6. A patient with SNHL demonstrates poor discrimination. Would you recommend hearing aids? Are there any contraindications to hearing aid use?

From Cummings:

Some patients have too much hearing loss for hearing aid use. Severe or profound loss can limit the usefulness of even the most powerful hearing aids. In many cases of profound hearing loss, a hearing aid can provide only environmental awareness or some rudimentary perception of speech. Many patients do not consider this benefit to be valuable enough to warrant the use of hearing aids. In these cases, cochlear implantation is often the most beneficial treatment strategy.

Another audiometric consideration in hearing aid use is suprathreshold speech recognition ability. In most patients, speech recognition is commensurate with degree of hearing loss and is simply a reflection of audibility of spoken speech. In these patients, amplification of the sound that is missing can provide significant enhancement of speech recognition. In other patients, speech recognition is poorer than expected for a given hearing loss. For example, cochlear hearing loss secondary to endolymphatic hydrops can cause substantial distortion of sound, resulting in very poor speech recognition ability. If it is sufficiently poor, hearing aid amplification may contribute to audibility but will be unsatisfactory overall.

Generally, most patients who seek hearing aids can benefit from their use. Even in cases in which the prognosis for successful hearing aid use is guarded, an amplification solution is usually available if the patient is sufficiently motivated.

Patient motivation is another key factor in predicting success with hearing aids. A patient who is internally motivated to hear better is an excellent candidate for successful hearing aid use. The breadth of amplification options for such a patient is substantial. In contrast, an unwilling patient who gives in to the requests of a spouse or other family members to seek hearing aid amplification often finds numerous reasons why hearing aid amplification is unsatisfactory.

Candidacy for hearing aid amplification is fairly straightforward. If a patient has a sensorineural or other nontreatable hearing loss that is causing a communication disorder, the patient is a candidate for amplification. Even when a hearing impairment is mild, if it is causing difficulty with communication, and the patient is motivated to do something about it, the patient is a candidate for hearing aid amplification and is likely to benefit from its use.

In short there do not appear to be an absolute contraindications for hearing aids just different degrees of possible success.
7. Discuss assistive listening devices.
From Cummings

Hearing Assistive Technologies

Assistive technologies other than hearing aids are available for situation-specific hearing, including assistive listening devices (ALDs), alerting and signaling devices, and telephone amplifiers. ALDs include personal amplifiers, FM systems, and television listeners. These devices are designed to enhance an acoustic signal over background noise by the use of a remote microphone. The use of a remote microphone allows the signal to be received by the listener without the degrading effects of distance and reverberation.

Several groups of patients benefit from use of ALDs. Some patients with severe hearing loss do not receive sufficient benefit from hearing aids and find that supplementing hearing aid use with ALDs is necessary. Other individuals with high communication demands in their workplace or social life also benefit from ALDs. Some patients may have communication limitations only in very specific situations, so that general use of a hearing aid is not indicated. An example is a patient who notes difficulty only with watching television or attending a meeting. ALDs tailored to particular needs are often a more appropriate solution in such cases. Some patients have auditory processing disorder that is not accompanied by a loss in hearing sensitivity. Communication difficulties for such patients are characterized by difficulty understanding speech in background noise. For these patients, use of a remote microphone for enhancement of signal-to-noise ratio is more appropriate than amplification from a hearing aid.

A personal FM system is an ALD designed to minimize the effects of noise and distance with a remote microphone. The system consists of two parts, a microphone-transmitter and an amplifier-receiver. The microphone and transmitter are worn by or are close to the speaker. Some transmitters have array microphones that are designed for directionality. The signal is transmitted to the receiver via FM radio waves. The amplifier and receiver are worn by the listener, usually integrated into the hearing aid or coupled to the listener's ear via earphones. Newer forms of wireless coupling of transmitter and receiver are also emerging as a solution for enhancing spatial hearing.

Other assistive technologies are available to provide solutions for specific listening situations. Telephone amplifiers, which are available in several forms, increase the ability to hear on the telephone for many patients. Another commonly used assistive technology is closed captioning of television shows, which allow the viewer to see the spoken dialogue in printed form. Alerting devices, such as alarm clocks, fire alarms, and doorbells, are designed to flash a light or vibrate a bed when activated.

Acoustic feedback occurs when the amplified sound emanating from a receiver is directed back into the microphone of the same amplifying system. Physical separation of the microphone and receiver is the most effective way to reduce feedback. Another feedback reduction mechanism is feedback suppression circuitry. With feedback suppression, the hearing aid recognizes the occurrence of feedback based on frequency, intensity, and temporal characteristics. It reduces amplification in the offending frequency range to reduce feedback or uses phase cancellation of the feedback signal to eliminate audible feedback.

Occlusion of the ear canal creates problems in some patients, and may influence style consideration. Occlusion of the ear canal results in reduced aeration of the external auditory meatus, which may lead to problems associated with external otitis. In addition, a certain amount of hearing loss, known as insertion loss, occurs with occlusion of the ear canal while the hearing aid is in place. This occlusion creates hearing loss for patients who have normal low-frequency hearing. Occlusion of the ear canal also causes a phenomenon referred to as the occlusion effect, wherein a patient’s own voice is perceived as loud and “echoing.”

One solution to occlusion problems is the placement of a vent. A vent is simply a passageway for exchange of air and sound around or through a hearing aid or ear mold. The acoustic characteristics of the hearing aid response can be manipulated by the size and type of vent used. Low-frequency amplification can be eliminated, and natural sound can be allowed to pass through the hearing aid for patients with normal low-frequency hearing. Generally, the larger the vent, the more pronounced is the effect. A vent also creates opportunity for acoustic feedback to occur, however, because sound is more likely to escape from the ear canal and be directed into the microphone. The use of an open-canal fit also reduces problems associated with occlusion, with the same feedback-related challenges encountered with venting.

Distortion (total harmonic distortion) is a measure of the hearing aids ability to amplify without disturbing the quality of the sound it amplifies. Calculated as a percentage of the harmonics generated as compared against the total signal delivered by the hearing aid with a single pure tone input. Normal below 5-10%