

# **AICHI CANCER CENTER**

## **Hospital and Research Institute**



**NAGOYA, JAPAN**  
**2016**



# M I S S I O N

**The mission of Aichi Cancer Center is to provide  
patients suffering from cancer  
with compassionate care and the best treatment based on  
evidence and leading-edge cancer research.**

# C O N T E N T S

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# Message from the President

Aichi Cancer Center was established in 1964, as the first comprehensive prefectural cancer center combining a Hospital and a Research Institute. Our Center has devoted long time to promote cancer prevention, diagnosis, treatment and research as one of the members of the leading cancer centers in Japan with the Cancer Institute and the National Cancer Center. In 2007 our Central Hospital was nominated as a prefectural strategical foothold to cooperate for cancer treatment. By the cooperation with the other 20 local foothold hospitals, any patient at any place in Aichi prefecture will be able to receive appropriate cancer diagnosis and treatment. In 2012 the Research Institute was evaluated as a highly active, outstanding and international level institute by the external review committee. In 2013 the Chemotherapy Center Building with 60 chairs and beds for outpatient chemotherapy was completed. In 2014 our Central and Aichi Hospital passed through the newest version Hospital Accreditation of Japan Council for Quality Health Care. Also we celebrated the 50th anniversary in 2014. In 2015 Aichi Hospital was nominated as a prefectural local strategical foothold.

In the Research Institute, a relatively wide range of cancer research has been conducted, and its research activity has contributed significantly to promotion of cancer research in Japan. During the past decade, translational researches to apply accomplishments in basic biological research for development of novel diagnosis, treatment and prevention of cancer have been emphasized, and new molecular diagnosis of hematologic and solid tumors has been applied for patients in this Hospital. Our Center has also provided in-depth training opportunities for new generations of physicians and surgeons specializing in clinical oncology and researchers in this field of cancer research.

Now baby-boom generation has reached to the range of cancer age, and an aging society will expand the needs for medicine, nursing and hospital beds. Under this situation, more efficient use of the limited medical resources are essential and prevention and early detection becomes more and more important since early treatment improves the chance of complete cure. Additionally, promotion of a tailor-made treatment and a home medical care is required to improve the quality of life of cancer patients. All the staff members of Aichi Cancer Center are always trying to be a best partner of the patients to fight against cancer with an ultimate goal for the eradication of cancer.



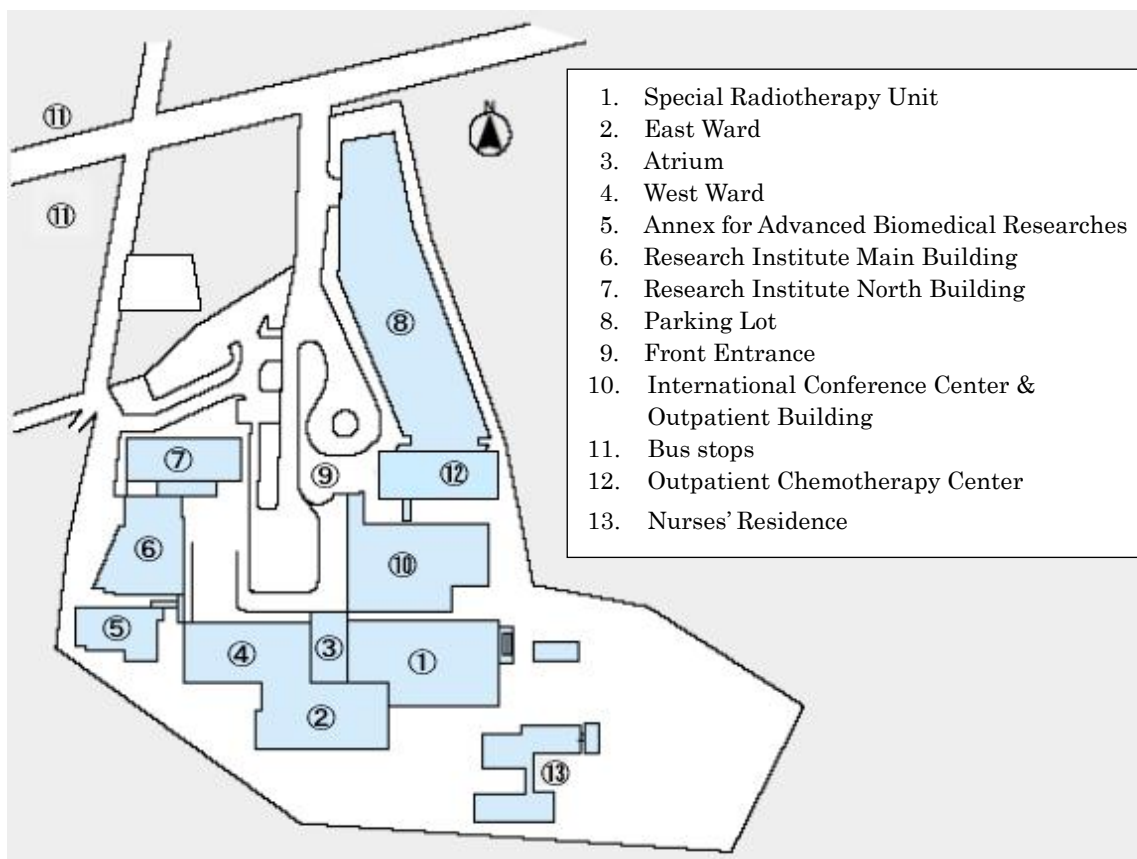
Taira Kinoshita, M.D., Ph. D.  
President, Aichi Cancer Center

## History

- .....
- January, 1961 The Governor of Aichi Prefecture approached the Aichi Cancer Control Committee as to how prevention and treatment of malignant neoplasms could best be implemented. In June, the Committee answered the Governor's inquiry by stating the necessity of establishing a Comprehensive Cancer Center.
  - December, 1964 Initiation of patient services. The Hospital had 333 beds.
  - April, 1965 Initiation of research activity at the Research Institute.
  - March, 1968 The present Emperor and Empress (Prince and Princess at the time) visited the Center.
  - February, 1992 Completion of the new Hospital building (500 beds).
  - May, 1994 Completion of the International Conference Center and the new Outpatient Building.
  - January, 2002 Completion of the new Research Institute Building.
  - April, 2005 Aichi Prefectural Hospital, Okazaki, joined as a member of this Center, and was named as Aichi Cancer Center Aichi Hospital.
  - October, 2010 Owari Clinic, Ichinomiya, joined as a member of this Center.
  - July, 2013 Completion of the Outpatient Chemotherapy Center.
  - March, 2014 Owari Clinic was closed.

# Facilities

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# Organization

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**President**     **T.Kinoshita**

## **Administration Office**

|          |                                 |          |
|----------|---------------------------------|----------|
| Director | Division of Management Strategy | M. Araki |
| T.Goto   | Division of Administration      | T.Mizuno |

## **Hospital**

|               |   |             |
|---------------|---|-------------|
| Director      | Department of Gastroenterology                        | K.Hara      |
| Y.Niwa        | Department of Endoscopy                               | M.Tajika    |
|               | Department of Thoracic Oncology                       | T.Hida      |
|               | Department of Hematology and Cell Therapy             | T.Kinoshita |
| Vice Director | Department of Clinical Oncology                       | K.Muro      |
| Y.Hasegawa    | Department of Clinical Laboratories                   | Y.Yatabe    |
|               | Department of Pathology and Molecular Diagnostics     | Y.Yatabe    |
| H.Iwata       | Department of Transfusion                             | T.Kinoshita |
|               | Department of Head and Neck Surgery                   | Y.Hasegawa  |
| T.Kinoshita   | Department of Plastic and Reconstructive Surgery      | I.Hyodo     |
|               | Department of Thoracic Surgery                        | Y.Sakao     |
| S.Kameshima   | Department of Breast Oncology                         | H.Iwata     |
|               | Department of Gastroenterological Surgery             | Y.Shimizu   |
|               | Department of Orthopedic Surgery                      | S.Tsukushi  |
|               | Department of Rehabilitation                          | M.Yoshida   |
|               | Department of Urology                                 | N.Soga      |
|               | Department of Gynecologic Oncology                    | M.Mizuno    |
|               | Department of Neurosurgery                            | K.Hattori   |
|               | Department of Anesthesiology                          | J.Nakada    |
|               | Department of Intensive Care                          | K.Hatano    |
|               | Department of Diagnostic and Interventional Radiology | Y.Inaba     |
|               | Department of Radiation Oncology                      | T.Kodaira   |
|               | Department of Outpatient Service                      | Y.Horio     |
|               | Department of Surgical Center                         | S.Ito       |
|               | Department of Cardiology                              | K.Hatano    |
|               | Department of Palliative Care                         | Y.Komori    |
|               | Department of Nursing                                 | S.Kameshima |
|               | Department of Pharmacy                                | Y.Mizuno    |
|               | Department of Nutritional Management                  | M.Tajika    |
|               | Department of Medical Safety Management               | T.Kinoshita |
|               | Department of Clinical Research                       | K.Yamamoto  |
|               | Department of Medical Record Administration           | H.Iwata     |
|               | Outpatient Treatment Center                           | K.Muro      |
|               | Regional Medical Liaison and Patient Support Center   | Y.Horio     |
|               | Palliative Care Center                                | Y.Komori    |
|               | Sarcoma Center  | S.Tsukusi   |

as of October 1, 2016

## Research Institute

|               |   |             |
|---------------|---|-------------|
| Director      | Division of Epidemiology and Prevention | H.Tanaka    |
| T.Kinoshita   | Division of Oncological Pathology       |             |
|               | Division of Molecular Oncology          | Y.Sekido    |
| Vice Director | Division of Molecular Medicine          | K.Matsuo    |
| Y.Sekido      | Division of Immunology                  | K.Kuzushima |
|               | Division of Microbiology and Oncology   | C.Oneyama   |
|               | Division of Molecular Pathology         | M.Aoki      |
|               | Division of Biochemistry                |             |
|               | Central Service Unit                    | M.Aoki      |

as of October 1, 2016



# Activities in the Hospital

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## Department of Gastroenterology

The primary concern of our department is to become a professional cancer center. We effort to early detection and precise diagnosis of gastrointestinal and pancreatobiliary malignancies. Also, we implement effective endoscopic treatment for these malignancies with prominent skill. In addition, not only clinical chemotherapeutic treatment for unresectable cancers in digestive organs, but also we are conducting clinical and molecular trial studies for gastrointestinal cancer, especially pancreatobiliary cancer. In the meanwhile, we are distributing the information about knowledge of new treatments and diagnostic techniques of gastrointestinal and pancreatobiliary cancer to our communities and we are also constantly improving the scope and quality of care offered to patients. In 2014, we performed more than 400 ERCPs including 246 endoscopic biliary stentings and more than 1000 EUS including nearly 400 EUS-FNA procedures. In addition to skillful endoscopic procedures, we also performed chemotherapy and chemoradiation therapy for 200 patients with pancreatobiliary malignancies. We thus play an important role in the process of GI tract and pancreatobiliary cancer diagnosis and treatment strategy. Currently, we have training program for Japanese physicians and international physicians in advanced endoscopy included ERCP and EUS. So, the trainees who accomplished the training program can become competent in advance endoscopic skill, and enhancing their institute's capability in EUS and ERCP field for both service and research ares. In the future, we expect to expand our capability of care the cancer patient, thus we need to continue make more efforts to improve our practice and research outcome and contribute to our society not only in Japan but also all over the world.

## Department of Endoscopy

Gastrointestinal endoscopy is an essential part of modern clinical gastroenterology, and our department plays an important role in the diagnosis and treatment of patients with diverse gastrointestinal (GI) diseases. Diagnostic endoscopy includes gastro-duodenoscopy, colonoscopy, and endoscopic ultrasonography (EUS). Therapeutic endoscopy includes, balloon dilation for the stenosis, polypectomy, endoscopic mucosal resection (EMR), and endoscopic submucosal dissection (ESD). For the precise diagnosis of tumor borders and depth of invasion of superficial GI tract malignancies, we use narrow band imaging (NBI), Blue LASER Imaging (BLI), and magnification endoscopy. In 2015, we performed an average of 5,500 EGD, 2,600 colonoscopies, 200 balloon dilations of operated esophagus, 350 polypectomies and EMR, and 200 ESD procedures per-year, for tumors in the esophagus, stomach, and colo-rectum. Recently, we start the double-balloon enteroscopy for the fine examination of small intestinal disease. Furthermore, double-balloon endoscopy is useful for ERCP in patients with Roux-en-Y anastomosis and Billroth II gastrectomy and for patients after incomplete conventional colonoscopy. We performed 4 double-balloon enteroscopy and 4 double-balloon ERCP per-year. In collaboration with department of Head and Neck Surgery, we treated 2 patients with the superficial hypo laryngeal cancer using endoscopic laryngo-pharyngeal surgery (ELPS). In addition to endoscopic procedures, we also perform chemotherapy and chemoradiation therapy for the patients with GI tract malignancies. We thus play an important role in the process of disease diagnosis and the patient's treatment strategy.

## Department of Thoracic Oncology

The particular goals of our department are to provide the highest quality of care to our patients and to advance the treatment of lung cancer, mediastinal tumor and mesothelioma through innovative clinical and laboratory research.

The most important clinically relevant advances were discovery of driver oncogenes that are constitutively activated by mutation, translocation or fusion and the discovery that oral small molecule tyrosine kinase inhibitors (TKIs) of these oncogenes produce high response rates and relatively long duration of these responses. Patients with EGFR activating mutations or ALK fusions receive a TKI due to superior progression-free survival whereas chemotherapy is superior if no mutation is present. Additional potential drivers in patients with lung cancer have been found in adenocarcinomas including mutations in KRAS, BRAF, HER2, and fusions involving the RET, ROS, and NTRK1 rearrangements. Recent studies indicated that monoclonal antibodies to antigens involved in immune checkpoints were useful for lung cancer. Antibodies to the programmed cell

death protein 1(PD-1) or programmed cell death protein ligand 1(PD-L1) called nivolumab, pembrolizumab, and atezolizumab have been shown to produce responses in lung cancer. We discuss diagnosis and treatment options for patients with thoracic malignancies at chest conferences every monday evening with thoracic surgeons, pathologists, and radiation oncologists. Clinical trials are based on work with the Japanese Clinical Oncology Group (JCOG) and the West Japan Oncology Group (WJOG), some being carried out under contract with pharmaceutical companies.

### **Department of Hematology and Cell Therapy**

New Patients (about 100 per year) with hematological malignancies (leukemia, lymphoma, myeloma) are treated with a curative intent while maintaining a good quality of life. Chemo (radio) therapy is selected where appropriate and for high risk patients high dose chemo(radio)therapy with stem cell transplantation (allogeneic stem cell transplantation from unrelated or related donors, autologous peripheral blood stem cell transplantation) are extensively applied. We focus on clinical studies for the development of more effective procedures in the field of combination chemotherapy and transplantation. Clinical trials are actively pursued for the development of new anti-cancer drugs, providing leadership in Japan in collaboration with the Aichi Cancer Center Research Institute experts in chemotherapy, immunology, virology and transplantation.

### **Department of Clinical Oncology**

The clinical subjects treated in the Department of Clinical Oncology are mainly cases of gastrointestinal cancer such as esophageal, gastric, and colorectal cancer, but we also treat patients with other carcinoma of unknown primary(CUP), germ cell tumor(GCT), head & neck cancer, breast cancer, sarcoma and so on. Although it has been thought efficacy of chemotherapy against gastrointestinal cancers is insufficient, we are trying to investigate and establish new strategies of chemotherapy or chemoradiotherapy. We treat many patients practically (70-80 patients at out-patient clinic in a day, about 50 hospitalized patients, and the average hospital stay is 11 days) and participate in various clinical studies to develop a new or standard treatment prospectively. The most appropriate treatment for all patients is determined in case conferences consisting of medical, surgical, radiation oncologists, and diagnostic radiologists.

### **Department of Clinical Laboratories**

The Department of Clinical Laboratories is committed to provide a wide range of diagnostic laboratory services for hospital inpatients and also to a large number of outpatients. The clinical laboratories are divided into several major sections: biochemistry, hematology, microbiology, molecular diagnostics and cytopathology, as well as functional tests, such as electrocardiography, diagnostic ultrasonography, and respiratory examination. The mission of our department is to provide reliable, timely, and informative services through physicians for the benefit of the patient. To achieve this mission, we also try to develop and improve laboratory technology and services through applied research.

#### **[Major equipment for testing]**

Flow cytometer:

FACScanto II, Becton Dickinson

Hematology analyzer:

Coulter LH750 series, Beckman Coulter

Automatic enzyme immunoassay system:

ARCHITECT i2000SR, Abbott laboratories,  
and LUMIPULSE F1200, Fujirebio

Automatic chemical analysis system:

LABOSPEC T008, Hitachi

DNA sequencer:

Genetic analyzer3500, Applied Biosystems

Liquid-based cytology system:

PrepsStain Slide Processor for Sure Path, Becton Dickonson

Next generation sequencer:

Ion S5 sequencing system, Thermofisher





## **Department of Pathology and Molecular Diagnostics**

The Department of Pathology and Molecular Diagnostics aims to achieve the highest standards in clinical practice and research. The department provides three major services, including pathologic, cytologic and molecular diagnosis, in a wide variety of areas, with the most modern available technologies and highly trained faculties who are recognized nationally and internationally for their expertise. The department recognizes the critical role of Pathology as a discipline that touches all of medicine and research, and our goal is to foster collaborative study to develop novel therapeutic strategies with members of Aichi Cancer Research Institute and throughout the world. Actually, a great deal of effort placed on this area enabled Aichi Cancer Center designated by Ministry of Health, Labor and Welfare as one of the nation's 14 special facilities to provide "Highly Advanced Molecular Diagnosis of Solid Cancer", since September 2000. Currently, the molecular diagnoses using advanced techniques have been approved by the National Health Insurance system, and we are providing practical information for treatment of choice, such as EGFR, KRAS and ALK mutations in lung cancer, HER2 amplification in breast and gastric cancer, KRAS mutation in pancreatic cancer, and many gene alternations of soft tissue sarcoma. We also collaboratively work with domestic clinical study groups, such as JCOG and WJOG, as well as international collaborators.



## **Department of Transfusion**

The mission of our department is control of quality and provision of education regarding transfusion of blood cell components and the testing of blood compatibility for transfusion and transplantation. Peripheral blood stem cells for allogeneic or autologous transplantation and cell therapy are extensively harvested in our laboratory using a continuous blood cell separator.

## **Department of Head and Neck Surgery**

Head and neck cancers include epithelial malignancies of the upper aerodigestive tract and glandular neoplasms of salivary and thyroid origin. Treatment of head and neck cancer involves not only issues of survival, but also concerns about preserving forms and functions such as speaking and swallowing.

To meet these diverse needs, our department cooperates with various medical professionals, including specialists in plastic surgical reconstruction, radiation oncology, medical oncology, neurosurgery, maxillofacial surgery, and swallowing and voice therapy. Our research focuses on chemosensitivity and molecular targeting, voice restoration and preservation, and sentinel node navigation surgery, all of which have significant potential to improve control of disease, while maintaining patient quality of life.

## **Department of Plastic and Reconstructive Surgery**

Plastic surgery concerns with the correction or restoration of form and function. Our department specializes in the treatment of reconstructive surgery after cancer ablation. We keep in mind to recover or maintain patient's quality of life. We think a purpose of head and neck reconstruction is optimization of function and low morbidity. In order to accomplish this, we select proper free flap and perform secure microsurgical technique. Breast reconstruction involves the use of implants or autogenous tissue. We actively perform muscle sparing transverse rectus abdominis myocutaneous flap or deep inferior epigastric perforator flap to reduce donor site morbidity.

## **Department of Thoracic Surgery**

We serve patients with thoracic malignancies including primary lung cancers, metastatic lung tumors, mediastinal tumors. About 300 patients with primary lung cancer are operated on annually. Recently, Video-Assisted Thoracoscopic Surgery (VATS) is routinely applied for early stage lung cancer as a standard radical surgery. However, patients with lung cancer sometimes recur even after complete resection. To improve treatment outcome, multi-disciplinary strategies combining surgery with chemo- and/or radiotherapy are sought in collaboration with the Departments of Thoracic Oncology, Radiation Oncology, and Pathology and Molecular Diagnostics. We are also active for clinical trials as a member of collaborative oncology groups such as JCOG (Japan Clinical Oncology

Group) and WJOG (West Japan Oncology Group). The research programs in our Department include development of individualized therapy of lung cancer through molecular analysis of the resected tumor specimens to maximize treatment effect while minimizing adverse reaction of the therapy. We have been interested in clinical application of mutational analysis of the driver oncogenes such as epidermal growth factor receptor (EGFR) gene or ALK gene to individualize treatment in order to obtain maximal benefit with minimal toxicities.

### **Department of Breast Oncology**

Our department is in charge of total breast care from diagnosis to treatment including surgery, systemic therapy, palliative care in our hospital. Many primary and metastatic breast cancer patients were treated in an outpatient office and inpatients' ward. About four hundred fifty patients were performed a primary operation last year.

We make effort to diagnose early using special technologies such as vacuum-assisted core needle biopsy (Mammotome) and MRI for breast cancer without mass. Sentinel node navigation surgery using combination methods with radioisotope and dye has been standard treatment for early breast cancer without lymph node metastasis from 15 years ago. We already experienced more than 4,000 patients treated with sentinel node biopsy (SLNB). Currently, we are challenging the re-SLNB for breast cancer patients with local recurrence at conservative breast and SLNB after neoadjuvant chemotherapy for primary breast cancer patients. Furthermore, immediate reconstruction (Expander or TRAM flap or other methods) has been one of option in standard treatment for early breast cancer with wide ductal spread. More than 40% patients who performed mastectomy chose immediate reconstruction last year. Patients can choose the surgical procedure according to cancer condition and patient's preference.

We perform systemic therapies such as neoadjuvant and adjuvant treatment for early breast cancer patients based on global guidelines and consensus of specialists obtained by multidisciplinary conference in our hospital. Current data is shown the excellent result in our hospital. Disease free survival rate is 98.6% for early breast cancer patients without lymph node metastasis (median follow up : 5.6 years)

However, unfortunately some patients were occurred distant metastases at liver, lung, bone, other organs. Aim of treatment for metastatic breast cancer is long survival with good quality of life. We make effort to choose the best selection among many drugs according to cancer condition, molecular subtype and patient's preference. For that reason, we attend many clinical trials including global registration study. We can use the new drug without approval by health assurance for some eligible patients. Finally, we make effort to improve outcome of primary and metastatic breast cancer patients by six staff, several residents and all co-medical specialists in our hospital.

### **Department of Gastroenterological Surgery**

Our department consists of four groups, and each group has experts of surgical oncology.

The Esophageal Surgery Group performs approximately 75 operations per year. For the complete cure of locally advanced esophageal cancer, we combine esophagectomy with pre-operative chemotherapy in a safe manner. The Gastric Surgery Group deals with 220 new patients every year and actively participates in national clinical studies to establish and revise standard treatments for gastric malignancies. Also we strive to offer minimally invasive surgery.

Likewise, the Colorectal Surgery Group annually operates about 250 primary cases. We perform not only laparoscopic resection for early stage, but also extend resection for advanced or locally recurrent colorectal cancer. More than 150 operations are performed by the Hepatobiliary and Pancreatic Surgery Group every year. We make every effort to improve the outcome of liver, bile duct, and pancreas cancer. Especially, the treatment results of pancreatic cancer and liver metastasis from colorectal cancer are outstanding.

### **Department of Orthopaedic Surgery**

We specialize in the diagnosis and treatment of bone and soft tissue sarcomas as well as metastatic bone tumors. Malignant bone and soft tissue tumors are aggressive tumors, and it is important to remove them widely in order to prevent further local recurrences. The recurrence rate is less than 9% in our department. 5-year overall survival rates of soft tissue sarcoma are 100% in Stage I, 100% in stage II, 73.3% in stage III, and 0% in stage IV. Those of bone sarcoma are 100% in Stage I, 88.2% in stage II, 66.7% in stage III, and 12.5% in stage IV. Moreover, we provide dose intensive treatment for patients with osteosarcomas, Ewing's sarcomas or rhabdomyosarcomas with a good survival rate.

## **Department of Rehabilitation**

The Department of Rehabilitation currently operates with three full-time physical therapists and one full-time speech-language-hearing therapist. We tailor therapy to each patient's condition and aim for recovery of ADL function and the function of postoperative patients. To this end, we proactively perform cancer rehabilitation aimed at post-discharge recuperation, as well as maintenance and improvement of patient quality of life (QOL). With respect to points of concern for patients in each clinical department, a joint rehabilitation conference is held with rehabilitation staff, ward nurses, post-discharge coordination staff, and the palliative care team, during which issues concerning each patient's rehabilitation are discussed and rehabilitation goals are unified.

## **Department of Urology**

We are specialized for diagnosis and treatment of cancers of the genitourinary and male reproductive system, encompassing the kidney, adrenal glands, bladder, prostate and testes. With the definite increase of aged population in Japan, we are especially interested in early diagnosis and QOL-oriented treatment of prostate and bladder cancers. Basic research is focused on the regulatory mechanisms of abnormal prostatic growth and molecular diagnosis of bladder cancer.

## **Department of Gynecologic Oncology**

Our Department is the most comprehensive gynecologic oncology center in the Tokai area. We perform approximately 140 major operations on new patients with gynecologic malignancies every year. We are committed to offering high standard options in technology and treatments for patients with gynecologic malignancies of the uterine cervix and endometrium, ovary and vulva. In addition to the decision to undergo surgery, patients can choose traditional or minimally invasive surgical treatments. For example, "Laparoscopic surgery" for early endometrial carcinoma, trachelercomy for early cervical cancer, and "Robotic assisted surgery" for early cervical cancer. Comprehensive surgery is followed by adjuvant therapy such as chemotherapy or radiation to improve the prognosis for patients with recurrence risk factors. For advanced cervical cancer, chemo-radiation therapy is ongoing in partnership with the Department of Radiation Oncology. In the treatment of the recurrent cancer, we perform chemotherapy, radiotherapy, or drug clinical trial for disease-control and palliation. Sometimes, we perform the total pelvic extirpation for the recurrent cancer if appropriate. To improve the treatment for gynecologic cancer, the research program in our department emphasizes three major areas: #1) molecular analysis of mechanisms of progression of CIN lesions; #2)presentation of optimal combination chemotherapy, and salvage chemotherapy for chemoresistant ovarian cancer; #3) treatment of hereditary cancer such as HBOC or lynch syndrome; women with BRCA1 and BRCA2 mutations can undergo risk reducing salpingo-oophorectomy(RRSO) as clinical trial.

## **Department of Neurosurgery**

The neurosurgical department of Aichi Cancer Center has a very short history established in 2016. Although our many patients with cancer suffered from involvement of the central nervous system such as brain metastasis, our Center has ever provided poor neurosurgical service. Now we are developing the neurosurgical apparatus, staffs and an environment in the Center to provide adequate service for those patients who have brain metastasis for their good QOL's. And furthermore, we will also treat primary brain tumors including benign ones in the near future.

## **Department of Anesthesiology**

More than 2600 operations for various kinds of malignant disease are performed annually. We are responsible for perioperative management of these patients in the OR as well as in the ICU. Another important task is to treat cancer patients with acute and chronic pain, alleviation of which is essential for maintaining quality of life.

## **Department of Intensive Care**

Department of intensive care at our center was established in April 2009.

The Unit is now a 21 bed, state-of-the-art facility in the 4th East Ward of the hospital, including 4 beds in the intensive care unit (ICU) and 17 beds in the high care unit (HCU).

Our medical system manages 24-hour acute dysfunction in patients with respiratory, circulatory, or metabolic disease. Especially, a respiratory support team (RST) composed of physician and special co-medical staff has been organized to achieve the optimal results for patients with respirator in April 2011. RST recommends to assist in making decisions regarding long-term respiratory management. Our medical staff is aiming to achieve ZERO mortality rate in the ICU and HCU.

### **Department of Diagnostic and Interventional Radiology**

Our department has major responsibilities in imaging diagnoses and image guided percutaneous treatments. Current diagnostic systems such as CT, MRI, US, mammography and unified CT/angiography (Interventional CT system) provide high diagnostic quality. Concerning image guided percutaneous treatments, we perform all kinds of interventions involving biopsy, drainage, embolization, ablation, and regional chemotherapy for better management of cancer patients. Especially, we have introduced many techniques and regimens in the treatment of hepatic cancer.

### **Department of Radiation Oncology**

We have three linear accelerators (linac), 192Iridium high dose rate remote-after-loading system (RALS), and low dose rate radiation sources (125I) for a brachytherapy treatment. Features of our Department are conformal radiotherapy as an external beam therapy, chemoradiotherapy. The conformal radiotherapy developed by expresident Dr.Takahashi was a first in the world and has been used in many cases for radical treatment. Chemoradiotherapy is being applied for most cases of locally advanced head and neck cancer, cervical cancer and esophageal cancer. Alternating chemotherapy(5FU and Nedaplatin or Cisplatin) and radiation therapy is standard therapy for locally advanced cervical cancer. Definitive radiotherapy for head and neck cancer, prostate cancer is modern type of IMRT by helical tomotherapy or volumetric modulated arc therapy (VMAT), supported with image-guided radiotherapy (IGRT).

### **Department of Outpatient Services**

Our Department is responsible for maintaining high quality and efficient outpatient services inside Aichi Cancer Center Hospital to provide comprehensive and specified medical care services, including radiation treatment, diagnostic imaging, infusion therapy, cancer specific clinics and support services. In addition, there are a number of designated services including: diabetic clinic, and genetic counseling. Sections of Ophthalmology and Dermatology have been assigned to the Department of Outpatient services.

The Section of Ophthalmology is committed to treatment of ocular, orbital and ocular adnexal malignancies, as well as providing comprehensive ophthalmic care for cancer patients in cooperation with Nagoya University Hospital and Nagoya Medical Center. The Ophthalmology clinic is open every Friday.

The Section of Dermatology provides clinical services for the diagnostic evaluation of skin cancer and interdisciplinary management of various diseases affecting skin and connective tissues. The Dermatology clinic is open every Wednesday except Monday. Patients with skin cancer are treated in close collaboration with tertiary care hospitals, such as Nagoya University Hospital.

### **Department of Surgical Center**

The mission of our department is linkage and coordination among various surgical departments. Actual operations are conducted through cooperation among the staff of the Department of Anesthesiology and of various sections of surgery, and nurses working in the operating rooms. Our department has multiple operating rooms where various endoscopic surgeries, intraoperative radiation therapy, and sentinel navigation surgeries can be performed. The number of surgeries has been increasing yearly and we perform about 3000 surgeries per year.

### **Department of Cardiology**

There are many cancer patients with heart troubles. And, many life-threatening diseases are being in heart diseases. And also, heart diseases associate with cancer are special and complicated. Therefore, in patient with cancer, medical treatment of heart disease is very important but very difficult. Our department is responsible for solution of heart problems related to cancer by superior cardio logical skills. Furthermore, we treat the various suffering with cancer by Kampo medicine

(that is oriental herbal medicine). It became clear recently, the treatment with Kampo medicine is very useful for cancer therapy.

### **Department of Palliative Care**

Our Department assists Cancer patients suffering from various types of physical and psychological pain so as to enable them to cope successfully with their illness. Though we do not have a hospice ward at Aichi Cancer Center Hospital, all the staffs are united in carrying out the hospice program led by the Palliative Care Team to support patients who do not have any chance of cure so that they may spend their remaining time in peace. A psycho-oncologist joined our department in April 2006 to provide in-depth counseling and support aimed at relieving patients' mental and spiritual anxiety. In July 2012, a palliative care doctor joined in full time to deal with the patient's Total Pain more systemically. We believe that the hopes of patients and their families take priority over all other things. We not only advise patients about options such as home care and admission to a hospice, but also offer counseling related to financial problems and interpersonal relationship issues.

### **Department of Nursing**

Our department is dedicated to providing a cancer-nursing service with the highest possible level of quality based on the mission of the Aichi Cancer Center. Through the collaboration of physicians and other medical staff, we help patients to cope with cancer and increase their quality of life. Although the duration of time of living with cancer can vary depending on the cancer type, we continue to make every effort to support patients and their families at any stage of the disease.

### **Department of Pharmacy**

Our Department is dedicated to provide high quality pharmacy services that result in optimal medication. We also provide admixture of anti-cancer drugs for patients undergoing chemotherapy. Our pharmacists provide to take medicine guidance to inpatients in wards, where we work closely with physicians and nurses to prevent, identify and resolve medication-related problems. Our Department is also responsible for providing drug information that facilitates optimal and safe drug use.

### **Department of Medical Safety Management**

The Department of Medical Safety Management is composed of three sections involved in patient safety.

- Section of Medical Safety Management  
Our mission is reducing medical errors in our hospital. All of the section members strive to attain and maintain the safe and comfortable environment of our hospital. To improve our medical care, we offer educational programs to reduce medical errors.
- Infection Control Management section  
We are working to control various infectious diseases and to maintain the quality of medical treatment. Our main objective is the prevention of nosocomial infection and the control of multidrug-resistant bacteria such as MRSA. We consistently monitor the frequency of detection of multidrug-resistant bacteria so as to take proper measures against outbreaks.
- Medical Electronics Maintenance section  
Medical electronics (ME) equipment is a part of modern medical advancement, and has applications in every area of medical specialization. The aim is to ensure the security of our ME equipment inside the hospital and to keep it in reasonable operating condition.

### **Department of Clinical Research**

The Department of Clinical Research at Aichi Cancer Center Hospital supports industry-sponsored, cooperative group, and investigator-initiated clinical trials in compliance with Good Clinical Practice (GCP) and other ethics and clinical trials guidelines in Japan to promote and facilitate the conduct of clinical research. The Department conducts operational activities including registration of application forms, management of essential documents, preparation for source data verification by monitors, preparation for audits, management of hospital charges for study participants, accounting, preparation for the Institutional Review Board (IRB), etc. Clinical Research Coordinator (CRC)



assists investigators to facilitate clinical trials and provides consultative support to study participants. In 2015, 150 industry-sponsored trials with unapproved agents and 160 cooperative group and investigator-initiated clinical trials are supported.

### Outpatient Treatment Center

The Outpatient Treatment Center is committed to provide infusional chemotherapy or oral anticancer agents against all kinds of cancers for a large number of outpatients. On July 1st 2013, we established a new "Outpatient Treatment Center" for increasing patients year by year who are undergoing chemotherapy as outpatient care with confidence in the comfortable environment utilizing the natural light and warmth of wood. Our Outpatient Treatment Center have 60 beds and reclining chairs which are largest in Japan, and also have full-time professional medical stuffs such as doctors, nurses, and pharmacists to be able to offer highly safe treatment with high quality.



### Regional Medical Liaison and Patient Support Center

The center is located on the 2nd floor of the outpatient clinic building and opens Monday - Friday 9:00 am-4:00 pm. This center provides regional medical liaison services and patient support services.

Newly diagnosed patients have lots of questions and concerns: Should I tell my family about my cancer? How do I choose treatment for my cancer? How much does treatment cost? As patient support programs, knowledgeable staffs including social workers in Patient Support Services Department provide an opportunity in a confidential setting to respond to questions, concerns and complaints from patients and families or to seek a resolution. They also provide information about resources and services including financial support programs, community support programs and hospice care, available to patients and families as well as education about patient rights and responsibilities. In addition, they collaborate with clinical staffs to provide cancer patients, caregivers and the general public with accurate, reliable information to help them make intelligent decisions about cancer care. If you have any questions, please call 052-762-6111.

Regional Medical Liaison Department provides pre- and post- hospitalization support. As a pre-hospitalization support, we provide medical referral assistance services. Weekday service hours are from 9:00 am to 7:00 pm. Since October 17 2015, we have extended this service hours from 9:00 am to 1:00 pm on Saturday. Through this medical acceptance process, referring physicians can smoothly obtain appointments for the patients. As a post-hospitalization support, we provide medical referral services as well as coordinate with the local attending doctor to arrange the return to home or to another community care setting when inpatients are discharged.

### Palliative Care Center

Our, newly opened in 2014 April, Center is located in just the center of the Out-Patient Clinic.

We assist Cancer patients suffering from total pain so as to enable them to cope successfully with their illness. Though we do not have a hospice ward at Aichi Cancer Center Hospital, all the staffs are united in carrying out the palliative care program. We not only advise patients about options such as home care and admission to a hospice, but also offer counseling related to financial problems and interpersonal relationship issues.



## Sarcoma Center

Sarcoma is one type of cancer that arises in the connective tissue of the body including bone, muscle, nerve, blood vessel, and fat. Compared to the major cancers (gastric cancer, lung cancer, colon cancer, breast cancer, liver cancer) it is a rare cancer with an extremely low incidence. Because of its rarity, experts of sarcoma are extremely few, interfering with its diagnosis at most institutions to such an extent that sarcoma has come to be referred to as 'THE FORGOTTEN CANCER'. For the optimal treatment of sarcomas a multidisciplinary approach at specialized institutions is essential, and it is considered desirable that patients be concentrated and treated at such specialized institutions. Against this background in October 2016 we established the first Sarcoma Center in the Chubu region of Japan.

At our hospital centered on the Division of Orthopedic Surgery we are engaged in the care of numerous sarcoma patients from throughout the Chubu region, and offer a team of professionals with extensive experience in sarcoma management consisting of orthopedic surgeons, medical oncologists, pathologists, radiologists and reconstructive surgeons, being one of the very few such institutions in Japan. Since sarcomas are not limited to the extremities but can also arise at any other site in the body including the head and neck region, trunk and retroperitoneum, we often hear of patients being baffled as to the hospital department they should present to, namely orthopedic surgery, dermatology, general surgery, plastic surgery, urology, gynecology and so on. As a result of this confusion, not a few patients finally end up at our hospital without a proper diagnosis having been made despite having consulted multiple medical institutions and multiple hospital departments. Our mission therefore is to make it possible for this kind of patient to be seen immediately and benefit from multidisciplinary therapy in our center without hesitation or anxiety. To this end we closely collaborate with multiple hospital departments to be able to provide the most up-to-date team medicine for all sarcoma patients wherever they may be from diagnosis to treatment. Furthermore, we participate in clinical research with other institutions specializing in sarcoma throughout Japan, and are active in the establishment of standard therapies and the devising of novel ones.

# Activities in the Research Institute

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## **Division of Epidemiology and Prevention**

Our research activities consist of the following five subjects:

- 1) Descriptive epidemiologic study on cancer incidence and mortality with special reference to improvement of Aichi Cancer Registry;
- 2) Development of hospital-based epidemiologic research program at Aichi Cancer Center (HERPACC) on risk and protective factors including gene-environment interaction for main sites of cancer;
- 3) Development of Japan Multi-Institutional Collaborative Cohort Study (J-MICC study) to investigate the causes of cancer and other lifestyle related diseases;
- 4) Establishment of intervention for personalized cancer prevention using individual risk assessment and consultation;
- 5) Utilization of Three-prefecture Cohort Study data for the international consortium and development of domestic cancer prevention program in Japan.

## **Division of Molecular Oncology**

Our goal is to determine the genetic lesions giving rise to human solid cancers and use this information for prevention, diagnosis, and treatment of these diseases. Currently, we are focusing on lung cancer, and malignant mesothelioma. These studies also provide an opportunity to dissect biochemical and pathological pathways of malignant phenotypes including dysregulated cell growth, differentiation, invasion, and metastasis. Human cancers arise because of genetic mutations in oncogenes and tumor suppressor genes, and so we are studying candidate genes, conducting systematic molecular analyses of biochemical pathways, and pursuing global approaches such as next-generation sequencing technologies. Epigenetic changes with DNA methylation and histone modification also identify this as an important mechanism of inactivation of tumor suppressor genes. Understanding the functions of the genes mutated and the signaling pathways disrupted will provide a foundation for a translational research approach to human malignancies from bench to bedside.

## **Division of Molecular Medicine**

Research in this laboratory is focused on elucidating genetic and molecular bases of human cancer in conjunction with environmental exposures, with a view to applying the obtained knowledge to clinical oncology and prevention. Currently we are working on two aspects, 1) molecular epidemiology of cancer and its application in clinical oncology and prevention, and 2) molecular biology on hematological malignancies, with physicians/researchers within and outside Aichi Cancer Center. Specifically, the first aspect is challenged by (1) elucidating new gene-environment interactions between genetic background and environmental factors, (2) development of risk prediction models integrating genetic and environment factors, and (3) development of application of developed models in pre- and post-clinical setting. The latter aspect is challenged by elucidation of biological and clinical significance of genetic alteration including chromosomal translocation and genomic amplification/loss in hematological malignancies.

## **Division of Immunology**

We have been pursuing identification of target proteins and epitopes recognized by cytotoxic T lymphocytes (CTL) specific to tumor-associated, minor histocompatibility or viral antigens. Recent activities also include elucidation of the intracellular processing pathway to yield such CTL epitopes. In addition, we have started studies on genetic susceptibility and drug sensitivity of breast cancer applying animal models and human cohorts. Our goal is to establish robust and safe immuno-therapy to treat cancer patients applying scientific achievements. To this end, we have started a preclinical study of T cell receptor gene transfer to patients' peripheral T lymphocytes. Animal models of immuno-therapy for lung cancer are also designed and conducted.

## Division of Microbiology and Oncology

Normal cellular homeostasis requires the coordinated regulation of signaling molecules in space, time and quantity. Accumulations of genetic and epigenetic alterations or oncogenic viral infections disrupt the stringent regulation of signaling networks and lead to cellular transformation and tumor progression. Our studies involve dissecting genes, proteins, and signaling mechanisms directly responsible for oncogenic phenotypes and identifying novel therapeutic targets. Currently, our research interest was concentrated on the following issues: 1) Spatial regulation of Src via lipid rafts controls cancer progression. 2) MicroRNA-mediated gene expression controls Src-related oncogenic signaling. 3) Molecular mechanisms of exosome regulation by Src-mediated cancer progression.

## Division of Molecular Pathology

The incidence of colorectal cancer is increasing steadily in Japan and the disease is predicted to become the most common cancer as of 2020. Accumulating evidence suggests that in addition to genetic and epigenetic changes in the genome of cancer cells, interactions with non-cancer stromal cells play essential roles in support of colorectal cancer progression. Our research has been primarily aimed at identifying novel molecular targets for prevention and/or therapy of colorectal cancer through detailed analyses of intestinal tumor progression in genetically engineered mouse models, followed by evaluation of the findings using clinical samples. We are currently focusing on the following subjects: (1) Clarifying the roles of tumor microenvironment in cancer formation and progression; (2) Elucidating the molecular mechanisms of metastasis; and (3) Unraveling the pathophysiology of cancer cachexia.

## Division of Biochemistry

Cells need to respond to environmental signals to proliferate in a coordinated fashion during development and differentiation. Mutations in genes functioning in cell cycle control and maintenance of tissue architecture lead to uncontrolled proliferation, genetic instability, and invasion (metastasis) by cancer cells. However, the precise mechanisms remain largely unknown.

Our research aim is to elucidate how the cell cycle (including cell cycle checkpoints) and tissue architecture (including the intracellular cytoskeletal network) are controlled. Our attention is focused on 3 specific areas: (1) Identification and functional analysis of protein kinases involved in cell cycle checkpoints; (2) Roles of centrosomes and primary cilia in cell cycle control; (3) Biological links between aneuploidy and tumorigenesis, senescence, or aging.

## Central Service Unit

The Division of Central Laboratory and Radiation Biology, which fulfills many functions as the Central Service Unit, has responsibilities for the maintenance and operation of various instruments for molecular and biochemical research. We also manage radio isotope (RI) related matters, such as dose management of RI users and periodic examination of RI contamination in radiation controlled area. In addition to such background support for all of the investigations carried out in this institute, we perform the following research projects, that is, analysis of mitochondrial polymorphisms in human cancers.



# Aichi Cancer Center International Symposia

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When the Aichi Cancer Center celebrated its 30th Anniversary in 1994, the first international Symposium was held inviting several distinguished guest speakers from abroad as well as from Japan. Since then, Symposia have been held on a regular basis. The topics so far have been as follows;

1. "From Prevention to Treatment", December 1994.
2. "Role of DNA Transactions in Carcinogenesis", December 1995.
3. "Recent Advances in Hepatobiliary-Pancreatic Cancer", December 1996.
4. "The Cutting Edge of Lung Cancer Research", January 1998.
5. "Role of Carbohydrate-mediated Cell Recognition and Adhesion in the Progression and Metastasis of Malignant Cells", November 1998.
6. "Recent Advances in the Surgical Treatment for Colorectal Cancer", December 1999.
7. "Cancer Diagnostics with the Power of Molecular Knowledge", January 2001.
8. "Prospects for Conquering Stomach Cancer in the 21st century", February 2002.
9. "Molecular Pathology and Immunotherapy of Hematological Malignancies: New Perspectives ", February 2003.
10. "Diagnostic & therapeutic advances in radiology", February 2004.
11. "Forefront of Cancer Prevention Strategy in Asia", February 2005.
12. "Perspective of Oncological Strategy for Gastrointestinal Cancer", January 2007.
13. "Perspective of Prevention and Tailored Diagnosis / Treatment for Breast Cancer", February 2008.
14. "Pancreatobiliary Cancer Update-Prevention, Diagnosis and Treatment", January 2009.
15. "New Molecular Target Therapy and Signal Transduction", March 2010.
16. "Cancer Drug Resistance : Mechanisms and Strategies for Its Circumvention" as an Aichi cancer Center 50th Anniversary International Symposium, Marc 2015.





# Statistics

## Organization

### Number of staff

| Type of profession \ Organization  | Total | Administration Office | Hospital | Research Institute |
|------------------------------------|-------|-----------------------|----------|--------------------|
| Total staff                        | 715   | 28                    | 634      | 53                 |
| Administrative staff               | 30    | 27                    | 3        |                    |
| Medical social workers             | 1     |                       | 1        |                    |
| Physicians                         | 129   | 1                     | 99       | 29                 |
| Dentists                           | 2     |                       | 1        | 1                  |
| Senior researchers                 | 12    |                       |          | 12                 |
| Radiological technicians           | 26    |                       | 26       |                    |
| Physical therapists                | 4     |                       | 4        |                    |
| Speech-language-hearing therapists | 1     |                       | 1        |                    |
| Pharmacists                        | 26    |                       | 26       |                    |
| Clinical laboratory technicians    | 30    |                       | 29       | 1                  |
| Clinical engineers                 | 3     |                       | 3        |                    |
| Nurses                             | 406   |                       | 406      |                    |
| Assistant nurses                   | 3     |                       | 3        |                    |
| Dieticians                         | 3     |                       | 3        |                    |
| Dental hygienists                  | 1     |                       | 1        |                    |
| Other meal service workers         | 15    |                       | 15       |                    |
| Clinical trial coordinators        | 13    |                       | 13       |                    |
| Research assistants                | 10    |                       |          | 10                 |

as of April 1, 2016

## Hospital

### Patients

| Item                                     | 2013<br>fiscal year | 2014<br>fiscal year | 2015<br>fiscal year |
|--|---------------------|---------------------|---------------------|
| 1) Outpatients                           |                     |                     |                     |
| Number of new patients                   | 5,468               | 5,279               | 5,240               |
| Number of total patient visits           | 154,951             | 141,149             | 138,798             |
| Average number of patient visits per day | 635.0               | 578.5               | 571.2               |
| Average visiting frequency of patient    | 28.3                | 26.7                | 26.5                |
| 2) Inpatients                            |                     |                     |                     |
| Number of new inpatients                 | 9,283               | 9,181               | 9,775               |
| Number of total discharged patients      | 9,300               | 9,140               | 9,789               |
| Number of deceased patients              | 434                 | 372                 | 370                 |
| Average number of inpatients per day     | 395.0               | 372.6               | 386.8               |
| Average patient stay in hospital         | 14.5                | 13.9                | 13.5                |

### Resident training

The resident system was started in April 1986 to train physicians in the diagnosis and treatment of cancer patients

|                     | 2013 fiscal year | 2014 fiscal year | 2015 fiscal year |
|---------------------|------------------|------------------|------------------|
| Number of residents | 50               | 53               | 48               |

### Research resident training

The research residency system was started in April, 2001 to train young researchers in the field of basic and a applied cancer researches at our research institute.

|                              | 2013 fiscal year | 2014 fiscal year | 2015 fiscal year |
|------------------------------|------------------|------------------|------------------|
| Number of research residents | 16               | 16               | 12               |

### Training of technical personnel for medical treatments

The shortage of specialized technical personnel for the treatment of cancer is an obstacle in the promotion of cancer control programs. To solve this problem, since 1966,full scale training has been provided.

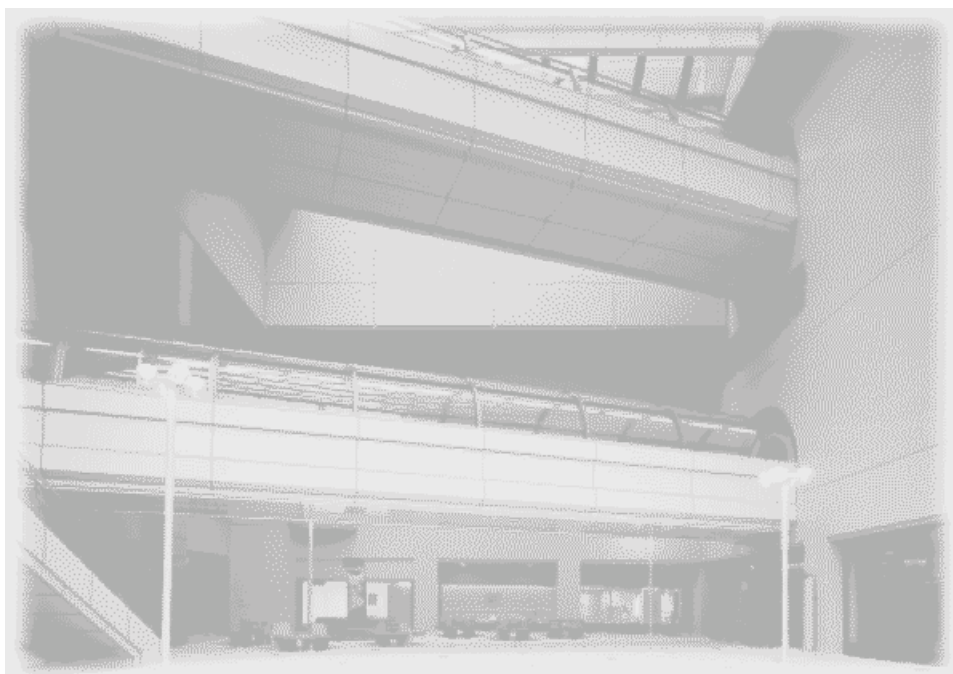
The accomplishment of this Center in this area has gained an international reputation and applicants for this training course now come from various countries as well as from all over Japan.

|                                 | 1966~2015<br>fiscal years | 2013<br>fiscal year | 2014<br>fiscal year | 2015<br>fiscal year |
|---------------------------------|---------------------------|---------------------|---------------------|---------------------|
| Total                           | 5,515                     | 77                  | 74                  | 72                  |
| Physicians                      | 3,476                     | 53                  | 51                  | 26                  |
| Radiology technicians           | 226                       | 1                   | 1                   | 0                   |
| Clinical laboratory technicians | 589                       | 4                   | 3                   | 7                   |
| Nurses                          | 317                       | 2                   | 2                   | 15                  |
| Others                          | 907                       | 17                  | 17                  | 24                  |

### Budget for the Cancer Center

| R e v e n u e                     |                     |                     |                     |
|-----------------------------------|---------------------|---------------------|---------------------|
| Item                              | 2014<br>fiscal year | 2015<br>fiscal year | 2016<br>fiscal year |
| Total                             | 19,343,047          | 19,272,025          | 23,574,351          |
| Revenues from medical practices   | 16,854,776          | 16,727,001          | 20,769,240          |
| Revenues from non-medical sources | 2,488,271           | 2,545,024           | 2,805,111           |

| E x p e n d i t u r e               |                     |                     |                     |
|-------------------------------------|---------------------|---------------------|---------------------|
| Item                                | 2014<br>fiscal year | 2015<br>fiscal year | 2016<br>fiscal year |
| Total                               | 21,341,072          | 18,770,901          | 22,391,814          |
| Expenditure for medical practice    | 17,433,703          | 18,622,752          | 22,211,626          |
| Expenditure for non-medical sources | 198,393             | 143,149             | 175,188             |
| Special losses                      | 3,703,976           | 0                   | 0                   |
| Reserve fund                        | 5,000               | 5,000               | 5,000               |



## **AICHI CANCER CENTER**

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