QuikCell
Worldwide Patent Pending

New Standard	Explanation of the new technology and its benefits	Explanation of the compromises without this technology
Cap based electrode placement: Fast, accurate and easy to use	Cap-based electrode systems allow a larger number of electrodes to be placed accurately and quickly. Extending beyond the 10 – 20 system, caps support up to 256 electrodes. Standard electrode positions are maintained by the cap structure and are automatically utilized in Neuroscan processing software.	Placing a high number of EEG electrodes without a cap is time consuming and difficult. Applications beyond the 10 – 20 system electrode placements are not standardized, requiring subjective placement.
Liquid Electrolyte: Make scalp contact simple and clean	Electrolyte is the conductive medium that creates the bridge between the scalp and the electrode. Gel and paste electrolytes are very thick and require the technician to create direct physical contact between the scalp and electrode. In contrast, liquid electrolyte uses gravity to create a conductive column requiring less effort for the technician. Conductivity of the solution is the same or better than standard gels and pastes. In addition, the liquid electrolyte requires little cleanup after testing is completed.	Paste and gel electrolytes require the technician to ensure that there is direct contact with the scalp. Air pockets in the conductive column are a known issue and can result in poor impedances. These thicker electrolytes are also more prone to sticking in the hair and not making direct connection with the scalp. Gel and paste recordings are very messy, requiring the subject to wash their hair after the study. This personal inconvenience can lead to a loss of repeat subjects.
QuikCell: Conduction and Containment Cell	Liquid electrolyte needs to be contained so that it does not spread and create bridging between the electrodes. It also requires a reliable method to ensure that it reaches the scalp and is not wicked away by hair. The QuikCell system retains the electrolyte and ensures scalp contact. By using a compressed, desiccated cell in the electrode reservoir and allowing the electrolyte to expand the cell, much like a sponge, the electrolyte is contained and delivered with a high level of precision to the target scalp area with little chance of bridging.	Neuroscan uses a rubber reservoir in our caps to contain the gel for typical gel recordings. However, in trying to prepare the cap quickly with a manual syringe, gel may spread beyond the containment of the reservoir. When gel containment fails, the application becomes messy and the risk of bridging between electrodes increases. Too much gel may prevent the conductive column from forming, concentrating the gel around the scalp and not supporting the column up to the electrode.
Calibrated Electrolyte Delivery: Quality control and assurance	Using a liquid electrolyte, it is easy to over-saturate electrodes when using a manual method to hydrate the cells. Therefore, the QuikCell system uses an electronic device that dispenses a precise volume of electrolyte. This device, a calibrated laboratory pipetter, assures the cells are fully hydrated with virtually no risk of under-saturation causing poor conductivity or over-saturation causing electrode bridging.	The amount of electrolyte determines the scalp surface area from which the EEG recording is made. Using various amounts of electrolyte is similar to using electrodes of different sizes. For source localization, the area of contact and the separation between areas is critical. Using uncalibrated amounts of gel or electrolyte is one more uncontrolled variable that may adversely impact the quality of the recorded data.
Scalp – Electrode Impedance: Balance preparation time and data quality	Today's best amplifier designs allow recordings from high impedance electrodes, but with a potentially significant reduction in data quality due to radiated electrical "noise." With the QuikCell system, simply hydrate the cell and allow the expansion to make a high impedance contact, or use blunt tip/syringe technique to prepare the scalp as in a typical gel recording. The QuikCell has an access column that allows placement of the blunt tip on the pad of the QuikCell just above the scalp. This facilitates parting the hair and preparing the scalp to obtain the lowest possible impedance, without direct skin abrasion. The lower pad of the QuikCell protects the scalp from direct contact with the blunt tip.	While both liquid and gel based electrolyte application methods have been established, they typically have a predetermined impedance criteria. Liquid methods have been associated with high impedance and gel based methods with low impedance. Only the QuikCell system allows use of the cleaner and faster liquid electrolyte as well as low scalp impedances. Scalp electrode impedances less than 10 kOhms are common. Impedances below 5 kOhms are often possible, without direct abrading of the skin. Quality of the recordings obtained with the QuikCell is uncompromised allowing acquisition of the smallest EEG activity such as the auditory brainstem response, with impedances as high as 50 kOhms.
Options for Electrode Preparation: QuikCell or Gel	Neuroscan serves the needs of over 5000 researchers around the world. Serving such a large market requires that Neuroscan provide options for electrode application to serve the varying needs of our researchers. The QuikCell is designed for complete backward compatiblity with our QuikCaps, allowing use of either Gel or the QuikCell system based on specific research requirements of each study or subject population.	Most cap application systems require a liquid or a gel (not both) as the electrolyte with specifically designed caps for each. This limits the users of non-Neuroscan caps to only one method and significantly increases expenses as caps for each method, in each size, must be purchased if dual capabilities are desired.
Recording in fMRI Environments: Multi-modal Functional Neuroimaging	The QuikCell is compatible with Neuroscan's MagLink Caps. This allows the fastest possible, lowest impedance recordings, with the utmost subject comfort during simultaneous EEG/fMRI recordings.	

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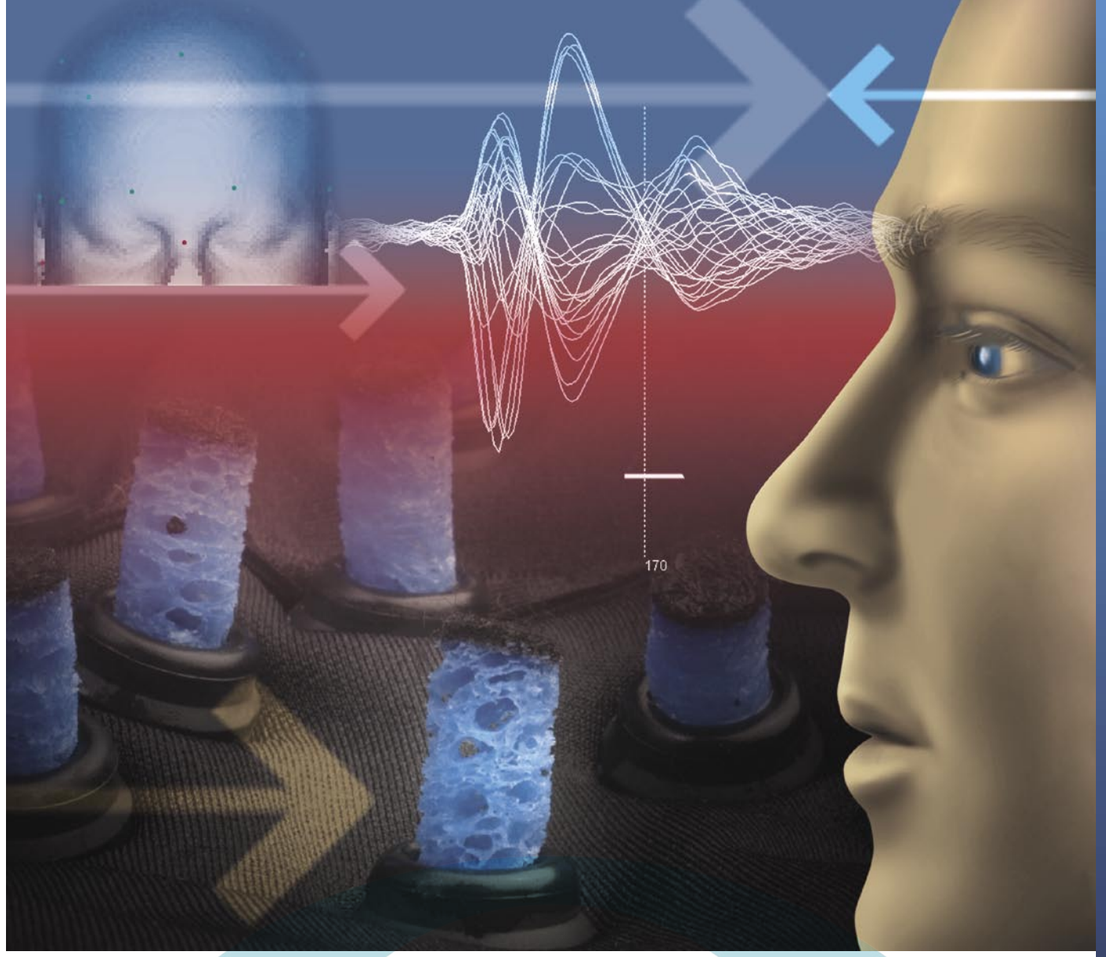

No Compromises Infinite Possibilities
THE REVOLUTION CONTINUES

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Unique Liquid Electrolyte Electrode Application System

COMPUMEDICS NeuroScan

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Introducing the QuikCell System for EEG electrode application.

Now you can balance EEG scalp electrode impedances and preparation time.

The QuikCell uses a new liquid electrolyte and cellulose based transmission and control system, coupled with a calibrated electrolyte delivery system for EEG electrode application.

The QuikCell procedure ensures that valid scalp electrode impedances can be obtained quickly and comfortably. This system allows recording with high impedances, improved control of salt-bridging and eliminates over-hydration and soaking of the subject. The speed of the QuikCell application reduces preparation time and increases subject comfort without sacrificing the quality of data collection.

Now you don't have to compromise data quality to obtain fast, low impedance recordings.

THE QUIKCELL EXPLAINED

1) QuikCell is intended to be used as a substitute for the conductive gel or paste used in standard QuikCap applications.

2 QuikCell is disposable in order to reduce bio-hazard.

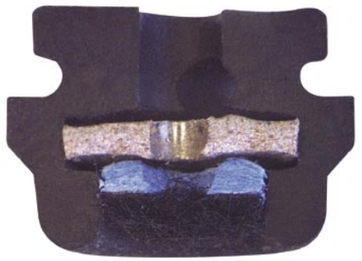
3) QuikCell features a deep well that allows you to insert a blunted needle and prepare the scalp to obtain low impedances. The pad at the bottom of this well ensures that even aggressive preparation will be comfortable for the subject.

4) QuikCell is installed into each electrode in the QuikCap, dry and compressed. This is done before the cap is placed on the subject. Once hydrated, QuikCell expands to provide moderate scalp pressure and a conducting bridge.

5) An automatic, calibrated pipetter ensures proper delivery of the electrolyte helping to prevent over-saturation and salt-bridging.

6) QuikCell, by design, allows easy clean-up for both the subject and the QuikCap.

QuikCell



QuikCell cross-section

QuikCell expanded after hydration

QuikCell is designed to fit snugly into the electrode cup of all current versions of the QuikCap. This allows the cap to be turned inside out making insertion of the QuikCells easy. Once all of the cups are filled, you can turn the cap right-side out, without risk of the QuikCells falling out. Hydration will cause the cell to expand and push out of the electrode cup, forming a column of electrolyte between the scalp and the electrode. While an immediate high impedance contact is made as the QuikCell expands, impedance can be lowered by using a blunted needle to part the hair or for additional preparation of the scalp.

HOW TO USE QUIKCELL

Step 1 – Turn the cap inside out and fill each electrode cup with a QuikCell. Turn the cap back right side out.

Step 2 – Place the cap on the subject's head according to the 10/20 positioning system.

Note - If impedance values of 20 to 50 kOhms are acceptable, use Step 3 (A).

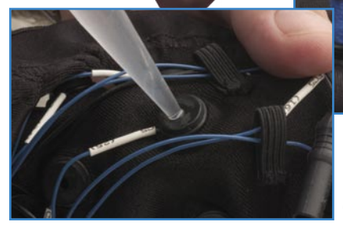
Step 3 (A) – For Higher Impedance Use:
Insert the pipetter all the way through the QuikCell electrode to the bottom. The hole through the QuikCell ensures cell hydration and that the electrolyte will not leak (see image 3A).

Step 3 (B) – For the Lowest Impedances:
Use the blunt needle tip inserted to the bottom of the QuikCell to part the hair and lightly abrade the scalp to ensure optimal impedance values (see image 3B). If impedance values of 20 to 50 kOhms are acceptable, use Step 3 (A).

1

2

3A



3B