Connecting 61 Hospitals with Videoconferences and Sharing Advanced Cancer Radiation Treatment Technologies Within the Entire Tohoku Region

The HD Visual Communications System was installed in 61 hospitals to achieve remote conferences between hospitals in distant locations.

Achieving a conference that gathers specialized knowledge using high-quality images.

The HD Visual Communications System, displays, switchers, and cameras were installed onto specialized racks at each hospital.

Customer Information

The Faculty of Medicine was founded in 1973 at Yamagata University, and the Yamagata University Hospital was founded three years later in 1976. Based on the concept of “informed consent” (providing treatment only after the doctor has fully explained the objective and details of the treatment to the patient), the hospital has supported the health of people in the Tohoku region for approximately 40 years, providing “treatment open to the community” and “the highest levels of treatment.” The development project for heavy ion radiotherapy was launched in 2015. The trendsetting university hospital continues to support the development of cancer treatment not only in the Tohoku region, but also throughout Japan.

Dr. Kenji Nemoto
Yamagata University Faculty of Medicine Chief Administrator of the Cancer Clinical Center Radiation Oncology Course

Members of the Yamagata University Hospital Radiotherapy Department
Motivation for Installation

Hospitals that have radiotherapy equipment for advanced cancer treatments are scattered throughout the Tohoku region, and there is a significant distance between each hospital. There are also differences between each of the devices, and when selecting the optimal treatment based on symptoms, patients are often required to spend hours traveling between hospitals. Reducing the burden on patients has been a major challenge. As a result, a "wide-area cancer radiation treatment network," aimed at enabling treatment consultation and selection of advanced radiation treatments regardless of the area that the patients live in, has been established at the Yamagata University Hospital. The construction of a system that links 61 hospitals and enables remote conferences between distantly located hospitals was studied.

System Selection Points

When implementing the system, conducting smooth communication between doctors and displaying clear, non-deteriorating images required in radiation treatment sites such as RTP (radiation treatment planning), CT, MRI, and electronic charts to other hospitals was necessary. In addition to meeting these high-level specifications, the ability to exchange communication and images between distant hospitals with no delays were key factors in the decision to use the HD Visual Communications System. Also, the HD Visual Communications System was already being used at Yamagata University Hospital, and its user friendliness and reliability were major points when constructing the system for all 61 hospitals affiliated with the "wide-area cancer radiation treatment network."

System Application Points

Establishing a Regular Remote Examination Consultation Service

In order to conduct optimal cancer treatment that suits the needs of the patient’s symptoms, remote examination consultation services are held by connecting the HD Visual Communications System with hospitals that can provide effective treatment environments at the 61 hospitals affiliated with the "wide-area cancer radiation treatment network." The consulted hospitals explain symptoms by displaying the patient’s information (CT, MRI images and electronic charts) onto the display of the other doctors. In doing so, conveying accurate, detailed patient information is important, but CT and MRI images are made up of cross-sectional images, which can often result in dozens of images per patient. In order to confirm the lesion area from this massive amount of images, the doctors must be in the same room and explicitly point out the images in question, or give instructions over the telephone to “look at the (1st, 2nd, 3rd ... 25th, etc.) image.”

So, a system was devised that connects each hospital’s HD Visual Communications System to a switcher to enable the consulting doctors to present images to the target doctor with a single touch. In terms of security, which was considered absolutely necessary when installing the system, the personal information of the patients is properly managed, enabling the system to be used with ease. The doctors all agree that the images of the HD Visual Communications System are high enough in quality and the operation is easy enough to confirm the lesion area, thus enabling real-time remote conferences, which was previously considered difficult in medical settings.

Medical images are displayed in high image quality with appropriate sizes.

What is the Wide-area Cancer Radiation Treatment Network?

The wide-area videoconference network features 61 hospitals in the Tohoku region, and is aimed at enabling patients who live in the area to consult and select advanced radiation treatments regardless of the region in which they live.
Presently, Yamagata University Hospital is researching and developing the construction of facilities for heavy ion radiotherapy, which is considered to be more effective than conventional radiation therapy. Heavy ion radiotherapy makes it possible to concentrate radiation precisely on the cancer lesion. Japan presently leads the medical world in this form of radiation therapy. In order to implement this relatively rare heavy ion radiotherapy beyond the prefecture and cover the entire Tohoku region, a “Tohoku Particle Beam Cancer Consortium” has been established that links seven specialized facilities.

The HD Visual Communications System enables the exchange of opinions from a specialized viewpoint among distant facilities, resulting in a system for large-scale, effective use of heavy ion radiotherapy. Also, in addition to Particle Beam Cancer Consortium conferences, remote conferences are held once a month with the Mahidol University Hospital in Thailand. Enabling real-time communication both in Japan and overseas, this system is helping to further advance high-level cancer treatment research.

Remote Conferences Based on Wide-area Treatment Collaboration

Yamagata University Hospital implements remote conferences for pediatric cancer treatment by connecting eight other hospitals that have pediatric departments using a videoconference system. For pediatric cancer treatment, it is necessary to consider the patient’s age and status and spend time deciding on the treatment plan. So, rather than have one-on-one conferences, specialized knowledge is accumulated by simultaneously connecting different hospitals in order to conduct more advanced conferences. Currently, conferences are often held by simultaneously connecting six hospitals. High-quality sound enables participants to hear clearly even when speaking simultaneously, and images can be displayed on a split screen. As a result, these types of conferences are now being used more frequently.

Installation Effect

According to Dr. Nemoto of the Yamagata University School of Medicine, establishing a remote examination consultation service and reducing the burden for patients were the two foremost achievements. In the past, when patients would visit their nearest hospitals and the hospital didn’t have the appropriate medical devices, they would have to bring a letter of introduction and medical data burned onto a CD-R to a hospital that could provide the proper treatment. There, they would have to be re-examined to discuss the treatment plan. Sometimes weeks would go by even for cancer treatments that required early intervention, and Dr. Nemoto viewed this as a major problem.

By installing the HD Visual Communications System, doctors can discuss treatment plans with one another in advance and then convey them to the patient, and information can be shared with doctors during a patient’s first examination in real-time, enabling doctors and patients to focus on a specific advanced radiation treatment regardless of the region they live in. In addition to utilizing the HD Visual Communications System, Yamagata University Hospital, which aims to connect all of the hospitals in the Tohoku region, continues to drive advanced cancer treatment with like-minded hospitals in different prefectures.
**System Configuration and Operation**

**Installed Models**

- HD Visual Communications Unit KX-VC1300 (67 Units)
- HD Communication Camera GP-VD131 (67 Units)
- Digital Boundary Microphone KX-VCA001 (67 Units)
- Full-HD LCD Display TH-47LF60 (67 Units)