

About professor Takashi Nakano



Dr. Takashi Nakano is Professor and Chairman of the Radiation Oncology Department and Director of the Heavy Ion Medical Research Center at Gunma University. He is a radiation oncologist who specializes in radiation therapy for gynecological cancers and charged particle therapy. Dr. Nakano has a strong focus on clinical research and teaching. He contributed to the improvement of the radiation oncology status in Asian countries and currently he is chairman of the Japanese advisory board of IAEA/RCA.

He is also Chairman of NPO, the Japanese Organization for International Cooperation in Radiation Medicine, and Secretary General of The Federation of Asian Organizations for Radiation Oncology (FARO). He has been contributing to develop the status of radiation oncology in Asia.

- What is the role of brachytherapy in the treatment of patients with cervical cancer at your institution?

In recent years, high-precision external radiation therapy has progressed rapidly, but in cervical cancer, the movement of the uterus, bowel and bladder, and the location of cervical cancer surrounded by the bladder and rectum causes' suboptimal dose distribution with external radiation.

Tumor control is especially limited due to the poor dose distribution, because as dose is spared to surrounding normal tissue there is a limit to the concentrated dose which can be delivered to the tumor target with external beam.

As described in the literature, brachytherapy can deliver enough dose to even moving tumors with good reproducibility and is a modality essential for tumor control in cervical cancer allowing a high dose to be delivered to the tumor target whilst sparing the organs at risk.

- Do you also treat other body sites with brachytherapy?

In our institution, various cancers other than gynecologic cancers, such as prostate cancers and anal cancers have been treated with HDR brachytherapy. With regard to LDR brachytherapy, head and neck cancers have been treated with LDR Brachytherapy previously, but now, I-125 seed implant therapy is used in the clinic.

- What are the advantages of brachytherapy for the patients in general? Why do you believe in it?

Brachytherapy has advantages of superior dose accumulation to tumor and the good reproducibility of dose distribution unaffected by motion. In addition the treatment system is relatively simple when compared to external irradiation.

- What are your particular research interests in the field of brachytherapy?

I have been developing image guided brachytherapy with CT, MRI for cervical cancers in the 1980s. In recent years, I have tried my best to spread Image Guided Brachytherapy (IGBT) in Asia and standardize the treatment protocol of IGBT for gynecologic cancers. In view of the different socio-economic status in the developing countries compared with Japan and Euro-American countries, IGBT with MRI seems to be too expensive now in the developing countries where gynecologic cancers are predominant. Hence I continue to develop an affordable treatment system for IGBT and suitable treatment protocols for IGBT in gynecologic cancers in Asia.

- Is brachytherapy optimally used in Japan?

In Japan, the use of center shielding pelvis external beam irradiation is different from what is done in United States and Europe. For this reason, the Japanese treatment system of external beam radiation + intracavitary irradiation had not been recognized correctly and in fact has been misunderstood by physicians in Europe and the United States. However new methods such as deformable registration have made it possible to evaluate the technique of external irradiation using central shielding + intracavitary brachytherapy.

In fact, with the Japanese technique the total effective dose combining external radiation using the central shielding and intracavitary irradiation for cervical cancer was found to be a reasonable dose in comparison to the dose achieved with whole pelvis external beam irradiation techniques, used in Europe and the United States. The Japanese standard method is therefore considered to be the best practical method of treatment in Japan that makes full use of the characteristics of Brachytherapy.

- What actions need to be taken to improve the usage of brachytherapy?

There are big difference in conditions such as health care resources and the fundamental status surrounding radiation therapy and brachytherapy in each country. The stereotype standardization of radiation therapy is not always the correct approach as it is necessary to optimize treatment according to the situation of each country. In particular, standardization and nationwide uniform deployment of IGBT in developing countries is considered to be very important when considering the characteristics of cervical cancer.

- What education is necessary for a radiation oncologist to become competent in the field of brachytherapy?

Brachytherapy for cervical cancer has the advantage that the tumors can be touched by hand and actually be seen by the eye, so that not only prior to the treatment, but also after treatment, the oncologists actually gain clinical skill with experience from various aspects of the patients.

- What ongoing education is needed for skills and knowledge for brachytherapy to be maintained and updated?

Whereas it is also important to participate in conferences and workshops in Europe and the United States, it is necessary to carry out research and development, such as new studies in Japan at the same time. Conducting new research lead to maintaining and updating knowledge.

- What would you recommend to make the BrachyAcademy more valuable for the brachytherapy community?

I would like to ask Elekta to communicate information with the developing countries in mind as well as the developed countries.

- You are involved in many international initiatives to improve the use and quality of radiation oncology in Asia, like IAEA and FARO. Could you tell us why such cooperation is necessary and give some examples of what has been achieved?

Because there is a history of radiation therapy developing with the progress of computer technology, in the developing countries, the sophisticated radiation therapy equipment including Brachytherapy has not been fully installed even in the cancer centers because of an economical problem or a problem of the infrastructure such as electricity issues.

I am proud that I have been contributing to standardization of radiation therapy in developing countries around Asia as a member of the Asia region. Cervical cancer and Head and Neck cancers in particular have a higher incidence in developing countries than in the developed countries. Hence, to improve quality of the radiation therapy for these cancers in these countries and to realize national deployment of the sophisticated radiation therapy equipment seems to mean true globalization for Japan.

At first, through an activity led by FNCA, an international clinical trial was set up in the Asia to standardize the radiation therapy for cervical cancer and Head and Neck cancers. In addition, I gave a refurbished radiation therapy apparatus (including the microSelectron and medical treatment equipment) for free to medical facilities in the poor countries in Asia through a NPO Corporation. I have been creating face to face

relationships and intimate exchanges with radiation oncologists in Asia through FNCA and IAEA activities for the last 20 years and in my opinion this has contributed to the establishment of FARO.

- What future developments do you expect in the field of brachytherapy in Japan?

For the future development of the definitive area of Brachytherapy in Japan, as a member of a developed country, it is important to continue to further develop Brachytherapy techniques. In addition, as a member of Asia, it is important for Japan to actively promote the standardization of Brachytherapy protocols unique to developing countries, and therefore try to spread Brachytherapy throughout Asia.