## ROLE OF TRUNK MUSCLES ON LUMBOPELVIC STABILITY AMONG THAI WEIGHTLIFTERS

PATRAPORN SITILERTPISAN

DOCTOR OF PHILOSOPHY
IN BIOMEDICAL SCIENCE

THE GRADUATE SCHOOL
CHIANG MAI UNIVERSITY
JANUARY 2011

# ROLE OF TRUNK MUSCLES ON LUMBOPELVIC STABILITY AMONG THAI WEIGHTLIFTERS

PATRAPORN SITILERTPISAN

A THESIS SUBMITTED TO THE GRADUATE SCHOOL IN
PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE DEGREE OF
DOCTOR OF PHILOSOPHY
IN BIOMEDICAL SCIENCE

THE GRADUATE SCHOOL
CHIANG MAI UNIVERSITY

JANUARY 2011

### ROLE OF TRUNK MUSCLES ON LUMBOPELVIC STABILITY AMONG THAI WEIGHTLIFTERS

#### PATRAPORN SITILERTPISAN

### THIS THESIS HAS BEEN APPROVED TO BE A PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF DOCTOR OF PHILOSOPHY IN BIOMEDICAL SCIENCE

**EXAMINING COMMITTEE** THESIS ADVISORY COMMITTEE Assist. Prof. Dr. Ubon Pirunsan Assist. Prof. Dr. Ubon Pirunsan laungmali CO-ADVISOR Assoc.Prof. Dr. Thyon Chentanez Assist. Prof. Dr. Aatit Paungmali Assist. Prof. Dr. Aatit Paungmali Assoc. Prof. Dr. Jonjin Ratanapinunchai Assoc. Prof. Dr. Jonjin Ratanapinunchai

16 January 2011

Chammaghich MEMBER

Assist. Prof. Dr. Samatchai Chamnongkich

16 January 2011
© Copyright by Chiang Mai University

#### ACKNOWLEDGMENTS

I am indebted to many persons for their help in completion of this study.

My sincere gratitude is to my advisor, Assist. Prof. Dr. Ubon Pirunsan, Assist. Prof. Dr. Aatit Paugmali and Assoc. Prof. Dr. Jonjin Ratanapinunchai for their encouragement and providing the excellent facilities for my work.

My appreciations to Prof. Dr. Julie Hides and Prof. Dr. Warren Stanton, Division of Physiotherapy, School of Health and Rehabilitation Sciences, The University of Queensland and Mater/UQ Back Stability Clinic, Mater Health Services, South Brisbane, Queensland who have been very cooperative and helpful.

My special thanks to members of Neuromusculoskeletal and Pain Research Unit, Department of Physical Therapy, Assist. Prof. Suchart Kiatwattanacharoen and Dr. Hudsaleark Neamin, Department of Radiologic Technology, Faculty of Associated Medical Sciences, Chiang Mai University for encouragement and providing of the ultrasound imaging equipment.

Many thanks to Prof. James Laskin, Leonard Joseph and Lucy Coombs, Thai Amateur Weightlifting Association, Commission on Higher Education, Ministry of Education, The Royal Thai government and Faculty of Associated Medical Sciences, Chiang Mai University. Finally, I would like to express my deepest gratitude to my parents and my family for their everlasting love and supports.