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Electrical promontory test





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Electrical promontory test

- **For the indication of severe hearing impairment the subjective and objective promontory test is a requirement.**
- **This includes:**
 - **Surditas (no residual hearing)**
 - **Injury of the cochlear and auditory nerve**
 - **Acousticus neurinomas, monitoring of the AN-surgery**
 - **Auditory Synaptopathies/Neuropathies**
 - **Otosclerosis**
 - **Central hearing disorders**
- **The rehabilitation is done by using a CI in most cases**





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Electrical promontory test

- **For CI indication it is preferable but not mandatory to use the electric stimulator.**
- **Nevertheless Mr. Hoth strongly recommended this test on the AGERA 2015 for the preoperative diagnostic.**
- **It distinguishes between subjective and objective promontory test.**
- **In both cases the electrical excitability of the auditory pathway up to the cortex is checked.**





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The subjective promontory test

- Clarification of a subjective hearing impression.
- The patient experiences a prickle or a similar hearing impression.
- Depending on the disease pattern and stimulus frequency (max. up to 1000Hz) different current intensities are selected.

Important!

Smaller currents are used first!

- In general:
smaller frequencies (e.g.: 50Hz) → result in lower electro stimulation:
ca. 10 μ A – 50 μ A

higher frequencies (e.g.: 800 Hz) → result in higher electro stimulation approx. Up to 500 μ A





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Der objective promontory test

The application is done as follows:

- **Placing the transtympanal promontory or eCochG electrode on the promontory! (extratympanal method is possible but not recommended).**
- **Starting the measurement with bipolar impulses with small currents.**
- **The patient announces a subjective perception.**
- **The examiner records this perception.**





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The objective promontory test

- Is a real electric BERA!
- The stimulation current is applied using a transtympanal electrode. Under local anaesthesia an electrode is inserted through the eardrum into the middle ear where it is fixed onto promontory as close as possible to the round window.
- The electric evoked potential is recorded with the MC-Corona System. The triggering is done by the electrical stimulator.
- The patient has to be relaxed and under local anaesthesia
- It is advised to use narcosis for children

Important!

Smaller currents are used first!





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Electrical promontory test

The objective promontory test

The application is done as follows:

- Placing the transtympanal electrode
- Placing the pick-up-electrodes:

| | |
|----------------------------|---------------|
| Active electrode 1 (red): | contralateral |
| Active electrode 2 (Blue): | Neck |
| Reference (black): | Forehead |
| Ground (white): | Sternum |
- Starting the measurement with programmed bipolar stimulus with smallest currents.
- Goal: Recording a typical wave V at approx. 4 ms!

Problem!

Usually a heavy artefact resulting directly out of the stimulus itself influences this potential.



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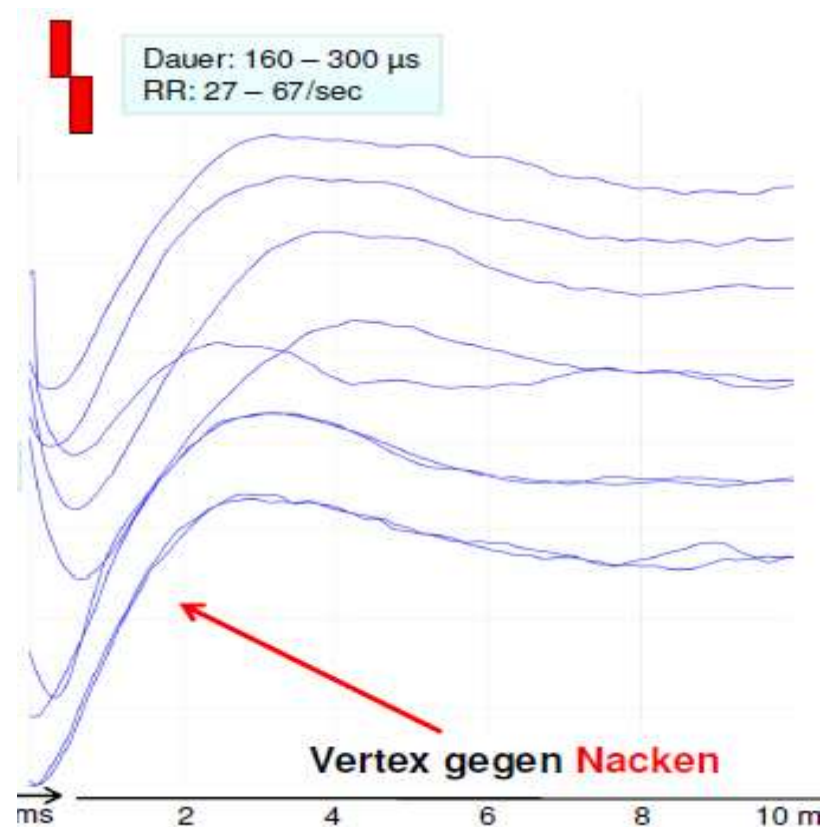


Electrical promontory test

The objective promontory test

The artifact:

- Duration: 160-300 μ s
- Vertex against neck





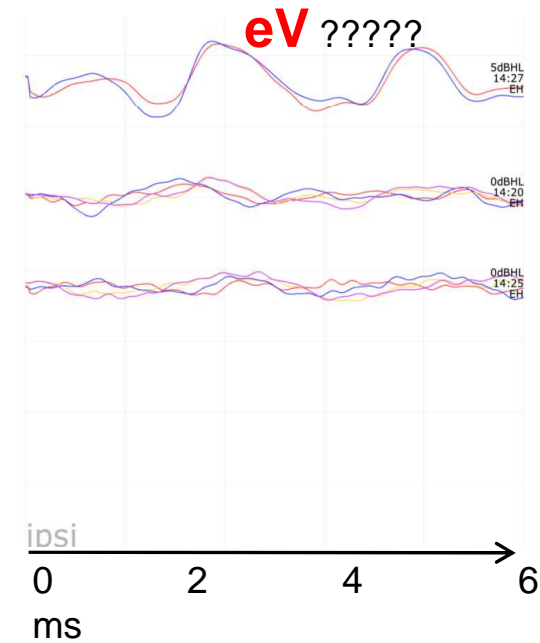
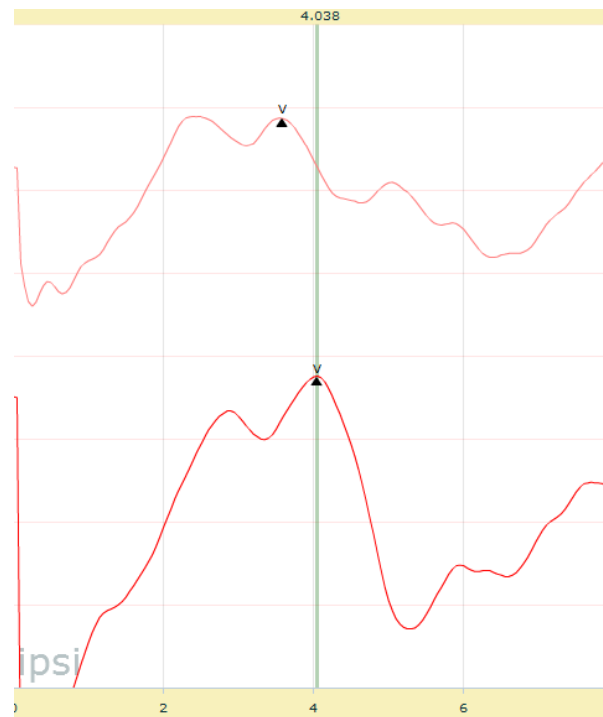
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Electrical promontory test

First measurement results of an E-BERA with the electric stimulator, without the artifact!

(Cooperation between: Prof. Walger CI Center Köln/Pilot Blankenfelde GmbH)





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Electrical promontory test

Special and unique characteristics of the electric stimulator:

- Stimulation currents from 0,01 mA up to 250 mA individually adjustable steps
- Easy programming and nearly endless recording of stimulus and impulse sequences
- Impedance check and current control display
- Integrated patient database
- Mobile system – for objective testing it can be used with a laptop





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Electrical promontory test

The stimulator is controlled by a laptop (for objective testing)

Galvanic isolation is done by the medical power supply from the Laptop!

Main window:

ISIS Neurostimulator Version 1.0.1.0

ISIS Neurostimulator

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ISIS Neurostimulator

Patient

New Open Undo Save Delete

ID male female

Last Name Emergency Patient

First Name

Date of Birth dd/mm/yyyy

Street

ZIP Code

City

Insurance

Protocols 23.06.2015 12:23 - default Open

Programs

Open Save as

Stimulation

Settings

Output HCS DNS

1 5 9
2 6 10
3 7 11
4 8 12

Channel

Control

Mode CONTINUOUS

Frequency 800 Hz

Pulse

Negative Positive Biphasic Free

Number of pulses 1

Width 150 μs

Protocol

Program default

Emergency Patient Patient

12:24:30
Stimulation started
12:25:08 HCS 1 | Pulses 1 biphasic | ISI 5 ms | Width 150 μs
12:25:08 CONTINUOUS | Frequency 800 Hz
12:25:09 0,25 mA
Current Confirm ON
12:25:09
Stimulation stopped
12:25:27

Comment
Export
Print

Current 0,25 mA
Impedance 10.0 kΩ

Start Stimulation

Quit





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Self-programmed sequences possible:

ISIS Neurostimulator

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Stimulation

Settings

ISIS Neurostimulator

Output

HCS DNS

5 9
2 6 10
3 7 11
4 8 12

Channel

Control

Mode CONTINUOUS

Frequency 800 Hz

Pulse

Negative Positive Biphasic Free

short biphasic.fpf

Edit

Free Pulse

100% delivered

Stop Stimulation

Quit

Protocol

Program default

Emergency Patient Patient

Current Confirm ON
12:25:09
Stimulation stopped
12:25:27
Stimulation started
12:35:57 HCS 1 | Free Pulse File short biphasic.fpf
12:35:57 CONTINUOUS | Frequency 800 Hz
Current Confirm ON
12:35:58

Comment
Export
Print

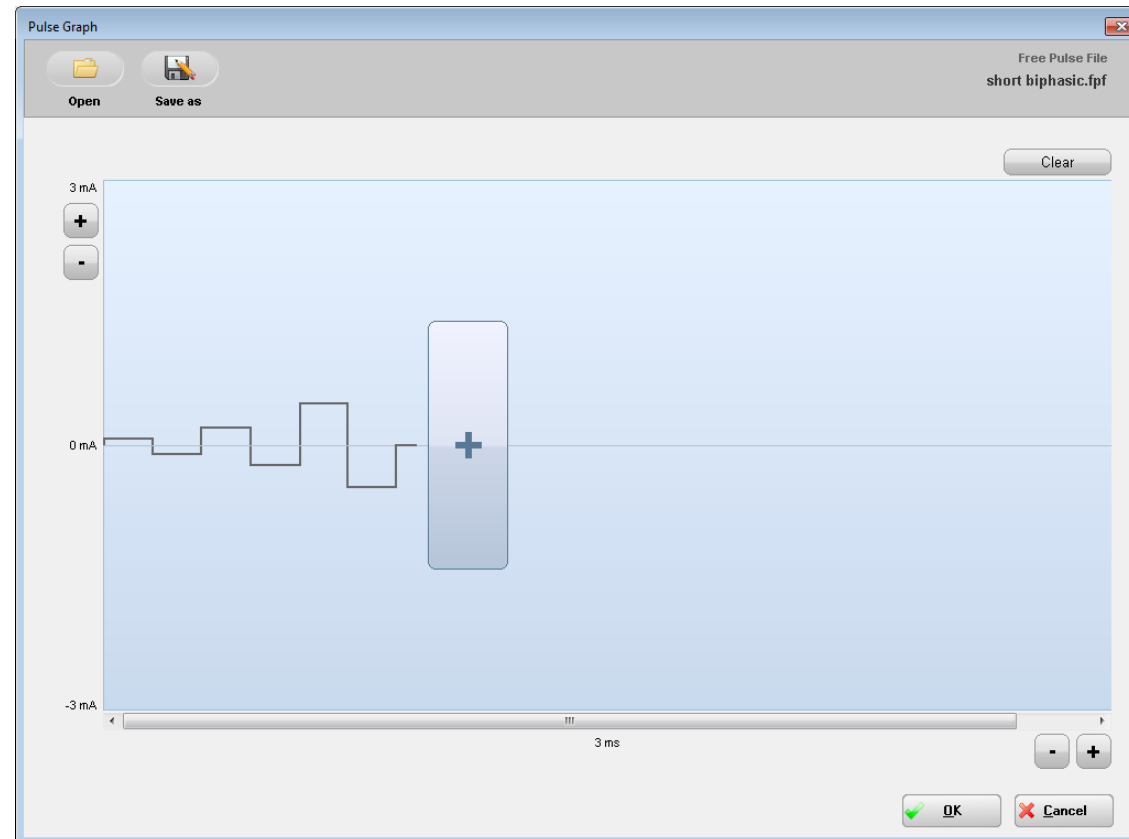


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With the pulse generator it is possible to program different stimulation sequences and polarities with intermissions and different currents – free programmable!





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