The mission of our center is “We will contribute to establish health and longevity society by promoting mental and physical independence.”
Greetings from the President

The National Center for Geriatrics and Gerontology (NCGG) was established as an independent body of the research institute with 320 hospital beds in 2010. In 2015, we became the National Research-Developing Institute to maximize the application outcome by integrating basic and clinical researches. The mission of our center is “to contribute the establishing health and longevity society by promoting mental and physical independence.”

As you know, Japan faces a super-aged society which the number of elderly people exceeds 27% of the whole population. Last year, dementia became the main cause of disability while cerebrovascular diseases had been the first place for a long time. In addition, frailty related to health condition such as senile vulnerability, joint disease and fall/fracture occupied the third to fifth causes of disability. We live in the era that more than two-third of people become dependent by dementia and/or frailty.

Based on that, we have been focusing on two major geriatric conditions related to disabilities; dementia and frailty, for recent 10 years. We have to keep in mind the weight of responsibility. People with cognitive decline exceeded 9 million, and the Ministry of Health Labor and Welfare (MHLW) implemented the new dementia measure named “New Orange Plan” in 2015.

As a matter of first priority, the information directly drawn from the people with cognitive decline is the most important needs for clinical research. These needs include new effective disease-modifying drugs, less expensive biomarker for accurate diagnosis, and medical and care advices for calm life at home, in other words, “Dementia in Place”. Early prevention of life-style related disease is promoted as “anti-metabolic syndrome”. In a super-aged society, these preventive trials against cognitive decline should be built in the national health strategy to delay the onset of dementia. In addition, we established a new dementia registry system called “ORANGE Registry (Organized Registration for the Assessment of dementia on Nationwide General consortium toward Effective treatment in Japan: ORANGE)”. Currently, more than 35 institutions join this registry system to register the data of preclinical, MCI, and advanced dementia. This multi-centered approach will ease the recruit of medical trials, explore the study of lifestyle modification, develop cognitive rehabilitation, and seek new approaches for palliative care. Indeed, candidates of biomarker and disease modifying drugs have been waiting to utilize the registry.

In response to the national project of “ORANGE Registry”, we have reformed the organization of NCGG. We have the largest memory clinic in Japan, working on the Comprehensive Care and Research on Memory Disorders. We also have the Medical Genome Center, in which the data of clinical information, imaging, blood and genomic information were accumulated. Comprehensive Care and Research on Memory Disorders collaborates tightly with basic dementia science (Center for Development of Advanced Medicine for Dementia) to find new seeds for dementia treatment.

Also, people experience the functional inconvenience as a common phenomenon when they get old. Frail is a transient state before bedridden in any disease, but it is a reversible condition. We try to minimize the functional decline after acute illness by sophisticated skills of rehabilitation with the knowledge of frailty. To keep a functional level after discharge, we provide periodical collaboration of care service and functional check. Also, at the Robotic Center, we develop and verify the new robotic technologies for better burden-free care.

Furthermore, we work together with Aichi prefecture, neighbor cities, medical and social welfare stakeholders, public and private companies, and persons with dementia as well as their family members to develop the “Orange Town”, dementia friendly community, by gathering fruitful knowledge and experiences.

NCGG has been, and will be trying to contribute to overcome the challenges in super-aged society. We appreciate your wonderful support and understanding.

Best regards,

Kenji Toba, MD, PhD.
President, the National Center for Geriatrics and Gerontology

Output Oriented Organization

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National Center for Geriatrics and Gerontology
The purpose of geriatrics and gerontology is to help patients maintain healthy and active lives as long as possible by providing medical treatments that prevent the deterioration of physical and mental independence in the elderly, using knowledge, and technology based on the health and longevity of patients.

To achieve that, we first provide the basic medical treatments that improve all patients' lives regardless of age to a standard level or higher, evaluating and treating organ-specific or systemic conditions. At the same time, we diagnose the cause and determine the severity of symptoms peculiar to the elderly, and provide appropriate preventative, beneficial, or palliative care based on our evaluations. By doing so, we are helping to preserve the health and longevity of patients.

Hidenori Arai, MD, PhD
NCGG Hospital Director

Departments (24 total)

Specific Outpatient Services
Memory Clinic, Osteoporosis Clinic, Hearing Aid Clinic, Total Denture Clinic, Oral Care Clinic, Mammary Gland & Proctology Clinic, Anal Disorder Clinic, Sleep Apnea Clinic, Normal Pressure Hydrocephalus Clinic, Mental Vitality Clinic, Palliative Care Clinic, Atherosclerosis Clinic, Frailty & Locomotive Syndrome Clinic, Foot Edema Clinic, Rheumatoid Arthritis Clinic

Number of Beds
Medical Law Approval General Beds 383
Number of Inpatient Beds 321 (8 nursing units)

A newly constructed outpatient building will be completed in February 2018. The new building will maintain and develop all current medical department functions, and will include two new cross-departmental centers: the Center for Frailty & Locomotive Syndrome and the Center for Sensory Organs. It is clear that dementia and frailty are the most important pathological conditions affecting the super-aged members of our society. By enhancing our outpatient functions, we can better focus our efforts on these conditions and make maximum efforts to raise independence and living functions of the elderly. In addition to each outpatient clinic and central treatment room, we also have or are developing areas for operating, rehabilitation medicine, a clinical laboratory, radiology, endoscopy, and other specialized functions to provide comprehensive treatment.

Outpatient Services and General Management Unit Floor Information

Topics
Dining Hall / Cafeteria, Multipurpose Hall
Administration Department
Operating Room
Center for Frailty & Locomotive Syndrome Rehabilitation Medicine
Center for Sensory Organ Function, Clinic Laboratory
Radiology, Endoscopy Room
Outpatient Services Central Treatment Room
General Reception, Sebion of Regional Medical Liaison, Outpatient Services Cafeteria
1. Summary

Our institute was originally established in 1995 as a National Institute for Longevity Science (NILS) in the Chubu National Hospital. In 2004, our institute developed into the Research Institute of National Center for Geriatrics and Gerontology (NCGG, one of the six national centers for advanced and specialized medicine in Japan). In association with the reorganization of NCGG as an Independent Administrative Agency in 2010, our institute further developed and expanded. Now NCGG together with other national centers has shifted to the National Research and Development Agency since 2015. Currently, our institute will be expected to substantially contribute to production of practical applications in the research field of geriatrics and gerontology. Given that we are confronted with unprecedented super-ageing society, now is the time to take action to innovate our ideas and technology to cope with various medical affairs in such a society. Our mission, that has been rather unchanged from the original establishment, is to promote physical and mental health of the elderly through various research activities.

Katsuhiko Yanagisawa
Director-General, Research Institute

Especially here in research institute, as our current research focus area, we have established our “Biomedical Molecular Aging” study that orchestrates the following triangle elements, basic research on molecular level, validation with animal model system and application to clinical research for the elderly. We realize that ‘Aging’ is the result of alteration or dysregulation of homeostatic function strongly linked to aging variation and at first, try to find what is the risk factors for aging not only internally (various trophic control, calorie intake, inflammatory cytokines as well as senescence associated secretory phenotype; SASP) but also externally (cell metabolism and stress control such as oxidative stress or DNA damage response; DDR). On the other hand, we evaluate to what extent we age referred to by the level of reduced physiological function as well as homeostatic persistence. To do this end, we are interested in finding novel seeds and strategies such as immune- or metabolic-modulators, removal of oxidative stress or specific protein interaction, senoysis or cell competition for clinical application against age-related diseases in addition to biomarkers for frailty, infection and physiological aging. Especially, we focus on brain or neural aging and immune-senescence as well as muscular or bone aging and fat or hepatic aging on the basis of general metabolic aging. One of our practical goals is to reveal how can cellular senescence contribute to a physiological aging in various tissues or organs or even our body itself. In other words, what mechanism or molecules would be involved in not only infection control but also inflammation control broadly linked the frailty to control of age-related decline of physiological function. Consequently, we aim for a life and society with healthy longevity to address the study of molecular mechanism of aging and frailty to control of age-related diseases like dementia or sarcopenia.

2. Research topics

1) Possible role of periodontal disease-associated bacteria Porphyromonas gingivalis in allergic inflammation.

Epithelial cells work not only as a physical barrier to pathogens, but also play a pivotal role in initiating innate immune responses to microbes. Interleukin (IL)-33, a member of the IL-1 family, is constitutively expressed in epithelial cells and is influentially associated to the pathophysiology of allergic diseases and inflammation. We demonstrated the involvement of a periodontal pathogen, Porphyromonas gingivalis, in the enhanced expression of IL-33 in human gingival epithelial cells. Gingipains, cysteine proteinases produced by P. gingivalis, increased the production of IL-33 via the activation of protease-activated receptor-2. These results indicate that increased expression of IL-33 in gingival epithelial cells induces allergic inflammation and may be involved in the pathogenesis of periodontal disease and systemic allergic disorders.
2) Pathophysiological roles of cellular senescence in pulmonary aging

Senescent cells accumulate in tissues as animals age, but little is known about its consequence. Our laboratory established a new genetically modified mouse of which senescent cells can be eliminated by sensitizing them to a specific drug. Using this system, we discovered senescent cells that accumulate in lung tissue during aging contribute to pulmonary aging. Removal of senescent cells from lung tissue of aged animals restored pulmonary functions which progressively decline during aging. Since aging of the lung tissue increases a risk for pulmonary diseases such as COPD (chronic obstructive pulmonary disease), our findings suggest that senescent cells are potential therapeutic and preventive targets for pulmonary diseases.

3) The mechanism of aging-associated decline in submandibular gland function

Xerostomia (the feeling of dry mouth) is a common problem that is particularly prevalent among the aged. Advances in research on the mechanism of xerostomia are desired. Using real-time in vivo imaging of the cyclin-dependent kinase inhibitor p16 expression in mice lacking Bmi1 which prevents stem cell aging by blocking expression of p16, we uncovered a novel function of the Bmi1/p16 pathway in controlling homeostasis of the submandibular glands (SMGs). This pathway is dysregulated during aging process, leading to the induction of p16 expression and subsequent decline in SMG function. These findings extend the current understanding of the molecular mechanisms underlying the aging-related decline of SMG function and associated degenerative diseases and will open up new possibilities for its control.
The Center for Gerontology and Social Science (CGSS) was founded in April, 2012 to promote empirical research in the field of gerontology and social sciences in the National Center for Geriatrics and Gerontology. The concept of the center is to promote the independence of older people’s mind and body, contributing to the development of a vigorous society and longevity.

CGSS consists of 6 divisions and 10 subdivisions and is inviting more than 20 researchers from outside. We are conducting empirical research on sociogerontological issues to develop a society where older people can live safely and independently in the community. The research key words in CGSS are social participation, independence support, social support, social welfare, home care, and regional comprehensive care. We are also taking the problem solution approach for the laws and measures related to older people along with health economics. Based on these research activities, CGSS is trying to promote the independence of older people, to improve the QOL, and to contribute to the end-of-life with dignity and thereby committing to the development of a vigorous society with longevity.

Hidenori Arai, MD, PhD
Director of CGSS

[Department of Preventive Gerontology]
This department conducts surveys on community-dwelling older people and builds the system for early detection of dementia and geriatric syndromes. Addressing whether non-pharmacological treatments such as exercise, nutritional supplementation, and intellectual activity are effective for preventing dementia and physical frailty, and developing programs for disability prevention and to extend the period during which people can safely drive a car.

[Department of Gerontological Policy]
Research on caregiver burden and issues related to driving of older people with dementia.

[Department of Frailty Research]
Verifying the usefulness of frailty concept and facilitating its introduction in health care service and geriatric medicine. Examining how we can utilize the assessment of frailty and effectively intervene for frail seniors in daily practice to minimize dependency and disability in older adults.

[Department of Homecare Medicine]
Research on factors related to continuation of home care for the elderly and development of indicators to evaluate home care and effective home care. Investigating the way to promote home care collaboration based on the actual situation of each community. In the local setting, investigating the effect of home care support ward and transitional care with enhancement of collaboration between hospitals and local outpatient clinics and interdisciplinary team approach.

[Department of Social Science]
Studies on the effect of environmental factors such as community level social capital or medical care system on the health of older adults and on social activities or social relationships among the older population using a longitudinal data, evaluation of mental health intervention programs for older adults, studies on the association between individual- and community-level social factors and health in older adults using a large-scale community sample, evaluation of community-based health promotion programs targeted at older adults, studies to develop support programs for family caregivers, and evaluation of quality of home-based medical care programs.

[Department of Gerontological Evaluation]
Central office of JAGES (Japan Gerontological Evaluation Study) project which aims to create a scientific foundation for the healthy ageing policy. Conducting surveys on 200,000 older people and develop JAGES HEART (Health Equity Assessment and Response Tool) and implementing and evaluating policy.

[Section of NILS-LSA]
NILS-LSA, "National Institute for Longevity Sciences – Longitudinal Study of Aging" is a long-term, epidemiological study on aging conducted by the NCGG. Utilizing the NILS-LSA data among interdisciplinary researchers for the study of aging to elucidate of aging and identify factors that contribute to the onset of geriatric diseases including dementia, osteoporosis, and frailty.
Center for Development of Advanced Medicine for Dementia (CAMD) was established in 2010 in National Center for Gerontology and Geriatrics (NCGG) to accelerate basic and applied researches for dementia, especially focusing on Alzheimer’s disease. As of January 2018, through partial restructuring, our center consists of departments and laboratories indicated as follows; Department of Clinical and Experimental Neuroimaging, Department of Alzheimer’s Disease Research, Department of Aging Neurobiology, Department of Drug Discovery, Laboratory of Animal Models of Aging, and Laboratory of Dementia Information.

Our mission is to control and prevent dementia, mainly Alzheimer’s disease. To this end, the research activity of our center is mainly divided into three areas, including the elucidation of molecular and cellular mechanisms underlying development of Alzheimer’s disease, the development of procedures for detecting early or even preclinical stages of Alzheimer’s disease, and the drug discovery for preemptive therapy of Alzheimer’s disease. We believe that combining these three areas of research in one center provides a credible achievement to overcome this intractable disease.

Katsuhiko Yanagisawa
Director
Center for Development of Advanced Medicine for Dementia

Unfortunately, trials to develop therapy that prevents or slows Alzheimer’s disease has not succeeded so far. One of possible reasons for the failures is that intervention in the clinical trials until now were too late since the emergence of neuropathological changes of Alzheimer’s disease precedes the onset of cognitive decline by more than 20 years. To overcome this problem, detection method to identify individuals at risk of developing Alzheimer’s disease is urgently needed. In addition, development of effective measures for secondary prevention of Alzheimer’s disease are keenly awaited. We strongly hope to contribute to this field in near future.

Recent scientific achievements of our center are as follows. First, novel imaging biomarkers to detect preclinical and prodromal stages of Alzheimer’s disease has been developed, employing positron emission tomography (PET), magnetic resonance imaging (MRI) and magnetoencephalography (MEG). Second, basic neuropathological mechanisms underlying Alzheimer’s disease have been elucidated from viewpoints of intraneuronal traffic impairment including endocytic impairment, genetic network disorders which are likely responsible for neuronal death in the disease and synaptic dysfunctions which are related to the pathological accumulation of amyloid and tau. Third, pathological significance of genetic and environmental risk factors for development of Alzheimer’s disease such as apolipoprotein E and diabetes mellitus has been investigated. Fourth, novel animal models for Alzheimer’s disease have been developed using drosophila and mice, which enable us to monitor neurotoxicities of amyloid and tau in the brain. Fifth, novel small compounds, which specifically binds an endogenous seed for Alzheimer amyloid (ganglioside-bound amyloid S-protein: GAS) and inhibits amyloid fibril formation in the brain, have been explored through refined medicinal chemistry. Sixth, information on prevention, diagnosis, treatment and long-term care of dementia have been collected, analyzed and disseminated to improve the situation surrounding the dementia.
The basic mission of the National Center for Geriatrics and Gerontology (NCGG) is to contribute to society through the results of advanced clinical research on diseases such as dementia and osteoporosis that require a rapid response in a super-aging society. In order to establish a support system for conducting a greater number of high-quality clinical trials and clinical studies, the Innovation Center for Clinical Research (ICCR) was founded on April 1, 2014.

Kengo Ito, MD, PhD, Director of ICCR

Outline of ICCR

With the aim of facilitating and supporting high-quality clinical trials and clinical studies at NCGG, ICCR is composed of the Clinical Research Promotion Division, the Clinical Research Support Division, the Data Center, and the Development and Affiliate Promotion Division (Figure 1).

- **The Clinical Research Support Division** conducts various support activities related to clinical trials and clinical studies, including intellectual property management, monitoring, and regulatory assurance performed by two project managers. The division also provides consultation services for researchers. Clinical research consultation includes protocol planning, monitoring, auditing, and data management. The division also conducts education and training on clinical research in collaboration with the Clinical Research Planning Unit of the Clinical Research Promotion Division. In September 2017, the first workshop on planning high-quality clinical studies was held for clinical researchers in NCGG and provided attendees with practical examples.

- **The Data Center** performs quality control of clinical research by appropriately collecting, managing, and analyzing clinical research data from an independent standpoint to ensure the reliability of the results. The medical doctor who belongs to the Medical Information Unit of the Data Center is promoting the digitization of data to improve the efficiency of the above work. In addition, one biostatistician belongs to the DM-Biological Statistics Unit of the Data Center. Together with the Clinical Research Support Department, the Data Center responds flexibly to various questions from researchers, such as selection of appropriate statistical methods, calculation of sample sizes, selection of test designs, and biostatistics counseling.

- **The Development and Affiliate Promotion Division** and its Industry-Government-Academia Promotion Unit was established with the aims of discovering the seeds of future research, not only in NCGG but also in the academic and corporate sectors, and providing a seamless bridge to clinical research. To realize a healthy and long-living society, it is extremely important to develop innovative new drugs, promising diagnostic devices, effective rehabilitation equipment, and nursing robots for elderly medical care. Therefore, it is necessary to discover promising seeds at the basic research stage, nurture the seeds until they proceed to clinical studies or clinical trials, and confirm their usefulness.

![Figure 2 The Amyloid imaging in clinical trials for Alzheimer’s disease](image)
**Medical Genome Center**

Medical genome center at NCGG (NCGG-MGC) was established in 2016 as an infrastructure for contributing to genomic medicine on geriatric diseases such as dementia and sarcopenia in Japanese populations. The center consists of three divisions, Biobank, Genomic Medicine and Data & Information Management, as below. A large number of human biological samples have been collected and stored at the biobank without personal information. A comprehensive analysis (omics), especially genomics, of the samples has been performed and the data stored into the MGC-database. These data and samples are provided to researchers for leading new approaches to prevent, diagnose and cure diseases. MGC also assists researchers and clinicians in interpreting genomic findings and applying them to the patients. We expect that MGC will keep being a useful facility for researchers and clinicians of geriatrics.

Shunpei Niida
Director
Medical Genome Center

**Division of Genomic Medicine**

To contribute to the future individualized/personalized medicine, called precision medicine, for geriatric diseases, our division assesses large-scale integrative analysis based on comprehensive genetic approach. Features of the division are identification and analysis of functional variants/genes associated with the risk of geriatric diseases in Japanese, development and application of disease prediction model as well as exploration of drug seeds and repositioning. Introduction/development of new technology for genomic medicine and smooth support of the genomic and omics analysis and comprehensive genomic data storage and public disclosure.

**Division of Biobank (NCGG Biobank)**

NCGG biobank is a member of National Center Biobank Network (NCBN) consisted of six National Center Biobanks. NCGG Biobank collects wide array human samples including serum, plasma, urine, tissues, cerebrospinal fluid and purified DNA from patients with such as dementia and osteoarthritis. In addition, samples and associated data of participants of regional cohort studies have been stored. Biobank samples and/or the associated-data are available for distribution to scientists who are investigating geriatric diseases. Approx.7,000 participants from NCGG hospital (disclosed) and approx.13,000 participants from regional cohort studies (undisclosed) have been registered. More than 10,000 samples and information have been transferred to approx. 100 researchers at universities and companies (at the end of Sept. 2017).

**Data and Information Management Division (DIM)**

DIM offers assistance to MGC on the security of massive amount of clinical records and omics data in MGC data storage by improving method for data management technology. The division developed a foundation that enables us to use data and information safely and efficiently, including a unified anonymize management system throughout facilities. DIM is also developing a new system for researchers, named general data base (GDB), which integrates the genome information and electronic health record and promotes utilization at the medical ITC. There are few facilities having a division specialized in data and information management.
Center of Advanced Medicine for Dental and Oral Diseases

Recent studies revealed that the elderly’s oral conditions are closely associated with their systemic health. For example, there are associations between oral bacteria and systemic diseases and between the oral function and ADobject dementia in elderly people. Plaque as a food for oral bacteria is a direct risk factor of caries and periodontal disease, and it may provide a reservoir for major causative bacteria of aspiration pneumonia and systemic infections represented by infective endocarditis, which can be lethal for the elderly. As periodontal disease also leads to the development of systemic diseases, such as diabetes, ischemic heart disease, cancer, cerebrovascular disease, atherosclerosis, premature delivery, and Bluerger disease, ‘oral health’ is being increasingly focused on in geriatric care.

The Center of Advanced Medicine for Dental and Oral Diseases was founded to promote surveillance and research for the development and improvement of preventive, diagnostic, and treatment methods used in dental and oral care. Our center consists of 3 research departments: 1) Department of Dental and Oral Infrastructure Development, 2) Department of Dental Regenerative Medicine, and 3) Department for Advanced Dental Research, to each of which specialized researchers are assigned. The center conducts research and development to support the elderly’s mental and physical independence by promoting their oral health, with the goal of contributing to the realization of a society with healthy longevity.

Yasunori Sumi, D.D.S., Ph.D.
Director

Department of Dental and Oral Infrastructure Development

We are conducting a study to clarify the causal relationship between periodontal disease and geriatric diseases and to determine whether we clarify that periodontal disease can become an exacerbating factor of Alzheimer’s disease (Figures 1 and 2). We will also attempt to clarify the molecular mechanism of oral senescence by analyzing age-related changes in the oral mucosa. We have also established collaborative programs at the dental departments of six universities in Japan, and we are aiming at promotion of basic dentistry for elderly and making people aware of the idea of extending a healthy life span by maintenance of a healthy oral cavity.

Department of Dental Regenerative Medicine

1) Pulp Regeneration Therapy: Pulp regeneration therapy involves placement of pulp stem cells into mature pulporganized teeth for pulp regeneration. The regenerative therapy may contribute to the functional survival and endurance of the tooth, leading to good health and longevity.

II) Application of Nanobubbles for Dental Clinics: Nanobubbles can enhance delivery of medication to complex tooth structure and irrigate to remove smeared layer, biofilm, and bacterial plaque for Caries, Periapical disease and Periodontal disease.

Department for Advanced Dental Research

Our department conducts the following activities to realize healthy longevity in aged society.
1) Research for development of advanced medical equipment and drugs
2) Dissemination activity for oral care
3) Dental treatment for elderly patients
4) Post graduate training and human resource development of dentists and dental hygienist

Part of our activity will be introduced below.

Development of the gel for oral care to prevent aspiration pneumonia

The oral care is very important for prevention of aspiration pneumonia. In our department, a gel for oral care to prevent aspiration pneumonia was developed and related researches are being conducted. By using the developed viscous gel without water, it is possible to reduce aspiration risk during oral care and to effectively remove contaminants. We also conduct researches and dissemination activities on oral care systems including this oral care gel.

Oral gel for professional oral care

Before oral care

After oral care using our new gel
Welcome to our memory center in NCGG!

The number of demented patients in Japan is increasing. The Ministry of Health, Labor and Welfare is planning to establish 500 medical centers for dementia all over Japan. In 2010, we established the Center for Comprehensive Care and Research on Memory Disorders (3CRMD) in the National Center for Geriatrics and Gerontology (NCGG), as an ideal model of medical center for dementia. Geriatricians, neurologists, psychiatrists, radiologists and neurosurgeons are cooperatively working together in the 3CRMD. The 3CRMD offers a series of services for the demented, from the latent stage to the terminal-care by providing precise diagnosis with the most advanced clinical instruments, implementing “interdisciplinary and comprehensive medical care” through cooperation of health care professionals and families of patients, thereby developing medico-social network.

The 3CRMD also creates prospective and longitudinal database on demented patients, and offers information based on the clinical and translational researches in cooperation with researchers all over Japan and abroad. Here, the fully equipped and functional 3CRMD, a new model of medical center for dementia, is briefly introduced.

Takashi Sakurai, MD., PhD
Director

3CRMD’s Mission

We attend to requests and hopes of demented patients and their families so that they can lead peaceful lives at home as long as possible.

To achieve the mission, we:

1. Provide care and services required to maintain the cognitive function
2. Promote rapid improvement of behavioral and psychological symptoms of dementia (BPSPD)
3. Improve patients’ ability to perform activities of daily living
4. Prevent patients from developing geriatric syndrome including fall, aspiration, and incontinence
5. Ease the care burden on patients’ families or carers
6. Provide information on readily accessible dementia care services
7. Maintain readiness for urgent hospitalization

Clinical activities in 3CRMD

Staff: Physicians and Surgeon (19), Nurses (8), Psychologists (9), Psychiatric social worker (1) and Reception Clerk (1)

Establishing an ideal model of medical care for dementia: ① Providing medical care to more than 1,000 new patients per year, ② Treatment of BPSPD by cognitive rehabilitation, ③ Treatment of geriatric syndromes associated with dementia by board-certified geriatricians, ④ Interdisciplinary care in cooperation with patients and their families by offering classes for families (figure 1), and ⑤ Cognitive rehabilitation aiming to improve daily life function from prodromal stage (figure 2).

Accumulation of database for clinical researches and trials (Orange registry): Including comprehensive geriatric assessment, neuropsychiatric battery, frailty measurement (body composition analyzer, Hand grip meter, gait speed), advanced neuroimaging (3.0T MRI, SPECT, PET-CT (FDG, Amyloid & Tau imaging), NIRS) and Lumbar puncture.

Education for medical and care staff in Japan and Asian countries

Breakthrough in 3CRMD

Clinical and translational researches are intensively conducted for dementia prevention and care in 3CRMD, such as development of blood biomarker for early dementia detection, preventive activities for dementia, robotics to help carers, and establishment of a new socio-medical network (Orange town).

We are very looking forward to seeing you and collaborating with you in 3CRMD.
Education and Innovation Center, NCGG

Our mission is to educate professionals and common people. We have been finished to educate over 6,700 Dementia Support Doctors, and also finished to educate members of early dementia intensive support team supported by government support. We also have training course for nurses and dementia preventive exercise, cognise. Our aims are to publish new data and experiences. Please check our home pages to get new lectures and meetings. There are 30 beds dormitory for participants. Please call our staff.

Hidetoshi Endo MD, PhD
Director, Education and Innovation center,

Organization

Main Program

① Training course for Dementia support Doctor
This program started from 2005 and now over 7,500 doctors have been certificated by Dec.2017. The role of dementia support doctor is to be a leader of dementia network in local communities and provide various support for multidisciplinary team. In actual, many dementia support doctors are active in their local communities. We have plan to increase the number of dementia support doctor by 10,000 until 2020.

② Training course for member of early dementia intensive support team
Over 6,400 health care workers in municipalities attend this program in three years (fig 2) and they are active in their local communities. We have plan to continue to provide this program in 2018.

Figure 2. Member of early dementia intensive support team

③ Training course for nurses
This program has various courses focused older people and more than 300 nurses attend a year. Participants learned about geriatrics and gerontology, specially dementia nursing, home care nursing and CGA.

Figure 3. Integrated nursing training for the elderly

④ Others
The lecture of Dementia preventive exercise, Cognicise™ for common people. We provide new information and knowledge related aging and dementia via training programs. Many papers have been published in these years to delay of onset of dementia because MCI participants improved their cognition after 4 years training. That’s why many cities want to provide. Then many cities or service providers want to introduce Cognicase to old people to prevent memory loss.

Training buildings
We have 30 rooms for accommodation

Over view View of Training Meeting room Dormitory
In order to support longevity and good health for older adults, it is necessary to equip robots at the place for medical remedy, care and usual life. It means that there are demands of robots for treatment of diseases, recovery, return to life, support for daily life and care. In addition, we have to consider the life place of older adults both at nursery home and usual house.

Izumi Kondo  
Director

This center was founded in April 2015 and it had opening ceremony on 17th August 2015. Aichi service robot support center, founded by Aichi regional government was placed at next door and currently both of two centers have established close relationship each other. However, these centers are at the initial phase of essential activities, so we hope to have as many as supports not only from inside of this country but also from abroad.

Application of robots to daily life

Camera at ceiling  
Communication robots  
Sensor at handrail  
Monitoring system of driving  
Rehabilitation robots for walking  
Watching robot  
Walking support robot
Extension of the healthy life expectancy, i.e., elongation of the period when elderly people can live independently to keep mental and physical health, has become a very important social challenge against the rapid graying of the Japanese society. In the Center for Frailty and Locomotive Syndrome we have been engaging in the approach to contribute to the promotion of healthy longevity, by establishing the Integrated Healthy Aging Clinic, the world’s first novel diagnostic system that comprehensively evaluates problems among elderly patients through a multidisciplinary and multidisciplinary cooperation and assesses their physical frailty status and sarcopenia.

Yasumoto Matsui
Director
Center for Frailty and Locomotive Syndrome

The aims

- Providing medical service to improve and keep physical, life and cognitive capability
- Prevention for disability and its aggravation
- Proper diagnosis, prevention and treatment of locomotive syndrome, frailty and sarcopenia
- Development and research to clarify pathologies and useful interventions for locomotive syndrome, frailty and sarcopenia
- Development of innovative medical and life instruments to prevent these conditions through collaboration with academia and industries
- Enlightenment and permeation of these conditions

The activities

- Comprehensive clinical evaluation of locomotive syndrome, frailty and sarcopenia through multidisciplinary cooperation
- Establishment of the database for clinical research and clinical trial
- Comprehensive evaluation for these conditions and case conference by multidisciplinary specialists
- Interventions for malnutrition and physical impairment
- Activities to promote the public awareness and dissemination of these geriatric conditions
- Development of innovative medical devices for these conditions and evaluation of newly provided various equipment by industries
- Collaboration and association with internal researchers and academic societies
- Holding lectures for general public to prevent and improve these conditions

Medical practice

Staffs: M.D.s (geriatrics, orthopedics, pulmonary medicine, metabolism, rehabilitation medicine, surgery, pathology), physical therapist, dietitian, pharmacist, nurse, clinical research coordinator, research assistant, medical clerk

Clinic: Mon, Tue, Fri (AM/PM), Thu (AM) (need reservation)

Assessments or tests: Questionnaires regarding basic attributes (e.g., age, sex, educational level, family structure, recognition of need for long-term care), higher cognitive function, sociability, frailty, locomotive syndrome, number of comorbidities, number of medications, nutrition, and anthropometric measurements, spinal radiography, dual-energy x-ray absorptiometry whole-body images, thigh computed tomography scan, body composition, blood biochemical profile (including nutrition, bone metabolism, and endocrinology), and motor function (walking speed; grip strength; timed up and go; SPPB (walking, balance, chair rise, total score); one leg standing time; two locomotive syndrome tests; ankle dorsiflexion angle measurement, etc.)

Case conference: one in 2 weeks. Pathological status or problems are examined for all cases to decide intervention methods (nutritional and exercise interventions, Interventions for polypharmacy, cognitive impairment, and social issues).
We receive external information through sensory organs. Aging results in sensory impairment, reducing cognitive and vital functions, which in turn reduces the independence of the elderly. The Sensory Organ Medical Center evaluates the functions of sensory organs and identifies elements that may compromise the independence of the elderly. Clinical treatment is performed in other centers of NCGG to improve vital functions.

Activities of the center, based on regular clinical diagnosis, are composed of “Comprehensive Sensory Organ Evaluation for the Elderly” and “Advanced Medicine”.

Hidenori Arai, MD, PhD
Director
Center for Sensory Organ

Comprehensive Sensory Organ Evaluation for the Elderly

Goals
Producing programs for patients with low independence. Identifying and treating patients with deficits or diseases that affect their quality of life.

1. Sense of balance: Us ng 3T Magnetic Res. Imaging to evaluate inner-ear pathology, and assessing the status of patients with deficits or diseases.

2. Vision: Eluc dating the relations between vision and balance, and assessing the status of patients in these conditions.

3. Hearing: Early detection of age-related hearing loss or ear wax, and treating patients with deficits or diseases that affect their quality of life.

Advanced Medicine

1. Advanced Medicine in Ophthalmological Fields.
   - Innovative Regenerative Medicine, using cultured corneal endothelial cell transplant for proliferative keratopathy patients.
   - Cultured auto-oral mucosal epithelium for treatment of refractory conjunctivitis.

2. Advance Medicine for Otology.
   - Cochlear implant.
   - Pathogenesis of Meniere’s disease.
   - Introducing hearing aids to patients with hearing loss.

Clinic

Staff: Physician, Nurse, Speech-language hearing therapist, Clerk

Clinic timings: Monday through Friday (am/pm)

Tests:

Balancing tests [Body sway test, Nystagmus test (infrared Charge-coupled Device camera), Thermal Nystagmus test, Vestibular nystagmus test, Saccadic eye movement]

Visual tests [Converted visual acuity test, Intraocular pressure test, Refraction test, Corneal curvature measurement, Ophthalmometry, Dioptric prosthesis]


Tasting tests [Electrogustometry, Quantitative examination of gustatory function by Filter-paper disc method]

Smelling tests [T&T olfactometry, Intranasal olfactometry]

Center for Sensory Organ

③ Comprehensive Sensory Organ Evaluation for the Elderly

1. Sense of balance: Using 3T Magnetic Res. Imaging to evaluate inner-ear pathology, and assessing the status of patients with deficits or diseases.

2. Vision: Evaluating the relationship between vision and balance, and assessing the status of patients in these conditions.

3. Hearing: Early detection of age-related hearing loss or ear wax, and treating patients with deficits or diseases that affect their quality of life.