

# PERFORMING THE ACCEPTABLE NOISE LEVEL (ANL) TEST

When being fit with hearing aids for the first time, some people have trouble adjusting to all the new amplified noises—that hearing aids provide along with the amplified speech signals. Researchers have determined that if you determine how much a person will accept noise within a speech signal, you can predict whether or not the person will be an immediately successful hearing aid user, or if the person will require extra care and counseling when fitted with hearing aids. The Acceptable Noise Level (ANL) test was designed for this purpose. In a typical 2-3 minute test time, it predicts with  $\pm 5\%$  accuracy whether a person will be a successful hearing aid user.

## Setup

The recommended setup includes a sound booth with a sound field speaker placed at 0 degrees azimuth to the patient. The test can also be performed with headphones, but the speaker configuration allows the clinician to present both speech and noise to both ears at the same time.

Connect the external CD player and the sound field speaker to the audiometer.

## Calibration

Calibrate both external channels using track 2 on the ANL CD.

## Determine the Most Comfortable Listening Level (MCL)

Before the test, the patient should be given both oral and printed instructions for the two parts of the test. An example of printed instructions is included as an attachment to these instructions for your use. Feel free to copy these instructions and use as needed.

The right channel of Track 4 of the ANL CD contains a speech passage. The left channel contains noise babble.

1. Set the controls of the audiometer to play the right channel of Track 4 of the ANL CD (the speech passage) at 30 dB HL.
2. Adjust the Hearing Level control on

the audiometer until the patient signals the speech passage is too loud. Use 5 dB steps.

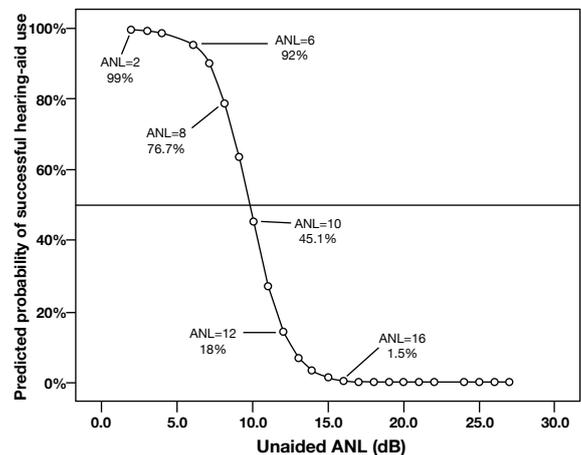
3. Adjust the Hearing Level control on the audiometer until the patient signals that the speech passage is too soft. Use 5 dB steps.
4. Adjust the Hearing Level control on the audiometer to the patient's most comfortable listening level. Use 5 dB steps for rough adjustment and then use 2.5 dB steps (or whatever is the finest step control on your audiometer) for the final score.
5. Record this level as the MCL.

## Find Background Noise Level (BNL)

1. Continue to play the speech passage at the MCL of the patient.
2. Add the noise babble to the speech signal using the left channel of the ANL CD (Track 4).
3. Adjust the Hearing Level of the noise channel upwards until the patient signals the story is incomprehensible. Use 5 dB steps.
4. Adjust the Hearing Level of the noise channel downwards until the patient signals that the story is very clear and easy to understand. Use 5 dB steps.
6. Adjust the Hearing Level of the noise channel until the patient signals that the background is the most that he would want to put up with while listening to the story for a long period of time without getting tense or tired. Use 5 dB steps for rough adjustment and then use 2.5 dB steps (or whatever is the finest step control on your audiometer) for the final score.
7. Record this level as the BNL.

## Determine ANL Prediction

1. Calculate:  $ANL = MCL - BNL$ .
2. Find the ANL score on the graph below to determine the patient's probability of successful hearing aid use. This prediction has an 85% accuracy.



To determine probability of hearing aid success, find the patient's ANL score on the "S curve". Then locate the corresponding probability on the y-axis.

## INSTRUCTIONS FOR DETERMINING ACCEPTABLE NOISE LEVEL (ANL)

**Purpose :** This test is used to find out how well you tolerate noise within a speech signal.

### Part 1: Finding your Most Comfortable Level (MCL)

You will listen to a story through a loudspeaker. First, we will turn the volume up until you signal that the story is too loud. Then we will turn the volume down until you signal the

story is too soft. Finally, we will adjust the signal until you tell us the signal is the loudness level most comfortable for you.

### Part 2: Determining the Background Noise Level (BNL)

You will listen to the same story with background noise of several people talking at the same time. First, we will turn up the noise level until you signal that the noise is too loud for you to understand the story. Then we will turn down the noise level until

you signal that you can understand the story very clearly. Finally, we will adjust the noise to the MAXIMUM level that you would be willing to "put up with" for a long time while following the story.

**That's it! The entire test should take about 2-3 minutes.**