

Report

Research Activities in the Department of Physical Therapy

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Introduction

It is already fifty years since the Japanese law of physical therapists and occupational therapists has been effective. The physical therapist is referred by the law as "the professionals who implements the physical therapy to persons with disabilities under the prescription of medical doctors". In fifty years, however, the target of physical therapy has been significantly expanded. The subject for physical therapy now includes the patients in acute disease just after the surgical operation in addition to those in rehabilitation stage. In other words, the physical therapy is now recognized as the indispensable intervention to the subject with acute as well as chronic disorders.

On the other hand, due to a rapid transition of the society into the aged society, prevention of diseases, and decline of activity capacity due to the aging have become major issues for the physical therapy. In order to fulfill the social demands to physical therapy, the modern physical therapy is expected to move from the hospital-based service to the one performed in the community or at client home. Already in some developed countries, physical therapy has been practiced in the community to promote the health maintenance, or prevention of chronic diseases, which implies the importance of physical therapy in disease prevention in addition to the functional

rehabilitation. We think it is important for the physical therapists at the Department of Aino University, to educate the philosophy and skills of future physical therapy which will be applied for disease prevention in addition to rehabilitation. It is critical for our graduates to learn the future therapy if they can serve for the society needs. Considering such circumstances, we regard the priority research challenges of the Department of Physical Therapy will be as follows ;

1. Physical therapy for prevention of functional decline with aging,
2. Physical therapy aiming for the prevention of chronic diseases and functional decline as prophylaxis of chronic diseases,
3. Valid exercise therapy to maintain ADL (activities of daily living) and health promotion,
4. Physical therapy related to prevention of a new disabilities during the physical movement for the purpose of health promotion and maintenance,
5. Physical therapy preventing the onset of disabilities associated with the high performance and improved performance of athletes,
6. Training method contributing to the improved performance of athletes,
7. Physical therapy on functional decline prevention of the patients with mental disorders,
8. Study of OSCE-R (Objective Structured Clinical Examination-Reflection) in physical therapy education,

9. Study of physical therapy education on the proficiency of technology learning.

Herein, we will describe the research activity going on at the department in more details.

1. Basic research on preventive physical therapy

We are studying general and locomotive physiology underlying the theory of preventive physical therapy, because it will be the main stream of physical therapy in near future. The team lead by Masahiro Goto is involved with the research which will elucidate the change in parameters of locomotive physiology resulting in the improvement of activity performance. Masahiro Goto has been carrying out his research on the effect of resistance training to change in blood flow of the skeletal muscle, in motor unit, and in the peripheral metabolic functions¹⁾. Masaki Iwamura is studying the changes in limb muscle mass with aging by measuring the body compositions with bioelectrical impedance analysis²⁾. He is also surveying the relationship of sarcopenia and/ or dynapenia to the risk of falls of the community elderly, where sarcopenia is defined as the loss of muscle mass, and dynapenia is as the decrease in muscle tonus. Yoshihiro Yamashina and Yousuke Yamato are studying the declined respiratory function, and arteriosclerosis of the peripheral blood vessels due to aging from the view point of physical therapists. Atsushi Nishimura, together with Hiroki Aoyama, Akifumi Sugimoto, and Kenji Shinbo, are studying the mode of various movements in sports by 3D analysis trying to analyze the essential component of the movement in each sports which will lead to development of better training method³⁾. Hirofumi Hori is studying the training theory which will contribute to the improved performance of athletes.

2. Study on community (home) physical therapy

Shouji Ueda is in charge of integrating the basic research on community based physical therapy. Hitoshi Kumada is studying the specific property of the practice of physical therapy to the disorders related with the shoulder joint to the community residents and he is also studying how to implement as the means of community based physical therapy. Masahiro Tamachi, and Chikako Maeda are studying the physical therapy that will contribute to the reduction of low back pain

symptoms of the carers. They are aiming for the development in methodology of physical therapy to reduce the low back pain in the community. Tomoko Hirayama, Emiko Morita, and Wataru Nanikawa are involved with the survey of the actual situation of the community-based physical therapy, and trying to summarize the role of physical therapy in the community comprehensive care, proposing the possible measures of implementation to the community. Nami Sakagami is interested in the present situation where the physical therapy to the disabled children is the social matter.

3. Study of physical therapy aiming for a new target

Emiko Morita is developing her study on rehabilitation and physical therapy to cancer patients⁴⁾, which is the highly expected area in recent days. Hiroyuki Kajimoto is studying the physical therapy to the patients with mental disorders. Yoshihiro Yamashina is studying the physical therapy to the patients with chronic diseases including chronic respiratory disease, diabetes, and others⁵⁾.

4. Research on physical therapy education

Tomoko Hirayama wants to summarize the research on professional education specialized in physical therapist training, who has been involved with the research on OSCE-R⁶⁻⁸⁾ for eight years under the supervision of Professor Kayoko Matsushita, Kyoto University Center for the Advancement of Higher Education, who is trying to establish the training method unique to Aino University in collaboration with the staff of the Department including Kenji Shinbo, Wataru Nanikawa, Emiko Morita, Nami Sakagami, Akifumi Sugimoto and others. Hiroki Aoyama in collaboration with Hiroshi Sakai and Mana Taguchi, Associate professor of Kyoto University Center for the Advancement of Higher Education, is studying on the course portfolio aiming for the better curriculum development. Atsushi Nishimura is tackling again with the research topics of improvement in the skill of physical therapists utilizing a knee joint motion reproduction robot in collaboration with Professor Yasuhiro Masutani, Osaka Electro-Communication University Graduate School of Information Studies⁹⁾. Kenji Shinbo and Wataru Nanikawa are studying the education methodology of physical therapy evaluation. Akira Mizutani's research

topic is educational methodology of exercise therapy.

5. Other research topics

Shouji Ueda studies the effect of psychological stress on the motor function¹⁰⁾. Masahiro Tamachi conducts research on philosophical discussion related to the physical therapy. Chikako Maeda performs the study of the education and learning of professional identity. In addition, Keiichi Shinoda's study on neuromuscular disease, and Parkinson's disease, Yoshihiro Yamada's study on stromal cells and leukemia, Toru Noda's study on fine structure and function of organelle and intracellular dynamics of zinc are examples of active research topics of the Department.

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