

**Recruitment of the diaphragm and sternocleidomastoid muscle during loaded
inspiration on varying sitting support in healthy adults**

Document Date: 2nd May 2025

HONG KONG METROPOLITAN UNIVERSITY

Information Sheet

TITLE OF THE STUDY

Recruitment of the diaphragm and sternocleidomastoid muscles during loaded inspiration on varying sitting support in healthy adults

INTRODUCTORY SENTENCE

You are invited to participate in a research study conducted by Prof. Tsang Wai Nam, William from Department of Physiotherapy of Hong Kong Metropolitan University (HKMU).

PURPOSE OF THE STUDY

Understanding the recruitment of the diaphragm on different postural demands during inspiratory loading and the coordination of activation of the diaphragm and SCM can investigate further progression of inspiratory muscle training (IMT).

PROCEDURES

You are invited to this study if you are (1) aged 18-35 years; (2) No recent thoracic surgery in past 6 months; (3) Absence in history of chronic respiratory illness; (4) Able to breathe spontaneously; (5) Able to follow IMT instructions. The baseline function will be assessed with spirometry and POWERbreathe device. You will be instructed to perform IMT training at 4 different sitting conditions, namely (S1) sitting on a chair, (S2) sitting on a soft pad with feet supported on the ground, (S3) sitting on a soft pad with feet supported by two additional soft pads, and (S4) sitting on a single soft pad with both feet supported by one soft pad, in a randomized order. Diaphragm thickness and sternocleidomastoid muscle activity will be evaluated via ultrasonography and surface electromyography respectively. The whole procedure last approximately 1 hour.

POTENTIAL RISKS/STRESS/PAIN/DISCOMFORTS/OTHER FACTORS AND THEIR MINIMIZATION

The procedures may cause transient dizziness, lightheadedness, or mild respiratory muscle fatigue due to spirometry and resistance training. Mild discomfort may occur

from probe pressure on the abdomen during ultrasonography for diaphragmatic thickness measurement. Skin irritation may also result from electrode placement during surface electromyography. All procedures are non-invasive and carry no significant risks.

POTENTIAL BENEFITS

There is no potential benefit for your participation.

COMPENSATION FOR PARTICIPATION

There is no direct compensation for your participation.

PARTICIPATION AND WITHDRAWAL

Your participation is entirely voluntary and that you can choose to withdraw from the study at any time you want without any penalty or negative consequences.

CONFIDENTIALITY

All data will be protected and securely kept in university storage (both online and physical), and will remain confidential and accessible only to the project team. The research data will be used solely for academic purposes. The findings of this evaluation may be presented in academic conferences and published in peer-reviewed journals. Your identity will not be revealed in any way in these dissemination avenues. If you wished to learn about the results, you can contact us directly, and we will share a summary report with you. Upon study completion, all materials containing personal identifiers will be securely destroyed.

QUESTIONS AND CONCERNS

If you have any questions or concerns about the research study, please feel free to contact Prof Tsang Wai Nam, William at telephone number 3970 8703/ email address wntsang@hkmu.edu.hk or Ms. Liu Fang at email address s1350035@live.hkmu.edu.hk. If you have questions about your rights as a participant of this research study, please contact the Research Ethics Committee of HKMU at 27686251.