2025　HICARE/IAEA Internship Report

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1. Overview

Duration：01 April 2025 – 30 June 2025
Dispatch source：Hiroshima International Council for Health Care of the Radiation-exposed (HICARE)
Dispatch destination：International Atomic Energy Agency (IAEA)
Assigned Department：Department of Nuclear and Applications
Division of Human Health, Director's office
Purpose of internship：To foster personnel who understand the significance and necessity of medical care for radiation-exposed individuals from a global perspective and who can inherit Hiroshima's expertise and achievements in this field.

With the recommendation and support of HICARE, I did a three-month internship at the IAEA headquarters in Vienna, Austria, utilizing the period of my research clerkship as a fourth-year medical student at Hiroshima University.

I was born and raised in Hiroshima, where I learned about the negative aspects of nuclear power through peace education. On the other hand, as a high school student, I had the opportunity to visit HIPRAC (Hiroshima High-precision Radiotherapy Cancer Center), where I was deeply impressed by the precision and usefulness of radiotherapy. This experience taught me that nuclear technology also has positive applications, such as in cancer treatment. Since then, I have been interested in radiotherapy, caring for atomic bomb survivors, and responses to radiological disasters. These interests led me to apply for this internship, hoping to learn more through work related to these fields at the IAEA.

During the internship, I engaged in various assignments and had numerous opportunities to interact with people from around the world, which greatly broadened my perspectives. The following sections detail my activities.

2. Activities during the internship

1) Literature Review: The dose-response relationship of palliative radiotherapy for bleeding from advanced gastric cancer

Through this internship, I tackled on the Literature review of palliative radiotherapy for bleeding from advanced gastric cancer. Bleeding from inoperative

gastric cancer is supposed to affect the prognosis and quality of life of patients and radiotherapy is one of the treatments often applied to relieve the symptom. However, the optimal dose and numbers of fractions are not clear yet. So, I worked on the literature review to discuss the effectiveness of palliative radiotherapy for bleeding from advanced gastric cancer and the factors which will affect the results with the support of Ms. May Abdel Wahab (Directors of Division of Human Health), Mr. Yuji Murakami (Professor of Department of Radiation Oncology, Hiroshima University Hospital), Mr. Nobuki Imano(Associate Professor of Department of Radiation Oncology, Hiroshima University Hospital). As this was my first experience conducting a literature review, I undertook the task with guidance from my supervisors, beginning with how to search academic papers using PubMed. It took me a lot of time to extract the papers and read them thoroughly, but that work gave me opportunities to deepen my understanding of the structure of papers and the contents.

Whenever I attempted to consider matters from a new perspective, I often encountered flaws in my reasoning, which made me feel that I was not producing effective analyses. However, I got advice from supervisors regularly and they answered my question kindly, so I could keep analyzing the problems and trying to discuss them deeply.

After coming back to Japan, I prepared for the presentation at Hiroshima University. I continue this study to aim to write the paper.

I am grateful for the opportunity to conduct research in such a wonderful environment where I received continuous guidance and support. Even the periods of trial and error became an invaluable part of my learning experience.

2) Task about the project of STS (Science, Technology and Society)

Under the supervision of Mr. Uwe Scholz, I worked on the STS (Science, Technology and Society) project.

[1] Preparation for Technical Meeting which will be held at QST hospital

I revised the timetable for the Technical Meeting which will be held at the QST hospital in August. At the two-day meeting, lectures about the various contents such as the response to the radiological disasters. I worked on this project continuously from April to June. By repeatedly revising the timetable, I had the opportunity to

observe how the details and schedule of the meeting were progressively finalized, which I found engaging. It was very impressive for me that Mr. Uwe was trying hard to make the meeting better by changing the contents and order of the session which doing the online meeting with people in Japan who also worked for the meeting repeatedly.

[2] Help modifying the book which will be published

I had the opportunity to assist with the proofreading of a handbook scheduled for publication.

(i) Confirming and organizing of the permission of cited tables and charts

I checked whether the permission of the tables and charts which will be included in the handbook were appropriately taken by checking the previous communication between the IAEA staff and the author of the tables and charts. After that, I summarized it into Excel and extracted the tables and charts which hadn't got permission yet and required further attention to use. About the tables and charts which already had permission, I restored the communication about the permission and organized the data in the IAEA file. Plus, I attached the link to the file to make it easier to grasp permission. I had to confirm not only the source of the table and charts but also the source of the data included in them, which took me a lot of time. However, through the procedure, I learned that publishing books needs this meticulous process, which was very interesting. Some of the permission was got by the student from Hiroshima University, who was dispatched by HICARE and came to the IAEA two years ago. I was so happy to take over the work of the senior student from Hiroshima and contribute as Japanese native speaker because some of the communication between her and the Japanese author of charts were done in Japanese.

(ii) Revising the Reference in the book

This handbook is going to be released not only physically but also digitally, so I added Digital Object Identifier (DOI) to the reference and checked whether the DOI and the link of other materials were correct and accessible. Making the reference list was also included in my work of the literature review so this experience will be helpful to my own research.

（iii） Making and revising list of contributors, abbreviations and contents

I checked and revised the list of contributors which included people who got involved in making the handbook. While I revised the lists of abbreviations, I read the book repeatedly and extracted the abbreviation words and where they were cited from. When I searched for abbreviation words, they sometimes had multiple meanings, which was so confusing to me. Choosing the full-text words which were appropriate to the context was a little bit difficult for me, but I managed to finish it. I learned it was an important process to make the book more understandable. This book aims to be made for doctors and medical students. I realized that some contents did not be concerned with medicine that much. Regarding that, Mr. Uwe told me that doctors and medical students should know the lifestyle and background of people in addition to medicine and I came to realize the importance of developing a perspective that considers not only the medical field but also the social context in which it exists.

Furthermore, I made and checked the contents of the books. I was so grateful and invaluable to have the opportunity to get involved in the process of publication.

[3] Collection and analysis of questionnaire and data of participants of previous meetings

At the IAEA, collection of data of experts from around the world who participated in the STS meeting had been conducted until 2021. Since the update of the data hadn't been done after 2021, I added the data while referring to the brochure of the previous meeting. In detail, I entered data such as gender, country/continent of origin, field of expertise, and number of participations into Excel while referring to the speaker introduction pages created for each conference. Plus, there are questionnaires for all participants including not only experts but also students which are conducted after every meeting. This data also hadn't been updated since 2021, so I collected and summarized it into Excel. I organized the survey responses, calculated the average scores of the 5-point scale ratings, and applied color-coding based on the rating levels. Plus, when it comes to the comments, I also reviewed the written comments to determine whether they were positive, negative, or included suggestions for future conferences, and summarized the findings accordingly. The amount was very large, but it was so impressive that Mr. Uwe put importance on the feedback to make the next meeting better, which motivated me to continue the work.

[4] Making tables and charts for pamphlets of conference, learning with the handbook published before

In addition to the task above, I made and added tables and charts to the pamphlets. Also, I learned by myself through the handbook “Health in Disaster”, which gave me opportunities to learn about the response toward the radiological disasters.

3) Getting involved into project of updating the Japanese data of DIRAC

IAEA has DIRAC (Directory of Radiotherapy Centres), which is the world’s most comprehensive database on radiotherapy resources for patient treatment. DIRAC comprises current and historical data on conventional radiotherapy and light-ion centres, teletherapy machines and brachytherapy equipment, treatment planning systems, computed tomography units and simulators. It is used worldwide for planning radiotherapy services, advocacy for equity in access to cancer treatment, investment in health care infrastructure, benchmarking of radiotherapy resources, academic research, and placement of fellows. (This explanation was cited from Division for Human Health: DIRAC (DIrectory of RAdiotherapy Centres))

I had an opportunity to take part in meetings about the data of radiotherapy sources in Europe and understood that IAEA is working with other international organizations. Also, I was getting involved into the communication about updating DIRAC of Japan, which Mr. Tamaki Tomoaki (Section Head, Applied Radiation Biology and Radiotherapy Section) are working on.

4) Helping the booth at the conference of radiation oncology

From July 2nd to 5th, ICARO (International Conference on Advances in Radiation Oncology)-4, which was the international conference about radiation oncology. This conference, held for the fourth time following previous editions in 2009, 2017, and 2021, was the largest conference about radiation oncology. It brought together radiation oncologists, radiobiologists, medical physicists, and radiation technologists from around the world. Over the course of four days, many sessions were held, including educational

lectures featuring the latest information on radiotherapy, panel discussions, and poster sessions. Since the Division of Human Health oversaw the conference, I was also involved in assisting with the management of the exhibition booth.

Specifically, I assisted at the counter where we distributed IAEA publications related to radiation therapy to participants and helped managing the VR experience booth. At the publication counter, participants were asked to select the materials they needed from among several available publications. After handing out the selected materials, I recorded which items were distributed. Given the high number of attendees at the conference, the counter occasionally became crowded, but by cooperating with the other interns, we were able to handle the situation smoothly. The counter also provided a great opportunity to engage in conversations with many participants. Among them were a medical physicist from Japan and a student from Indonesia conducting radiation research who was around my age. Talking with them was incredibly inspiring, and when they told me they were looking forward to working with me in the future, it strongly motivated me to continue studying hard.

At the VR experience booth, I helped facilitate a virtual simulation that allowed participants to experience external beam radiotherapy and brachytherapy for cervical cancer from the perspective of a radiation oncologist using a VR headset and controllers. Before the booth opened, I was given the opportunity to try the system myself, including checking the equipment and confirming how it functioned. The VR simulation guided the user from patient interviews through explanations of the treatment instruments in a detailed and comprehensible way. Since I had not yet participated in clinical training, the experience was fresh and highly educational.

Before beginning the internship, I learned that the IAEA promotes the use of e-learning and VR-based training to support the education of radiotherapy professionals in developing countries, where access to such training is often limited. I also realized that learning methods using e-learning and VR have great potential. It can be applied not only to train healthcare professionals in developing regions, but also to support medical students who have not yet begun clinical practice and to make young children interested in medicine.

The conference itself was also deeply engaging. During breaks in my duties, I attended some of the sessions, and after the event, I watched the recorded presentations. These sessions greatly enhanced my understanding of radiation oncology.

(Picture: Working at the booth of distributing books and VR experience)

5) Presentation in Intern's forum

I got the opportunity to do my presentation in front of Ms. May, other section heads and interns at the end of June. I presented it for 20 minutes, and it was mainly about the literature review I was working on, including topics about other tasks and my hometown, Hiroshima.

I had never done such a long presentation before, so I had difficulty from the beginning, but Mr. Uwe and interns around me gave me advice and answered my questions so I could improve the contents step by step. When I started practicing presentation at home, I couldn't keep talking for 20 minutes and I needed some rest in the presentation, but I could get used to it after practicing repeatedly.

As I continued to develop my research until just before the presentation, I wasn't entirely confident in the content, which made me feel a bit nervous. However, thanks to the warm and supportive atmosphere, I was able to give my presentation successfully. After the presentation, I received valuable feedback and questions from the audience, which pointed out aspects I had not considered. Reflecting on these insights allowed me to deepen my research even further.

Through this presentation experience, I realized how meaningful it is to share one's work and thoughts with others, and how receiving comments and questions can lead to further growth and development. I felt that I would like to actively take part in similar opportunities in the future.

(Picture: My presentation at the intern's forum)

6) Participation in seminars, meetings and volunteer work

[1] Participation in the Human health seminar

Division of Human Health, where I worked for, has some seminars irregularly and I took part one of them," Radioligand therapy in Belgium." The seminar was about Belgium's past efforts and roles in the field of radioligands, as well as strategies for enhancing the therapeutic effects of radioligand treatments by responding to clinical needs. Radioligand therapy is a technique in which a radiopharmaceutical is administered to enable diagnosis and treatment through the radiation emitted by the isotope. Before attending the seminar, I was not familiar with radioligand therapy, so I found the content very interesting and informative.

[2] Other seminars and events

There are some opportunities for staff and interns to take part in seminars. I took part in a seminar about artificial intelligence and radiological protection. Plus, I also heard staff working as business process analysts. There are many staff with different fields surrounding nuclear power, so I could hear about not only medicine but also other fields, which allowed me to broaden my perspectives.

[3] Participation in the volunteer work

I did volunteer at the event," Vienna International Science & Engineering fair." The overview of this event was elementary and junior high school students present their own science research and receive assessments and lectures at University in Vienna.

Some students came from outside of Austria. I could see some contents of presentation. The levels of contents were extremely high and some of them were about medicine, which was so stimulating.

3. What I learned through international interaction and thought after the internship

I had never lived outside of Hiroshima before, so it was so new and inspiring to me to meet many new people in the new environment. Since I also had few opportunities to talk to non-Japanese, I was a bit nervous to start the conversation, but everyone was so kind and talked to me with smile, which motivated me to talk to people positively without being afraid of making mistakes.

There are other international organizations in the Vienna International Centre, where IAEA was located. I could interact with staff and interns not only from IAEA but also from other organizations. I felt that interns around me were so eager to learn new languages and understand international affairs, which was so stimulating. I also could meet staff and interns from Japan. I had opportunities to talk to them, and they gave me some advice about daily life in Vienna. While I learned the importance of international interaction, I thought the connection with people from the same region and country is also important.

Looking back on the internship, I was able to absorb a great deal from the outstanding professionals around me. I can say with confidence that what I have learned during this experience will stay with me and continue to benefit me throughout my life.

4. Acknowledgement

This 3-month experience was so fast, but it wasn't just a moment if thinking from what I could learn from this rich experience. I sincerely appreciate Ms. May, the staff and interns at the IAEA who I could work with. I also would like to extend my appreciation to HICARE, Hiroshima Prefecture, and Hiroshima University for giving me this wonderful opportunity and support during my internship.

I really appreciate it.

(left：Vienna International Centre, where the IAEA is located)
(Right：With interns from NAHU at IAEA)