

CPM Device for Upper Limbs -Innovation by industry-government-academia cooperation-

Keyword: CPM (Continuous Passive Motion), Orthopedic treatment, Rehabilitation, Frozen shoulder

Organizations Involved

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[Abstract]

In Kumamoto University, we developed the Flexible Force Control techniques and put to practical process-responding production systems successfully, which was selected as one of 16 best NEDO industry-academia cooperation projects. Based on this technique, a new CPM device for upper limbs, an orthopedic treatment, was developed by a task force team including entrepreneur, medical doctors. The developed CPM device was transferred to a new venture, and commercialized under approval of the MHLW.

[Summary of the technology transfer]

●Technological Impact

CPM (Continuous Passive Motion) is an orthopedic treatment or physiotherapy after injury or operation and can aid impaired joint recovery by external continuous force. But the validity has been shown in animal experiments or for the legs. In 1995, we started on the development of new CPM device for upper limbs by industry-government-academia cooperation, and have experimented clinically many years. And it was commercialized in a newly venture from Kumamoto University Incubation Center in 2004.

As used in dorsal position, inner and external rotations of scapular can be realized.

Natural pro-/supination due to the flex-/extension is realized by introducing the ball grip.

As the patients themselves can control the start/stop/reverse motions, they make efforts for rehabilitation or treatment without pain or fear.

Adequate ROM parameters can be set, and flexible torque control is realized according to reactive force from patient.

●Market Impact

A new CPM device which is user-friendly for patient or co-medical was developed through medical tests. "Advanced Health Laboratory Ltd." was established in 2004 and started to commercialize under approval of the MHLW. This product is on sale through ADVANFIT Ltd. or a general agent throughout the country.

●Special Features of the Collaboration

The needs from medical field and marketability were considered from the start. Since applicable to the treatment of frozen shoulder, it is possible to deploy ordinary family.

Project Background

In 1995, RIST research group started on the development of new CPM device, under participation of researchers, medical doctor, entrepreneur, administrator etc..
*RIST: Research for Intelligent System Technology in Kumamoto.

CPM Device for Upper Limbs

AH706

Advanced Health Laboratory Ltd.

Funding History

1. 1996, 2003: Grants of Kumamoto Prefecture
2. 2004 : Grant of SMRJ
3. 2004-2008 : Grant-in-Aid for Scientific Research (B)

Intellectual property protection

National and international patents are preparing for application



Turning point of success

- The mutual trust and collaboration system between core members of development are indispensable. Specially, the leader must win strong confidence.
- Members include researcher, engineer, entrepreneur, administrator, and user .
- Administrative program should be utilized and be constrained in right sense.