Frequently Asked Questions: EroScan OAE Test System

Q: How is the EroScan different from other OAE test systems on the market?

A: The EroScan is the only completely hand-held unit. It can test in greater amounts of background noise and still get reliable test results due to a patent-pending noise reduction algorithm. In addition, the EroScan offers more features at a lower price than any other OAE unit.

Q: What do otoacoustic emissions results tell us?

A: Available evidence suggests that otoacoustic emissions (OAEs) are generated by the cochlea's outer hair cells, and that the presence of OAEs is an indication that the outer hair cells are normal. Although OAE test data provides no indication of inner hair cell function, or degree of hearing ability, current research indicates that the majority of hearing-impaired individuals will be identified by a simple OAE test. Patients who fail to generate OAEs should be rescreened and/or referred for additional audiological testing.

Q: How does the EroScan device work?

A: The digital signal processor in the instrument generates two pure tones (f1 and f2) through a digital-to-analog converter. These tones are presented to the ear via speaker tubes located in the probe. A microphone in the probe measures the sound in the ear canal and transmits the signal to the analog-to-digital converter. The digital signal processor then filters the signal into narrow frequency bands, and detects any emissions present. The level of these emissions can be compared with the average level of the noise in adjacent frequency bands. An emission is judged to be present when the level in the emission band is 5 db or more above the level in adjacent bands. (The actual pass-fail criterion used in the EroScan instrument uses a more sophisticated statistical test).

Q: What are DPOAEs?

A: Distortion product otoacoustic emissions are acoustic signals that can be detected in the ear canal of a person with normal cochlear outer hair cell function, subsequent to stimulation of the auditory system with a pair of pure tone at frequencies.

Q: How does the EroScan device measure DPOAEs?

A: The EroScan instrument generates a series of test tones, directs them into the ear canal, and then measures the level of the DPOAE tone generated by the cochlea. By using different test frequencies, the EroScan device provides an estimate of outer hair cell function over a wide range of frequencies.

Q: What is the difference between TEOAE and DPOAE?

A: DPOAE is a more frequency-specific test stimulus. TEOAE uses a more broadband signal (composed of many frequencies). One difference lies in the frequencies that can be tested using the two different types. In general, TEOAEs can test lower frequencies and DPOAEs can test higher frequencies. There is, however, a large area of overlapping frequencies in the speech range that can be tested using either type. The typical screening test frequency range for TEOAEs is 700 - 4000 Hz and for DPOAEs is 1500 - 6000 Hz.

Q: What does a REFER result mean?

A: Test results are either PASS or REFER. REFER means that the patient did not pass the test. This could be due to many reasons including ear wax, middle ear fluid, noise, improper test technique or hearing loss. All REFER results should be immediately repeated. If the test result continues to be REFER, the patient should be screened using pure-tone testing and tympanometry. If passing results are not achieved on these tests, then a referral to an audiologist and/or physician should be made.

Q: I do third party billing, what are the reimbursement codes for the unit?

A: OAE screening is billed with CPT code 92587 – Screening. Diagnostic OAE testing is billed with CPT code 92588 – Comprehensive.

Q: I see different units listed and one is more expensive than the other. What is the difference between the less expensive alternatives?

A: The screener has a lower price because it has set test protocols in the unit that cannot be altered by the user. The standard unit allows the user to modify the test protocol allowing for the testing of more frequencies at different levels. The higher priced unit will allow for billing of the 92588 reimbursement code for comprehensive otoacoustic emission testing.

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Q: How many test frequencies are there in the EroScan screener?

A: There are four test frequencies: 2 kHz, 3 kHz, 4 kHz and 5 kHz.

Q: How many test frequencies are there in the standard EroScan?

A: There are six test frequencies: 1.5 kHz, 2 kHz, 3 kHz, 4 kHz, 6 kHz, 8 kHz and 12 kHz. These higher frequencies are for diagnostic testing.

Q: Is the EroScan available with both TEs and DPs?

A: Yes. The standard EroScan is available in a combo system with both TE and DP.

Q: When should I use the remote probe?

A: The remote probe is just as effective when testing but gives you a bigger range of motion. It is the preferred method for testing because it allows head movement and is more comfortable – especially for newborns.

Q: How old does a child have to be before being able to get screened with the EroScan?

A: The EroScan can be used to screen from newborn to adult.

Q: Can I test patients with pressure equalization (PE) tubes?

A: Patients with PE tubes can be tested by bypassing the auto-start function of the unit. This is accomplished by first inserting the EroScan with an appropriate ear tip into the ear canal and obtaining a proper seal. To disable the auto-start, at the main menu select the ear to be tested by holding down the right or left arrow keys for 3 seconds until the green "test" light turns off. Once the key is released, the EroScan will calibrate and test as before.

Q: If a patient's ear is impacted with wax can I still screen her?

A: No, impacted wax will yield a refer result. In addition, any significant amount of wax can potentially cause a refer result.

Q: If a patient has otitis media can he still be screened with the EroScan unit?

A: Middle ear fluid will yield a refer result. This should then be followed up with pure tone testing and tympanometry so you can determine if there is otitis media based on the flat tympanogram.

Q: What size tips should I be using on what age group?

A: All ears are different and eartip sizes therefore will vary from patient to patient. The eartip must seal the ear canal, so the best test results can be obtained when the eartip is inserted deeply into the ear canal instead of flush with the ear canal opening.

Q: How can the EroScan save me time?

A: The EroScan cuts in half the usual time to screen hearing. Typical school screening, for example, requires two tests, pure-tone testing and tympanometry. Otoacoustic emissions can replace these two tests and requires no response from the patient. This is a definite advantage for children with physical disabilities, young children, and children who do not use English as their primary language. Some children simply will not respond to conventional pure-tone testing despite time consuming attempts at conditioning.

Q: Is training required before the unit is purchased or can anyone learn to use the product from the manual?

A: Anyone can learn to use the product, however, there is a technique for proper screening, and practice is required to do the technique properly. A training video comes with each unit and will help you to learn the technique.

Q: Does the unit need to be calibrated?

A: The instrument requires no regular maintenance beyond routine cleaning and battery replacement.

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Q: How many tests can I print on a roll of paper?

A: Approximately 250 tests can be printed using one roll of paper.

Q: How do I clean my EroScan unit?

A: The instrument and its accessories may be wiped clean with a damp cloth using a mild antiseptic solution (e.g. cetylcide). Take care not to put excessive pressure on the clear display window or allow any utensil to puncture the display window or keypad. Do not allow any fluid to enter the device. Do not immerse the instrument in fluids or attempt to sterilize the instrument or any or its accessories. Probe tips should be replaced when they become clogged. Replacement probe tips are included with the instrument. Do not attempt to clean the probe tips, they are disposable and must be replaced when they become clogged. For instructions on replacing probe tips, see the Product Use and Procedure section under "Hints for successful testing".

Technical Specifications

PROBE	
Measurement Type	Otoacoustic Emissions (OAE)
Stimulus Intensity Range	40 to 65 dB SPL
Maximum Output (protection)	90 dB SPL
Microphone System Noise	-20 dB SPL @ 2 kHz (1 Hz bandwidth)
Averaging Time	0.5, 1, 2, or 4 seconds
Artifact Rejections	Unit will correctly measure strong OAEs in speech babble background noise of 65 dB

INSTRUMENT	
Power Supply	(4) AA cells - alkaline (6V Total)
Battery Life	Approximately 300 tests
PRINTER	
Type	Thermal dot matrix line printer
Speed	>10 lines per second
Operating Noise	<50 dB SPL
Weight	1.4 lbs. (630g) including battery pack
Paper	Thermal roll - 2.25" wide
PROCESSOR	
Digital Signal Processor	Motorola 56303 24-bit 66 MHz 3.3V
Storage	1 MB flash EEPROM (non-volatile)
Battery Backup	0. 1F 5.0V (approx. 24 hours)
CODEC	18 bit D/A, 18 bit A/D 96 dB SNR
Display	4 line x 10 character STN liquid crystal

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