

What the Experts Say

Ear Infections

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WHY IT IS IMPORTANT

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Ear infection is one of the most common reasons young children visit the doctor, take antibiotics, or have surgery. Ear infections occur most often in children between 3 months and 3 years of age.¹⁻⁵ By 4 years of age, 80% to 90% of children will have had some type of ear infection.^{5,6} As children grow older, ear infections become less common. However, between the ages of 5 and 6, when children are starting school, they may reappear.⁷ Ear infections can cause fever and pain. Ear infections that occur repeatedly or last a long time can lead to other complications. Despite their frequent occurrence, ear infections can be complicated and challenging to resolve.^{5,8}

WHAT THE EXPERTS SAY

Definitions

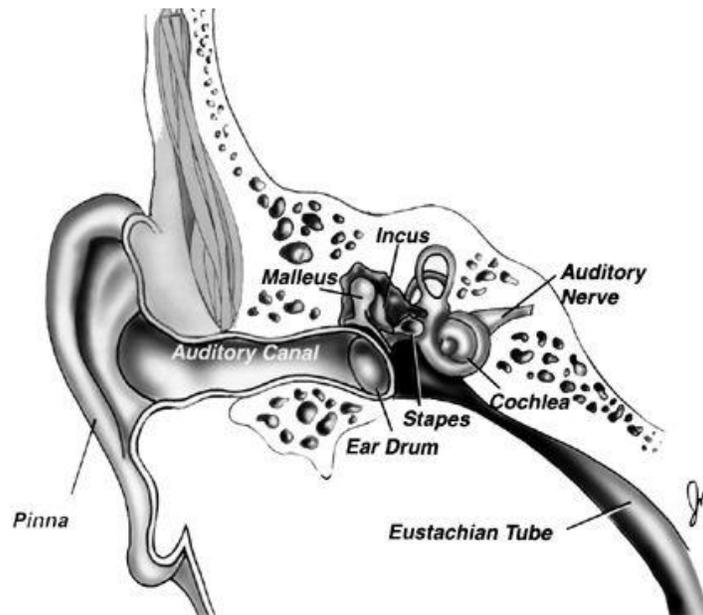
3-100

The medical term for infection or fluid buildup in the middle ear is otitis media.⁹ When there are signs of infection (such as fever or pain), it is called acute otitis media. Fluid in the middle ear without infection is otitis media with effusion. All ear infections involve fluid in the middle ear behind the eardrum. One type of ear infection can lead to another type.^{3,5}

Causes

Approximately 70% of middle ear infections are bacterial, but viruses can also cause ear infections. In fact, ear infections often follow upper-respiratory infections, such as the cold or flu, which are caused by viruses.^{10,11} Upper-respiratory infections and allergies affect the Eustachian tube. The Eustachian tube is a small tube that goes from the back of the nose to the middle ear (See Figure 1).¹² When germs travel from the throat to the Eustachian tube, fluid can build up and an infection can occur.⁹ One reason babies and young children have more ear infections is that the Eustachian tube is narrow, short, and horizontal. As the child matures, the size, shape, and function of this tube changes and improves. This is why most children outgrow ear infections by 6 to 7 years old.^{1,5,11}

Figure 1. The eardrum separates the middle ear and external ear. The Eustachian tube connects the back of the nose to the throat.



Risk Factors

Other risk factors for ear infections include the following^{4,7,13-15}:

- **Immature immune systems.** Infants are prone to infections due to immature immune systems, which are less able to fight off germs.
- **Cold climate.** Ear infections happen more often during the winter months when children are more likely to catch the cold or flu.
- **Genetic Factors.** The tendency to have an ear infection runs in families. Some children never have any, while others have one infection after another.
- **Race.** Native American, Alaskan and Canadian Inuit, and Hispanic children have more ear infections than children in other ethnic groups.
- **Poverty.** Poverty is an important risk factor for ear infections because it is accompanied by crowded living conditions, uncleanliness, and lack of good medical care.
- **Gender.** Males have a higher incidence of ear infections than females, which is true of most infections in infancy and childhood.
- **Pacifier Use.** Use of pacifiers increases the incidence of ear infections.
- **Having siblings.** This creates a greater chance of children sharing upper-respiratory infections, which can lead to ear infections.
- **Recent illness.** Having an illness of any kind lowers the body's resistance to infection, which can lead to an ear infection.

Symptoms

Doctors look closely at a child's symptoms to determine the best course of action. Table 1 shows the similarities and differences in the symptoms for acute otitis media and otitis media with effusion.^{5,11,16-19}

Table 1. Symptoms of Infection or Fluid Buildup in the Middle Ear

| Acute Otitis Media | Otitis Media with Effusion |
|---|---|
| Symptoms of infection start rapidly | Symptom-free |
| Fever (100° or higher), pain, earache | Ear may feel full or have popping sound; child may rub ear |
| Pain or discomfort interferes with daily activity | Trouble with sleep |
| Crying more than usual, irritability, or rubbing or pulling at ears | Infant may fail to respond or turn to sound; older child may turn the TV up |
| Fluid draining from ear | Problems with balance |
| Headache, lack of appetite, vomiting, or diarrhea | If continual or frequent, delays in speech or language development or school problems |
| Pain or discomfort interferes with daily activity or sleep | |

The buildup of fluid from infection can cause pain and swelling. Sometimes the pressure causes the eardrum to burst and blood or pus drains. This may be frightening to see but generally does not require an emergency room visit. In fact, the drainage may actually relieve the pain and the eardrum usually healed on its own. However, call and make an appointment with the child's regular doctor when this happens.^{9,11}

Treatment

Most ear infections are not serious and do not require emergency room treatment. They often clear up on their own. However, if the child has pain or fever for more than one day, see the doctor.¹¹ The doctor considers the child's age, medical history, and the severity and type of ear infection before deciding on a treatment.^{5,20}

Most ear infections are not serious and do not require emergency room treatment.

Medication. The first step in treatment is to determine if the child is in pain. To relieve the child's discomfort, doctors often recommend pain and fever reducers such as acetaminophen (Tylenol) or ibuprofen (Motrin).²⁰ Do not give aspirin to children unless directed by his or her doctor.¹⁵ For older children, the doctor may suggest ear drops.¹⁹ Placing a warm, moist washcloth over the affected ear may also help lessen the pain.¹¹

Antihistamines and decongestants are not recommended for ear infections. These over-the-counter drugs do not help and can have dangerous side effects for young children. Possible side effects include insomnia, hyperactivity, drowsiness, and changes in behavior or blood pressure.^{11,17}

Often, doctors prescribe antibiotics for acute otitis media. This is especially true when the child is younger than 2 years, the infection is severe, in both ears, the child has a history of recurring ear infections, or tests show the infection is bacterial.^{3,21-23} Amoxicillin is the antibiotic most often prescribed and is recommended by the American Academy of Pediatrics.¹⁹ If the child has otitis media with effusion (i.e. no infection present) or that the germ causing the problem is a virus, antibiotics are not prescribed.^{6,20,24}

Observation (Watch and Wait). In mild cases with children older than 6 months, the doctor may choose to keep a close watch and come in for a second visit in a few days rather than prescribing antibiotics. The reasons for this include:

- When there are no complications, 80% of ear infections resolve in 2 to 7 days without antibiotics.^{17,18}
- There is some concern that when antibiotics are prescribed too often, germs may become resistant to the medicine.^{3,20,25}
- Although rare, antibiotics can have side effects such as diarrhea, nausea, or vomiting.^{3,6}

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The “watch and wait” treatment method is less likely to be used if the child is younger than 2 years, both ears are infected, or the infection is more advanced or severe.^{5,17,23,26}

The American Academy of Pediatrics and the American Academy of Family Physicians recommend watch and wait for otitis media with effusion and describe it as an option for children with acute otitis media.^{19,27}

Surgery. For a small percentage of children who have chronic problems with ear infections and fluid in the middle ear, the doctor may recommend surgery. In cases where the ear infections are chronic (long lasting), improvement is not seen with antibiotics, and the child’s hearing is affected, the doctor may recommend this surgical procedure. In this operation, the child is given general anesthesia and a small drainage tube is inserted through a hole cut in the eardrum.¹¹ Medical terms for drainage tubes include tympanostomy tubes, ventilation tubes, or grommets. The tube allows fluid to drain and air to go into the middle ear. While the drainage tube is in place, care must be taken so water does not get in the ear. Parents can ask the doctor about ear plugs for bathing and swimming.

Usually tubes fall out on their own in 6 to 12 months. If not, the doctor will remove them when they are no longer needed. The hole in the eardrum eventually heals on its own.¹¹ Studies show drainage tubes reduce ear infections the first year after placement.^{5,28} However, there can be complications, particularly if the tubes stay in for longer periods (2 to 3 years). Foul-smelling fluid and pus drainage are the most common complications. Others include hardening or scarring of the eardrum.²⁹

Adenoidectomy is a surgical procedure in which the adenoids are removed while the child is under general anesthesia. Adenoids are located in the back of the upper throat, near the Eustachian tubes. With repeated ear infections, the adenoids can also become swollen and infected.¹¹ For children who continue to have problems with ear infections after having drainage tubes, this surgery may reduce the need for additional tubes. However, for children who have not had tube surgery, an adenoidectomy does not reduce future ear infections.²⁸ Adenoidectomy is an option for children 4 years and older and who have hearing loss and developmental delays due to chronic fluid in the middle ear. If the child is not experiencing delays, this surgery is not recommended.⁵

Alternative Therapy. Alternative therapies, such as homeopathy or chiropractic treatments, are not generally recommended for children. If you decide to use alternative ear infection treatment, be sure to³⁰:

- Learn about treatments. Understand your options. Learn about potential risks or side effects. Remember that some products used to treat ear infections are not regulated by the Food and Drug Administration.
- Find out what the treatment costs. Some alternative therapies are not covered by medical insurance.
- Check the credentials of anyone who advocates alternative medicine. Gather information from a variety of sources and review the information carefully.
- Tell your doctor. Tell your doctor if you choose to use an alternative therapy. Some treatments, such as herbal supplements, may alter the effects of other medications. It can create dangerous drug interactions.

Excluding from Daycare. Because ear infections are not contagious, there is no reason to keep a child home unless there is fever or signs of upper-respiratory infection, such as the flu. However, parents need to talk with their child's daycare about diagnosis and treatment.

Complications from Ear Infections

Although most ear infections clear up on their own, severe or chronic infections can occasionally lead to complications. Possible complications include^{1,11,14,31-33}:

Hearing loss. Today, the biggest problem from ear infection is the potential for hearing loss. **Mild hearing loss that comes and goes is fairly common with an ear infection.** This type of hearing loss is temporary and normal hearing returns after the infection clears. However, persistent infection or fluids in the middle ear may result in a more significant hearing loss. Children with a history of chronic ear infections may need their hearing checked by their doctor following treatment.

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Parents and teachers can help children who experience temporary hearing difficulties due to ear infections. If you suspect hearing loss, strategies for listening and talking to children include²⁷:

- Getting within 3 feet and facing the child when talking.
- Speaking slower and pronouncing words carefully.

- Repeating words or questions if the child does not seem to understand.
- Using visual cues (e.g. hand signals, pictures) in addition to talking.
- Turning off background sounds such as TV or radio.

Language or developmental delays. If a child suffers from chronic ear infections and either temporary or permanent hearing loss, they may experience delays in speech, social, and developmental skills. The child's primary doctor is often the first stop for screening.

Spread of infection. Untreated ear infections or infections that do not respond to treatment can spread to nearby tissues resulting in less common complications such as the formation of an abscess or cyst or the development of an infection of the bones around the skull. Rarely, serious ear infections can spread to other tissues in the skull, including the brain.

Facial paralysis. This is caused by inflammation around the facial nerve that runs near the ear. It generally can be relieved by antibiotics or drainage of the pus.

Enlarged adenoids or tonsils. Long-term inflammation can lead to swelling in the adenoids or tonsils. Antibiotics or surgery may relieve symptoms or prevent complications in those with frequent ear infections. It may also be done when ear tubes have not successfully reduced infections.

Meningitis. This is an infection of the brain caused by a virus or bacteria. The severity of the illness and the treatment differ depending on the cause. Viral meningitis is generally less severe and can clear up without treatment. Bacterial meningitis, however, can be quite severe, resulting in disability or death if not treated quickly. For this reason, if you think your child has meningitis, contact your doctor immediately. Table 2 lists symptoms of meningitis for newborns and infants, and children aged 2 years and older. The classic symptoms of high fever, headache, and neck stiffness may be absent or difficult to detect in newborns and infants.

Table 2. Meningitis Symptoms in Newborns, Infants, & Children Age 2 Years and Older.

| Newborns & Infants | Children Age 2 Years and Older |
|-------------------------------|---------------------------------------|
| High fever | High fever |
| Headache | Headache |
| Stiff neck | Stiff neck |
| Slowness or inactivity | Sleepiness |
| Vomiting | Vomiting |
| Irritability | Discomfort looking into bright lights |
| Feel poorly | Confusion |
| Seizures | Seizures |
| | Nausea |

WHAT YOU CAN DO

Currently, the best way for parents and caregivers to prevent ear infections is to reduce the risk factors associated with them. Following are some things you can do to lower children's risk for ear infection.^{7,11,14,15,34}

Preventing Ear Infection

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- **Breast-feed.** Breast milk contains antibodies that offer protection from ear infections. If possible, breast-feed your baby for at least 6 months.
- **Avoid propping a bottle or sippy cup in your baby's mouth.** Never put your baby down for a nap, or for the night, with a bottle or sippy cup. Make sure to hold your baby in an upright position when he or she is being fed.
- **Talk to your doctor about vaccinations.** Vaccinate your child against the flu every year and also get the PCV13 (valent pneumococcal conjugate) vaccine. The PCV13 protects against more types of infection-causing bacteria than the previous PCV7. If your child has already begun PCV7 vaccination, consult with your doctor on how to transition to the PVC13.
- **Avoid secondhand smoke.** Avoid exposing your baby to cigarette smoke by making sure no one smokes inside your home or car and try to stay in a smoke-free environment when away from home.
- **Choose a daycare with fewer children in groups.** The more children in a daycare group, the higher the chance of your child getting a cold or similar infection, which can lead to ear infections.
- **Separate sick children.** Limit a child's exposure to other sick children as much as possible.
- **Wash hands frequently.** Regular hand washing with soap and clean water is the best way to avoid illness and prevent the spread of germs to others.³⁵⁻⁴⁰
- **Wash toys often.** Clean dishwasher-safe toys in the dishwasher, and stuffed animals in the washing machine (unless the manufacturer's instructions say otherwise).
- **Never put anything in a child's ear.** Never use cotton swabs or put anything smaller than a finger into a child's ear.
- **If a child has tubes, take extra care to keep water out of his or her ear.** The ear can get infected if any germs in the water get into the ear. Talk to a doctor about using earplugs or get other advice about when your child takes a bath or a shower or goes swimming. A doctor can tell you when the hole in the eardrum has healed and when it will be okay to go back to regular water activities.

Caring for an Ear Infection. Following are some things that you can do if a child gets an ear infection^{13,14,41-43}:

- **Watch the child's ear infections closely.** A child should start to feel better within a few days of visiting the doctor. If it has been several days, the child is still sick, call the doctor. The child may need a different or additional treatment. Once the infection is gone, fluid may still remain in the middle ear but usually disappears in 3 to 6 weeks.
- **Avoid overusing antibiotics.** The American Academy of Pediatrics has recommended "watchful waiting" as an acceptable option in healthy children with mild symptoms, since overusing antibiotics can lead to antibiotic resistance. However, antibiotics are recommended for all children younger than 6 months and for children between 6 months and 2 years if the diagnosis is certain, and for children with severe infection.

If the doctor prescribes an antibiotic, make sure the child takes it exactly as prescribed and until the antibiotic is completely gone.

- **Give antibiotics properly.** If the doctor prescribes an antibiotic, make sure the child takes it exactly as prescribed until the antibiotic is completely gone. Even if the child seems better in a few days, the infection still has not completely cleared from the ear. Stopping the medicine too soon could allow the infection to come back.
- **Inform parents about the daycare medication policy.** Parents need to be aware of the medication policy at their child's daycare.
 - ◇ If the center gives medication, advise parents to request a separate, labeled bottle of medication to be kept at the center.
 - ◇ If the center's policy does not allow distribution of medication, advise parents to talk to their doctor about how to schedule their child's medicine.

RESOURCES

American Academy of Pediatrics

www.aap.org/

National Center for Complementary and Alternative Medicine

www.nccam.nih.gov/

National Institute on Deafness and Other Communication Disorders

www.nidcd.nih.gov/

National Institutes of Health

www.nih.gov/

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Quick Reference

**PREVENTING EAR INFECTIONS
01-A9a**

Parent Messages

- Ear infection is one of the most common reasons young children visit the doctor, take antibiotics, or have surgery.
- The best way to prevent an ear infection is to reduce the risk factors associated with them.
- Ear infections often follow upper-respiratory infections, such as the cold or flu.

Parent Skills

- Recognizes benefits of breast feeding and chooses to breast feed.
- Feeds baby in the upright position.
- Gets child flu shots and PVC13 vaccine.
- Avoids secondhand smoke.
- Uses proper hygiene.
- Never uses cotton swabs in a child's ear.

Parent Tip

PREVENTING EAR INFECTIONS

Dear Parents,

Ear infections often happen after your child has been sick with a cold or the flu. The best way to keep your child from getting an ear infection is to:

- Breast feed your baby for at least 6 months.
- Never prop a bottle or sippy cup in baby's mouth.
- Hold baby in an upright position while he or she drinks.
- Talk to your child's regular doctor about getting a flu shot and PVC13 vaccinations.
- Keep children away from secondhand smoke at home, in the car, and outside of your home.
- Choose a daycare with smaller groups of kids in a room.
- Do not let your children play with kids who are sick.
- Clean plastic toys in the dishwasher and wash stuffed animals in the washing machine.
- Never put cotton swabs or anything else smaller than your finger in your child's ear.

PREVENIENDO LAS INFECCIONES DE OÍDO

Queridos Padres,

Las infecciones de oído frecuentemente ocurren después de que su hijo a estado enfermo de un catarro o una gripe. La mejor vía para mantener a su hijo lejos de obtener una infección de oído son:

- Alimente su niño de pecho al menos por 6 meses.
- Nunca deje una mamila o un vaso de chupar en la boca de niño.
- Mantenga el niño en una posición hacia arriba cuando el o ella estén tomando líquidos.
- Hable con su doctor acerca de las vacunas de la gripe y la PVC13.
- Mantenga su niño alejado de la gente que fuma en casa, en los carros, y afuera de su casa.
- Escoja una guardería con grupos pequeños de niños en el salón de clase.
- No deje a su niño jugar con niños que estén enfermos.
- Lave los juguetes plásticos del niño en el lavaplatos y los animales de peluche en la lavadora.
- Nunca coloque cotonetes o algún objetos más pequeño que su dedo en el oído de su niño.

*Quick Reference***TREATING AN EAR INFECTION
01-A9b****Parent Messages**

- Ear infection can cause fever or pain. A child's discomfort can be relieved with pain and fever reducers, like acetaminophen or ibuprofen, or a warm washcloth over the ear that hurts.
- Most ear infections are not serious and do not require emergency room treatment.
- If a child has pain or fever for more than one day, take the child to his or her doctor.
- If a child is prescribed antibiotics, make sure he or she takes them exactly as prescribed.

Parent Skills

- Recognizes the need to take child with pain or fever for more than one day to the doctor.
- Follows through with recommended treatment.

*Parent Tip***TREATING AN EAR INFECTION**

Dear Parents,

Having an ear infection makes me feel really bad. Help me feel better by getting me the right medicine (pain and fever reducers as directed by my doctor). A warm washcloth on my ear may help. Call the doctor if I have a fever or have been hurting for more than a day.

- I may need special medicine if I am younger than 2 years old, my ear infection is really bad, both of my ears are hurting, or when I have had lots of ear infections.
- My doctor may want to keep a close watch on me and ask us to come back for a second visit in a few days instead of giving me medicine.
- If my doctor gives me antibiotics, make sure to follow the doctor's directions. I have to finish my medicine, even if I look and feel better before my medicine runs out.

Thanks,
Your Child

TRATANDO UNA INFECCIÓN DE OÍDO

Queridos Padres,

Cuando yo tengo una infección de oído esto me hace sentir realmente mal. Ayúdenme a sentirme mejor dándome la correcta medicina (medicinas que reducen el dolor y la fiebre como lo indique el doctor) Una toalla tibia húmeda en mi oído me hará sentir mejor. Llama a el doctor si yo tengo fiebre o me ha estado doliendo por más de un día.

- Yo puedo necesitar medicina especial si yo soy menor de 2 años y mi infección de oído es realmente mala, los dos oídos me están doliendo o cuando yo he tenido muchas infecciones de oído.
- Mi doctor puede que quiera mantener observándome de cerca y nos diga que debemos regresar para una segunda visita en pocos días en vez de darme ahora la medicina.
- Si mi doctor me receta antibióticos, estén seguros de seguir las indicaciones del doctor. Yo tengo que terminar la medicina, aun si yo me veo y me siento mejor antes de que la medicina se termine.

Gracias,
Su Hijo

*Quick Reference***EAR INFECTIONS AND DAYCARE
01-A9c****Parent Messages**

- Ear infections are not contagious, so there is no reason to exclude a child with one unless there is fever or symptoms of an upper-respiratory infection, such as the flu.
- Know your daycare's policy on giving children medication.
- Inform the child's teacher about the diagnosis and treatment.

Parent Skills

- Understands when it is appropriate for a child to return to daycare.
- Knows the daycare's medication policy to help plan for the child's treatment.
- Informs the child's teacher about the diagnosis and treatment.

*Parent Tip***EAR INFECTIONS AND DAYCARE**

Dear Parents,

Are you worried about when it is okay for me to go back to daycare? If I do not have a fever or feel sick with a cold or the flu, it is okay for me to go. If the doctor prescribes medicine for me, it is important that I take it until it is gone.

- If my daycare will help me with my medicine, ask my doctor about getting an extra bottle of medicine with a label that I can keep at the daycare.
- If my teacher cannot help with my medicine, talk to my doctor about how to take my medicine before and after school.
- If after a couple of days of taking medicine I do not feel better, we need to go back to the doctor.

Tell my teacher what the doctor said so she can help too. With the right help, I will feel better soon.

Thanks,
Your Child

INFECCIÓN DE OÍDO EN LA GUARDERÍA

Queridos Padres,

Están ustedes preocupados acerca de cuando es bueno para mí regresar a la guardería? Si yo no tengo fiebre o me siento enfermo por un catarro o la gripa, está bien para mí de que regrese. Si el doctor me ha recetado medicina es importante que la tome hasta que esta se termine.

- Si mi guardería me va a ayudar a mí con mi medicina, pregúntele al doctor que le dé una botella extra de la medicina con la etiqueta para que yo la pueda mantener en la guardería.
- Si mi maestro no puede ayudar con la medicina, hable con mi doctor para ver cómo puede tomar la medicina antes y después de la escuela.
- Si después de dos días de estar tomando la medicina yo no me siento mejor, nosotros necesitamos regresar al doctor.

Dígale a mi maestra lo que el doctor ha dicho y así ella podrá también ayudar. Con la ayuda correcta yo me voy a sentir mejor pronto.

Gracias,
Su Hijo

*Quick Reference***EAR INFECTIONS AND TUBES
01-A9d****Parent Messages**

- In some cases, when there has been no improvement and a child is having long-lasting ear infections, a doctor may recommend surgery.
- Tubes usually fall out on their own in 6 to 12 months, and the ear heals itself.
- Inform the child's teacher about the diagnosis and treatment

Parent Skills

- Understands that for some children with long-lasting ear infections, a doctor may recommend surgery to place tubes.
- Informs the child's teacher about the diagnosis and treatment.

*Parent Tip***EAR INFECTIONS AND TUBES**

Dear Parents,

If your child has a lot of ear infections, the doctor may want your child to have surgery to put tubes in his/her ears. The tubes help drain the fluid in the ear that causes ear infections. The tubes fall out on their own after 6 to 12 months. The ear heals itself after the tubes fall out.

Talk to your child's teacher if your child is going to have this surgery. Your doctor will give you directions on how to help your child feel better after surgery and keep his or her ears healthy. Your child's teachers will need to know this information too, so that they can help your child when you are not there.

INFECCIONES DE OÍDO Y LOS TUBOS

Queridos Padres,

Si su hijo tiene muchas infecciones de oído, el doctor puede que quiera que su hijo tenga una cirugía para colocar unos tubos en sus oídos. Los tubos ayudan a los oídos a drenar el líquido que causa las infecciones en estos. Los tubos se caen por si solos después de 6 a 12 meses. El oído se cura por si mismo después de que los tubos se cayeron.

Hable con la maestro de su hijo su hijo va a tener esta cirugía. Su doctor le va a dar seguro indicaciones de cómo le puede ayudar a que su hijo se sienta mejor después de la cirugía y a como mantener los oídos de su niño saludables. La maestra de su niño necesitara conocer esta información también, y así ellos podrán ayudarlo cuando usted no esté con él.

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