

SPECIAL ARTICLES

Graduate Programs in Advanced Pharmacy Practice in Oncology in Japan

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Cancer has been the leading cause of death in Japan since 1981. The Japanese government implemented the Comprehensive 10-year Strategy for Cancer Control (1984-1993) and the New 10-year Strategy to Overcome Cancer (1994-2003) to tackle the problem.^{1,2} The Ministry of Health, Labour, and Welfare (MHLW) has focused on hospitals to control health care costs, and developed and implemented a prospective payment system similar in concept to the diagnosis-related group (DRG) system in the US Medicare system in 2003.³ Since 2004, the third-term Comprehensive 10-year Strategy for Cancer Control has been implemented in order to promote cancer research and disseminate high-quality cancer medical services, with the slogan “Drastic reduction in cancer morbidity and mortality.”

In May 2005, the MHLW founded the Headquarters of Cancer Control in order to promote multidisciplinary activity for comprehensive cancer control, and launched Action Plan 2005 for the Promotion of Cancer Control. In 2006, the ministry created a new section called the Office for Cancer Control in the Health Service Bureau, MHLW. In June 2006, the Cancer Control Act was approved, and the law has been implemented since April 2007. Based on this law, the Basic Plan to Promote Cancer Control programs was discussed by the Cancer Control Promotion Council and approved by the Japanese Cabinet in June 2007. Its basic concepts are: (1) promotion of cancer research (utilize research outcomes, promote clinical trials, and improve the clinical research environment), (2) standardization of cancer medical services (nurture specialized medical staff, develop medical facilities, improve the quality of life of cancer patients, and build databases on cancer medical services), and (3) development of cancer medical services to satisfy patients (promote cancer prevention and improve cancer screening quality).² The ultimate goal of the programs is to realize a society where

the general public can understand, face, and overcome cancer.

FOSTERING CANCER CARE PROFESSIONALS

It is essential to foster specialists in radiation therapy, chemotherapy, and palliative management, as well as oncology specialist nurses and pharmacists, for those fields in which human resources are extremely limited. The Ministry of Education, Culture, Sports, Science and Technology (MEXT) focused on basic concept 2 of the Cancer Control Act and provided support for selected programs with specific features at graduate schools to reform university-based education. The Plan for Fostering Cancer Care Professionals (PFCCP), established in 2007 by MEXT, aims at reinvigorating university education and the training of cancer treatment professionals by providing financial assistance to superior programs at national, public, and private universities nurturing high-quality cancer professionals.⁴ The plan, which medical schools play a key role in, receives the cooperation of other universities and colleges. Eighteen programs throughout the country have been selected by MEXT. These programs’ plans call for specialists in the treatment of cancer to be educated mainly at the graduate school level, with extensive cooperation among the universities that have signed up for the systematic fostering, as well as hospitals that are designated as partner facilities in the region where the universities are located. This wide-ranging, professional development system is beyond the framework of conventional graduate school education. It requires a system for university credit transfer, hospital-university collaboration, an e-learning system, and the enrollment of graduate students.

TOKAI GANN PROFESSIONAL PLAN

Nagoya University group’s plan, the Tokai Gann Professional Plan (TGP),⁵ is 1 of 18 PFCCPs and was jointly proposed by 8 universities (Nagoya University, Hamamatsu University School of Medicine, Meijo University, Gifu University, Gifu Pharmaceutical University, Fujita

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Health University, Nagoya City University, and Aichi Medical University) to establish a program for the education and training of medical oncology teams to achieve global standards.⁵ It is a *united* graduate school, using the combined cancer research from the participating universities as a foundation to improve cancer-related medical training and nurture advanced cancer specialists.

TGP offers several programs consisting of master's (2 years) and doctoral (3 or 4 years) courses coupled with oncology programs in medicine, radiation, nursing, and pharmacy. Nagoya University takes charge of the fostering of medical and radiation oncologists, oncology nurses, and oncology pharmacists. Hamamatsu University School of Medicine takes charge of the fostering of medical and radiation oncologists, and oncology pharmacists. Gifu University, Fujita Health University, Nagoya City University, and Aichi Medical University take charge of the fostering of medical oncologists. Meijo University and Gifu Pharmaceutical University take charge of the fostering of oncology pharmacists. This system meets the needs of the 8 universities. As Meijo University has a School of Pharmaceutical Sciences but not a hospital, this system is useful for us to promote and enhance oncology pharmacy practice.

BOARD-CERTIFICATION OF ONCOLOGY PHARMACISTS IN JAPAN

To provide effective and safe cancer treatment, medical staff members must form a team with patients and their family members. Clinical pharmacists have to be responsible for verifying chemotherapy prescription orders, mixing anticancer drugs, management of adverse drug reactions, and patient education, while providing drug information and palliative care. It is necessary to promote specialized training, knowledge, and skills in pharmacy to improve cancer patient care. The education system and post-licensure specialty certification for pharmacist started in 2006.⁶ The system to designate a board-certified oncology pharmacist established by the Japanese Society of Hospital Pharmacists (JSHP) involves 2 steps.⁷ First, board-certified hospital pharmacists receive a designation of Board-Certified Pharmacist in Oncology Pharmacy (BCPOP) and becomes a candidate to become a Board-Certified Oncology Pharmacy Specialist (BCOPS); thus, BCOPS certification can be easily attempted. The oncology specialty can be advanced 2 steps according to this system. Eligibility criteria for BCPOP and BCOPS are shown in Table 1. It is a certification only used in Japan and is equivalent to the Board-Certified Oncology Pharmacist (BCOP) in the United States.⁸ The BCPOP/BCOPS and BCOP systems are similar; however, there are 9 major differences (Table 1)⁹:

- (1) The BCPOP/BCOPS consists of 2 steps, while the BCOP is attained in 1 step.

Table 1. Eligibility Criteria for Board-Certified Pharmacist in Oncology Pharmacy and Board-Certified Oncology Pharmacy Specialist

Board Certified Pharmacist in Oncology Pharmacy
1. Current, active license to practice pharmacy
2. Completion of 5 years of practice with substantial time spent in oncology pharmacy
3. Board-Certified Hospital Pharmacist
4. Specialized residency program (3 months) in selected clinical cancer centers
5. Attending lecture meetings for cancer (total: 10 hours)
6. Achieving passing scores in examinations
7. Presentation of 50 cancer cases for cancer management
Board-Certified Oncology Pharmacy Specialist
1. BCPOP
2. 3 conference presentations and 2 manuscripts for publication in journals related to cancer
3. Achieving passing scores in examinations

Abbreviations: BCPOP = Board-Certified Pharmacist in Oncology Pharmacy; BCOPS = Board-Certified Oncology Pharmacy Specialist

- (2) The BCOP requires graduation from a pharmacy program accredited by the Accreditation Council for Pharmacy Education (ACPE) or a program outside the United States that qualifies the individual to practice in the jurisdiction, but not BCPOP/BCOPS.
- (3) The BCPOP/BCOPS requires completion of 5 years of practice experience with substantial time spent in oncology pharmacy (Table 1). The BCOP requires completion of 4 years of practice experience with at least 50% spent in oncology pharmacy activities or completion of a second post-graduate year (PGY2) residency in oncology pharmacy plus 1 additional year of practice with at least 50% of the time spent in oncology pharmacy activities.

The BCPOP/BCOPS requires them below (4)-(8), but not BCOP.

- (4) The BCPOP/BCOPS requires board-certification as a hospital pharmacist.
- (5) The BCPOP/BCOPS requires 3 months of training in a qualified hospital. However, the pharmacists who are on the staff of the hospital are exempt from the training.
- (6) The BCPOP/BCOPS requires completion of 10 or more oncology training sessions.
- (7) The BCPOP/BCOPS requires completing 50 cases in oncology settings.
- (8) The BCPOP/BCOPS requires completing at least 3 presentations in a conference and publication of at least 2 peer-reviewed articles. All BCPOP and BCOPS must re-certify every 5

years. The BCPOP requires 50 training sessions in 5 years including at least 12 sessions in oncology hosted by JSHP; completing 50 cases in an oncology setting; completing at least 1 presentation in a conference; and publication of at least 1 peer-reviewed article. The BCOPS also requires 50 training sessions in 5 years including at least 12 in oncology hosted by JSHP, completing at least 2 presentations at a conference, and publication of at least 1 peer-reviewed article. On the other hand, all BCOP must re-certify every 7 years. Recertification for BCOP requires assessment of a practitioner's knowledge and skills through 1 of 2 methods: achieving a passing score on the 100-item, multiple-choice objective recertification examination, based on the content outline of the certification examination, or earning 100 hours of continuing education credit provided by a professional development program approved by Board of Pharmaceutical Specialties (BPS).

The above difference between the 2 countries' board certification programs may be based on the different status of oncology pharmacy in Japan, where the pharmacy technician works as a pharmacy staff member under the direct supervision of a licensed pharmacist and performs many pharmacy-related functions.

The BPS in the United States is equivalent to board-certified hospital pharmacists in Japan.¹⁰ The numbers of pharmacists with BCPOP and BCOPS certification were 424 and 164, respectively, in 2008.⁷ The number is too small to meet the increasing demand for advanced cancer chemotherapy. The career structure for pharmacists in hospitals had focused on management progression; however, this has changed with the emergence of more senior clinical positions as clinical pharmacists develop expertise in areas such as oncology and infectious diseases.

MEIJO UNIVERSITY ONCOLOGY SPECIALTY PROGRAMS

New oncology-focused Meijo University Oncology Specialty Programs (MUOSP) offer 2 master's and doctoral courses coupled with a board-certified oncology pharmacist program for cancer research and specialist training in the hospital in addition to a clinical program developed in 2003 to train master's students.¹¹ As a merit of this clinical program, students can get a master's degree, a doctor of pharmaceutical sciences degree, and designation as a board-certified oncology pharmacist (BCPOP and BCOPS) through the united graduate school established jointly by 8 universities (Tokai Gann Professional Plan [TGP]). Both programs are designed to pro-

vide advanced education in oncology pharmacy practice and focus on training individuals to fulfill advanced practice in hospitals, as well as train individuals to provide and promote excellence in patient-focused care based on the philosophy of pharmaceutical care. However, Tohoku University group's plan jointly proposed by 3 universities (1 of 18 PFCCPs) is similar to our group's graduate courses coupled with oncology programs. However, the oncology program in pharmacy only offers master's level courses.¹² We first developed teaching based on practice and experience following initiation of the collaboration with universities in the TGP. University pharmacy staff members, hospital pharmacists, nurses, and the hospital director (a physician) discussed the goal of the program, activities for students in each experience, supervision by hospital pharmacists, and the collaboration of nurses and physicians on each rotation. In order to achieve all of the goals, the students have to assist pharmacists and other health care providers to dispense medicines and counsel patients with cancer. Students are required to discuss patient cases with practitioners to show they can apply their ideas and knowledge to improve patients' quality of life. Faculty members and hospital pharmacists supervise students together in each rotation setting. The advanced practice experience will give students the opportunity to practice the skills learned during didactic work or observed during introductory pharmacy practice experiences. Student pharmacists will have the opportunity to make a difference in the health outcomes of their patients on a consistent basis. We expect that our program will reduce students' workload, give them a greater expert knowledge, help them gain more skills and develop positive attitudes to the profession, and nurture them to become leaders in cancer therapy promotion through active-learning activities.

MASTER'S PROGRAM AT MUOSP

The 2-year master's degree program at MUOSP is designed to prepare graduate students to become board-certified oncology pharmacists. The practice experience is aimed at developing students' experience in pharmaceutical care and encouraging them to provide health promotion information to patients in all clinical settings. In the first year, the basic objectives for the oncology pharmacy curriculum are as follows:

- (1) Develop expert knowledge in a specific area of clinical pharmacy through special lectures in Meijo University (MU) and e-learning (16 weeks).
- (2) Participate in clinical pharmacy practice based on clinical rotation (20 weeks): Students will be making daily rounds in their area of practice. Times for daily rounds may vary by service. Most

students will be meeting with their preceptors daily to review discussion topics and/or patients.

- (3) Participate in basic oncology pharmacy practice based on oncology clinical rotation (12 weeks). Students will contribute to an interdisciplinary health-care team offering patient-specific therapeutic interventions to treat, cure, rehabilitate and alleviate medical conditions and diseases unique to cancer patients.
- (4) Give a case report and presentation.
- (5) Participate in journal club and presentation seminars.

E-learning contents are prepared by specialist physicians in the Tokai Gann Professional Plan (TGP) and provided on-demand through Internet access. In basic oncology pharmacy practice, the students participate in a specialized residency program (3 months) in selected clinical cancer centers to obtain the first-step designation with the candidates (Table 1). Through this early program, they will learn that oncology pharmacy specialists are highly skilled clinicians with experience and training and it will nurture a real motivation in them to become specialists. The second-year curriculum is as follows: (1) specialized practice in oncology pharmacy (24 weeks), and (2) research in oncology pharmacy (24 or 48 weeks).

After students are awarded a master's degree, they must accumulate at least 5 years of oncology pharmacy practice experience to obtain the designations. Curriculums 2 and 3 in the first year, and curriculum 1 in the second year are performed in different feature-based hospitals in TGP. Curriculum 2 in the first year is not limited to TGP's hospital.

This curriculum nurtures areas of expertise that must be mastered to earn BCPOP, BCOPS, and BCOP credentials, as described below^{7,8}

- (1) Optimize drug therapy for patients with cancer through the design, recommendation, implementation, monitoring, and modification of individualized pharmacotherapeutic plans in collaboration with the healthcare team.
- (2) Contribute to the care of patients with cancer through research, the application of research results, and education.
- (3) Ensure the safe, effective, and appropriate use of medications in patients with cancer through the implementation of guidelines and the development and modification of pharmacy policies and systems.
- (4) Raise awareness among the public and healthcare providers regarding cancer-related issues (risk factors, prevention, screening, and treatment).

At present, 8 students are enrolled in this graduate course (4 students in the first year and 4 in the second).

We will compare those who completed this program with others on various aspects of oncology pharmacy at least until they obtain designation. As soon as the first students graduate from the program, we will compare their mastery of various aspects of oncology pharmacy and time required to attain certification with that of graduates from other programs.

MUOSP: DOCTORAL PROGRAM

The doctoral program at MUOSP is designed to prepare graduate students who must work and obtain at least 3 years of oncology pharmacy practice experience as hospital pharmacists to obtain both their degree and designation. They must keep up practice experience with substantial time spent in oncology pharmacy to get BCPOP/BCOPS. It will develop continuing professional programs to ensure the current pharmacy workforce is "fit for the purpose," and find and train the next generation of academic pharmacists. The specialized oncology pharmacy program is as follows:

- (1) Specialized practice in oncology pharmacy based on oncology clinical rotation including the 4 areas of expertise described above.
- (2) Research in oncology pharmacy.
- (3) E-learning.

The students must include completely 3 conference presentations and 2 manuscripts for publication in journals related to cancer at least through joint degree and certificate programs. Faculty members and hospital pharmacists supervise them to increase their ability to promote cancer therapy through the advanced oncology pharmacy service-learning programs, and they achieve the goals of the program through receiving generous assistance. They will also try to implement curriculums 1 and 2 in their or other hospitals in the united graduate school (TGP). We plan to compare graduates of this program to others from various aspects of oncology pharmacy for several years at least.

Five components were used to evaluate students' performance on the rotations of 2 programs.¹³

- (1) The daily log that each student maintained.
- (2) A rotation evaluation form, which covered 3 dimensions of the students' personality, knowledge to approach and provide care to patients, and an overview of the student's performance. The faculty members, pharmacists, physicians, and/or nurses who worked with the student while on the rotations evaluated the students' performance and sent their feedback to the faculty coordinator.
- (3) A patient's evaluation case report, which was sent to faculty members every 2-3 weeks to evaluate.
- (4) A case presentation evaluation form that assessed the students' ability to prove a care

plan, search for data, make a presentation, and show comprehension was constructed by the faculty member.

- (5) A bedside evaluation form, which was rated on a scale of fair, good, and best, and covered students' performance in the patient care wards and their general knowledge.

CONCLUSION

PFCCP, including TGP, is expected to develop into a regional framework that will be extended to include all universities and university hospitals as professional training organizations, and promote the vitalization of university education and nurturing of high-quality medical professionals to meet the demands of society. It is also a lot of flexibility to students to select universities or university hospitals for cancer training programs which get a master's degree, a doctor's degree or BCPOP/BCOPS, and the unique program will motivate students. We hope that these programs will provide significant opportunities for students to develop the necessary skills for specialized practice in oncology pharmacy, and enable them to contribute to the improvement of people's health through the professional knowledge and skills in cancer management they acquire.

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