



Cortical taps Global market with Breakthrough MedTech

Cortical Dynamics Ltd is an unlisted Australian medical device technology company that has developed an industry disruptive brain function monitor that, the Directors believe, based on the Company's market research, has the potential of delivering a significant advantage in the brain monitoring and depth of anaesthesia markets.

Industry research suggests that currently there is no reliable objective measure of a patients' consciousness during surgery. Cortical's Brain Monitoring System ("BARM") was developed to better detect the effect of anaesthetic agents on a patients' brain activity, assisting anaesthetists in keeping patients optimally anaesthetised.

The Directors believe that the BARM System improves on currently used electroencephalogram (EEG- is a recording of the electrical activity of the brain) technologies, by incorporating the Company's latest advances in understanding how the human's brain electrical activity is produced (brain wave patterns) by means of a disposable single use patient sensor with electrodes that is placed on a patients' forehead connected to the "BARM"

There is a significant global market with up to 312 million surgical operations requiring anaesthesia each year.

The Company is confident that the BARM System is a fundamentally different, more accurate and reliable basis of measurement of brain electrical activity during anaesthesia. The BARM System uniquely produces two measures:

- a) Composite Cortical State (CCS) – this measures the level of consciousness of the patient under anaesthetic; and
- b) Cortical Input (CI) – this measures analgesia (pain input received by the brain).

The BARM System, the Directors believe gives Cortical competitive advantage. The main advantages of the BARM System include:

- It is the only monitor with algorithms based on a model of brain electrical activity derived from physiological principles. Other anaesthesia monitoring systems on the market use statistically based empirical approaches.
- Consequently, it is sensitive to a range of sedative and anaesthetic agents including midazolam, propofol, ketamine, nitrous oxide and sevoflurane, some of which other depth of anaesthesia monitors cannot detect.
- The monitor produces a reading within 2 seconds, compared with 30 seconds for a leading industry competitor, which provides for a more responsive and accurate measurement for the anaesthetist and a significant competitive advantage for the BARM System.
- The BARM System is believed to be the only EEG based depth of anaesthesia monitor to measure both hypnotic (level of consciousness) and analgesic (pain relief) state.



BARM: Approvals, Awards, Patents, Papers and Achievements:

- The BARM System has both TGA (Therapeutic Goods of Australia) approval and CE. Cortical Dynamics has 22 patents registered in Australasia, Europe, USA, Japan & China.
- In November 2016 Cortical was awarded the Advanced Manufacturing award at the Australian Technologies awards ceremony. Further, the Australian Trade and Investment Commission (**Austrade**) has labeled Cortical as an “Australian unlimited” technology success company.
- In 2018, Cortical signed two five-year exclusive distribution agreements, one with a European distribution company, Innomed, covering Belgium, Netherlands and Luxembourg and the other with a South Korean distribution company, Globaluck.
- LiDCO Ltd UK, whose hemodynamic monitoring products, which based on Cortical’s market research, are used in more than 50% of the NHS Hospitals in the UK, are currently trialling the BARM System at Southampton University Hospital until end of October 2019.
- Cortical Dynamics has 12 published clinical papers relating to the BARM System including the clinical trial results. A list of references for these clinical publications can be attained from the Company.

Comments by Dr. Adrian Sultana, consultant anaesthetist based in Sydney

- Dr Adrian Sultana MD FRCP (GLASG) FANZCA, consultant anaesthetist in Sydney, Australia, who currently uses the BARM System stated that: “The BARM System has shown significant reduction in anaesthesia recovery time using TIVA (Total Intravenous Anaesthesia) a technique of general anaesthesia which uses a combination of agents given exclusively by the intravenous route without the use of inhalation agents (Gas Anaesthesia)) whilst using the BARM”.
- His conclusion was that “BARM was remarkably stable and the responsive signal permitted a new level of belief in the awareness monitoring technique and allowed me to run cases at a Composite Cortical State(CCS) index of 45 with confidence in early tapering of the patients anaesthesia using TCI(Infusions of propofol and remifentanyl).” He further commented that: “I was very impressed with its stability and speed of response”. I was able to administer significantly less TIVA”. Often when using the BIS/Entropy, they dramatically lag the patients emergence and I have had patients that take up to 20 minutes to wake up after exceeding 65 on either modality or conversely that in a rapidly changing situation eye opening may occur before the processed EEG signal “takes off” from a baseline of 35-45”.



A handwritten signature in black ink, appearing to read "Gary Todd".

Director's Signature

Gary Todd

Director's Name

Managing Director

Director's Position

Date: 18 September 2019