News

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CYBERDYNE,INC.

CYBERDYNE announced its innovative interface “Cyin™” based on Cybernic Technology
~ The device enables patients who have difficulty to speak or move, to control various devices, communicate and move more actively~

CYBERDYNE, INC. [Tsukuba, Ibaraki, CEO: Yoshiyuki Sankai (the “Company”)] announced to commence selling of Cyin™ for Living Support (“Cyin”) in Japan from the coming spring. Cyin is an innovative Cybernic Interface, which utilizes Cybernic Technology, and it allows patients with difficulties to communicate verbally or physically due to disease etc., to transmit their intention and control other devices.

Alike the Company’s signature product HAL, Cyin reads faint bio-electric signals that is sent from the brain to the muscles through nerves when an patient intends to move the body, so that he/she can transmit their intention or operate various controlling devices such as nurse calls through Cyin and computers, even if the patient has a difficulty to speak or move. Cyin is a device that enables its patient to act more positively.

Product image of Cyin

Background of developing Cyin

Traditionally, a patient who was severely restricted with their vocal or physical capabilities due to neuromuscular diseases etc., attempted to communicate through transparent character plate with an assistance of caregivers, various switches, devices controlled by eye tracking or devices controlled by

sensing various biological phenomenon such as brain waves. However, each methodology had its challenges such as burden of the caregivers, difficulty for the patient to move physically upon controlling the devices, obscurity of the intention transmitted in the progression of diseases.

The Company already developed HAL for Medical Use Lower Limb Type ("Medical HAL") that is used for treatment against neuromuscular disease such as Amyotrophic Lateral Sclerosi（ALS）in Japan with national health insurance covering the treatment cost. From this experience, the Company often found the bio-electric signals of patients with these diseases to be very faint. The Company therefore had to create advanced technology to detect these faint signals and form data analysis algorithms. As a solution to the aforementioned challenges, the Company utilized the experiences it accumulated through Medical HAL for Cyin, and newly developed sensors and algorithms suitable for assisting communication of patients in severe conditions. Due to these endeavors, the Company was able to complete the productization of Cyin as a new Cybernic Interface.

Main characteristics of Cyin

- By utilizing the Company's Cybernic Technology, even a patient unable to move his/her body due to the progression of a disease, can still communicate or operate control devices such as nurse calls[*1], as long as Cyin could detect the faint bio-electric signals of him/hers, which will be converted into input signals. Bio-electric signals could be detected from various parts of the body, depending on the physical condition of the patient[*2].
- Cyin has eight input ports and eight output ports, allowing it to utilize bio-electric signals from multiple parts of the body. This realizes complex control of each device and control of multiple devices simultaneously.
- Cyin can be flexibly connected to existing input devices such as sensors or output devices such as computers according to the patient's needs. For example, if it is connected to the voice reading devices, the patient could transmit their intention with their eyes closed.
- As the device is palm-size and light, it can be carried and used outside. The battery could be charged wirelessly, simply by placing Cyin on the charging board.

*1: Clinical trial was conducted using A102, which was a clinical trial model of Cyin, with 15 severely quadriplegic subjects with a limitation of a communication switch to one area of the body, due to progress of ALS and other diseases. In this trial, subjects were asked to use A102 in the body regions with which they no longer handled other intention transmitting apparatus due to reduction of muscular strength. As a result, all 15 subjects were able to transmit their intention with A102, and they were able to continue to communicate

stably after one hour from A102 setup. [A Multicenter, Open-Label, Self-Controlled Study concerning the Usefulness of Cybernic Switch AI02 for People with Disabilities Such as Advanced Amyotrophic Lateral Sclerosis (ALS) Patients et al. (JMACCTID:JMA-IIA00280)]

"Assistive technology for supporting communication for patients with incurable and progressive neuromuscular diseases, including transparent character boards, a mouth-shape character method, and an advanced Cybernic Interface device" Takashi Nakajima, Niigata National Hospital, NHO

https://www.niph.go.jp/journal/data/66-5/201766050004.pdf

*2: Detection of bio-electric signals depends on the condition of individuals and the Company cannot guarantee that Cyin could be use for every patients.

The Company plans to sell Cyin in Japan, starting from spring of 2018. Details of how it will be sold will be announced on later dates. Recommended retail price will be 600 thousand Japanese yen excluding tax[*3].

In the "Provision System of Assistive Products in Japan", the Ministry of Health, Labour and Welfare includes "communication devices for people with severe disability" as a orthosis that should be supplied to those in need, and Cyin falls within this category. Whether Cyin could be provided to patients with this provision system will be judged by the relevant municipality depending on the patients' conditions.

*3: Installation and adjustment fee and training fee are not included in the recommended retail price.

The Company hopes to help the patient with a restricted means of communication with Cyin, which will enable them to have more initiative in their action. The Company will promote its business with Cyin, so that the patient can feel hope or joy through communication and the device will "bridge" its patients with their family members and their friends. In addition, the Company also intends to develop Cyin even more, so that it could be used to analyze vital information such as bio-electric signal. Through this endeavor, the Company hopes to make further contribution to the development of Cybernics fields, such as medicine and engineering.

The Company notes that, part of the basic researches as well as clinical researches related to Cyin was supported by the research project, "development of communication aid device for persons with disabilities including advanced ALS patients" (primary researcher: Dr. Takashi Nakajima, Niigata National Hospital NHO) that was hosted by Japan Agency for Medical Research and Development (AMED) in fiscal years 2016 and 2017. Furthermore, the basic research and development of the

product partly used the outcome of “Innovative Cybernic System for a Zero Burdening-care Society” project, which was one of the “Impulsing Paradigm Change through Disruptive Technologies Program (ImPACT Program)” hosted by the Cabinet Office of Japan.

Live demonstration of Cyin and presentation ceremony

The Company will conduct a live demonstration of Cyin at “public briefing session for citizens – future with Cybernics-“ that will be held in Pacifico Yokohama on January 13, 2018. Further, after this event, Daido Life Insurance Company (Chuou, Tokyo, President: Minoru Kudo), whom the Company has a business alliance with, will donate Cyin as part of their supporting initiative of communication for intractable disease patients, to a patients association as well as a support association of patients who helped the clinical research of Cyin and HAL Systems.

* Cybernics: A new academic field that is centered around human, robots and information systems . Targeting medicine, welfare and living support fields (including labor support) as its main industries, it fuses and combines the functions of humans, robots and information systems, realizing interactions between physical-information-vital systems. Cybernics is championed by Dr. Yoshiyuki Sankai, a professor at the University of Tsukuba (he is also the President and CEO of CYBERDYNE) and the technology is thought to be one of the core technical domain that drives the movements to realize “Society 5.0”. Cybernics is an interdisciplinary and multifaceted approach that is effective upon inventing solution towards practical issues of human and society.