

Assessment, Communication and Training with DOC/Coma Patients

Imagine you are trapped in your body.
You cannot move or speak.
But you can hear, feel and think.



Photo: Florian Voggenreder

What is mindBEAGLE?

mindBEAGLE is a new system that can be used with patients who have disorders of consciousness (DOC) and live with one of the following conditions due to a serious brain injury:

→ Coma → Unresponsive Wakefulness Syndrome → Minimal Consciousness → Locked-In Syndrome

Because these patients cannot move, it can be exceedingly difficult to assess their cognitive function and conscious awareness. mindBEAGLE provides new information about a patient's consciousness, and provides cognitive training and communication for some of them.



Attention Training

The patient is asked to focus on auditory and tactile stimuli. This aims to extend the patient's period of conscious awareness and the ability to maintain attention.



Sensory Training

Vibrotactile stimulation is used to induce sensation in different body parts. The pairing of sensorimotor imagery and vibrotactile stimulation could help train corresponding brain regions.



Motor Imagery Training

The patient is asked to imagine a limb movement to activate the sensorimotor regions while participating in motor rehabilitation therapy, including passive limb movement, functional electrical stimulation (FES), and virtual reality feedback.

Patients who can perceive auditory and tactile stimuli might be able to communicate via mindBEAGLE!

Patients can use mindBEAGLE as a training system for attention, sensation and movements.



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CONSCIOUSNESS ASSESSMENT

mindBEAGLE uses auditory, vibrotactile stimulation and motor imagery tests to assess a patient's condition. Auditory awareness is tested by playing sounds with high and low frequencies to the patient. To test tactile awareness, the patients feel vibrations on both hands and a third location. During these tests, the patient is asked to focus on certain sounds or vibrations. In another test, patients are asked to imagine left or right hand movements.

COMMUNICATION

Patients who exhibit conscious awareness may be able to communicate using a vibrotactile or motor imagery system. In the vibrotactile system, the patient is asked to focus attention on vibrations on a specific body part (e.g. right hand or left hand). When the patient is asked a simple YES or NO question, she or he has to focus on the vibrations on the left hand to answer YES. If the patient wants to answer NO, she or he has to focus on vibrations on the right hand. In the motor imagery communication system, the patient can imagine the movement of the left hand to say YES and the movement of the right hand to say NO.

MENTAL & PHYSICAL TRAINING

If the patient is able to perceive and understand language, and imagine specific limb movements, then mindBEAGLE might be used for mental and physical rehabilitation training.

MINDBEAGLE MOBILE SERVICE

g.tec's **mindBEAGLE Mobile Service** performs measurements in hospitals, rehab centers, care facilities or at home. The assessment results help physicians and caregivers to evaluate the patient's awareness and to show improvements of the mindBEAGLE training. In addition, mindBEAGLE provides basic communication with patients who are able to sense and understand their environments.

More information about the **mindBEAGLE Mobile Service** is available in Schiedlberg, Barcelona and New York, where scientists and physicians study how mindBEAGLE works. In addition to the locations, mindBEAGLE is used in different hospitals worldwide. Learn more at www.mindBEAGLE.at or in a personal meeting. Contact us via phone, fax, or e-mail.

