



Dissolving Barriers Between People and Quality of Life, Everywhere

eMoyo Product Brochure



WELL BEYOND INNOVATION

emoyo.tech

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At eMoyo, we believe in the power of the human spirit

It's what motivates us every day to keep building state-of-the-art, portable healthcare solutions that break down barriers between people and quality of life everywhere.

But it's about more than making what's next. It's sharing what works.

We believe that challenges are just solutions-in-waiting

We understand the demands of a modern medical practice. That's why we're passionate about creating state-of-the-art, location-independent medical technology that will support healthcare professionals, employers and organisations across the globe to work smarter, faster and more cost-efficiently.

Increasing patient reach, enhancing patient care

Every day, we work to make access to high-quality healthcare simpler and more affordable. We do this by creating state-of-the-art, affordable medical technology solutions that empower medical professionals, clinicians and occupational health officials globally to treat more people, and enhance patient care.





Who we are

We are a proudly South African medical technology company and passionate team of engineers, designers, clinicians and innovators based in Johannesburg, South Africa.

eMoyo is derived from the Swahili word "moyo" (heart); the Shona word "moyo" (life) and the Zulu word "umoya" (breath or spirit).

We're about life, and we believe the future of healthcare is human.

eMoyo. Well Beyond Innovation



Meet the KUDUWAVE

A Highly Accurate, Location-Independent
Diagnostic Audiometer Designed To
Help You Take Hearing Healthcare Further

The medical technology inside our iconic Kuduwave audiometers has been transforming hearing healthcare since 2008

That's why our clinically validated, high-frequency Kuduwave audiometers are trusted by audiologists, clinicians and occupational health professionals worldwide.

Featuring increased passive attenuation capabilities and a host of other features, the Kuduwave is a one-of-a-kind medical device – and the only truly booth free diagnostic audiometer available today.

Our internationally acclaimed range of highly portable audiometers includes the Kuduwave OH and the Kuduwave Prime, designed specifically for use in occupational health environments. It further includes the diagnostic Kuduwave Pro and Kuduwave Pro-TMP audiometers, the latter offering users integrated bilateral tympanometry for the first time ever.

The Kuduwave truly offers users a complete set of state-of-the-art screening and diagnostic audiometry tools. Lightweight and tele-audiology enabled, these location-independent devices support clinicians in reaching more patients and enhancing patient care, making them ideal for hearing testing in any clinical audiology or occupational health setting.

To find out how our tele-audiology enabled range of Kuduwave screening and diagnostic audiometers can help transform the way you work, [visit www.emoyo.tech](http://www.emoyo.tech)

KUDUWAVE Audiometer Range

Kuduwave Pro-TMP High-Frequency Portable Diagnostic & Screening Audiometer with Integrated Bilateral Tympanometer

The **Kuduwave Pro-TMP** is a highly portable, location-independent diagnostic audiometer that integrates bilateral simultaneous tympanometry, eustachian tube functionality and acoustic stapedius reflex measurement functionality into the audiometry headset for the first time ever. KuduTMP technology can be integrated into any Kuduwave audiometer, transforming it into a Kuduwave Pro-TMP high frequency audiometer with integrated tympanometers, one in each ear cup.

Kuduwave Pro High-Frequency Portable Diagnostic & Screening Audiometer

The Kuduwave Pro offers users a complete set of highly accurate diagnostic audiometry tools. This clinically validated boothless audiometer combines the sound booth, audiometer, bone conductor and extended high-frequency headset in a single, lightweight device. Trusted by audiologists worldwide, the Kuduwave Pro is the ideal audiometer for use in any clinical audiology setting.

Kuduwave Prime High-Frequency Portable Screening Audiometer

The Kuduwave Prime is a highly accurate, tele-audiology enabled portable screening audiometer. Fast, lightweight and fully booth free, the Kuduwave Prime is ideally suited for rapid, high-volume hearing loss screening in occupational health, wellness and school settings.



Kuduwave OH Portable High-Frequency Screening Audiometer (available in South Africa only)

Robust, lightweight and fully booth free, the Kuduwave OH is a highly accurate, tele-audiology enabled portable screening audiometer. The sturdy Kuduwave OH with protective plastic sleeves was specifically designed for cost-effective, rapid on-site hearing loss screening in occupational health environments.

The Innovation Inside Your Kuduwave

eMoyo-EMR SOFTWARE

Our full-featured suite of eMoyo-EMR software enables you to perform a full range of hearing tests, store and manage unlimited patient records, and verify your Kuduwave audiometer's calibration status – all using a single interface.

X-CHECK CALIBRATION VERIFICATION

X-Check (pronounced “cross-check”) is an integrated digital calibration verification tool designed for accurate calibration verification in only 30 seconds. X-Check comes standard with all Kuduwave audiometers manufactured after March 2018, and is available as an upgrade for older models.

AMBI-DOME ATTENUATION

Our unique Ambi-Dome passive attenuation functionality is built into every Kuduwave headset. It consists of the combination of physical passive noise blocking and active noise monitoring technology, and provides the core boothless testing ability of all Kuduwave audiometers.

SPEECH AUDIOMETRY

Recorded materials improve both the intrasubject and intersubject precision of threshold and suprathreshold measures by providing a consistent level for all speech test items. All our Kuduwaves

incorporate pre-recorded speech testing, offering users greater signal intensity control as well as improved test-retest reliability.

What Makes the Kuduwave Unique?

The Kuduwave Pro and Kuduwave Pro-TMP are the only truly booth-free diagnostic audiometers available at present

These leading-edge med-tech devices have been peer-reviewed, clinically validated and are certified capable of conducting screening and diagnostic pure-tone and speech audiometry. They are also equipped to conduct acoustic immittance measurements. The Kuduwave Pro-TMP with built-in tympanometry is the first and only acoustic immittance measurement device that can conduct bilateral simultaneous tympanometry and ipsi and contralateral acoustic reflex measurements without swapping the probe to the opposite ear. These functionalities make the Kuduwave Pro and Kuduwave Pro-TMP truly unique audiological instruments. Because of their increased passive attenuation capabilities they are, at present, the only comprehensive, diagnostic, all-in-one audiometers capable of providing both trusted screening and diagnostic audiometry outside of a sound booth.

The Advantages of Owning a Kuduwave

TEST ANYWHERE WITH TRULY BOOTHLESS AUDIOMETRY

Our Kuduwave audiometers are the only pure-tone audiometers clinically validated for true, booth-free audiometric testing. The Kuduwave Pro outperforms standard, single-wall sound booths, making the Kuduwave a real-world alternative to traditional audiometric screening equipment.

TAP INTO THE POWER OF TELE-AUDIOLOGY

All Kuduwave audiometers are equipped with tele-audiology functionality. This feature makes the Kuduwave completely location-

independent, allowing users to conduct testing remotely while enjoying the advantages of integrated patient management, manual or automated testing and secure cloud storage facilities.

CHOOSE BETWEEN AUTOMATIC OR MANUAL OPERATION

Kuduwave audiometers offer the convenience of both manual and automatic audiometry options. This feature enables users to set their own automated screening protocols according to their requirements and facilitates reliable, repeatable results customised to individual preferences.

INTUITIVE AUDIOMETRY SOFTWARE

All Kuduwave audiometers are supported by our complimentary, state-of-the-art eMoyo-EMR software. User-friendly and easy to learn, eMoyo-EMR is a free, full-featured Windows-based software suite designed to empower clinicians, occupational health officials and healthcare professionals worldwide to work faster, smarter and more cost-efficiently.

INTEGRATED PATIENT MANAGEMENT

Our eMoyo-EMR software enables users to store and manage unlimited patient records and perform testing from a single user interface. eMoyo-EMR offers a complete testing and patient-management platform, making it ideal for occupational health, primary care and mass hearing loss screening initiatives, including school hearing screening programmes.

YOUR DATA - SECURE IN THE CLOUD

eMoyo-EMR software offers users the convenience of rapid reporting and data retrieval while eliminating paperwork. Users can backup and synchronise unlimited patient audiograms and test records in the cloud, while encrypted cloud storage means electronic medical record data remains private, securely backed up and easily accessible at all times.

Calibrating Your Kuduwave Audiometer

All Kuduwave audiometers come with X-Check, a built-in digital calibration verification tool that enables accurate calibration verification (within 5dB) to objectively measure and ensure the precision of your results. Like biological checks, X-Check does not replace the need for regular calibrations. All Kuduwave audiometers will require calibration at regular intervals as set out by local standards.

Free with your KUDUWAVE

Every Kuduwave audiometer comes with:

- Complimentary eMoyo-EMR Audiometry Software
- Selected Speech Audiometry & Word List Plug-ins
- Kudupress Patient Response Button
- USB Cables
- Sound Tubes
- Kuduwave Training Video
- Kuduwave Digital User Manual
- Free 30-day Online (Or Depending on Region, One-on-One) Kuduwave Product Training
- Unlimited eMoyo Online, E-mail & Telephonic User Support



KUDUWAVE Speech Audiometry

*Every Kuduwave audiometer comes with a pre-loaded selection of free Speech Audiometry & Word List plug-ins. Premium Speech Audiometry & Word List plug-ins are also **available for download from our website.***

FREE KUDUWAVE SPEECH PLUGINS

- Afrikaans SRT
- Afrikaans WR
- Zulu WR
- Sepedi WR
- Afrikaans Word List
- Gauteng Afrikaans
- Pedi Word List
- SA English
- SA English Word List
- Zulu Word List

PREMIUM SPEECH PLUGINS

- Auditec NU6
- Maryland CNC
- Speech Recognition and Identification Materials, Disc 4.0
- Spanish Auditory Test
- Auditec Quick SIN (Adult)
- Afrikaans FVEWA
- South African English AB (Arthur Boothroyd Isophonemic)
- South African English NU-6 – Ordered by difficulty

Kuduwave System Requirements

- Windows® 8 or 10 (32 or 64-Bit)
- Intel® Celeron® Processor N3050 or better
- 2 GB RAM
- 700 Mb Free HDD Space
- 2 available USB 2.0 Ports (3 recommended)
- Compatible with powered USB hub

Kuduwave Delivery, Product Training & Customer Support Information

- All eMoyo products are delivered free of charge to any location in South Africa.
- All eMoyo customers enjoy access to free 30-day online (or depending on region, one-on-one) Kuduwave Product Training.
- All eMoyo customers enjoy unlimited access to free online, telephonic, e-mail & social media support.
- All eMoyo customers enjoy lifetime access to our free Kuduwave online training resources.



FDA
Registered



Kuduwave audiometers are manufactured by an ISO 13485 certified company, are FDA-registered, and are compliant with all IEC, ANSI and SANS standards for audiometry, tympanometry and calibration.

eMoyo Product Warranty

All Kuduwave audiometers are supported by a 3-year repair-or replace warranty, with the option of an extended warranty for a further 2 years. All other eMoyo products & accessories carry a 1-year warranty.

01

Audiometry Products,
Services, Accessories
& Consumables



KUDUWAVE[™]
PRO-TMP

KUDUWAVE PRO-TMP

Portable High-Frequency Diagnostic
& Screening Audiometer with
Integrated Bilateral Tympanometer

- Screening
- Diagnostic
- High-Frequency Testing
- Integrated Bilateral Tympanometry
- Acoustic Reflexes
- Tele-Audiology Enabled
(Location Independent)





A One-Of-A-Kind Audiological Instrument

The Kuduwave Pro-TMP is far more than a boothless audiometer

It is the first and only acoustic immittance measurement device that can conduct bilateral simultaneous tympanometry and ipsi- and contralateral acoustic reflex measurements without swapping the probe to the opposite ear. This makes our flagship Kuduwave Pro-TMP High-Frequency Diagnostic & Screening Audiometer with Integrated Tympanometry a truly unique audiological instrument – and an all-in-one audiometry solution.

BILATERAL TYMPANOMETRY & ACOUSTIC REFLEXES

The Kuduwave Pro-TMP features dual tympanometers integrated into the audiometric headset. This configuration incorporates all audiological screening and diagnostic features of the Kuduwave Pro audiometer, combined with bilateral tympanometry and acoustic reflexes. To learn more about our one-of-a-kind Kuduwave Pro-TMP High-Frequency Diagnostic & Screening Audiometer with Integrated Tympanometry, please click [here](#).

KUDUTYMP: INTEGRATING TYMPANOMETRY INTO YOUR KUDUWAVE

Our unique Kudutymp technology seamlessly integrates tympanometry and acoustic stapedius reflex measurement functionality into any **Kuduwave audiometer**, transforming it into a Kuduwave Pro-TMP High-Frequency Diagnostic & Screening Audiometer with Integrated Tympanometry. Kudutymp functionality is available as an add-on component for your Kuduwave, to be selected at the point of purchase in our online shop. It is also available as a hardware upgrade to your existing Kuduwave audiometer*.

*Kudutymp functionality is available as a hardware upgrade in South Africa only.

For price enquiries, visit our [online shop](#) or request a quotation.

Take Hearing Healthcare Further with the Kuduwave Pro-TMP

AUTOMATIC SIMULTANEOUS BILATERAL TYMPANOMETRY

Dual tympanometers enable automatic bilateral tympanometry, offering users significant time-saving benefits. This feature further enhances patient care in sensitive young patients, as by testing both ears simultaneously, pain-related difficulties are minimised.

SUPERIMPOSED TYMPANOGRAMS & REAL-TIME DATA PRESENTATION

Tympanograms of each ear are immediately viewable on the same set of axes and in real time, allowing for easy comparison of ear results, as well as a single-view review of both data sets.

INTUITIVE TYMPANOMETRY SOFTWARE

Automatic seal checking speeds up testing functionality while providing additional quality assurance. Assistive test classification ensures accuracy, efficiency and simplifies use.

EUSTACHIAN TUBE FUNCTION

Simply and intuitively evaluate Eustachian tube function in patients with intact or perforated tympanic membranes. Multiple tympanograms can be displayed for each ear, with functionality to switch between results or delete results as required.

DIAGNOSTIC REFLEX MEASUREMENTS

Save valuable clinical time while yielding all pertinent clinical information and store the reflex measurement history for each frequency tested. The Kuduwave Pro-TMP audiometric headset was designed with speakers (probe tones) and microphones in both ear cups. This allows for testing without swapping the probe or activator-stimuli tips, offering users significant time-saving benefits.

REFLEX DECAY MEASUREMENT

Introduce continuous stimulation (≥ 10 seconds) to the ear at 10 dB above the acoustic reflex threshold (ART), allowing for reflex decay measurement useful in detecting or confirming retrocochlear pathology.

OPTIONAL STIMULUS TYPE & DURATION

Select either pure-tone testing (500, 1000, 2000 and 4000 Hz) or Broadband noise. The stimuli can be either pulsed or continuous, with a selected duration.

MEASUREMENT HISTORY VIEWER

Yield valuable data with ipsilateral and contralateral measurements. Store multiple reflex thresholds for each ear and specific test frequency; and compare reflexes elicited at various intensities with eMoyo-EMR's Measurement History Viewer.

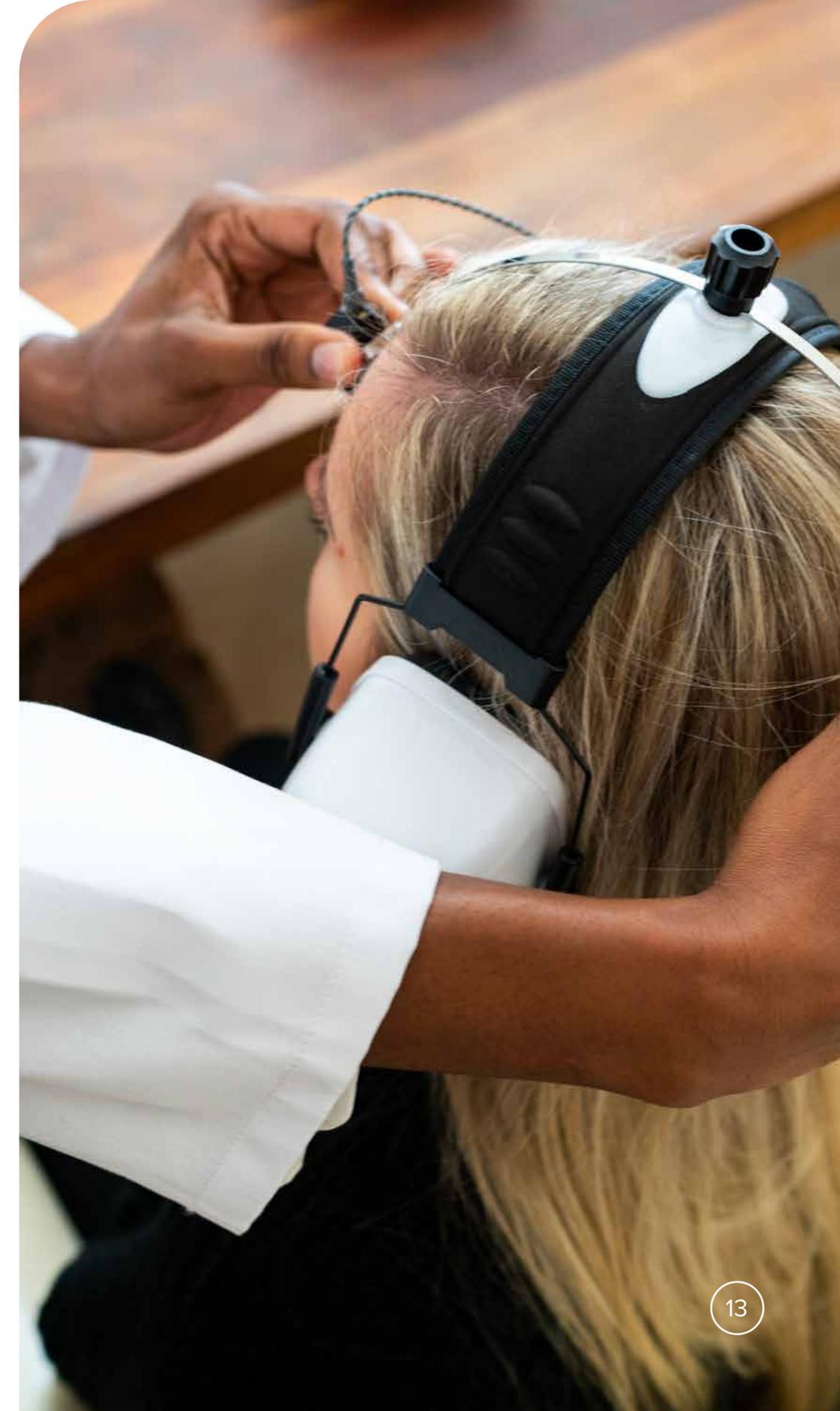
Kuduwave Pro-TMP Features

- Bilateral tympanometry
- Ipsi- and contra-lateral acoustic reflexes
- Ultra high-frequency testing (up to 16 kHz)
- Pure-tone air conduction
- Bone conduction:
 - Forehead bone conduction (maximum 70 dBHL in midrange frequencies)
 - Narrowband noise masking
 - Automatic & manual non-test ear masking for air and bone conduction
- Automatic & manual diagnostic tone thresholds testing (Air, Bone & Masking)
- Speech-testing software, including:
 - Integrated speech audiometry (WR, SRT, CAPD pre-recorded word lists)

- Speech-weighted random noise & four-talker babble noise
 - Free standard word list plugins
- Boothless operation
- Complimentary eMoyo-EMR software, featuring:
 - Patient management & medical record suite
 - Automatic patient response monitoring
 - Customisable automatic & manual testing protocols with auto-threshold seeking
 - Custom-branded reports
 - Standard threshold shift, milestone baseline, PLH, HSE & more
 - Assistive interpretation tools
 - Talk forward
 - Smart folders work-flow management tools:
 - Ototoxicity Monitoring
 - School Screening
 - Mass Screening
 - Occupational Health
 - Customisable testing protocols
- X-Check automated calibration verification
- Active noise monitoring
- Telemedicine enabled (location independent)
- Stenger test
- Various threshold-seeking methods
- Cloud synchronisation, Google Drive, Microsoft OneDrive, Drop Box & more

[Kuduwave Pro-TMP Technical Specifications Sheet](#)

[Download the Kuduwave Pro-TMP's Technical Specifications Sheet.](#)



Calpod Calibration Pod

Calibrate Your Kuduwave Pro-TMP's Integrated Tympanometer with the Calpod

Plugged into your Kuduwave Pro-TMP, the Calpod Calibration Pod will enable you to perform a calibration check as well as calibrate your Kuduwave Pro-TMP's integrated tympanometer.

The Calpod Calibration Pod comes standard with any Kuduwave Pro-TMP audiometer. It can also be purchased separately as a Kuduwave accessory.

Built-in environmental sensor

Barometric pressure, ambient temperature and relative humidity are all crucial for the accuracy of your Kuduwave Pro-TMP's integrated tympanometer.

The Calpod calibration device includes 0.5cc, 2cc and 5cc precision-engineered calibration cavities, suspended in soft silicone to reduce ambient noise and vibration interference.

Included with Your Kuduwave Pro-TMP Audiometer

- Calpod Calibration Pod (hardware accessory)
- Free eMoyo-EMR integrated audiometry software
- USB patient response button
- USB cables
- Sound tubes with quick couplers
- Pack of 100 reusable eartips (assorted sizes)
- Kuduwave online training video
- Kuduwave digital user manual
- Kuduwave hard shock-absorbing carry case



eMoyo Product Warranty

All Kuduwave audiometers are supported by a 3-year repair-or replace warranty, with the option of an extended warranty for a further 2 years. All other eMoyo products & accessories carry a 1-year warranty.



KUDUWAVE[™]
PRO

KUDUWAVE PRO

Portable High-Frequency Diagnostic
& Screening Audiometer

- Screening
- Diagnostic
- High-Frequency Testing
- Tele-Audiology Enabled
(Location Independent)





An All-In-One, Advanced Audiometry Solution

The Kuduwave Pro combines the sound booth, audiometer, bone conductor and extended high-frequency headset in a single, lightweight device

These features make this remarkable audiological instrument the ideal solution for workplace screening, school and other hearing-loss screening programmes, ototoxicity monitoring programmes and audiology practices alike. Our state-of-the-art Kuduwave Pro audiometer offers healthcare professionals, clinicians and occupational health officials a complete set of diagnostic tools to test patients in their homes, in hospital, in the workplace and even on-site – without the need for an audiometric sound booth.

To learn more about the iconic Kuduwave Pro High-Frequency Diagnostic & Screening Audiometer, [please click here](#).

Enhance Patient Care & Take Quality Healthcare Anywhere with the Kuduwave Pro

LOCATION-INDEPENDENT & TRULY BOOTH-FREE

Kuduwave audiometers are the only pure-tone audiometers clinically validated for true, boothless audiometric testing. Our unique portable audiometry technology outperforms standard, single-wall sound booths, making the Kuduwave audiometer a real-world alternative to traditional audiometric screening equipment that can be used in just about any setting or location.

TELE-AUDIOLOGY ENABLED

Coupled with integrated patient management and cloud storage facilities, Kuduwave audiometers' tele-audiology capabilities enable state-of-the-art services, empowering users to conduct more hearing tests and reach more patients than ever before.

AUTOMATIC OR MANUAL OPERATION

Kuduwave audiometers offer the convenience of both manual and automatic audiometry options. This functionality enables users to set their own automated screening protocols, allowing for reliable, repeatable results customised to individual preferences.

COMPLIMENTARY AUDIOMETRY SOFTWARE

All Kuduwave audiometers are supported by our free, state-of-the-art eMoyo-EMR audiometry software. eMoyo-EMR is a user-friendly, full-featured Windows-based audiometry software suite designed to support clinicians, occupational health practitioners and other healthcare professionals to work faster, smarter and more cost-efficiently.

INTEGRATED PATIENT MANAGEMENT

Our simple and intuitive eMoyo-EMR software enables users to store and manage unlimited patient records while performing tests from a single user interface. Perfect for any audiology practice, eMoyo-EMR software is also ideal for occupational health primary care and mass hearing loss screening programmes, offering users a complete testing and patient-management interface.

SECURE IN THE CLOUD

Enjoy the convenience of rapid reporting and data retrieval while eliminating time-consuming paperwork and duplications. Backup and synchronise unlimited patient audiograms and test records in the cloud. Encrypted cloud storage means electronic medical record data remains private (not even eMoyo can see your data), securely backed up and easily retrievable – regardless of your location.

For price enquiries, [visit our online shop](#) or [request a quotation](#).

Kuduwave Pro Features

- Ultra high-frequency testing (up to 16 kHz)
- Pure-tone air conduction
- Bone conduction:
 - Forehead bone conduction (maximum 70 dBHL in midrange frequencies)
 - Narrowband noise masking
 - Automatic & manual non-test ear masking for air and bone conduction
- Automatic & manual diagnostic tone thresholds testing (Air, Bone & Masking)
- Speech-testing software, including:
 - Integrated speech audiometry (WR, SRT, CAPD pre-recorded word lists)
 - Speech-weighted random noise & four-talker babble noise
 - Free standard word list plugins
- Boothless operation
- Complimentary eMoyo-EMR software, featuring:
 - Patient management & medical record suite
 - Automatic patient response monitoring
 - Customisable automatic & manual testing protocols with auto-threshold seeking
 - Custom-branded reports
 - Standard threshold shift, milestone baseline, PLH, HSE & more
 - Assistive interpretation tools
 - Talk forward
 - Smart folders work-flow management tools:
 - Ototoxicity Monitoring
 - School Screening
 - Mass Screening
 - Occupational Health
 - Customisable testing protocols

- X-Check automated calibration verification
- Active noise monitoring
- Telemedicine enabled (location independent)
- Stenger test
- Various threshold-seeking methods
- Cloud synchronisation, Google Drive, Microsoft OneDrive, Drop Box & more

Kuduwave Pro Technical Specifications Sheet

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Included with Your Kuduwave Pro Audiometer

- Free eMoyo-EMR integrated audiometry software
- USB patient response button
- USB cables
- Sound tubes
- Kuduwave online training video
- Kuduwave digital user manual
- Kuduwave shock-absorbing carry case



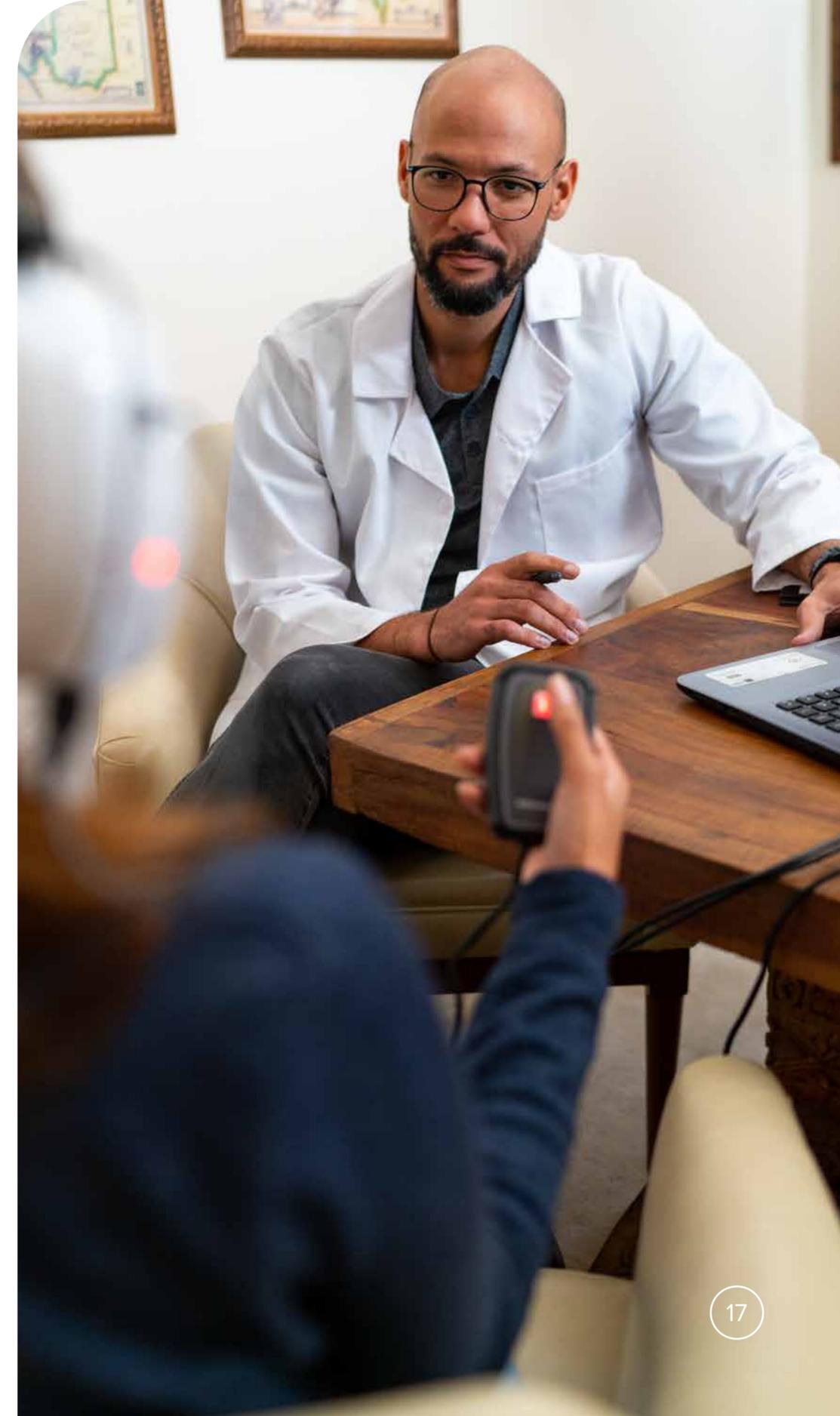
FDA
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All other eMoyo products & accessories carry a 1-year warranty.



KUDUWAVE[™]
PRIME

KUDUWAVE PRIME

Portable High-Volume Screening
Audiometer for Occupational Health

- High-Volume Screening
- High-Frequency Testing
- Tele-Audiology Enabled
(Location Independent)





Rapid, Reliable & Designed for the Workplace

The Kuduwave Prime is a lightweight, fully boothless audiometer ideal for rapid, high-volume occupational health screening

Tele-audiology enabled and highly portable, our user-friendly Kuduwave Prime audiometer was designed specifically for use in mobile medical service providers, on-site clinics, industrial hearing conservation programmes, as well as in school and outreach hearing loss screening programmes.

To learn more about the Kuduwave Prime Screening Audiometer, please [click here](#).

Work Faster, Smarter and More Cost-Efficiently with the Kuduwave Prime

LOCATION-INDEPENDENT & TRULY BOOTH-FREE

Our unique portable audiometry technology outperforms standard, single-wall sound booths, making the Kuduwave audiometer a real-world alternative to traditional audiometric screening equipment that can be used in just about any setting or location. Kuduwave audiometers are the only pure-tone audiometers clinically validated for true, boothless audiometric testing.

TELE-AUDIOLOGY ENABLED

Coupled with integrated patient management and cloud storage facilities, Kuduwave audiometers' tele-audiology capabilities enable state-of-the-art services, empowering users to conduct more hearing tests and reach more patients than ever before.

AUTOMATIC OR MANUAL OPERATION

Kuduwave audiometers offer the convenience of both manual and automatic audiometry options. This functionality enables users to set their own automated screening protocols, allowing for reliable, repeatable results customised to individual preferences.

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INTEGRATED PATIENT MANAGEMENT

Our simple and intuitive eMoyo-EMR software enables users to store and manage unlimited patient records while performing tests from a single user interface. Perfect for any audiology practice, eMoyo-EMR software is also ideal for occupational health primary care and mass hearing loss screening programmes, offering users a complete testing and patient-management interface.

SECURE IN THE CLOUD

Enjoy the convenience of rapid reporting and data retrieval while eliminating time-consuming paperwork and duplications. Backup and synchronise unlimited patient audiograms and test records in the cloud. Encrypted cloud storage means electronic medical record data remains private (not even eMoyo can see your data), securely backed up and easily retrievable – regardless of your location.

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Kuduwave Prime Features

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- Bone conduction:
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Included with Your Kuduwave Prime Audiometer

- Free eMoyo-EMR integrated audiometry software
- USB patient response button
- USB cables
- Sound tubes
- Kuduwave online training video
- Kuduwave digital user manual
- Kuduwave hard shock-absorbing carry case



FDA
Registered



eMoyo Product Warranty

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All other eMoyo products & accessories carry a 1-year warranty.





KUDUWAVE OH

High-Frequency Audiometer for
Occupational Health Screening

- Screening
- High-Frequency Testing
- Robust Design
- Tele-Audiology Enabled
(Location Independent)





A Hard-Working, Modern Industrial Audiometry Solution

Lightweight and highly accurate, the Kuduwave OH is an ideal pure-tone audiometry solution for mass hearing loss screening

Designed specifically to withstand knocks, drops and workplace accidents, the Kuduwave OH with protective plastic sleeves is an ideal audiometer for on-site hearing loss screening in the workplace or on location.

The highly portable, tele-audiology enabled Kuduwave OH can be used by mobile medical service providers, as well as in industrial hearing conservation programmes, on-site clinics, outreach and school hearing loss screening programmes and more. With robust, shock-absorbing sleeves, Noise-Check built-in noise survey sound level meter and Seal Check exterior noise-blocking functionality, the Kuduwave OH can transform your workplace hearing screening programmes to run faster, smoother and more cost-efficiently.

To learn more about the Kuduwave OH Screening Audiometer, please [click here](#).

Revolutionise Your Workplace Hearing Screening Programmes with the Kuduwave OH

LOCATION-INDEPENDENT & TRULY BOOTH-FREE

Kuduwave audiometers are the only pure-tone audiometers clinically validated for true, boothless audiometric testing. Our unique portable audiometry technology outperforms standard, single-wall sound booths, making the Kuduwave audiometer a real-world alternative to traditional audiometric screening equipment that can be used in just about any setting or location.

TELE-AUDIOLOGY ENABLED

Coupled with integrated patient management and cloud storage facilities, Kuduwave audiometers' tele-audiology capabilities enable state-of-the-art services, empowering users to conduct more hearing tests and reach more patients than ever before.

AUTOMATIC OR MANUAL OPERATION

Kuduwave audiometers offer the convenience of both manual and automatic audiometry options. This functionality enables users to set their own automated screening protocols, allowing for reliable, repeatable results customised to individual preferences.

COMPLIMENTARY AUDIOMETRY SOFTWARE

All Kuduwave audiometers are supported by our free, state-of-the-art eMoyo-EMR audiometry software. eMoyo-EMR is a user-friendly, full-featured Windows-based audiometry software suite designed to support clinicians, occupational health therapists and other healthcare professionals to work faster, smarter and more cost-efficiently.

INTEGRATED PATIENT MANAGEMENT

Our simple and intuitive eMoyo-EMR software enables users to store and manage unlimited patient records while performing tests from a single user interface. Perfect for any audiology practice, eMoyo-EMR software is also ideal for occupational health primary care and mass hearing loss screening programmes, offering users a complete testing and patient-management interface.

SECURE IN THE CLOUD

Enjoy the convenience of rapid reporting and data retrieval while eliminating time-consuming paperwork and duplications. Backup and synchronise unlimited patient audiograms and test records in the cloud. Encrypted cloud storage means electronic medical record data remains private (not even eMoyo can see your data), securely backed up and easily retrievable – regardless of your location.

For price enquiries, visit our [online shop](#) or [request a quotation](#).

Kuduwave OH Features

- Ultra high-frequency testing (up to 16 kHz)
- Automatic & manual pure-tone air conduction
- Bone conduction:
 - Forehead bone conduction (maximum 70 dBHL in midrange frequencies)
 - Narrowband noise masking
 - Automatic & manual non-test ear masking for air conduction
- Automatic & manual screening tone thresholds testing (Air & Masking)
- Speech-testing software, including:
 - Integrated speech audiometry (WR, SRT, CAPD pre-recorded word lists)
 - Speech-weighted random noise & four-talker babble noise
 - Free standard word list plugins
- Boothless operation
- Complimentary eMoyo-EMR software, featuring:
 - Patient management & medical record suite
 - Automatic patient response monitoring
 - Customisable automatic & manual testing protocols with auto-threshold seeking
 - Custom-branded reports
 - Standard threshold shift, milestone baseline, PLH, HSE & more
 - Assistive interpretation tools
 - Talk forward
 - Smart folders work-flow management tools:
 - Ototoxicity Monitoring
 - School Screening
 - Mass Screening
 - Occupational Health
 - Customisable testing protocols

- X-Check automated calibration verification
- Active noise monitoring
- Telemedicine enabled (location independent)
- Stenger test
- Various threshold-seeking methods
- Cloud synchronisation, Google Drive, Microsoft OneDrive, Drop Box & more

Kuduwave OH Technical Specifications Sheet

[Download the Kuduwave OH's Technical Specifications Sheet.](#)

Included with Your Kuduwave OH Audiometer

- Free eMoyo-EMR integrated audiometry software
- USB patient response button
- USB cables
- Sound tubes with quick couplers
- Kuduwave online training video
- Kuduwave digital user manual
- Kuduwave shock-absorbing carry case



FDA
Registered



eMoyo Product Warranty

All Kuduwave audiometers are supported by a 3-year repair-or-replace warranty, with the option of an extended warranty for a further 2 years.

All other eMoyo products & accessories carry a 1-year warranty.



Accessories & Consumables

For All Kuduwave High-Frequency Portable Audiometers

In order to operate your Kuduwave audiometer, the use of specific Kuduwave accessories and consumables is required.

Kuduwave Accessories

CalPod Calibration Pod

The Calpod Calibration Pod comes standard with any Kuduwave Pro-TMP audiometer. It can also be purchased separately as a Kuduwave accessory from eMoyo's [online shop](#).

When the probe of a Kuduwave Pro-TMP audiometer is plugged into the CalPod Calibration Pod, the Calpod enables users to perform a calibration check, as well as calibrate the Kuduwave Pro-TMP's integrated dual tympanometers at 0.5cc, 2cc and 5cc.

Kuduwave Consumables

Please note that certain consumable items are suitable for use with all Kuduwave audiometers, while certain consumables are only to be used with specific Kuduwave audiometers.



Kuditip Eartips

Universal size - for use with all Kuduwave audiometers.



Kudutymp Eartips

Various sizes - for use with Kuduwave Pro-TMP & Kuduwave OH audiometers

Each pack of Kudutymp eartips contains 100 Kudutympts in 5 different sizes (20 Kudutympts per size, per pack).



Kuduwave Pro-TMP & Kuduwave OH Replacement Sound Tubes and Couplers

In order to operate your Kuduwave Pro-TMP or Kuduwave OH audiometer, you will require the use of sound tubes and couplers. Each pack of Kuduwave Pro-TMP or Kuduwave OH Replacement Sound Tubes and Couplers contains: 3 x Kuditip Coupler Tubes; 3 x Kudutymp Coupler Tubes and 3 x Kuduwave Cupside Coupler Tubes.

Kuduwave Prime & Kuduwave Pro Replacement Sound Tubes and Couplers

Each pack of Kuduwave Prime and Kuduwave Pro Replacement Sound Tubes contains 2 x Anodised Aluminium Couplers and 6 x Sound Tubes.

Please note that there is no need to calibrate your Kuduwave Prime or Kuduwave Pro audiometer after sound tube replacement.

Accessories & Consumables continued...



Kudupress Patient Response Button

The robust, USB-powered Kudupress Patient Response Button fits comfortably into one hand and features a single button, allowing for faster and easier patient testing. It can plug into your Kuduwave audiometer as well as your laptop and offers additional visual feedback through a light-up button.

Kuduwave Hygiene Kit

The Kuduwave Hygiene Kit was designed for use with all Kuduwave audiometers. It includes 2 replacement circum-aural foam pads (one for each Kuduwave audiometer cup) and 4 replacement foam inserts, two for each Kuduwave audiometer cup.

Kuduwave USB Cable Bundle

Kuduwave USB cables power your Kuduwave and ensure lossless digital communication between your laptop computer and Kuduwave device.



Kuduwave Hard Carry Case

The original robust, shock-absorbing Kuduwave carry case with a soft foam insert will protect your Kuduwave audiometer against knocks, bumps and falls.



Kuduwave Material Carry Bag

Lightweight and space efficient, the soft Kuduwave Material Carry Bag is foldable and easy to wipe clean. It can also be custom printed with any supplied artwork design.



KUDUSCOPE™

KUDUSCOPE

Ultra-Light Otoscope-and-Mini-Endoscope-in-One

The ergonomic Kuduscope otoscope-and-mini-endoscope-in-one is a PC-controlled device that offers users a clear view of both the ear canal and tympanic membrane

This innovative digital otoscope enables clinicians to conduct examinations and investigate symptoms, regardless of setting or location. Powered by eMoyo's eMoyo-EMR software, the Kuduscope is exceptionally user friendly, operating in conjunction with a default laptop camera – or without.

Easy Integration With eMoyo-EMR

Annotate images and make clinical notes, even when offline, as the Kuduscope Otoscope-and-Mini-Endoscope requires no internet connection to operate. Integrated into our user-friendly eMoyo-EMR software interface, the Kuduscope enables users to store all their Kuduscope and Kuduwave results in one place.

Kuduscope Features

- 1 megapixel
- PC controlled
- Pen sized and feather slim
- USB powered
- Brightness control
- Cold LED lighting
- IP67 waterproof
- Easy tip-cleaning with rubbing alcohol

The Kuduscope Otoscope-and-Mini-Endoscope comes with 3 Washable Speculas; 4 Wax-Removal Currettes and a Welch Allyn Speculums Adaptor.





OTOCLEAR

Ear Irrigation Device

With a soft, flared, 3-stream tip to eliminate spills while increasing patient comfort & safety

This lightweight, ergonomic ear irrigation device requires no electrical power source to operate, making it highly portable and ideal for use outside of a traditional clinical setting.

The Otoclear Ear Irrigator features a soft, flared, 3-stream tip that was specially designed to eliminate liquid spills while improving the comfort and safety of patients during wax removal procedures, while a tri-directional water flow (each stream delivered at a 30-degree angle) means minimal water is required for effective wax removal. The Otoclear's 650 ml water bottle delivers a pressurised, continuous stream during use and features a temperature gauge for monitoring water temperature during use. Water is delivered to the ear at 37 °C (98,6°F) to ensure efficient wax removal.

Otoclear Features

- Continuous-stream irrigation mode
- Temperature gauge
- Built-in manual pressure pump
- Operation without a power source
- Allows for two-handed procedures

Otoclear Tips Features

- Multiple-hole design ensuring tri-directional, 30°- angle water flow into the ear canal
- Designed to prevent backsplash
- Designed to prevent over-insertion

OTOCLEAR continued...

For Use With Your Otoclear Ear Irrigator



Otoclear Tips

Uniquely designed Otoclear Tips fit onto the Otoclear Ear Irrigator. These tips were designed to direct water to the ear canal wall, allowing it to flow around ear wax instead of being directed at the tympanic membrane.



Otoclear Irrigation Basin

This anthropometrically designed, hand-held plastic ear irrigation basin was designed to collect expelled cerumen and water very effectively during the ear-irrigation process.



A woman with short blonde hair, wearing teal scrubs and red-rimmed glasses, is looking at a whiteboard. She has her hands on the board, which displays a graph. The background features framed anatomical diagrams on a light-colored wall.

02

Spirometry Products,
Services, Accessories
& Consumables





ORCAWAVE™

ORCAWAVE Spirometer with 3D Tilt Sensing Technology

Portable High-Resolution Spirometer for Occupational Health Testing

The Orcawave is a state-of-the-art portable spirometer specifically designed for workplace lung capacity and lung function testing

Discover just how fast, simple and cost-effective high-resolution lung function testing can be.

Our Orcawave portable spirometer is a clinically validated spirometry solution, built for powerful, rapid, and highly accurate occupational health respiratory and lung function testing.

The Orcawave offers users a user-friendly, lightweight and effective solution for testing lung function in patients who have been exposed to chemicals, dust and other airborne particles that may affect pulmonary function and the respiratory system.

What's more – all Orcawave portable spirometers come with complimentary eMoyo-EMR spirometry software and our unique built-in 3D Tilt Sensing technology.

3D Tilt Sensing – A Spirometry World First

The Orcawave is the first-ever portable spirometry device to feature built-in 3D Tilt Sensor technology.

3D Tilt Sensing monitors the position of the spirometer (front, back, left and right), ensuring that patients undergo lung function testing in an upright position while keeping the correct posture, in order to ensure accurate results every time.

The Orcawave Measures the Following Pulmonary Functions & More

FORCED VITAL CAPACITY [FVC]

The volume of air (measured in litres) that can be forcibly exhaled after a full inhalation.

FEV1 VS FVC (FEV1/FVC RATIO)

The ratio of air a patient can expel in one second, compared to their full lung volume.

PEAK EXPIRATORY FLOW [PEF]

A patient's maximum speed of exhalation, measured in litres per second.

FORCED EXPIRATORY VOLUME IN ONE SECOND [FEV1]

The amount of air (measured in litres) a patient can exhale in one second during a forced exhalation.

TIDAL VOLUME [TV]

The volume of air transported in and out of a patient's lungs during a normal (unforced) breath.

AND MANY MORE

For price enquiries, visit our online shop or request a quotation.



The Technology Inside Your Orcawave

The Orcawave comes complete with a complimentary suite of feature-rich spirometry software

User friendly and customisable to your specifications, our eMoyo-EMR spirometry software includes the following features:

- Interactive Incentive Graphics
- Rapid, 3-stroke Calibration Routine
- Customisable Settings
- 3D Tilt Sensing Technology
- Test-Sharing Functionality (sharing with other Orcawave software users)
- Regular Updates & Backups
- USB Powered (battery-free operation)

ORCAWAVE Calibration Syringe

Robust, durable & precision-manufactured

Our Orcawave Calibration Syringe was designed to be compatible with all commonly available spirometers. It is constructed with a robust aluminium casing for low-friction operation, and precision manufactured to deliver 3.00 litres.

Specifications

- Bi-Directional 3-litre Calibration Syringe
- 401.6 mm Stroke Length

Orcawave Calibration Syringe Calibration

Please note that your Orcawave Calibration Syringe will require annual calibration. This calibration service can be booked via our online shop.





ORCAWAVE Weather Station

USB key for real-time measurement of barometric pressure, room temperature & humidity

Barometric pressure, room temperature and humidity data are integral to ensuring an accurate spirometry environment.

The Orcawave Weather Station is a USB key with multiple sensors that accurately measure barometric pressure (mmHg, mbar), room temperature (Celsius or Fahrenheit) and humidity (as required by the 2019 ATS/ERS Spirometry Standards) in real time. eMoyo's Orcawave app for eMoyo-EMR spirometry software will automatically input barometric pressure, room temperature and humidity data from the Orcawave Weather Station, populating all relevant fields. This saves users valuable time while providing highly accurate, real-time information.

Orcawave Weather Station Specifications

- Temperature: 0 - 70 °C (minimal 0.5% error)
- Barometric Pressure: 98.5% accuracy (1.5% error)
- Humidity: 96.5% accuracy (3.5% error)



ORCAWAVE Spatter Guard Mouthpieces

Disposable & 100% biodegradable

Our environmentally friendly, biodegradable Orcawave Spatter Guard Mouthpieces were designed to prevent blockages of the Orcawave spirometer's calibrated flow tube.

Orcawave disposable Spatter Guard Mouthpieces are used for expiratory testing only. Each mouthpiece is UV sterilised before being individually sealed. Compared to similar products made from plastic, Orcawave disposable Spatter Guard Mouthpieces reduce medical waste by up to 25%.



03

eMoyo-EMR
Software



eMoyo-EMR Software

Simple, Powerful & Exceptionally User Friendly

eMoyo-EMR is a full-feature medical software interface from which to run all tests and store all data on the PC drive, backed up to the Cloud.

Our revolutionary eMoyo-EMR software supports clinicians, occupational health officials and medical professionals around the globe to work smarter – and simpler. Because less time spent on administration and paperwork means more time for patients – and unlocking a medical practice’s full potential.

eMoyo-EMR Audiometry Software

Simplify Procedures. Increase Reach. Optimise Patient Care

Intuitive, easy-to-use and tele-audiology enabled, eMoyo-EMR’s revolutionary, state-of-the-art audiometry software has been transforming the way audiologists, clinicians and hearing healthcare professionals work for over a decade.

Engineered to yield highly accurate hearing test results every time, eMoyo-EMR’s audiometry software solution offers a core battery of automated audiometric tests, including Pure Tone Audiometry (Bone Conduction and Air Conduction) as well as Speech Audiometry. eMoyo-EMR’s automated audiometry user interface further allows for automatic and manual hearing testing as well as patient conditioning, while custom macros allow for the customisation of testing protocols. Assistive interpretation functionality assists with interpreting audiometric results, allowing users to automatically calculate interpretations for Pure Tone Audiometry; Ototoxicity Monitoring; PLH Interpretation as well as Tympanometry Automatic Classification.

eMoyo-EMR Audiometry Software Features Include:



Tele-Audiology
Functionality



Integrated Patient
Management



Cloud
Connectivity



Secure Data
Storage



Automated or Manual
Testing Options



Smart Folders
with Customisable
Testing Protocols



Customisable
Patient Reports
(report formats include
Standard Audiometry;
OSHA; HSE categorisation;
PLH comparisons; STS monitoring
& Assistive Interpretations)

For more information about eMoyo-EMR Audiometry software, please [click here](#).

The Innovation Inside Kuduwave Portable Audiometers

Our state-of-the-art eMoyo-EMR audimetry software enables users to perform a full range of hearing tests, store and manage unlimited patient records, and verify their Kuduwave audiometer’s calibration status – all using a single interface.



X-Check Calibration Verification

X-Check is an integrated digital calibration verification tool, designed for accurate calibration verification in only 30 seconds. X-Check comes standard with all Kuduwave audiometers manufactured after March 2018, and is available as an upgrade for older Kuduwave audiometers.

Designed to replace manual/biological audiometer calibration checks, X-Check (cross-check) is a digital calibration verification tool developed to help users save time; ensure compliance with relevant standards and produce accurate test results between calibrations.

By enabling accurate calibration verification (within 5dB) to objectively measure and ensure the precision of results, X-Check replaces biological audiometer calibration checks with a more reliable and accurate digital calibration verification process.

eMoyo-EMR Software continued...

Audiometer calibration should be performed as per the local country standards. In some standards, such as the South African SANS 10154-1.3 for Occupational Health, quarterly calibration intervals for portable audiometers are required. This standard also applies to any audiometers moved from one location to another.

Please Note: While providing accurate, digital calibration verification for your Kuduwave portable audiometer, X-Check does not replace the need for regular calibrations.

Ambi-Dome Attenuation

Built into your Kuduwave portable audiometer is our unique Ambi-Dome high attenuation functionality.

By combining physical passive noise blocking and active noise monitoring technology, Ambi-Dome provides the core boothless testing ability of every Kuduwave portable audiometer.

Ambi-Dome's passive attenuation functionality is made possible by a unique combination of dual circumaural ear cups and insert earphones. Through Ambi-Dome technology, all Kuduwave audiometers now offer the same level of attenuation as a standard audiometric screening booth.

Speech Audiometry

Speech audiometry is employed to assess a patient's sensitivity to speech, as well as clarity of speech heard. It is a vital tool in the assessment and management of hearing loss.

eMoyo offers Kuduwave owners a limited selection of free Word Recognition and Speech Recognition Threshold Speech Test Lists, as well as premium, commonly used speech lists, available as downloadable software plugins.

All Kuduwave portable audiometers incorporate pre-recorded speech testing, offering users greater signal intensity control, as well as improved test-retest reliability. Recorded materials improve both the intrasubject and intersubject precision of threshold and supra-threshold measures by providing a consistent level for all speech test items.

The benefits of using eMoyo-EMR speech audiometry software include:

Reliable, valid and repeatable testing; reduced paperwork and office clutter and the elimination of scorer errors through the use of automated scoring functionality.

For more information on eMoyo's free and premium Speech Audiometry software plugins, please [click here](#).

eMoyo Product Training

All new eMoyo clients are eligible for 30 days' free, post-purchase online product training. For more information, please visit our [Product Training page](#).





04

Boothless Audiometry
vs. Audiometry Without
a Soundbooth





What Does Truly Booth-free Audiometry Mean?

Kuduwave audiometers are the only **truly** booth-free diagnostic and screening audiometers available in the world at present

As eMoyo, we can confidently make this claim, as the Kuduwave Pro-TMP's clinical validation, as per MEDDEV (Medical Devices) guidance and ISO-14155 certification confirms it can conduct screening and diagnostic pure-tone and speech audiometry, as well as acoustic immittance measurements, outside of a sound-treated booth. These unique technical capabilities, confirmed in multiple, peer-reviewed scientific and medical **publications** make the Kuduwave Pro and Kuduwave Pro-TMP truly unique audiological instruments.

Because of the increased passive attenuation capabilities, Kuduwave audiometers are, at present, the only comprehensive, all-in-one audiometers with the capability to provide both trusted screening and diagnostic audiometry outside of a sound booth. The Kuduwave Pro-TMP with built-in tympanometry is the first and only acoustic immittance measurement device that can conduct bi-lateral simultaneous tympanometry and ipsi- and contra-lateral acoustic reflex measurements without swapping the probe to the opposite ear.

As there is currently no other portable diagnostic audiometer on the global market capable of measuring ambient noise and blocking sound as efficiently as the Kuduwave, we can proudly and confidently state that the Kuduwave is the only truly booth-free diagnostic audiometer available in the world today.

Boothless Audiometry vs. Audiometry Without a Sound Booth

"While there's little consensus when it comes to standards for sound booths globally, there is one overarching concept that is widely agreed upon: any hearing test environment, whether screening or diagnostic, should be quiet enough to ensure that ambient noise levels do not interfere with a patient's ability to hear the tones presented to him or her."

Hlolo Ramatsoma, Audiologist

A Look at How the Kuduwave Audiometer Compares to Commonly Used Supra-Aural & Circum-Aural Headsets

Attenuation (The Headset's External Noise-Blocking Capability)

	Kuduwave	Commonly Used Supra-Aural Headsets	Commonly Used Circum-Aural Headsets
Grading	Excellent	Very Poor	Poor
500Hz	43.8	6	9.4
1000HZ	40.8	11.7	12.8
2000Hz	38.1	17	15.1
4000Hz	52.3	22.2	28.8
8000Hz	45.8	22.7	26.2

Maximum Environmental Noise Allowed During Occupational Healthcare Hearing Screening Testing

	Kuduwave	Commonly Used Supra-Aural Headsets
Grading	Excellent	Very Poor
500Hz	59	20.5
1000HZ	50	24
2000Hz	43	31
4000Hz	58	37
8000Hz	57	35.5

Typical Environmental Noise Criteria Grading Where the Headset Can Still Test PLH Accurately Outside a Sound Booth

		Kuduwave	Commonly Used Supra-Aural Headsets	Commonly Used Circum-Aural Headsets
Requires a Sound Booth		Can Test Without a Sound Booth	Can Test Without a Sound Booth	Can Test Without a Sound Booth
50dB	Very noisy public areas, very noisy factories	YES	NO	NO
45DB	Cafeterias, canteens, supermarkets	YES	NO	NO
40dB	Open offices, toilets & washrooms	YES	NO	NO
35dB	Small conference rooms, churches, lecture halls	YES	NO	NO
30dB	Boardrooms, home living rooms	YES	NO	NO
25dB	Bedroom in private home, cathedrals	YES	NO	YES
20dB	Studios for sound production, opera halls	YES	YES	YES

Attenuation and Active Monitoring

	Kuduwave	Commonly Used Supra-Aural Headsets	Commonly Used Circum-Aural Headsets
Two layers of environmental noise blocking	YES	NO	NO
Built-in microphone in each ear cup to monitor environmental noise	YES	NO	NO
Notifies operator when environment is too noisy for accurate testing	YES	NO	NO

05

Publications
& Studies



Publications & Studies

The Kuduwave portable audiometer has been the subject of several publications, studies and research reports. Please [click here](#) for a comprehensive list of Kuduwave publications and studies.

1. Pure-Tone Audiometry Outside of a Sound Booth Using Earphone Attenuation, Integrated Noise Monitoring & Automation (Publication)

International Journal of Audiology

Accessibility of audiometry is hindered by the cost of sound booths and a shortage of hearing health personnel. This study investigated the validity of an automated mobile diagnostic audiometer with increased attenuation and real-time noise monitoring for clinical testing outside a sound booth.

DESIGN:

Attenuation characteristics and reference ambient noise levels for the computer-based audiometer (Kuduwave) were evaluated alongside the validity of environmental noise monitoring. Clinical validity was determined by comparing air-and-bone conduction thresholds obtained inside and outside the sound booth (23 subjects).

STUDY SAMPLE:

Twenty-three normal-hearing subjects (age range, 20-75 years; average age 35.5) and a sub group of 11 subjects to establish test-retest reliability.

RESULTS:

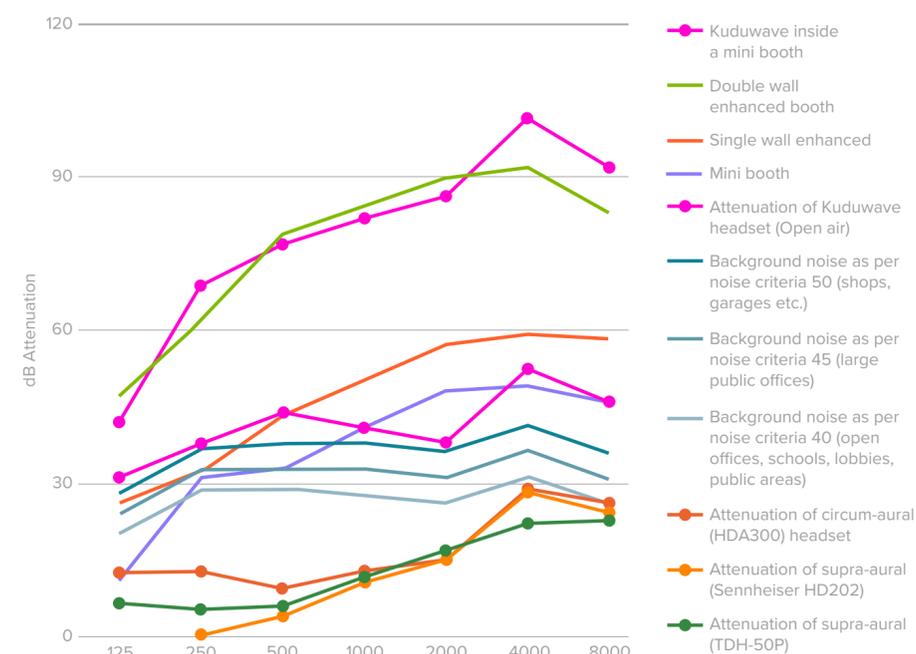
Improved passive attenuation and valid environmental noise monitoring was demonstrated. Clinically, air-conduction thresholds inside and out-

side the sound booth corresponded within 5 dB or less > 90% of instances (mean absolute difference 3.3+/-3.2 SD). Bone conduction thresholds corresponded within 5 dB or less in 80% of comparisons between test environments, with a mean absolute difference of 4.6 dB (3.7 SD). Threshold differences were not statistically significant. Mean absolute test-retest differences outside the sound booth were similar to those in the booth.

CONCLUSION:

Diagnostic pure-tone audiometry outside a sound booth, using automated testing, improved passive attenuation. Real-time environmental noise monitoring demonstrated reliable hearing assessments.

Attenuation: Comparing sound booths used in audiology



2. Evaluation of the Kuduwave Audiometer for Compliance with Standards for Hearing Conservation Purposes (Research Report)

CSIR: Council for Scientific and Industrial Research, Centre for Mining Innovation

The evaluation of the Kuduwave audiometer against standards and regulations revealed that the Kuduwave complies with all required standards as an audiometer used for hearing conservation purposes, as guided by the SANS 10083:2012. The Kuduwave (and its insert earphones) specifications further adhere to the SANS 8253-1:2011.

This report specifies that the end user using the Kuduwave audiometer for hearing conservation purposes as per the SANS 10083:2012 must comply with the minimum of three-monthly calibration services and the keeping of adequate records of daily and weekly biological checks, as per the SANS 10154:2012. Furthermore, as much as the Kuduwave is able to highly attenuate ambient noise, the user must ensure that the environment where testing down to 0 dBHL is conducted complies with maximum permissible ambient noise levels, as per the SANS 10182:2006.

This report concludes that the Kuduwave complies for use in hearing conservation and therefore in medical surveillance, since the above-mentioned standards are requirements for SANS 10083:2012 - the standard which specifies how the medical surveillance is conducted. The Kuduwave has an advantage for quality control of the test validity and reliability, which is often a concern in occupational health and industrial settings.

3. Ambient Noise Impact On Accuracy of Automated Hearing Assessment (Publication)

International Journal of Audiology

This study investigated the accuracy of pure-tone air conduction thresholds obtained by the Kuduwave audiometer in automated mode of testing, with a controlled level of background noise (40 dBA), at a level that would typically be present in a closed, non-sound treated room.

Air conduction thresholds from individuals with normal hearing and those with hearing loss were collected and compared. These thresholds were obtained in three test conditions. (1) GSI-61 clinical audiometer in a double-walled sound-booth, (2) Kuduwave audiometer in a quiet environment (sound-treated booth), and (3) Kuduwave audiometer in a noisy (40 dBA) environment. Findings from this study revealed that Kuduwave audiometer testing in automatic mode can accurately obtain pure-tone air conduction thresholds in a quiet sound booth, as compared to thresholds obtained with a typical clinical audiometer in a sound booth.

Furthermore, this study indicates that the Kuduwave audiometer produced accurate thresholds in the presence of background noise (40 dBA). Ambient noise used in this study is similar to typical ambient noise found in a closed room without a sound booth.

This study shows that the Kuduwave audiometer can be used outside of a sound booth.

4. Research Report Validating the Kuduwave for Medical Surveillance Without a Sound Booth

CSIR: Council for Scientific and Industrial Research,
Centre for Mining Innovation

This study aimed to investigate the validity of the use of the Kuduwave audiometer for testing hearing threshold levels and the Percentage Loss of Hearing (PLH) in occupational health settings for medical surveillance of hearing without a sound booth.

This study was conducted to answer the question: “How do Kuduwave results compare with industry standard annual air conduction pure-tone audiometry?”. Participants’ hearing thresholds levels were obtained with the use of a conventional audiometer inside a sound booth.

The same participants were further tested to obtain their threshold levels using the Kuduwave audiometer in a room without a sound booth to validate the results. The PLH of each participant was calculated with both the Kuduwave results and the conventional audiometer results respectively.

The results from this study conclude and confirm that the Kuduwave can be used for medical surveillance audiometry without a sound-treated booth. Additionally, the study confirms the clinical validity of the Kuduwave audiometer for calculating the Percentage Loss of Hearing accurately, without a sound-treated booth.

5. Validity of Diagnostic Pure-Tone Audiometry Without a Sound-Treated Environment In Older Adults (Publication)

International Journal of Audiology

This study aimed to investigate the validity of the use of the Kuduwave audiometer for diagnostic pure-tone audiometry in a natural environment. The Kuduwave used in this study used a combination of insert earphones covered by circumaural headphones to attenuate ambient noise during audiometric testing.

The device also incorporates real-time monitoring of environmental noise, in order to notify the clinician if the ambient noise is masking the tone presented. The clinician waited for the ambient noise to subside before continuing with the test.

The sample for this study consisted of 147 elderly people with an average age of 75.8 years (Range = 65-94). The subjects in the study were selected as they had visibly intact tympanic membranes through an otoscope, and a normal Type-A tympanogram.

Audiometric testing (air and bone conduction) was conducted using the Kuduwave in both a natural environment (a quiet, furnished room) and in a sound -treated booth in an audiology clinic respectively. The results of the study showed that both air and bone conduction thresholds corresponded within 0 to 5 dB between the two test-environment comparisons.

The average threshold differences and standard deviations were within typical test-retest reliability limits. Thresholds recorded showed no statistically significant differences. This concludes and confirms that the Kuduwave audiometer can be used for valid diagnostic pure-tone audiometry in a natural environment without a sound-treated booth.

6. Validity of Diagnostic Computer-Based Air & Forehead Bone Conduction Audiometry (Publication)

Journal of Occupational and Environmental Hygiene

In this study, the air and bone conduction threshold results obtained with the GSI-61 audiometer were compared with thresholds obtained with the Kuduwave audiometer.

The test-retest reliability was also assessed and compared. This was done in order to validate the Kuduwave's air and forehead bone conduction audiometry results. All tests were conducted in a sound-treated booth. Air conduction thresholds for the two audiometers corresponded within 5 dB or less, whilst bone conduction thresholds corresponded with 10 dB or less.

Occlusion effect may have influenced BC thresholds in this study. The researcher minimised the occlusion effect by deeply inserting the earphones down to the bony areas during BC testing. However, the insertion may not have been deep enough.

The average absolute test-retest threshold difference for bone conduction on the industry standard audiometer was 5.1 dB (5.3 SD) and for the computer-based audiometer 7.1 dB (6.4 SD).

Computer-based audiometry provided air and bone conduction thresholds within the test-retest reliability limits of industry standard audiometry.

7. Hearing Assessment - Reliability, Accuracy & Efficiency of Automated Audiometry (Study)

Telemedicine and e-Health Journal

This study investigated the reliability, accuracy and time-efficiency of automated pure-tone audiometry (air and bone conduction testing) using the Kuduwave audiometer.

This was done by comparing thresholds obtained through automated air and bone conduction audiometry using the Kuduwave audiometer with manually obtained air and bone conduction thresholds. The time it takes for each test method (automated vs. manual) was recorded during audiometric testing.

The results from this study indicate that test-retest reliability of automated air conduction audiometry is equivalent to that of manual audiometry. Furthermore, test-retest correspondence for automated audiometry was slightly better than manual audiometry in this study, though not statistically significant. The time required to complete an automated or a manual audiometry test with the Kuduwave audiometer was similar.

8. Validation of a Bilateral Simultaneous Computer-Based Tympanometer (Study)

American Journal of Audiology

This study aimed to investigate the accuracy of bilateral simultaneous tympanometric measurements using the Kuduwave Pro-TMP diagnostic audiometer with integrated tympanometry.

A within-subject repeated-measures design was used to compare tympanometric measurements obtained with the Kuduwave Pro-TMP in unilateral and bilateral simultaneous conditions and compared with tympanometric results from an industry-standard tympanometer.

The study found no significant bias ($p > .05$) between the mean of the differences of tympanometric measurements yielded by the two devices, except for a significant bias ($p < .05$) of the mean of the differences for ear canal volume measurements (0.05 cm³).

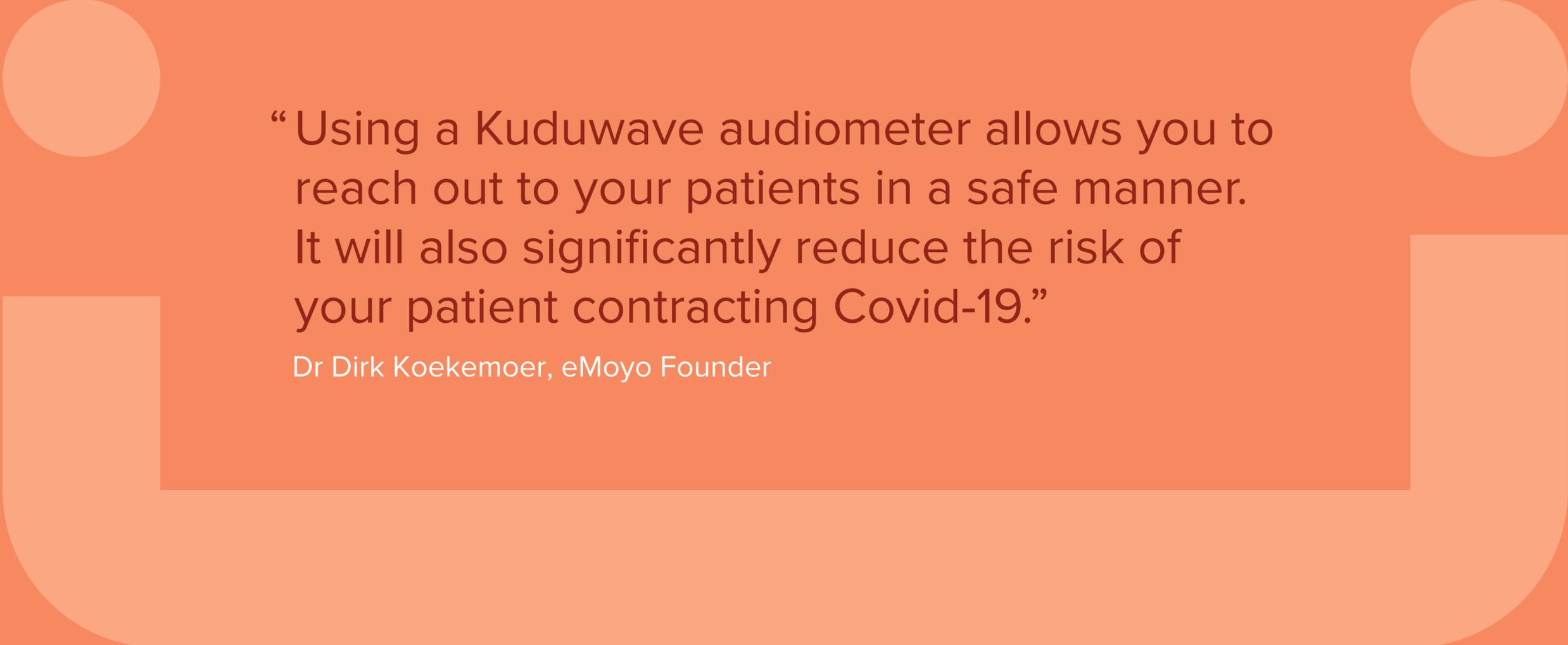
The Bland-Altman plots showed overall good agreement between the tympanometric measurements between the two instruments. The tympanometric results from both tympanometers were highly comparable, with a sensitivity and specificity of 100% (95% CI [86.8%, 100%]) and 92.3% (95% CI [84.0%, 97.1%]), respectively.

The study concluded that the investigational device is a suitable instrument for unilateral or bilateral simultaneous tympanometric measurements in adults and demonstrates the potential of decentralised and accessible tympanometry services.

06

KUDUWAVE
in the time
of Covid-19



A decorative graphic consisting of two light orange circles at the top, one on the left and one on the right. Below them is a light orange U-shaped bar that spans across the width of the page, with rounded ends. The quote and attribution text is centered within the negative space of this U-shaped bar.

“Using a Kuduwave audiometer allows you to reach out to your patients in a safe manner. It will also significantly reduce the risk of your patient contracting Covid-19.”

Dr Dirk Koekemoer, eMoyo Founder

KUDUWAVE Portable Audiometers - Taking hearing health- care further during the Covid-19 pandemic

Accurate, Safe & Efficient Hearing Testing in the Time of Covid-19

During a global pandemic, the option of using a portable audiometer in an open-air setting instead of a sound booth is an incredible advantage.

A Safer Testing Environment for Patients & Clinicians

With a Kuduwave portable audiometer, conducting highly accurate diagnostic air, bone, speech and impedance audiometry outside of a sound booth has never been easier.

Employing the Kuduwave's tele-audiology functionality, users can conduct safe and effective diagnostic hearing assessments on patients in their homes, vehicles or, in the case of hospitalisation, at the patient's bedside - all conducted in real time.

Testing outside of a sound booth safeguards patients by significantly reducing the risk of contracting Covid-19 in often-crowded and easily contaminated clinical environments.

Lockdown Limitations - No Match for the Highly Portable Kuduwave

The global call for lockdowns amidst the Covid-19 pandemic has had intended and unintended consequences. Lockdown regulations have significantly aided the management of a raging global pandemic. On a less-positive note, it also contributed to the economic ruin of many industry sectors.

When it comes to feeling the impact of lockdown restrictions, the field of audiology is no exception. As a result of lockdown regulations, the services offered by countless healthcare workers in the field of audiology have been severely curtailed. With Covid-19 restrictions continually in flux, only one thing remains certain: the Covid-19 pandemic and its effects will remain part of our lives for a significant time to come.

Why Infection Control Through Boothless & Open-Air Hearing Testing is Essential

A recent correspondence published in the **New England Journal of Medicine** found that the virus that causes Covid-19 can survive in the air and on surfaces for time periods of several hours up to several days. Of interest is that this study could detect the virus in the air for only up to three hours.

During a global pandemic, in traditional hearing healthcare settings (where a patient is required to undergo testing in a closed sound booth), this poses a grave risk. Not only does hearing testing in a sound booth hamper Covid-19 infection-control measures, it also - as a result of an immovable booth - limits the clinicians' ability to increase their patient reach.

In a best-case scenario, an asymptomatic Covid-19 carrier will not touch any sound booth surfaces, and the clinician will clean the sound booth thoroughly after testing each patient.

However, the question of how to effectively deal with airborne droplets remains. Although science has shown that ultraviolet light can terminate the virus in the air and on surfaces, this may prove a costly (and only moderately effective) measure for combatting Covid-19 transmission and infection.

Affordable & Efficient Infection Control with the Kuduwave Portable Audiometer

Although studies have shown that the Covid-19 virus can remain alive for up to 3 hours when airborne and on surfaces, this is not the case when it comes to outdoor environments.

In the outdoors and in open-air environments, the Covid-19 virus can quickly be eliminated by real-world exposures to the elements of sunlight and wind, as well as extreme temperatures.

In summary, using a Kuduwave portable audiometer to conduct hearing tests in controlled and open-air environments significantly reduces the risk of Covid-19 cross contamination. Additionally, Kuduwave audiometers are very easy to sterilise and disinfect after use, between patient testing procedures.

Covid-19: Protect Your Patients & Yourself with a Kuduwave Portable Audiometer

Lightweight and highly portable, the Kuduwave is simply an ideal solution for safe, efficient and highly accurate screening and diagnostic hearing testing in just about any setting or environment.

Kuduwave audiometers are ISO 13485 certified, FDA-registered, CE-mark certified for medical devices and are compliant with all IEC, ANSI and SANS standards for audiometry, tympanometry and calibration.

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