



NON-INVASIVE DEEP MUSCLE ELECTROMYOGRAM DEVICE

A non-invasive, easy to use device for measuring deep muscle electromyogram using surface electrodes

BACKGROUND

Electromyogram (EMG) is a medical test performed to measure or record the electrical activity of muscles and nerves in the body. EMG is performed in order to assess muscle function in a variety of different fields including sports, biomechanics research, physiotherapy and clinical neuromuscular diagnostics as well as to identify different types of disease or injuries on the nerves. These tests can also be used to prescribe treatment tailored to the patient's body needs. However current technologies make use of invasive procedure to obtain electromyography recordings for deep muscles which are not close to the surface of the body. These invasive procedures utilize fine-wires or needles that physically pierce the skin in order to communicate with the deep muscle under investigation. Invasive techniques can only be performed by highly specialized and suitably certified practitioners. The use of these techniques also carries the risk of infection and surgical trauma that preclude their routine use. A need exists for safe, easy to use and non-invasive EMG devices.

TECHNOLOGY DESCRIPTION

The SAMRC and UCT have developed a novel, simple to use, non-invasive deep muscle EMG device to measure muscle electrical activity. The device comprises of an array of suitable surface electromyography electrodes, which is placed on the skin of a patient and record the electrical potentials of selected electrodes. The array of electrodes is arranged in one or more rings encircling a part of the human body in which a deep muscle being investigated is located. The electrical activity is then measured by recording the reference mono-polar and bi-polar electrodes in the array, thereby processing the recorded potentials of the selected electrodes being made by the investigated deep muscle. The data is then analysed by use of conventional approximations or algorithms.

VALUE PROPOSITION

The non-invasive deep muscle electromyogram is an easy to use, safe and patient friendly EMG test device, which does not

require highly specialized and suitably certified practitioners to operate. The EMG surface electrode device has been shown to have comparable accuracy, sensitivity and specificity to the invasive devices. The device can be used in medical centers and in research. For this reason, the device consists of a dual function, a standard non-invasive function for use in superficial muscles and the novel non-invasive deep muscle EMG mode for use in real patients. The strategic decision to incorporate the dual function in the development of the EMG device was mainly to facilitate the introduction of the novel deep muscle EMG to those customers whose initial intention would be to use the system solely for superficial muscle EMG.

CURRENT STATUS

The non-invasive deep muscle device has been licensed to Elemedic CC since 2018 for manufacturing and commercialization in South Africa.

INTELLECTUAL PROPERTY STATUS & PUBLICATIONS

National phase patent applications based on PCT/IB2010/001876 are pending India and Europe and granted in USA (US9687168), Japan (JP5662443), South Africa (ZA2011/09253) and China (CN102573620).

OPPORTUNITIES

The SAMRC and UCT are seeking international commercial partners who would be interested in commercializing the technology.

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