THE DEVELOPMENT OF A KNEE ELECTRO-ORTHOSIS FOR PATIENTS WITH HEMIPLEGIA

2/02/03/15

WEERANAN YAMRATTANAKUL

MASTER OF SCIENCE IN MOVEMENT AND EXERCISE SCIENCES

ลิขสิทธิ์มหาวิทยาลัยเชียงใหม่ Copyright[©] by Chiang Mai University All rights reserved

THE GRADUATE SCHOOL CHIANG MAI UNIVERSITY JULY 2008

THE DEVELOPMENT OF A KNEE ELECTRO-ORTHOSIS FOR PATIENTS WITH HEMIPLEGIA

267831

WEERANAN YAMRATTANAKUL

A THESIS SUBMITTED TO THE GRADUATE SCHOOL IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF SCIENCE IN MOVEMENT AND EXERCISE SCIENCES

All rights reserved

THE GRADUATE SCHOOL CHIANG MAI UNIVERSITY JULY 2008

THE DEVELOPMENT OF A KNEE ELECTRO-ORTHOSIS

FOR PATIENTS WITH HEMIPLEGIA

WEERANAN YAMRATTANAKUL

2/520013 THIS THESIS HAS BEEN APPROVED TO BE A PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF SCIENCE IN MOVEMENT AND EXERCISE SCIENCES

EXAMINING COMMITTEE

.CHAIRPERSON

ซียงไหม

ser

versity

Assoc. Prof. Dr. Jonjin Ratanapinunchai

... MEMBER Asst. Prof. Dr. Somporn Sungkarat

Rumpa Boon sellMEMBER

Asst. Prof. Dr. Rumpa Boonsinsukh

CPT. M.L. Buddhibongsa Devakula, M.D.

S

r

28 July 2008 © Copyright by Chiang Mai University

ACKNOWLEDGEMENT

I would like to express sincere gratitude and appreciation to my thesis advisor, Assoc. Prof. Dr. Jonjin Ratanapinunchai for her valuable guidance, recommendations, and encourage me throughout this thesis.

I would like to express a great thank to Asst. Prof. Dr. Somporn Sungkarat, Asst. Prof. Dr. Rumpa Boonsinsukh, and CPT. Dr. M.L. Buddhibongsa Devakula to their valuable suggestions and helpful advices.

I would like to express great thanks to Faculty of Associated Medical Sciences and Center of Biomedical Engineering Chiang Mai University for a research grants.

I am deeply obliged to Mr. Mongkol Viboolrungsun and Mr. Narong Turtpongsameurpak who helped me produced the knee electro-orthosis.

I would like to give my appreciate many thanks to all of my friends Miss Siriporn Klangkhokkruad, Miss Benjamaporn Hancharoenkul, and Miss Jittima Charoenlimprasert for their helps and friendships.

Especially, I would like to express a great thanks to all patients and their family who participated in the study.

I am extremely appreciative to Miss Kris Schrock for her nice recommendation and warm encouragement.

Finally, I would like to express my gratitude to my parents and my elder sister for their love and warm encouragement through my thesis study.

Weeranan Yamrattanakul