

Department of Internal Medicine

Division of Cardiology

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General Summary and Research Activities

Research in every field, both clinical and basic, is being driven by the desire to obtain reliable results.

Clinical research

In clinical research, we have been participating in multicenter collaborative studies, including large-scale clinical studies, and conducting research during routine clinical practice. In the large-scale clinical studies, we have primarily collaborated in subanalyses in the Japanese Investigation of Kinetic Evaluation in Hypertensive Event And Remodeling Treatment (JIKEI HEART) Study, whose results were reported last year, and in such studies as the Japanese Rhythm Management Trial for Atrial Fibrillation II (J-RHYTHM II) (a multicenter study comparing upstream drug therapy with calcium antagonists and angiotensin receptor blockers for atrial fibrillation associated with hypertension), the Assessment of β -Blocker Treatment in Japan Chronic Heart Failure (J-CHF) study (a large-scale clinical study to establish a β -blocker treatment methods in chronic heart failure), the Pitavastatin Heart Failure (PEARL) study (a multicenter cooperative study to investigate the ameliorative effects of hydroxymethylglutaryl coenzyme A reductase inhibitors on chronic heart failure), and the Nationwide Gender-specific Atherosclerosis Determinants Estimation and Ischemic Cardiovascular Disease Prospective Cohort (NADESICO) Study (multicenter cooperative prospective cohort study on sex differences in risk factors for arteriosclerotic diseases and prevention), which used computed tomographic examinations of the coronary arteries.

We have converted patient data, including risk factors and lesion morphology, during catheter examinations and treatment in various clinical research divisions into a database and have performed a study comparing risk factors, outcome, and other aspects of ischemic heart disease, cardiomyopathy, and other conditions. In addition, we have participated in nationwide clinical studies, mainly detailed investigations of treatment with drug-eluting stents and the diagnosis of coronary vasospasm, which is closely related to the etiology of ischemic heart disease. These studies include: Japan-Drug Eluting Stents Evaluation; a Randomized Trial (J-DESSERT), Coronary Spasm Association (CSA), Japan Unprotected Left Main Coronary Artery Disease Percutaneous Coronary Intervention Strategy On New Generation Stents (J-LESSON), and Optimal Duration of DAPT

Following Treatment With Endeavor (Zotarolimus-eluting Stent) in Real-world Japanese Patients (OPERA).

In regard to heart failure, which is an extremely common circulatory condition, we have been assessing data related to serum brain natriuretic peptide concentrations, which are an index of disease severity, and been conducting research on standard values that will be of use in actual clinical practice. In addition, we have reported in detail the pathologic changes of heart failure before and after admission to the hospital and are now assessing clinical data that will serve as a new index.

We have been aggressively treating atrial fibrillation by catheter ablation, and during this fiscal year we have treated approximately 160 patients. In addition, in clinical research we have investigated: 1) the usefulness of the pulmonary vein antrum isolation procedure by new mapping systems and 2) optimal catheter ablation strategies for persistent atrial fibrillation.

Basic research

Our research activities include studies at other institutions in Japan and abroad by basic science and clinical science graduate students and presentation of the results of many studies. In the field of arrhythmia, we have used various experimental models to study the development of atrial fibrillation in regard to the effects on the myocardium of inflammatory cell invasion mechanisms and fibrosis. In the field of cardiomyocyte physiology, we have investigated the physiological and pathophysiological regulatory mechanisms of myocardial contraction and relaxation and performed a study using molecular biology techniques and physiological techniques. We have also studied a new signal transmission system in the α -receptor stimulation effect in relation to L-type Ca channels in the rat myocardium, the effects of β -receptor stimulation in sarcoplasmic reticulum function, and cardiomyocyte intracellular Ca kinetics in mice in which dilated cardiomyopathy develops as a result of troponin T mutations. In the field of myocardial metabolism, we have investigated the association between ischemia-reperfusion damage and intracellular ion kinetics in isolated perfused hearts of type-2 diabetic mice.

Publications

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