

TEOAE

DPOAE

ABR/BERA

Neuro-Audio-Screen

Hearing screening system
for newborns “in your pocket”



Neuro-Audio-Screen — portable system for hearing screening and diagnostic tests

All-in-one Solution:

- Transient evoked otoacoustic emission (TEOAE) for hearing screening
- Distortion product otoacoustic emission (DPOAE) for hearing screening
- Auditory brainstem response / brainstem evoked response audiometry (ABR / BERA) for in-depth screening

The device can be referred to diagnostic class because of the possibility to perform the techniques in expert mode

The exams can be exported instantly to patient database of medical institution via Bluetooth

External memory: up to 64 GB SD card

Intuitive 4.3" touch screen

The test results can be printed on a portable or standard laser printer



Neurosoft
Medical diagnostic equipment

Neuro-Audio-Screen Advantages

Device Usability

The whole front panel of the device is 4.3" touch screen. The menu with the list of available tests will be displayed on the screen after device switching on. You should insert OAE probe into a patient's ear properly and start the test by touching the screen two times. The program will inform you if the OAE probe is inserted incorrectly. The test will be performed in automatic mode if everything is correct. After the test the program will give "PASS" or "REFER" result. It is quite simple. Detailed video guide supplied with [Neuro-Audio-Screen](#) will help you to master the program operation. The system is real easy to use even for untrained medical personnel including nursing staff.

Wireless Bluetooth Interface

provides the opportunity to print exam results on wireless printer and export data saved in the device memory to the external computer with installed [Neuro-Audio-Screen Manager](#) software. The program is supplied free with the device.

Neuro-Audio-Screen Manager Software

works on Windows-based computer. Using this program you can prepare a list of patients you plan to examine, export exams to the computer database, print results or export to [Neuro-Audio.NET](#) software.

Compatibility of Data Format with Neuro-Audio Diagnostic OAE and EP System

provides continuity of diagnostic information obtained during hearing screening and during specialized diagnostic research.

Customizable Settings

You can change test settings using the configuration menu. For example, you can use different modes of OAE test: "Screening", "Noisy (screening)", etc. It helps to customize settings quickly in order to perform any hearing exam starting from screening in a noisy room and up to expert study in a specialized hospital.

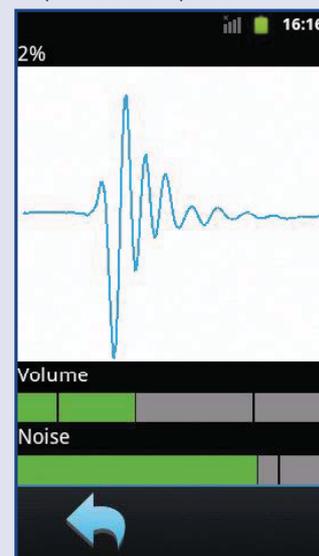


A screenshot of the Neuro-Audio-Screen app's data entry screen. At the top, there are status icons for Bluetooth, signal strength, and battery, along with the time 09:37. The form fields are: Name (Jackson D.), ID (3), Sex (Not set), Birthday (8/19/2013), and Comment (empty). At the bottom, there are two blue arrows: a left-pointing arrow and a right-pointing arrow.

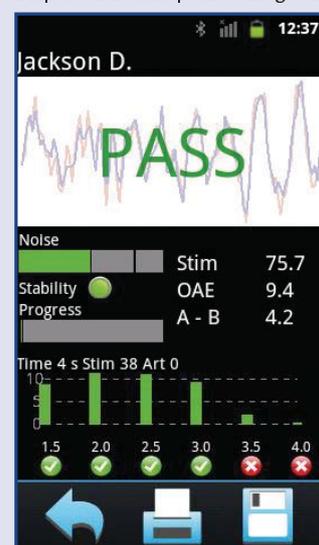
Step 1. Enter patient's data and select test



Step 2. Insert OAE probe



Step 3. Automatic probe fitting check



Step 4. Signal acquisition and preview test result

High-power Li-ion Battery without Memory Effect

operates the whole day without recharge. To recharge battery, use power supply unit. It looks like power adapter of your laptop. The device can operate being connected constantly to the power supply unit.

Big Color Display

shows the exam procedure and exam results in both text and graphic form. If you doubt about the text result, you can study graphs, traces and spectra and make your own decision. Color screen displays the graphic results in convenient form (red graphs for right ear responses and in blue graphs for left ear responses).

**All-in-one: TEOAE,
DPOAE, ABR / BERA**

Customizable settings

Small Dimensions and Light Weight

make the device portable. You can carry it with you during the work day in hospital or infant care center, take it to examine patients at home or just use it during the reception at clinic.

SD card up to 64 GB

**Intuitive 4.3" touch
screen**

High-capacity Memory

provides the opportunity to store a large amount of exams in a device memory. You can examine up to several hundred patients during several days and then print results or export them to computer database of your hospital via Bluetooth.



Neuro-Audio-Screen Features

Why is It Important?

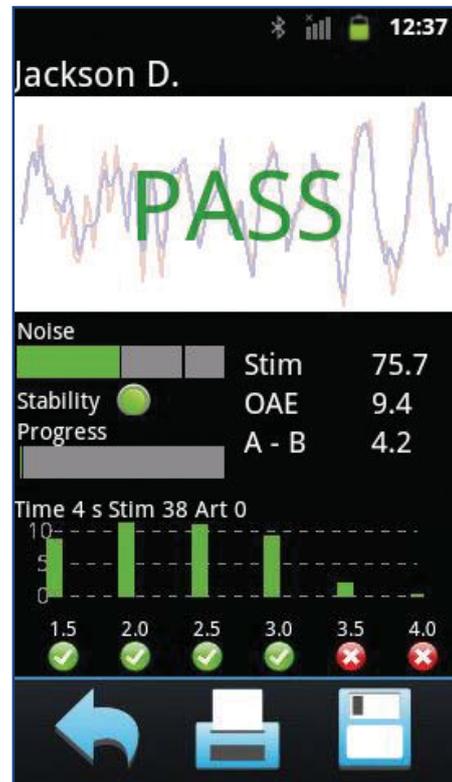
The hearing impairment is diagnosed in three of every thousand babies born, that is twice more than frequency of cleft lip (palate), twice more than frequency of Down's syndrome and ten times more than frequency of phenylketonuria.

The problem of diagnostics and correction of hearing loss and deafness in this special category of patients is actual both in medical and social relations. Often the visual examination and other traditional diagnostic techniques of hearing impairment detection do not reveal the problem until 1 to 3 years of age — which is well beyond the critical period (6 months) for healthy speech and language development.

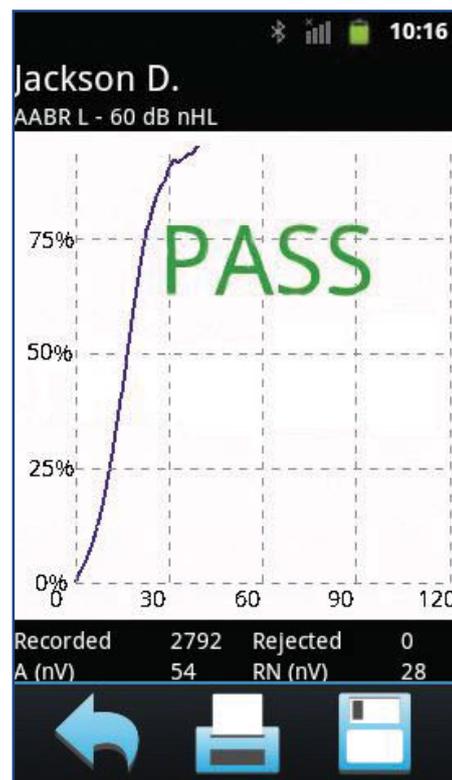
However, if a hearing impairment is identified and corrected in its early stages, studies have shown that the child's speech and language skills will be comparable to his or her normal-hearing peers. For these reasons, hearing screening at birth and routinely throughout childhood is extremely important. Timely and correct diagnosis provides an opportunity to start the hearing rehabilitation and child integration to speech environment as soon as possible.

What Should be Done?

In all developed countries the problems of early diagnostics and early rehabilitation of infants suffering from hearing impairments and deafness are solved by universal newborn hearing screening (objective hearing study of all newborns using OAE and/or ABR techniques) in maternity hospitals and maternity wards of patient care institutions.



TEOAE test results



ABR test results

OAE

The otoacoustic emission (OAE) test is an accurate, informative and time-saving tool which is simple to perform. It is considered that if OAE is recorded, an infant's hearing is not impaired. In case OAE is not recorded, it is an indication to see an audiologist to perform the further examination of an infant.

Otoacoustic emission is the acoustic response which reflects the normal functioning of the auditory receptor. These are low-intensity sounds generated by cochlea which can be recorded in ear canal with the use of highly sensitive microphone. These sounds are the result of active mechanical processes running in the organ of Corti, namely in outer hair cells.

OAE is intended mostly for screening as it takes little time. It is very important also because the long term immobility of an infant is sometimes impossible. Several types of this technique exist, but in practice the most often used ones are transient evoked otoacoustic emission (TEOAE) and distortion product otoacoustic emission (DPOAE).



DPOAE test

ABR / BERA

When you use only OAE technique for screening, patients with normal cochlea function but with possible retrocochlear impairments (for example, with auditory neuropathy) drop out of sight. The ABR technique does not have such drawback.

The essence of this technique is the acquisition of the electrical potentials evoking in different structures of auditory system in response to auditory signal which defines its objectivity.

Auditory brainstem response (ABR) or brainstem evoked response audiometry (BERA) is widely used in audiology.

The advantages of this test:

- ABR can be recorded in newborn from first hours of life including premature infants and newborns suffering from central nervous system diseases.
- ABR acquisition is noninvasive (safe and harmless).
- ABR acquisition provides objective information concerning the state of auditory pathways.
- ABR characteristics are stable and do not depend on a patient's state (whether she/he is awake or asleep, this sleep is natural or drug-induced).

Besides, ABR screening has the following advantages:

- The stimulation frequency is increased up to 93 Hz, it allows making 8000 averagings per less than 2 minutes.
- The test has several automatically calculated "Pass" criteria. As soon as these criteria are checked, the test is stopped automatically and "PASS" or "REFER" result is displayed on the screen.
- To record ABR, the same OAE probe as for OAE acquisition is used.

During two-stage hearing screening, in case an infant did not pass OAE test, a doctor should make ABR test to specify the diagnosis.

All tests are performed in automatic mode. The exam results are displayed on the screen immediately and if the thermal printer with wireless Bluetooth interface is available (is not included in the base delivery set), they are printed on the thermal paper. All these features are very important for the screening.

Variants of Delivery Set

Two delivery set variants are available: Neuro-Audio-Screen and Neuro-Audio-Screen/OAE

	Available Techniques		
	ABR	TEOAE	DPOAE
Neuro-Audio-Screen	+	+	+
Neuro-Audio-Screen/OAE	-	+	+



Neuro-Audio-Screen Delivery Set

- Electronic unit
- Power supply unit for Neuro-Audio-Screen
- Neuro-Audio-Screen cable for EP electrodes
- Cable for disposable electrode connection: "Alligator" clip - touch-proof (1.2 m) – 3 pcs. (green, red and black)
- Disposable surface electrode (set of 100 pcs.)
- OAE probe
- OAE probe tip
- Set of ear tips (pediatric) (3-8 mm diameter)
- Test cavity
- Bluetooth adapter
- Dental floss for probe tip cleaning
- Probe tip extractor
- Neuro-Audio-Screen Manager software
- Training video "Hearing Screening of Newborns"
- Technical manual

Option



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