Introduction to Tinnitus Management
What is tinnitus?
What is Tinnitus?

Tinnitus is not a disease!

It is a symptom comparable with pain.

Triggering factors can be:

- Noise
- Infections
- Medications
- Head injury
- Mental or physical stress
What is Tinnitus?

About 1 in 10 people experience some tinnitus

About 1 in 200 people is severely bothered by tinnitus

More than 50 % of tinnitus patients also have hearing loss.

Effects include:
- Reduced concentration
- Trouble sleeping
- Depression
- Anxiety
What is Tinnitus?

There are several types of treatment approaches for tinnitus:

- Pharmacological
- Acoustic/physical
- Psychological
- Combinations

No one treatment approach has been shown to relieve all cases of tinnitus.
Overcome tinnitus –
and hear better at the same time

The tinnitus noiser function is a programmable option in the Life instruments.

You can choose between hearing instrument or noiser, or both at the same time.
You can adjust the therapy signal (Noise Level and Noise Shaping separately) in each frequency channel.

- With Life 700 in 16 channels
- With Life 500 in 12 channels
- With Life 300 in 8 channels

The wearers can adjust volume themselves in accordance to their individual preferences.
Siemens Life – two in one

You can use Life as a hearing instrument and tinnitus control instrument simultaneously.

With the additional ePen or ProPocket the wearer can switch the programs and adjust the volume.
Connexx settings
To enter the Tinnitus functionality you have to click on “Show Tinnitus Masker“ in the “Instrument Settings“ Tab Card.
Under Mic Noise you can select one of the following modes:

**Microphone**: This is the normal hearing instrument mode.

**Noise**: In this mode the instrument works as a nosier only.

**Mixed**: In this mode the instrument works as a hearing instrument and at the same time a noise is presented as well.

With a click on this area you can switch back to the hearing instrument settings.
Software
Noise Mode: Life 700

With a click on this area you can switch back to the hearing instrument settings.

With the 16-channel equalizer the hearing care professional can adjust the noise to the individual preferences of the user.
Software
Noise Mode: Life 500

With a click on this area you can switch back to the hearing instrument settings.

With the 12-channel equalizer the hearing care professional can adjust the noise to the individual preferences of the user.
Software
Noise Mode: Life 300

With a click on this area you can switch back to the hearing instrument settings.

With the 8-channel equalizer the hearing care professional can adjust the noise to the individual preferences of the user.
Software
Noise Mode: Mixed

With a click on this area you can switch back to the hearing instrument settings.

With this slider the hearing care professional can adjust the volume of the broadband noise signal to the individual preferences of the user.
Software

Microphone mode:
hearing instrument functionality

Noise mode

Mixed mode

Life 700
Life 500
Life 300
Putting it Together
Masking

Just as there is no one cause for tinnitus, there is no one approach to masking therapy.

The Life tinnitus feature provides the flexibility for selecting the right masking approach.
Measuring Tinnitus

How can we quantify or measure tinnitus?

Pitch matching
- Find the frequency of the tinnitus signal
- Find the perceived level of the tinnitus signal

Questionnaires
- Determine the impact of tinnitus on the patient
- Several different types, some open questions, some closed questions
### Measuring Tinnitus

#### Tinnitus Handicap Questionnaire (Kuk et al, 1990)

- **Method of assessing the impact of tinnitus**
- **Addresses Functional, Emotional and Catastrophic subscales**

<table>
<thead>
<tr>
<th></th>
<th>Question</th>
<th>Yes (4)</th>
<th>Sometimes (2)</th>
<th>No (0)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1F</td>
<td>Because of your tinnitus is it difficult for you to concentrate?</td>
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<tr>
<td>2F</td>
<td>Does the loudness of your tinnitus make it difficult for you to hear people?</td>
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<tr>
<td>3E</td>
<td>Does your tinnitus make you angry?</td>
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<tr>
<td>4F</td>
<td>Does your tinnitus make you feel confused?</td>
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<tr>
<td>5C</td>
<td>Because of your tinnitus do you feel desperate?</td>
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<tr>
<td>6E</td>
<td>Do you complain a great deal about your tinnitus?</td>
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<tr>
<td>7F</td>
<td>Because of your tinnitus do you have trouble falling to sleep at night?</td>
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<tr>
<td>8C</td>
<td>Do you feel as though you cannot escape your tinnitus?</td>
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<tr>
<td>9F</td>
<td>Does your tinnitus interfere with your ability to enjoy social activities (such as going out to dinner, to the movies)?</td>
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<tr>
<td>10C</td>
<td>Because of your tinnitus do you feel frustrated?</td>
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<tr>
<td>11C</td>
<td>Because of your tinnitus do you feel that you have a terrible disease?</td>
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<tr>
<td>12F</td>
<td>Does your tinnitus make it difficult for you to enjoy life?</td>
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<tr>
<td>13F</td>
<td>Does your tinnitus interfere with your job or household responsibilities?</td>
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<tr>
<td>14F</td>
<td>Because of your tinnitus do you find that you are often irritable?</td>
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<tr>
<td>15F</td>
<td>Because of your tinnitus is it difficult for you to read?</td>
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<tr>
<td>16E</td>
<td>Does your tinnitus make you upset?</td>
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<tr>
<td>17E</td>
<td>Do you feel that your tinnitus problem has placed stress on your relationship with members of your family and friends?</td>
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<tr>
<td>18F</td>
<td>Do you find it difficult to focus your attention away from your tinnitus and on other things?</td>
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<tr>
<td>19C</td>
<td>Do you feel that you have no control over your tinnitus?</td>
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<td>20F</td>
<td>Because of your tinnitus do you often feel tired?</td>
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<tr>
<td>21E</td>
<td>Because of your tinnitus do you feel depressed?</td>
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<tr>
<td>22E</td>
<td>Does your tinnitus make you feel anxious?</td>
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<tr>
<td>23C</td>
<td>Do you feel that you can no longer cope with your tinnitus?</td>
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<tr>
<td>24F</td>
<td>Does your tinnitus get worse when you are under stress?</td>
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<tr>
<td>25E</td>
<td>Does your tinnitus make you feel insecure?</td>
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</tbody>
</table>

*F denotes an item on the functional subscale; E, an item on the emotional subscale; and C, an item on the catastrophic response subscale.*
Masking

Which ear do I mask?

- Ear where it is reported may be the most effective
- Possible that tinnitus in this ear was masking tinnitus in the other ear
- Opposite ear may provide more relief
- Both ears may provide relief
- May want to consider trying one week on each ear and keeping a diary to report improvement
Which ear do I mask?

- Tinnitus could be at the ear level
- Could also be at a higher level, at the brain
- Sound therapy for both ears is highly recommended in such cases
Masking

Should I use the hearing aid, masker or combo?

- Normal hearing would use the masker only
- Hearing loss may do well with just the hearing aid
- If they need help with hearing and amplification does not mask the tinnitus, the combo setting may be useful
  - Use lowest SPL setting to prevent masking speech
  - Set up separate programs for hearing aid alone and masker alone
Masking

- Reported effectiveness of hearing aids on patients with tinnitus (survey of 230 hearing health care professionals)
- About 60% of patients are reported to receive some benefit

Kochkin & Tyler, 2009
Masking

How should I set the masker?

Frequency settings

- Matching to the tinnitus signal is often not necessary
- Try different frequency settings
- Try different bandwidths
- Try frequencies outside of important speech ranges
Masking

How should I set the masker?

Level settings

- Find lowest SPL setting
- Noise signal must be audible
- Provide remote control for volume adjustment
- Sometimes completely masking the tinnitus is effective
- Sometimes only partial masking of the tinnitus is effective
Masking

How long should the masker be worn?

- Some patients have residual inhibition after wearing the instruments
- Length of residual inhibition can vary
- Length of wearing time for postmasking effects can vary
- Small percentage of patients do notice increase in tinnitus loudness with masking
- Too long and loud may impact hearing

Postmasking effect on tinnitus loudness
Tyler, Conrad-Armes, & Smith, 1984
Masking

Do I need to counsel?

Pre-fitting counseling is quite important

- Explain about tinnitus
- Discuss the concept of masking or other treatments
- Discuss realistic expectations
  - It may not work
  - It may only have limited success
  - It may work very well
- Discuss impact of tinnitus (lifestyle, attention, sleeping, concentration)
Counseling

General guidelines for counseling

- Be perceived as a knowledgeable professional
- Demonstrate that you understand tinnitus
- Provide a clear therapy plan
- Be sympathetic
- Show that you sincerely care
- Provide reasonable hope

From Tyler, 2006
Counseling

Provide information about:
- Hearing
- Hearing Loss
- Tinnitus and Attention

Providing such basic information will be helpful for:
- patients to realize they are not alone
- removing some of the fear of the unknown
- assisting them in developing realistic expectation
Diagram representing how neural impulses convey information to the brain

From Tyler, 2006
Counseling

Some examples to help the patients to describe their Tinnitus

From Tyler, 2006
Diagram representing how the neural activity of the tinnitus can be partially masked by presenting low-level background sound

From Tyler, 2006
Illustration depicting the analogy between partial masking of light and sound.
Masking

Was it successful?

- This all depends on how success is measured
- It is unlikely that masking will “cure” tinnitus
- Treatment takes time and it may take several months to notice benefit
- Success will be individual with each patient
- Pre-fitting counseling and questionnaires can help determine goals or show a measure of improvement
Summary

- Treatment is always a combination of counseling and sound therapy
- Tinnitus might be a good vehicle to generate interest in your services
- Siemens is already established as being active in tinnitus and continues that activity with the tinnitus feature in Life
Introduction to Tinnitus Management