



MediBrite

Medical NIRS device for
clinical research



CE marked
medical device



Truly portable
and lightweight



Minimal set-up time
and skills required



Applicable for
patients of all
ages

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MediBrite



Medical device for clinical research

The MediBrite is the first European portable NIRS device receiving CE mark according to Medical Device Regulation (EU) 2017/745. It safely and reliably measures Near-Infrared Absorption changes, which can be used for fNIRS to get information on local brain activity.

Easy to use and comfortable

The MediBrite is quick to setup and comes with optodes designed to provide maximum comfort, which is especially important when measuring in sensitive or less compliant patients. Further, it comes with an intuitive user interface enabling easy use of basic operations.

Designed for every setting

Weighing only 188 grams, the MediBrite is completely portable, wireless and can be attached in different ways. This enables measurements in every setting – not only bedside, but also during active tasks and movements, for instance, walking or even exercising.

Improved signal quality

To ensure reliable measurements, the MediBrite provides features to ensure high data quality: Next to incorporated ambient light protection, it comes with multi-power gain control to regulate LED light output for perfect measurement in different brain regions and skin types. It is also possible to include short separation channels to measure from superficial tissue layers.

Available in two variants - suitable for every patient:



MediBrite C

The MediBrite C comes with optodes that fasten at three different heights. This ensures both comfort and optimal signal quality when measuring from any desired brain area, including hairy areas such as the temporal or motor cortex.



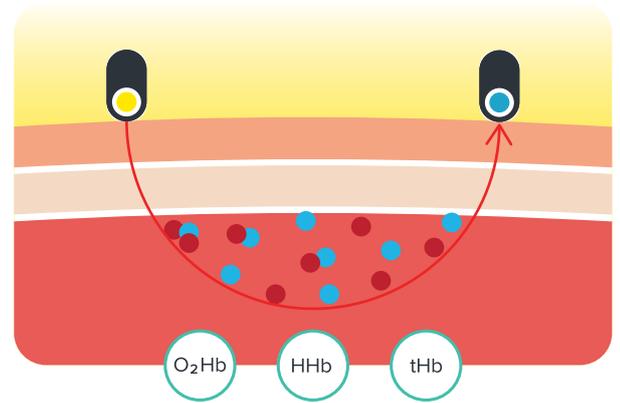
MediBrite S

The MediBrite S is designed for sensitive subjects, for instance, infants and the elderly. It provides flat optode tips, prolonged cables and can come with holders made out of soft material to enhance comfort and flexibility.

What is Near-Infrared Spectroscopy?

The MediBrite comes with two different optodes – transmitters and receivers. The transmitter emits light in two different wavelengths being relatively transparent for biological tissue, but absorbed by two important chromophores: oxygenated hemoglobin (O₂Hb) and deoxygenated (HHb) hemoglobin. The receiver detects the changes in optical density (OD), the relation between the intensity of incoming and outgoing light.

In fNIRS, these changes in ODs can be used to calculate concentration changes in O₂Hb and HHb in local brain tissue, using the modified Lambert-Beer-Law (mLLBL). When a certain brain region gets active, a mechanism called neurovascular coupling is induced, leading to an increase in HbO₂ and slight decrease in HHb. fNIRS can give information about local neural activity in any cortical region by measuring these changes.



WHY USE fNIRS FOR CLINICAL RESEARCH?

In comparison to other neuroimaging technologies, such as fMRI, fNIRS provides certain advantages making it a suitable technology to measure brain activity in clinical research:

- fNIRS is a non-invasive and affordable technology.
- fNIRS is relatively easy to use, provides a quick set-up time and is less prone to movement artifacts. This makes it a suitable technique to be used in less compliant patients.
- fNIRS can be used in patients of all ages and conditions - from infants to adults.
- fNIRS can be completely portable, enhancing application possibilities: measurements can be performed during movement and physical activity, but also at bedside without the requirement to remain still during data acquisition.

Clinical fNIRS application areas

fNIRS finds application in a variety of clinical areas to measure brain activation in all types of patients, for instance:



Psychiatry



Neurology



Geriatrics



Neonatology / Pediatrics

Technical specifications

TECHNOLOGY	Functional near-infrared spectroscopy (fNIRS)
MEASURES	Infrared absorption changes
MEASUREMENT RANGE	4.2 OD
DYNAMIC RANGE	7.2 OD
RECEIVER	8 photodiodes with ambient light shielding
TRANSMITTER	10 LEDs, with 2 wavelengths each
NOMINAL WAVELENGTHS	760 nm and 850 nm
CHANNELS	Up to 27
POWER LEVELS	4
SIZE (CONTROL UNIT)	8.3 cm x 8.6 cm x 2.6 cm
WEIGHT	188 g
SAMPLE RATE	25 to 75 Hz
RESOLUTION	16-bit
BATTERY	1400 mAh, ~ 2h
ORIENTATION SENSOR	6-axis inertial measurement unit: 3-axis Accelerometer (x, y, z); 3-axis Gyroscope (x, y, z)
STORAGE	8 GiB (approximately 200 h of data storage)
APPLIED PART	BF

References to clinical research with fNIRS

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