

Department of Respiratory and Nervous System Science

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(1) Outline

We research and educate on the respiratory and nerves systems. Our interests are looking at the living body as an integrated system from the molecular and cellular level to the organs and looking at the relationship between clinical medicine and physiological tests.

Until last year, research and education on respiratory, cardiovascular, and nerves were conducted by the name of “ Biofunctional Informatics ” . At the time of reorganization of Tokyo Medical and Dental University, cardiovascular division separated, and we moved from “ Graduate School of Health Care Sciences ” to “ Graduate School of Medical and Dental Sciences ” and was renamed to “ Respiratory and Nervous System Science ” .

(2) Research

The research is conducted independently in each field by specialists in the respiratory and nervous system.

In the respiratory field, we are studying the clinical significance of new lung function tests, mechanisms and endotype classification of bronchial asthma and COPD, gene therapy for lung diseases, and diagnostic imaging using AI.

In the central nervous system area, we are researching on electroencephalogram (EEG) and epilepsy, and in the peripheral nervous system area, we are developing a new imaging methods.

(3) Education

In education, we provide education in general clinical medicine and acquire theory and skills through lectures and practical training in physiological function tests (lung function, EEG, peripheral nerve tests, various sonography, etc.). Undergraduate and graduate research educations are conducted in each specialized field.

1) Undergraduate student education

In the 1st year, a lecture on “ Respiratory and Nervous System Science ” is given on Advanced Laboratory Sciences. Second-year students have Physiological Laboratory Science, Lecture(I). Here students learn the basics of EEG, lung function tests, and sonographies. Physiological Laboratory Science, Lecture(II) and Physiological Laboratory Science, Laboratory(II) will be conducted jointly with the cardiovascular field in the 3rd years (2nd and 3rd years in the new curriculum). The contents include neurophysiological examination, respiratory examination, circulatory examination, ultrasonic examination, image analysis, thermography, sense of equilibrium function examination, fundus examination, and other basic examinations such as blood sampling practice, sample collection, etc. We also provide education on clinical techniques in general, including taking vital signs and procedures for critical care. In the 4th graders, students undergo Undergraduate research. In the clinical training, practical training of respiratory tests including blood gas measurement, EEG, evoked potential test, and abdominal ultrasonography will be given during two weeks.

2) Graduate education

In the Master's course, we are in charge of Medical Technology I, Medical Technology II, Seminar of Respiratory and Nervous System Science, Practice of Respiratory and Nervous System Science, and Respiratory and Nervous System Analysis Research for Thesis. Medical Technology I deepens the understanding of the scientific knowledge that is the basis of clinical tests currently being conducted in the medical field from various levels of genes, molecules, cells, tissues, and individuals, and further toward the future. The purpose is to reinforce the foundation for studying research topics. The purpose of Medical Technology II is to deepen the understanding of clinical tests currently being conducted in the medical field and to develop the ability to consider future research issues. In each lecture of Respiratory and Nervous Systems Science, we educate new knowledge and techniques, clarify areas that have already been elucidated and areas that do not, and acquire scientific research attitudes to clarify areas that are still unknown.

In the Doctoral course, we are in charge of Clinical Reasoning and Respiratory and Nervous System Science. In the Clinical Reasoning, we aim to cultivate the clinical laboratory technologists who can discuss with physicians of inferring disease conditions from laboratory data. In the Respiratory and Nervous System Science, we aim to teach the theory and techniques to inspect the living body as an integrated system. In particular, students learn the cutting edge medical knowledge in the respiratory or nervous system, the methodology to analyze the relationship between the biological information obtained by the examination and the pathogenesis, and the theory and techniques to developed novel examination methods.

(4) Lectures & Courses

What is important in education is to motivate learning. In particular, in the lower grades of undergraduate students, many students do not understand how basic learning is useful, and are not motivated to study despite being important. For this reason, we have increased practical training, conducted early exposure to understand how it is needed in the clinical setting. We wish students to be eager to learn and to acquire competency as if the water is soaking into dry sand.

In particular, as the physiological function testing is a clinical front line that is conducted in direct contact with patients, we educate from the standpoint of clinical medicine. The goal is that students learn theories and techniques of clinical physiological examinations in nerves, respiration, cardiovascular, digestive organs, and diagnostic imaging, and be able to apply them to researches. Physiological function testing involves not only device operation, safety measures, recording of biological phenomena, data organization / analysis techniques and knowledge, but also testing directly in contact with humans, so medical knowledge about diseases, medical ethics and communication skills are also required. It is also important to cultivate the ability to quickly recognize and take appropriate measures for test results that require emergency treatment of patients. In addition to these, we are also educating students on how to respond to sudden changes in patients during testing.

(5) Clinical Services & Other Works

Dr. Sumi is a Respiratory specialist and Respiratory instructor, and Allergy specialist certified by the academic society. He treats patients at respiratory medicine department in the hospital. He also takes care of the study groups of doctors and takes part in as discussant. He gave lecture at Evening seminar for medical interns, at CC (Clinical Clerkship) in respiratory medicine for undergraduate 5th and 6th grade medical students, at PCC (Preparation for Clinical Clerkship) in respiratory internal medicine for 4th year undergraduate medical students, at Respiratory Internal medicine for 3rd year undergraduate medical students, at Respiratory physiology for 2nd year undergraduate medical students, and at MIC (Medical Introductory Course) for 1st year undergraduate medical students.

The neurologist, Dr. Akaza, is familiar with peripheral neuropathy in addition to neurological diseases in general, and plays a central role in performing peripheral nerve tests and evaluating results in medical hospitals.

Dr. Hara is the psychiatrist, Mental health designated physician, specialist / instructor of the Japan Epilepsy Society, certified by the Japanese Society of Clinical Neurophysiology (EEG), and Delegate of the Japanese Society of Clinical Neurophysiology, Councilor of the Japan Pharmaco-EEG Society, Board secretary of the Japan Epilepsy Society. She examines many patients with epilepsy in the outpatient department including second opinions. In cooperation with the Department of Neurosurgery, she attends weekly EEG conferences, monthly EEG and epilepsy lectures, and analyzes high frequency EEG (HFO). She also performs intraoperative electroencephalogram measurements in many brain surgeries.

(6) Clinical Performances

Dr. Akaza is a specialist in peripheral nerve function testing and performs most tests for neurological patients. She is conducting clinical research on peripheral neuropathy in diabetic patients.

Dr. Hara treats many patients with epilepsy including second opinions. She specializes in the treatment of pregnant women with epilepsy. In cooperation with obstetrics and gynecology doctors, patients with epilepsy are referred to her consultant before pregnancy since 2013.

(7) Publications

[Original Articles]

1. Koike F., Otani Y., Oyama S., Furuie W., Endo J., Nakamura Y., Akaza M., Sasano T., Miyazaki Y., Inase N., Sumi Y.. The Role of Forced Oscillation Technique to Diagnose Patients with Cough Variant Asthma. AMERICAN JOURNAL OF RESPIRATORY AND CRITICAL CARE MEDICINE. 2018; 197;
2. A case of absence epilepsy in the 30s 2018.01; 36(1); 52-58
3. Miyoshi Takao, Furuie Wakaba, Otani Yoshio, Tani Chihiro, Waku Marika, Miyazaki Yasunari, Inase Naohiko, Akaza Miho, Sasano Tetsuo, Koike Fumika, Kubota Tetsuo, Sumi Yuki. Study on indoor cleaning effect by air purifier and the influence on asthma(和訳中) アレルギー. 2018.05; 67(4-5); 519
4. Koike Fumika, Otani Yoshio, Furuie Wakaba, Endo Junji, Nakamura Yoichi, Akaza Miho, Sasano Tetsuo, Tsuchiya Kimitake, Tamaoka Meiyo, Miyazaki Yasunari, Inase Naohiko, Sumi Yuki. The role of Most-Graph to diagnose patients with untreated Cough Variant Asthma(和訳中) アレルギー. 2018.05; 67(4-5); 498
5. Miho Akaza, Itaru Akaza, Tadashi Kanouchi, Tetsuo Sasano, Yuki Sumi, Takanori Yokota. Nerve conduction study of the association between glycemic variability and diabetes neuropathy. Diabetol Metab Syndr. 2018.09; 10; 69
6. Nagamori Chizuko, Hara Keiko, Hirose Yuka, Ohta Katsuya, Akaza Miho, Sumi Yuki.. Public awareness and experiences associated with epilepsy in Japan, 2013-2017 EPILEPSY & BEHAVIOR. 2018.09; 86; 138-144
7. Miyoshi Takao, Furuie Wakaba, Otani Yoshio, Tani Chihiro, Waku Marika, Koike Fumika, Miyazaki Yasunari, Inase Naohiko, Sasano Tetsuo, Akaza Miho, Kubota Tetsuo, Sumi Yuki. Can air purifier promote the indoor cleanliness and improve the patients with asthma? EUROPEAN RESPIRATORY JOURNAL. 2018.09; 52;
8. Koike Fumika, Otani Yoshio, Oyama Saki, Furuie Wakaba, Endo Junji, Nakamura Yoichi, Miyoshi Takao, Akaza Miho, Sasano Tetsuo, Miyazaki Yasunari, Inase Naohiko, Sumi Yuki. Cluster analysis of cough variant asthma using exhaled value of forced oscillation technique. EUROPEAN RESPIRATORY JOURNAL. 2018.09; 52;
9. Nagamori C, Hara K, Hirose Y, Ohta K, Akaza M, Sumi Y. Public awareness and experiences associated with epilepsy in Japan, 2013-2017. Epilepsy Behav. 2018.09; 86; 138-144
10. Akaza M, Akaza I, Kanouchi T, Sasano T, Sumi Y, Yokota T.. Nerve conduction study of the association between glycemic variability and diabetes neuropathy. Diabetology and Metabolic Syndrome. 2018.09; 12(10); 69

[Conference Activities & Talks]

1. Miho Akaza 他. Magnetic recordings of sensory action currents in the cervical cord.. 31st International Congress of Clinical Neurophysiology of the IFCN 2018.05.03
2. Fumika Koike, Yoshio Otani, Saki Oyama, Wakaba Furuie, Junji Endo, Yoichi Nakamura, Miho Akaza, Tetsuo Sasano, Yasunari Miyazaki, Naohiko Inase, Yuki Sumi.. The Role of Forced Oscillation Technique to Diagnose Patients with Cough Variant Asthma.. ATS 2018 International Conference 2018.05.20 San Diego

3. 赤座 実穂 , 赤座 至 , 叶内 匡 , 笹野 哲郎 , 角 勇樹 , 横田 隆徳 . Study for association between glycemc variability and diabetic neuropathy assessed by NCS. 第 59 回神経学会総会 2018.05.24
4. Takao Miyoshi, Furuie wakaba, Yoshio Otani, Chihiro Tani, Waku Marika, Yasunari Miyazaki, Naohiko Inase, Miho Akaza, Tetsuo Sasano, Fumika Koike, Tetsuo Kubota, Yuki Sumi.. Study On Indoor Cleaning Effect By Air Purifier And The Influence On Asthma.. The 67th Annual Meeting of Japanese Society of Allergology. 2018.06.23
5. Fumika Koike, Yoshio Otani, Wakaba Furuie, Junji Endo, Yoichi Nakamura, Miho Akaza, Tetsuo Sasano, Kimitake Tsuchiya, Meiyo Tamaoka, Yasunari Miyazaki, Naohiko Inase, Yuki Sumi.. The role of Most-Graph to diagnose patients with untreated Cough Variant Asthma.. The 67th Annual Meeting of Japanese Society of Allergology. 2018.06.23
6. T. Miyoshi, W. Furuie, Y.Otani, C. Tani, M. Waku, F. Koike,Y. Miyazaki,N. Inase, T.Sasano, M. Akaza, T. Kubota, Y. Sumi. Can air purifier promote the indoor cleanliness and improve the patients with asthma?. ERS International Congress 2018 2018.09.01 Paris
7. F. Koike, Y. Otani, S. Oyama1, W. Furuie, J. Endo, Y. Nakamura, T. Miyoshi, M. Akaza, T. Sasano, Y. Miyazaki, N. Inase, Y. Sumi. Cluster analysis of cough variant asthma using exhaled value of forced oscillation technique. ERS International Congress 2018 2018.09.01 Paris
8. Diagnosis of C8 radiculopathy by magnetospinogram. 2018.11.09