

## Tips for Hearing in Noise

*Patricia B. Kricos, Ph.D. - University of Florida, Gainesville, Florida*

Ask new hearing aid users to name the number one thing they like about their new hearing aids, and they will probably answer, “I don’t have to strain so much to hear anymore!” Ask them to name the number one thing they *don’t* like, and they will probably say, “I can’t stand the background noise. It’s driving me crazy!”



Despite tremendous advances in hearing aid technology, even with the latest digital noise reduction circuitry, background noise continues to be a problem. Problematic background noise is any noise that interferes with your ability to hear, understand, and/or pay attention to the signal that you want to hear. Background noise includes traffic noise, music, a marching band; reverberation, which causes sounds to echo when reflected off room surfaces; voices such as children playing and laughing, several people talking at once, or even one person talking in a way that prevents or distracts you from listening to a signal you want to hear, usually another talker. Background noises can particularly bother new hearing aid users during the first few weeks because for years they may not have heard everyday noises such as screeching brakes, clattering dishes, and rustling papers. Most long-time hearing aid users will tell you that the sudden ability to hear annoying noises—loud and clear—is challenging, but the ability to tolerate these noises does get better with time. Remember, you probably have not been hearing much background noise since the onset of your gradual hearing loss.

Experienced hearing aid user or not, noise can affect you in at least two ways. First, it can make it nearly impossible to understand what someone is saying because the noise is louder than the signal you want to hear. Second, noise may be a problem because it distracts you from what the speaker is saying. Even a voice softer than that of the person you are trying to hear can take your attention away from the main source to which you need or want to listen. Although there is no cure for the problems that hearing aid users often experience with distracting noises, some options may at least lessen problems with background noise:

- ? two hearing aids, rather than just one
- ? hearing aids with digital signal processing
- ? hearing aids with a directional microphone option
- ? FM technology
- ? auditory training
- ? communication strategies

Two Hearing Aids or One?

A number of advantages of wearing two hearing aids include better ability to hear sound from either side, increased loudness of sound when two ears are listening, and ability to locate where sounds are occurring. Using two hearing aids will improve speech understanding in noise for most people, at least in normal, everyday communication situations. Some listeners will actually do better with just one hearing aid in either the right ear or the left, but the bulk of scientific evidence to date indicates better and easier speech perception in typical noisy listening situations for the wearer with two hearing aids.

### Digital Signal Processing Hearing Aids

In the past decade, the development of digital hearing aids has created advances in signal processing strategies. Hearing aids with digital signal processing (DSP) differentiate between speech and noise, and they turn down the volume when they identify noise. Many people who wear hearing aids with DSP circuitry report less stress because the background noise seems to fade and the quality of speech is better. Although helpful, hearing aids with digital noise reduction at this time are not perfect and cannot completely remove problems associated with trying to listen in noise. As research in this area continues, we probably will see advances in noise reduction technology.

### Hearing Aids with Directional Microphones

Many hearing aids have a directional microphone option. With this option, the hearing aid user can switch the hearing aid from an omnidirectional setting (one that picks up sound from all directions, front, back, and sides) to a directional setting that picks up primarily sounds coming from the front of the hearing aid user. The hearing aid circuitry in many newer hearing aids automatically switches from omnidirectional to directional, thus freeing the user from having to use a switch.



In most listening situations, the sound source that the hearing aid user wants to hear is in front of the listener. Depending on lifestyle, as much as two-thirds of listening will be in noise. Thus, having a hearing aid that can focus primarily on sound coming from the front will be an advantage for the listener. Directional technology does not completely remove the noise coming from the sides and/or back, but it does reduce it by as much as 3 to 4 dB, making it much easier to understand the sound coming from the front.

Proper positioning of directional microphones is important for optimizing their use in noisy situations. This entails holding the head so that the hearing aid microphones face the talker. Many people fail to get the full advantage of directional technology because they turn and bend their head down to hear someone's comment, and then the hearing aid

microphones are no longer in an advantageous position. Thus, head positioning is a critical factor to consider.

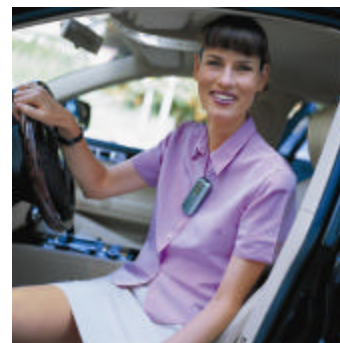
If your hearing aid has a directional microphone option that you must engage by changing the switch from omnidirectional to directional, it is important for you to know when to make the change. The majority of the time, depending on your lifestyle and daily activities, the desired signal is likely coming from the front. When you are eating at a restaurant table with three or four diners, waiting at the grocery store checkout, or chatting with friends at a party, you will probably want to use the directional microphone mode. However, as much as 20% of the time, the message or signal may come from the side or from the back. When someone taps your shoulder from behind to make a comment about a lecture you are attending, with a hearing aid set to the directional mode, you would not be able to hear the person speaking from the row behind you, unless you could shift your seating position and your head to hear what the speaker is saying. Other examples of situations in which messages come from the back or sides include riding in the front of the automobile with passengers in the back seat, attending family dinners with family and friends seated at a large rectangular dining table, walking your dog, or babysitting your grandchildren. You will want to change the microphone setting to omnidirectional in these instances, so that you can hear sounds from any direction and hear if a person or car is coming up behind you or know what your darling grandchildren are up to behind your back. With hearing aids that provide a switch for you to change the directional/omnidirectional settings, it may take some practice to decide which switch setting to use, but in no time at all, you will probably find it quite easy and advantageous to have this option on your hearing aids.

As mentioned earlier, signals of interest to the hearing aid wearer may not always come from the front. Several research studies have shown that wearing a directional hearing aid in one ear and an omnidirectional in the other ear may help the hearing aid user who needs to hear something from the side, without compromising the benefits of directional microphone technology mentioned above.

### FM Technology

If you are having a great deal of difficulty hearing in noise, one of the best solutions is to use FM technology. FM technology involves two components:

1. An FM transmitter that picks up a talker's voice and sends it to an FM receiver. The transmitter may be a handheld device, a lapel or small boom-mike device, or a transmitter that sits in the middle of a table; and
2. An FM receiver that connects or transmits sounds (such as via loudspeakers) to the listener's ear.



FM technology is helpful because the FM transmitter favors sounds (e.g., the talker's voice) that are very close to it. Thus, the talker's voice is delivered at a level significantly louder than the noise, as much as 20 dB higher. People who use FM systems report that they find speech significantly easier to understand, especially in noisy settings, and that they feel much more relaxed when listening via FM transmission.

Many behind-the-ear hearing aids used with wireless FM technology deliver the talker's voice via a wireless FM transmitter directly to the listener's hearing aid. If your hearing aid has a telecoil, you can use a small, inconspicuous neck loop that connects to a small FM receiver, which then will send the signal from the FM transmitter directly to your hearing aid. Or if your behind-the-ear hearing aid has direct audio input capability, a small "boot" device that attaches to the back of your hearing aid can connect the FM system.

FM technology is particularly helpful in group situations such as family dinners, restaurants, religious services, and auditoriums. Even if you are sitting 20 rows back from a lecturer at an auditorium podium, and the person sitting behind you is coughing, rustling papers, and/or talking, you should be able to hear the lecturer clearly as long as she is wearing or using an FM transmitter and you are using an FM receiver. There are a number of options for using FM technology, with or without hearing aids, so check with your hearing healthcare provider to see what might help you in the situations that you find the most difficult.

### Auditory Training

A number of recent research studies have demonstrated the effectiveness of listening training for adults with hearing loss. The Sensimetrics Seeing and Hearing Speech™ and the Listening and Auditory Communication Enhancement (LACE™) are two popular training programs. The Sensimetrics™ program (<http://www.seeingspeech.com/>) provides lessons via a CD-ROM in both lipreading and hearing. Using their home computers, users can practice their lipreading and auditory skills at their own pace, with feedback provided regarding their performance.

The LACE™ program provides computerized, interactive software used via home computers or at a hearing healthcare provider's office. As with the Sensimetrics™ program, the LACE™ also allows users to proceed at their own pace, with feedback provided for each activity as well as at the end of a session. Tasks include listening practice in the presence of background noise and competing speakers, as well as with rapid speech. Additional training tasks provide practice in filling in missing words and activities to improve memory skills. Ask your hearing healthcare provider about getting your personal copy of LACE™.

### Communication Strategies

You can also temper the effects of challenging listening conditions by using effective communication strategies. Think about the last time you went to a restaurant and found yourself bombarded by noise: other people's conversation, mood music in the background, clanging dishes and cutlery, noise from the kitchen, etc. Now think about what strategies you could use to minimize the difficulties you have the next time you dine out. You may find these suggestions helpful:

1. Plan ahead by picking a quieter restaurant. For example, unless you're content to read the captioning on the televisions, avoid sports bars. Try to find carpeted restaurants that have chairs with rollers on the legs (thus preventing an annoying scraping sound when they are moved), plants, and sound absorbent materials on the tables and walls.
2. Make reservations ahead of time, and ask for accommodations.
3. Go to your favorite restaurants, so you already know their specialties and options, such as choices of salad dressings or side dishes.
4. Pick the best day and time (not Friday nights!) to dine out.
5. Look on the restaurant's website to preview the menu.
6. Choose to dine with a smaller number of dining partners.
7. Pick a table in the least noisy part of the restaurant (e.g., away from the kitchen, bar, wait service stations, etc.).
8. Ask for seating in a well-lit area.
9. Remember that even people with normal hearing experience greater difficulty in a noisy listening environment than they do in a quiet listening environment. So, don't expect to do as well with your hearing aids in the noisy restaurant as you do in the quiet of your home.
10. Sit with your back to the window, so that lighting is on the speaker's face, *not* in your eyes.
11. Request that staff turn down background music (you are probably not the only patron bothered by the volume of the music).
12. Tell the host/hostess and waiter/waitress, as well as your dining companions, that you have a hearing loss and that it will help you if they slow down a bit, speak a little bit louder, and face you directly.
13. When possible, indicate choices before you're asked. Examples: "I'd like a salad with Italian dressing" or "I would like a burger, no fries."
14. Ask the waiter/waitress for a printed list of the specials of the day.
15. Use directional microphones and/or an FM system. If your hearing aids are set to directional, be sure to sit with your back to the main noise source.
16. Don't bluff!
17. If restaurant dining is for business, request another place to meet.
18. Relax/breathe and enjoy the fine food and the company, even if you don't catch every word.

Hearing aid users may also be particularly troubled by background noise in places of worship. During services, the hearing aid user typically sits too far for the hearing aid microphone to pick up and amplify the religious leader's voice. Unfortunately, the hearing aids can pick up and amplify noises closer to the wearer, such as coughing

people, crying babies, and rustling papers. One solution might be to request the installation of a large area induction loop system in the place of worship. With the induction loop system, you can set your hearing aids to the telecoil position and clearly hear the religious leader. Another option is to use an FM system. In the place of worship as well as in any associated community halls or meeting rooms, you can be proactive by asking religious leaders and councils to take action to improve the listening environment. Simple steps such as installing floor carpets and acoustic ceiling tiles will benefit many people who attend services, not just those with hearing loss. Finally, try to think of communication strategies that will help you, such as arriving early so that you can sit close to the religious leader, asking the religious leader and other speakers to talk clearly, etc.

A number of possible solutions help decrease the problems of listening in a noisy environment. Although in some listening situations it may be impossible to carry on a relaxed conversation—such as trying to hear someone when standing next to a noisy jack hammer, interventions can ease some or most of the distressful listening conditions experienced by people with hearing loss. Try some of the suggestions in this article, and you may once again enjoy dining out with friends, attending parties, participating in religious services, and conversing with relatives at family dinners.