly smokers) with persistent hoarseness will need to see an otolaryngologist (ear, nose, and throat doctor) for tests of the throat and upper airway.

Treatment

Since most common laryngitis is viral, treatment with antibiotics is generally not indicated. Your health care provider will make this decision.

Voice rest helps both the voice and to reduce inflammation of the vocal cords. A humidifier may provide comfort for the scratchy feeling sometimes associated with laryngitis. Decongestants and pain killers may relieve symptoms of an accompanying upper respiratory infection.

Prognosis (Expectations)

Full recovery is expected in uncomplicated laryngitis.

7. Pharyngitis

Acute inflammation of the pharynx.

Although usually viral in origin, pharyngitis may be due to a group A β-hemolytic streptococcus, *Mycoplasma pneumoniae, Chlamydia pneumoniae,* or other bacteria. It is characterized by sore throat and pain when swallowing.

Differentiating viral from bacterial pharyngitis on the basis of physical examination alone is difficult. In both, the pharyngeal mucous membrane may be mildly injected or severely inflamed and may be covered by a membrane and a purulent exudate. Fever, cervical adenopathy, and leukocytosis are present in both viral and streptococcal pharyngitis but may be more marked in the latter.

Treatment

Treatment includes acetaminophen to relieve discomfort and rest. In patients with clinical evidence suggesting bacterial infection, antibiotic therapy is usually administered while awaiting results of cultures for group A β-hemolytic streptococcus. Penicillin V 250 mg po q 6 h for 10 days is indicated for group A streptococcal pharyngitis, primarily to prevent rheumatic fever. Alternatively, parenteral penicillin G benzathine, oral erythromycin, or a first-generation cephalosporin may be used.

8. Tonsillitis

*Acute inflammation of the **palatine tonsils**, usually due to **streptococcal** or, less commonly, to viral infection.*

Epidemics of viral tonsillitis occur among military recruits. Tonsillitis is characterized by sore throat and pain, most marked when swallowing and often referred to the ears. Very young children may not complain of sore throat, but they refuse to eat. **High fever, malaise, headache, and vomiting** are common.

Diagnosis

The tonsils are edematous and hyperemic. There may be a **purulent exudate** from the crypts and a membrane--white, thin, nonconfluent, and confined to the tonsil--that peels away without bleeding. Differential diagnosis includes **diphtheria**, Vincent's angina (trench mouth), and infectious mononucleosis. In diphtheria, the membrane is dirty gray, thick, and tough; it bleeds if peeled away, and smear and culture show *Corynebacterium diphtheriae*. Vincent's angina, characterized by superficial, painful ulcers with erythematous borders, is caused by a fusiform bacillus and a spirochete that are demonstrable on smear. Inflamed tonsils in infectious mononucleosis are characteristically associated with micropetechiae of the soft palate; atypical lymphocytes on smear and a positive monospot test confirm the diagnosis of mononucleosis.

Treatment

For viral tonsillitis, symptomatic therapy is the same as that for pharyngitis (see above). Penicillin V 250 mg po q 6 h or, for children < 6 yr, penicillin V 125 mg po q 8 h is the treatment of choice for streptococcal tonsillitis and should be continued for 10 days. If possible, another throat culture should be performed 5 to 6 days later. Throat cultures of family members should be performed initially so that carriers may be treated at the same time. Tonsillectomy should be considered if acute tonsillitis returns repeatedly after adequate treatment or if chronic tonsillitis and sore throat are relieved only temporarily by antibiotic therapy.

9. Globus Sensation ("Lump in the Throat"; Globus Hystericus; Plum pit)

The subjective sensation of a lump or mass in the throat.

No specific etiology or physiologic mechanism has been established. Some studies suggest that elevated cricopharyngeal (upper esophageal sphincter) pressures or abnormal hypopharyngeal motility exists during the time of symptoms. The sensation may result from GERD or from frequent swallowing and drying of the throat associated with anxiety or other emotional states. Although not associated with a specific psychiatric disorder or stress factors, globus may be a symptom of certain mood states (eg, grief, pride, happiness from mastery of hardship), and some persons may have an inherent or learned predisposition to respond in this manner. Suppression of sadness is most often implicated.

Symptoms

Symptoms resemble the normal reaction of being "choked up." With globus, symptoms do not worsen during swallowing, food does not stick in the throat, and eating or drinking often provides relief. There is no pain or weight loss. Chronic symptoms may occur during unresolved or pathologic grief and may be relieved by crying.

Diagnosis

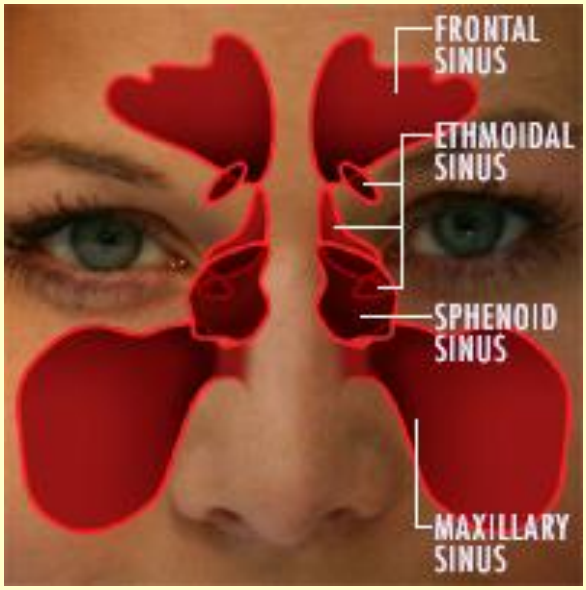
A careful history and physical examination usually exclude disorders that can be confused with globus sensation, including cricopharyngeal (upper esophageal) webs, symptomatic diffuse esophageal spasm, GERD, skeletal muscle disorders (myasthenia gravis, myotonia dystrophica, polymyositis), or mass lesions in the neck or mediastinum causing esophageal compression. True dysphagia must be ruled out, for it suggests a structural or motor disorder of the pharynx or esophagus.

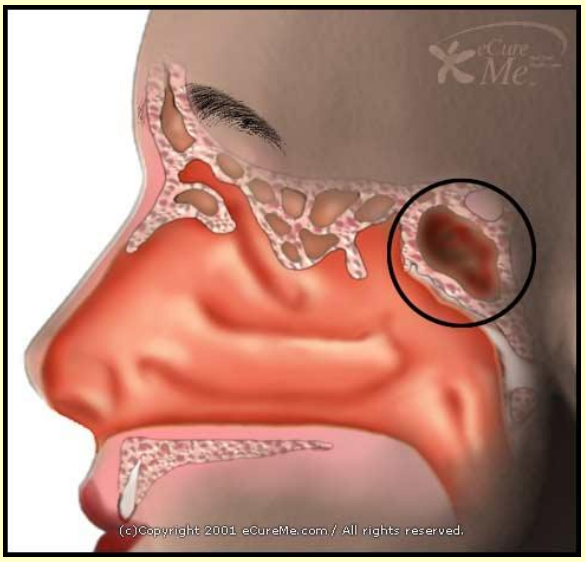
If psychosocial factors have been elicited and the physical examination is negative, a diagnosis of globus is probable; if the diagnosis is still in doubt, a CBC, plain or video-esophagogram, chest x-ray, and esophageal manometry as indicated by the clinical data may exclude other disorders.

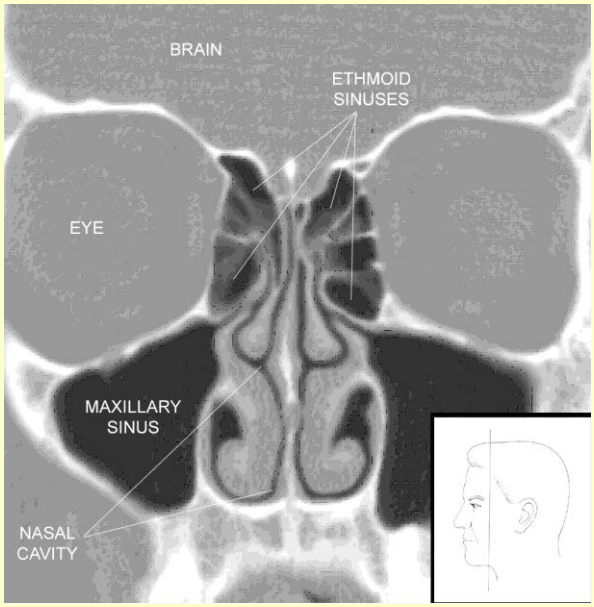
Treatment

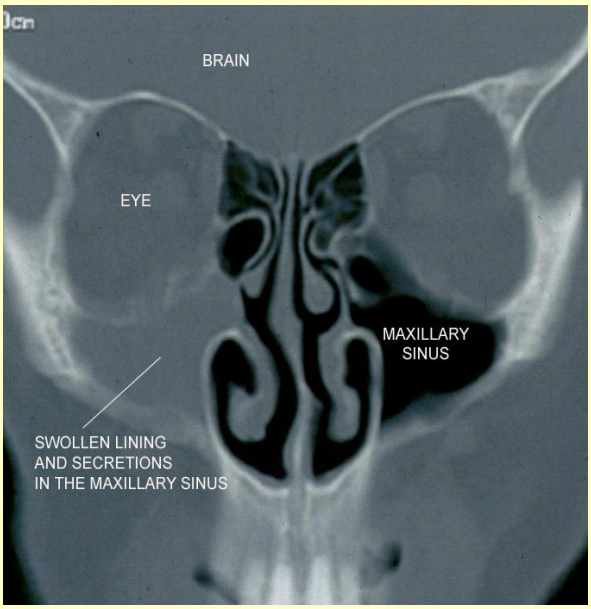
Treatment involves reassurance and sympathetic concern. **No drug is of proven benefit.** Underlying depression, anxiety, or other behavioral disturbances should be managed supportively, with **psychiatric referral** if necessary. At times, communicating to the patient the association between his or her symptoms and mood state can be beneficial.

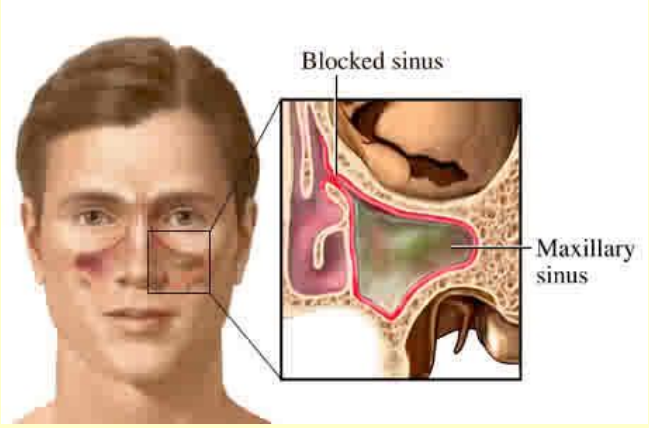
10. Sinusitis











*Inflammation of the **paranasal sinuses** due to viral, bacterial, or fungal infections or allergic reactions.*

Acute sinusitis is caused by streptococci, pneumococci, *Haemophilus influenzae*, or staphylococci and is usually precipitated by an acute viral respiratory tract infection. Chronic sinusitis may be exacerbated by a **gram-negative rod** or **anaerobic microorganisms**. In a minority of cases, chronic **maxillary sinusitis** is secondary to dental infection.

In a URI, the swollen nasal mucous membrane obstructs the ostium of a paranasal sinus, and the O_2 in the sinus is absorbed into the blood vessels of the mucous membrane. The resulting relative negative pressure in the sinus (vacuum sinusitis) is painful. If the vacuum is maintained, a transudate from the mucous membrane develops and fills the sinus; the transudate serves as a medium for bacteria that enter the sinus through the ostium or via a spreading cellulitis or thrombophlebitis in the lamina propria of the mucous membrane. An outpouring of serum and leukocytes to combat the infection results, and painful positive pressure develops in the obstructed sinus. The mucous membrane becomes hyperemic and edematous.

Symptoms, Signs, and Diagnosis

Acute sinusitis and chronic sinusitis produce similar symptoms and signs. The area over the affected sinus may be tender and swollen. **Maxillary sinusitis** causes pain in the maxillary area, toothache, and frontal headache. **Frontal sinusitis** produces pain in the frontal area and frontal headache. **Ethmoid sinusitis** causes pain behind and between the eyes and a frontal headache often described as splitting. Pain from **sphenoid sinusitis** is less well localized and is referred to the frontal or occipital area. Malaise may be present. Fever and chills suggest an extension of the infection beyond the sinuses.

The nasal mucous membrane is red and **turgescent**; yellow or green purulent rhinorrhea may be present. **Seropurulent or mucopurulent exudate** may be seen in the **middle meatus** with maxillary, anterior ethmoid, or frontal sinusitis and in the area medial to the middle turbinate with posterior ethmoid or sphenoid sinusitis.

In acute and chronic sinusitis, the swollen mucous membrane and retained exudate cause the affected sinus to appear opaque on x-rays. CT provides better definition of the extent and degree of sinusitis. X-rays of the apices of the teeth may be required in chronic maxillary sinusitis to exclude a periapical abscess.

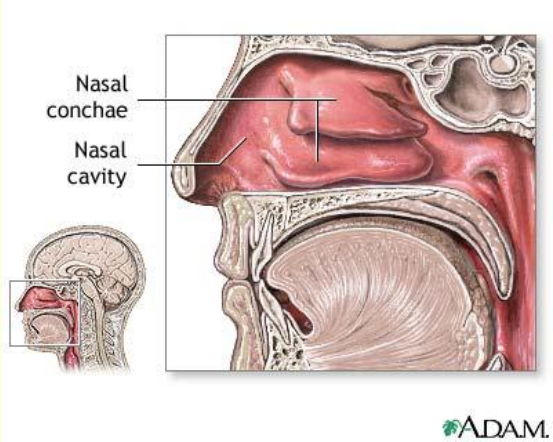
Treatment

In acute sinusitis, improved drainage and control of infection are the aims of therapy. Steam inhalation effectively produces nasal vasoconstriction and promotes drainage. Saline nasal washes may promote drainage. Topical vasoconstrictors, such as phenylephrine 0.25% spray q 3 h, are effective but should be used for a maximum of 7 days; systemic vasoconstrictors, such as pseudoephedrine 30 mg po (for adults) q 4 to 6 h, are less effective.

In acute and chronic sinusitis, antibiotics should be given for at least 10 to 12 days. In acute sinusitis, penicillin V 250 mg po q 6 h is the initial antibiotic of choice, and erythromycin 250 mg po q 6 h is the second choice. In exacerbations of chronic sinusitis, a broad-spectrum antibiotic, such as ampicillin 250 or 500 mg or tetracycline 250 mg po q 6 h, is better. In chronic sinusitis,

prolonged antibiotic therapy for 4 to 6 wk often results in complete resolution. The sensitivities of pathogens isolated from the sinus exudate and the patient's response guide subsequent therapy. Sinusitis not responsive to antibiotic therapy may require an operation (maxillary sinusotomy, ethmoidectomy, or sphenoid sinusotomy) to improve ventilation and drainage and to remove inspissated mucopurulent material, epithelial debris, and hypertrophic mucous membrane. These operations are usually performed intranasally with the aid of an endoscope (functional endoscopic sinus surgery). Chronic frontal sinusitis is managed with osteoplastic obliteration of the frontal sinuses but may be treated endoscopically in selected patients.

11. Epistaxis (Nosebleed)



Epistaxis occurs secondary to local infections, such as vestibulitis, rhinitis, and sinusitis; systemic infections, such as scarlet fever, malaria, and typhoid fever; drying of the nasal mucous membrane; trauma (digital, as in picking the nose, or blunt, as in nasal fractures); arteriosclerosis; hypertension; a tumor in a paranasal sinus or the nasopharynx; septal perforations; and bleeding tendencies associated with aplastic anemia, leukemia, thrombocytopenia, liver disease, hereditary coagulopathies, and the Rendu-Osler-Weber syndrome.

Treatment

Most nasal bleeding originates from a plexus of vessels in the anteroinferior septum (Kiesselbach's area). *Bleeding may be controlled by pinching the nasal alae together for 5 to 10 min.* If this maneuver fails, the bleeding site must be found. Bleeding can be controlled temporarily by applying pressure with a cotton pledget impregnated with a vasoconstrictor, such as phenylephrine 0.25%, and a topical anesthetic, such as lidocaine 2%, until the site is anesthetized. The bleeding point may be cauterized, using electrocautery or silver nitrate in a 75% applicator bead, which may control bleeding without burning mucous membranes too deeply.

For epistaxis due to a bleeding tendency, petrolatum gauze is used to apply pressure as atraumatically as possible to the bleeding point. Cautery is not used because the periphery of a cauterized area might begin to bleed. The bleeding disorder should be identified and corrected, if possible.

In arteriosclerosis and hypertension, bleeding likely occur far posterior in the inferior meatus and may be difficult to control. Ligating the internal maxillary artery and its branches or packing the posterior part of the nasal cavity is required to control the bleeding. The arteries may be ligated with clips using microscopic guidance and a surgical approach through the maxillary sinus. A postnasal pack is placed in the posterior part of the nasal cavity to obstruct the choana. The pack consists of 4-in gauze squares folded, rolled, and tied into a tight bundle with two strands of heavy silk suture. The ends of one suture are tied to a catheter that has been introduced through the nasal cavity on the side of the bleeding and brought out through the mouth. As the catheter is withdrawn from the nose, the postnasal pack is placed behind the soft palate in the nasopharynx. The second suture is trimmed below the level of the soft palate so that it can be used to remove the pack. (Alternatively, the balloon of a Foley catheter may be inflated in the nasopharynx to obstruct the choana.) The nasal cavity, particularly the posterior part of the inferior meatus, is firmly packed with petrolatum gauze, and the first suture is tied over a roll of gauze at the anterior nares to secure the postnasal pack. The packing remains in place for 4 days. An antibiotic is given to prevent sinusitis and otitis media. Optimally, the choice of an antibiotic is based on knowledge of locally prevalent patterns of bacteria and antibiotic-resistant strains. Postnasal packing lowers the arterial PO_2, and supplementary O_2 should be given while the packing is in place.

In the Rendu-Osler-Weber syndrome, multiple severe nosebleeds may result from arteriovenous aneurysms in the mucous membrane, causing severe and persistent anemia that is not easily corrected with administration of iron. A split-thickness skin graft (septal dermatoplasty) reduces the number of nosebleeds and allows the anemia to be corrected.

Severe epistaxis is often caused by liver disease. Blood may be swallowed in large amounts and should be eliminated as promptly as possible with enemas and cathartics; the GI tract should be sterilized with nonabsorbable antibiotics (eg, neomycin 1 g po qid) to prevent the breakdown of blood and the absorption of ammonia.

Need for blood replacement is determined by the Hb level, vital signs, and central venous pressure.

12. Rhinitis

Rhinitis is inflammation and swelling of the mucous membrane of the nose, characterized by a runny nose and stuffiness and usually caused by the common cold or an allergy.

The nose is the most commonly infected part of the upper airways. Rhinitis may be acute (short-lived) or chronic (long-standing). Acute rhinitis commonly results from viral infections but may also be a result of allergies or other causes. Chronic rhinitis usually occurs with chronic sinusitis (chronic **rhinosinusitis**).

Viral Rhinitis Acute viral rhinitis (the common cold) can be caused by a variety of viruses. Symptoms consist of runny nose, congestion, post-nasal drip, cough, and a low-grade fever. Stuffiness can be relieved by taking phenylephrine as a nasal spray or pseudoephedrine by mouth. These drugs, available over the counter, cause the blood vessels of the nasal mucous membrane to narrow (constrict). Nasal sprays should be used for only 3 or 4 days because after that period of time, when the effects of the drugs wear off, the mucous membrane often swells even more than

before. This phenomenon is called rebound congestion. Antihistamines help control runny nose but cause drowsiness and other problems, especially in older people. Antibiotics are not effective for acute viral rhinitis.

Allergic Rhinitis Allergic rhinitis is caused by a reaction of the body's immune system to an environmental trigger. The most common environmental triggers include dust, molds, pollens, grasses, trees, and animals. Symptoms include sneezing, runny nose, stuffiness, and itchy, watery eyes. A doctor may diagnose allergic rhinitis based on a person's history of symptoms. Often, the person has a family history of allergies. More detailed information may be obtained using blood tests or skin testing.

Avoiding the substance that triggers the allergy prevents symptoms but is often not possible. Nasal corticosteroid sprays decrease nasal inflammation caused by many sources and are relatively safe for long-term use. Antihistamines help prevent the allergic reaction and thus symptoms. Antihistamines dry the mucous membrane of the nose but many of them also cause sleepiness and other problems, especially in older people. Newer ones require a prescription but do not have these side effects. Allergy shots (desensitization) help to build long-term tolerance to specific environmental triggers, but they may take months or years to become fully effective. Antibiotics do not relieve the symptoms of allergic rhinitis.

Atrophic Rhinitis Atrophic rhinitis is a form of chronic rhinitis in which the mucous membrane thins (atrophies) and hardens, causing the nasal passages to widen (dilate) and dry out. The cells normally found in the mucous membrane of the nose—cells that secrete mucus and have hairlike projections to move dirt particles out—are replaced by cells like those normally found in the skin. The disorder can develop in someone who had sinus surgery in which a significant amount of intranasal structures and mucous membranes were removed. A prolonged bacterial infection of the lining of the nose is also a factor.

Crusts form inside the nose, and an offensive odor develops. A person may have recurring severe nosebleeds and can lose his sense of smell (anosmia).

Treatment is aimed at reducing the crusting, eliminating the odor, and reducing infections. Topical antibiotics, such as bacitracin applied inside the nose, kill bacteria. Estrogens and vitamins A and D sprayed into the nose or taken by mouth may reduce crusting by promoting mucosal secretions. Other antibiotics, given by mouth or intravenously, may also be helpful. Surgery to narrow the nasal passages may reduce crusting because the decreased airflow prevents drying of the thinned mucous membrane.

Vasomotor Rhinitis Vasomotor rhinitis is a form of chronic rhinitis. Nasal stuffiness, sneezing, and a runny nose—common allergic symptoms—occur when allergies do not appear to be present. In some people, the nose reacts strongly to irritants (such as dust and pollen), perfumes, and pollution. The disorder comes and goes but is worsened by dry air. The swollen mucous membrane varies from bright red to purple. Sometimes, people also have slight inflammation of the sinuses. When persistent, endoscopy of the nose or computed tomography (CT) of the sinuses may be needed. If inflammation of the sinus is not significant, treatment is aimed at relieving symptoms. Avoiding

smoke and irritants and using a humidified central heating system or vaporizer to increase humidity may be beneficial.

13. Hysterical aphonia

Conversion disorder

Definition

Conversion disorder is defined by ***Diagnostic and Statistical Manual of Mental Disorders***, 4th Edition, Text Revision, also known as the *DSM-IV-TR*, as a mental disorder whose central feature is the appearance of symptoms affecting the patient's senses or voluntary movements that suggest a neurological or general medical disease or condition. Somatoform disorders are marked by persistent physical symptoms that cannot be fully explained by a medical condition, substance abuse, or other mental disorder, and seem to stem from psychological issues or conflicts. The *DSM-IV-TR* classifies conversion disorder as one of the somatoform disorders, first classified as a group of mental disorders by the *DSM III* in 1980. Other terms that are sometimes used for conversion disorder include pseudoneurologic syndrome, hysterical **neurosis**, and psychogenic disorder.

Conversion disorder is a major reason for visits to primary care practitioners. One study of health care utilization estimates that 25–72% of office visits to primary care doctors are involved in psychological distress that takes the form of somatic (physical) symptoms. Another study estimates that at least 10% of all medical treatments and diagnostic services are ordered for patients with no evidence of organic disease. Conversion disorder carries a high economic price tag. Patients who convert their emotional problems into physical symptoms spend nine times as much for health care as people who do not somatosize; and 82% of adults with conversion disorder stop working because of their symptoms. The annual bill for conversion disorder in the United States comes to $20 billion, not counting absenteeism from work and disability payments.

Description

Conversion disorder has a complicated history that helps to explain the number of different names for it. Two eminent neurologists of the nineteenth century, Jean-Martin Charcot in Paris and Josef Breuer in Vienna were investigating what was then called hysteria, a disorder primarily affecting women (the term "hysteria" comes from the Greek word for uterus or womb). Women diagnosed with hysteria had frequent emotional outbursts and a variety of neurologic symptoms, including paralysis, fainting spells, convulsions, and temporary loss of sight or hearing. Pierre Janet (one of Charcot's students), and Breuer independently came to the same conclusion about the cause of hysteria—that it resulted from psychological trauma. Janet, in fact, coined the term "dissociation" to describe the altered state of consciousness experienced by many patients who were diagnosed with hysteria.

The next stage in the study of conversion disorder was research into the causes of "combat neurosis" in World War I (1914-1918) and World War II (1939-1945). Many of the symptoms observed in "shell-shocked" soldiers were identical to those of "hysterical" women. Two of the

techniques still used in the treatment of conversion disorder—**hypnosis** and **narcotherapy** —were introduced as therapies for combat veterans. The various terms used by successive editions of the *DSM* and the *ICD* (the European equivalent of *DSM*) for conversion disorder reflect its association with hysteria and dissociation. The first edition of the *DSM* (1952) used the term "conversion reaction." *DSM-II* (1968) called the disorder "hysterical neurosis (conversion type)," *DSM-III* (1980), *DSM-III-R* (1987), and *DSM-IV* (1994) have all used the term "conversion disorder." ICD-10 refers to it as "**dissociative (conversion) disorder**."

DSM-IV-TR (2000) specifies six criteria for the **diagnosis** of conversion disorder. They are:

- The patient has one or more symptoms or deficits affecting the senses or voluntary movement that suggest a neurological or general medical disorder.
- The onset or worsening of the symptoms was preceded by conflicts or stressors in the patient's life.
- The symptom is not faked or produced intentionally.
- The symptom cannot be fully explained as the result of a general medical disorder, substance intake, or a behavior related to the patient's culture.
- The symptom is severe enough to interfere with the patient's schooling, employment, or social relationships, or is serious enough to require a medical evaluation.
- The symptom is not limited to pain or sexual dysfunction, does not occur only in the context of **somatization disorder**, and is not better accounted for by another mental disorder.

DSM-IV lists four subtypes of conversion disorder: conversion disorder with motor symptom or deficit; with sensory symptom or deficit; with **seizures** or convulsions; and with mixed presentation.

Although conversion disorder is most commonly found in individuals, it sometimes occurs in groups. One such instance occurred in 1997 in a group of three young men and six adolescent women of the Embera, an indigenous tribe in Colombia. The young people believed that they had been put under a spell or curse, and developed dissociative symptoms that were not helped by antipsychotic medications or traditional herbal remedies. They were cured when shamans from their ethnic group came to visit them. The episode was attributed to psychological **stress** resulting from rapid cultural change.

Another example of group conversion disorder occurred in Iran in 1992. Ten girls out of a classroom of 26 became unable to walk or move normally following tetanus inoculations. Although the local physicians were able to treat the girls successfully, public health programs to immunize people against tetanus suffered an immediate negative impact. One explanation of group conversion disorder is that an individual who is susceptible to the disorder is typically more affected by suggestion and easier to hypnotize than the average person.

Causes

The immediate cause of conversion disorder is a stressful event or situation that leads the patient to develop bodily symptoms as symbolic expressions of a long-standing psychological conflict or

problem. One psychiatrist has defined the symptoms as "a code that conceals the message from the sender as well as from the receiver."

Two terms that are used in connection with the causes of conversion disorder are primary gain and secondary gain. Primary gain refers to the lessening of the anxiety and communication of the unconscious wish that the patient derives from the symptom(s). Secondary gain refers to the interference with daily tasks, removal from the uncomfortable situation or increased attention from significant others that the patient obtains as a result of the symptom(s).

Physical, emotional, or sexual abuse can be a contributing cause of conversion disorder in both adults and children. In a study of 34 children who developed pseudoseizures, 32% had a history of depression or sexual abuse, and 44% had recently experienced a parental divorce, death, or violent quarrel. In the adult population, conversion disorder may be associated with mobbing, a term that originated among European psychiatrists and industrial psychologists to describe psychological abuse in the workplace. One American woman who quit her job because of mobbing was unable to walk for several months. Adult males sometimes develop conversion disorder during military basic training. Conversion disorder may also develop in adults as a long-delayed after-effect of childhood abuse. A team of surgeons reported on the case of a patient who went into a psychogenic coma following a throat operation. The surgeons found that she had been repeatedly raped as a child by her father, who stifled her cries by smothering her with a pillow.

Symptoms

In general, symptoms of conversion disorder are not under the patient's conscious control, and are frequently mysterious and frightening to the patient. The symptoms usually have an acute onset, but sometimes worsen gradually.

The most frequent forms of conversion disorder in Western countries include:

- **Pseudoparalysis**. In pseudoparalysis, the patient loses the use of half of his/her body or of a single limb. The weakness does not follow anatomical patterns and is often inconsistent upon repeat examination.
- **Pseudosensory syndromes**. Patients with these syndromes often complain of numbness or lack of sensation in various parts of their bodies. The loss of sensation typically follows the patient's notion of their anatomy, rather than known characteristics of the human nervous system.
- **Pseudoseizures.** These are the most difficult symptoms of conversion disorder to distinguish from their organic equivalents. Between 5% and 35% of patients with pseudoseizures also have epilepsy. Electroencephalograms (EEGs) or measurement of serum prolactin levels, are useful in distinguishing pseudoseizures from epileptic seizures.
- **Pseudocoma.** Pseudocoma is also difficult to diagnose. Because true coma may indicate a life-threatening condition, patients must be given standard treatments for coma until the diagnosis can be established.
- **Psychogenic movement disorders**. These can mimic myoclonus, parkinsonism, dystonia, dyskinesia, and tremor. Doctors sometimes give patients with suspected psychogenic

movement disorders a placebo medication to determine whether the movements are psychogenic or the result of an organic disorder.

- **Pseudoblindness.** Pseudoblindness is one of the most common forms of conversion disorder related to vision. Placing a mirror in front of the patient and tilting it from side to side can often be used to determine pseudoblindness, because humans tend to follow the reflection of their eyes.
- **Pseudodiplopia**. Pseudodiplopia, or seeing double, can usually be diagnosed by examining the patient's eyes.
- **Pseudoptosis.** Ptosis, or drooping of the upper eyelid, is a common symptom of myasthenia gravis and a few other disorders. Some people can cause their eyelids to droop voluntarily with practice. The diagnosis can be made on the basis of the eyebrow; in true ptosis, the eyebrows are lifted, whereas in pseudoptosis they are lowered.
- **Hysterical aphonia.** Aphonia refers to loss of the ability to produce sounds. In hysterical aphonia, the patient's cough and whisper are normal, and examination of the throat reveals normal movement of the vocal cords.

Psychiatrists working in various parts of the Middle East and Asia report that the symptoms of conversion disorder as listed by *DSM-IV* and ICD-10 do not fit well with the symptoms of the disorder most frequently encountered in their patient populations.

Demographics

The lifetime prevalence rates of conversion disorder in the general U.S. population are estimated to fall between **11 and 300 per 100,000 people**. The differences in the estimates reflect differences in the method of diagnosis as well as some regional population differences. In terms of clinical populations, conversion disorder is diagnosed in 5%–14% of general hospital patients; 1%–3% of outpatient referrals to psychiatrists; and 5%–25% of psychiatric outpatients.

Among adults, women diagnosed with conversion disorder outnumber men by a 2:1 to 10:1 ratio; among children, however, the gender ratio is closer to 1:1. Less educated people and those of lower socioeconomic status are more likely to develop conversion disorder; race by itself does not appear to be a factor. There is, however, a major difference between the populations of developing and developed countries; in developing countries, the prevalence of conversion disorder may run as high as 31%.

Diagnosis

Conversion disorder is one of the few mental disorders that appear to be overdiagnosed, particularly in emergency departments. There are numerous instances of serious neurologic illness that were initially misdiagnosed as conversion disorder. Newer techniques of diagnostic imaging have helped to lower the rate of medical errors.

Diagnostic issues

Diagnosis of conversion disorder is complicated by its coexistence with physical illness in as many as 60% of patients. Alternatively explained, a diagnosis of conversion disorder does not exclude the

possibility of a concurrent organic disease. The examining doctor will usually order a mental health evaluation when conversion disorder is suspected, as well as x rays, other **imaging studies**that may be useful, and appropriate laboratory tests. The doctor will also take a thorough patient history that will include the presence of recent stressors in the patient's life, as well as a history of abuse. Children and adolescents are usually asked about their school experiences; one question they are asked is whether a recent change of school or an experience related to school may have intensified academic pressure.

In addition, there are a number of bedside tests that doctors can use to distinguish between symptoms of conversion disorder and symptoms caused by physical diseases. These may include the drop test, in which a "paralyzed" arm is dropped over the patient's face. In conversion disorder, the arm will not strike the face. Other tests include applying a mildly painful stimulus to a "weak" or "numb" part of the body. The patient's pulse rate will typically rise in cases of conversion disorder, and he or she will usually pull back the limb that is being touched.

Factors suggesting a diagnosis of conversion disorder

The doctor can also use a list of factors known to be associated with conversion disorder to assess the likelihood that a specific patient may have the disorder:

- **Age**. Conversion disorder is rarely seen in children younger than six years or adults over 35 years.
- **Sex.** The female to male ratio for the disorder ranges between 2:1 and 10:1. It is thought that higher rates of conversion disorder in women may reflect the greater vulnerability of females to abuse.
- **Residence.** People who live in rural areas are more likely to develop conversion disorder than those who live in cities.
- **Level of education.** Conversion disorder occurs less often among sophisticated or highly educated people.
- **Family history**. Children sometimes develop conversion disorder from observing their parents' reactions to stressors. This process is known as social **modeling**.
- **A recent stressful change or event** in the patient's life.

An additional feature suggesting conversion disorder is the presence of *la belle indifférence*. The French phrase refers to an attitude of relative unconcern on the patient's part about the symptoms or their implications. *La belle indifférence*is, however, much more common in adults with conversion disorder than in children or adolescents. Patients in these younger age groups are much more likely to react to their symptoms with fear or hopelessness.

Medical conditions that mimic conversion symptoms

It is important for the doctor to rule out serious medical disorders in patients who appear to have conversion symptoms. The following disorders must be considered in the differential diagnosis:

- multiple sclerosis (blindness resulting from optic neuritis)
- myasthenia gravis (muscle weakness)

- periodic paralysis (muscle weakness)
- myopathies (muscle weakness)
- polymyositis (muscle weakness)
- Guillain-Barré syndrome (motor and sensory symptoms)

Treatments

Patients diagnosed with conversion disorder frequently benefit from a team approach to treatment and from a combination of treatment modalities. A team approach is particularly beneficial if the patient has a history of abuse, or if he or she is being treated for a concurrent physical condition or illness.

Medications

While there are no drugs for the direct treatment of conversion disorder, medications are sometimes given to patients to treat the anxiety or depression that may be associated with conversion disorder.

Psychotherapy

Psychodynamic psychotherapy is sometimes used with children and adolescents to help them gain insight into their symptoms. Cognitive behavioral approaches have also been tried, with good results. **Family therapy** is often recommended for younger patients whose symptoms may be related to family dysfunction. **Group therapy** appears to be particularly useful in helping adolescents to learn social skills and coping strategies, and to decrease their dependency on their families.

Inpatient treatment

Hospitalization is sometimes recommended for children with conversion disorders who are not helped by outpatient treatment. Inpatient treatment also allows for a more complete assessment of possible coexisting organic disorders, and for the child to improve his or her level of functioning outside of an abusive or otherwise dysfunctional home environment.

Alternative and complementary therapies

Alternative and complementary therapies that have been shown to be helpful in the treatment of conversion disorder include hypnosis, relaxation techniques, visualization, and **biofeedback**.

Prognosis

The prognosis for recovery from conversion disorder is highly favorable. Patients, who have clearly identifiable stressors in their lives, acute onset of symptoms, and a short interval between symptom onset and treatment, have the best prognosis. Of patients hospitalized for the disorder, over half recover within two weeks. Between 20% and 25% will relapse within a year. The individual symptoms of conversion disorder are usually self-limited and do not lead to lasting disabilities; however, patients with hysterical aphonia, paralysis, or visual disturbances, have better prognoses for full recovery than those with tremor or pseudoseizures.

Prevention

The incidence of conversion disorder in adults is likely to continue to decline

14. Hoarseness

Hoarseness is described as having difficulty producing sound when trying to speak, or a change in the pitch or quality of the voice. The voice may sound weak, excessively breathy, scratchy, or husky.

Hoarseness is usually caused by a problem in the vocal cords. Most cases of hoarseness are associated with inflammation of the larynx (laryngitis).

Persistent hoarseness (hoarseness that lingers for weeks or months) may be caused by a variety of problems ranging from trivial to dangerous.

Common Causes

- Laryngitis
- Excessive use of the voice (as in shouting or singing)
- Allergies
- Inhaling irritating substances
- Excessive use of alcohol or tobacco
- Coughing (may be caused by allergies or some diseases such as bronchitis)
- In children, prolonged or excessive crying
- Viral illness
- Gastric reflux (acid from the stomach irritating the voice box)

Other causes include:

- Heavy smoking and drinking, especially in combination
- Overall weakness caused by other diseases
- Tonsillitis
- Ingestion of a caustic liquid
- Foreign body in the esophagus or trachea
- Infectious mononucleosis
- Postnasal drip
- Vocal cord nodules or paralysis (post-surgical)
- Bronchoscopy or other tests (temporary)
- Puberty
- Cancer of the voice box (laryngeal cancer)

Hoarseness may be acute or chronic, but is treated the same in most cases.

Rest and time are really the only way to cure hoarseness that is not associated with other symptoms. This kind of hoarseness is very resistant to medical therapy. Crying, shouting, and excessive talking

or singing will only worsens the problem. Be patient, the healing process may take several days. Don't talk unless it is absolutely necessary and avoid whispering. Whispering can strain the vocal cords more than speaking does.

Gargling has no therapeutic effect on the vocal cords. Avoid decongestants because they dry the vocal cords and prolong irritation. If you smoke, reduce or stop smoking.

Humidifying the air with a vaporizer or drinking fluids can offer some relief.

Other underlying disorders such as bronchitis, allergies, laryngitis, or alcoholism should be treated.