



## The World Leader in Radiotherapy for Solid Cancers

National Institute of Radiological Sciences (NIRS) constructed the first original machine in the world specialized for heavy ion radiotherapy named HIMAC (Heavy Ion Medical Accelerator in Chiba). HIMAC has achieved remarkable results in clinical trials and advanced medicine.

### What Is the Radiotherapy?

Radiotherapy = cure without surgery: neither painful, hot, nor scary, and no traces left.

Radiotherapy is not a treatment by killing cells with the heat generated by radiation, but a sophisticated method of killing cancer cells with radiation, by making microscopic cuts within the molecules of DNA (deoxyribonucleic acid) in a cell nucleus, and of preventing further cell division.

### Cancer, the First Cause of Death

The ultimate solution for treatment is radiotherapy. The numbers of patients with cancer, and of deaths resulting from cancer are increasing recently. In 2006, the number of people who died of cancer in Japan amounted to 330,000, which is 33% of the total deaths of the year.



# Carbon Ion Beam : Physical and Biological Features

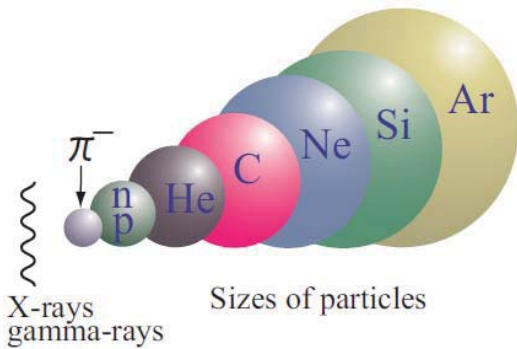
## Advantages of Carbon Ion Radiotherapy:

- Cure for intractable cancers, short-term treatment, high quality of life
- Curing cancers not curable by surgery nor conventional radiation

## What is a heavy ion beam?\*

Heavy ion beam: beam of such ions as carbon(C), neon(Ne), silicon(Si) or argon(Ar), etc. , flying at extraordinarily high speed. NIRS is using a heavy ion (carbon ion) beam for cancer treatment.

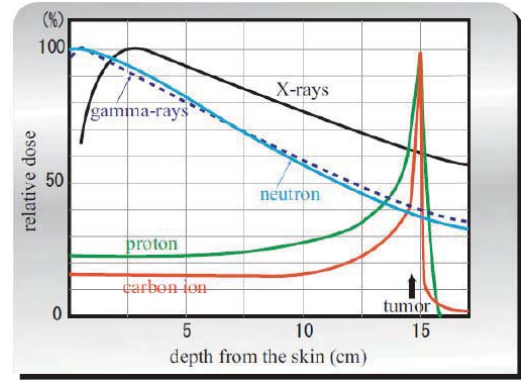
## Other radiations\*



**Proton beam:** beam of protons (nuclei of hydrogen) flying at an extraordinarily high speed.

**Photon beam:** a beam of photons, particles of light . They fly at the speed of light. X-rays and gamma-rays are photon beams at high energy.

\*When these ions are used for the treatment, an extremely large number of flying particles is made up to a bundle (beam) with the same direction for irradiating the tumor.



As you can see in the figure, X-rays are not suitable for the treatment of cancers located in a deep region of the body because their effect is gradually decreasing with depth.

In comparison, heavy ions are suitable for the treatment of these cancers because they affect cells only weakly until they reach the tumor, and demonstrate an enormous effect at the moment they stop in the tumor.

## Physical features of a carbon ion beam

The depth where the ion stops is exactly predetermined. The effect becomes enormous only when the ion stops.

## Biological features of a carbon ion beam

The effect is stronger than X-rays for the same dose.

## What data prove this therapy is really effective from your clinical results?

The rate the size of tumor reduces or its growth stops by treatment, is called the local control rate, an index for the effectiveness of treatment. Our carbon ion radiotherapy obtained fairly high values of the 3-year local control rate; more than 90% for non-small-cell lung cancers, 80%~90% for liver cancers, and almost 100% for prostate cancer, for example. We can therefore conclude that the carbon ion radiotherapy is reasonably effective.

### Difference between X-ray and carbon ion beam treatments

**Cancer treatment by conventional radiation**

The conventional radiation (photon beam) has the strongest effect in shallow regions of the body and its effect is gradually decreasing with depth; in addition, it does not stop at a finite depth but is penetrating furthermore. Therefore, it causes damage to normal tissue before and after the tumor.

**Cancer treatment by carbon ion beam**

Carbon ions stop at the exact depth given by the injection energy. In addition, they have the advantage that enormous effect on killing cells is shown only at the point where they stop. Therefore, one can concentrate the damage to cancer cells by adjusting the stopping point for them.

## Applicable Cases and Clinical Results

What cases the carbon ion radiotherapy can be applied at NIRS?

### [Cases Advanced Medicine is applicable]

- Head and neck cancers / nose, paranasal sinus, salivary gland : 4-week treatment
- Lung cancers (non-small-cell cancers) / local advanced cancer : 3 to 4-week treatment
- Liver cancers : within 1 week treatment
- Prostate cancer : 4 to 5 week treatment
- Bone and soft tissue sarcoma / surgery not applicable cases : 4 week treatment
- Malignant melanoma (choroid\*) : 1 week treatment (\*eye)

### [Cases Clinical Trial still applicable]

- Lung cancers (non-small-cell-cancers) : stage I 1 week treatment
- Uterine cancers
- Brain tumors
- Pancreas cancer
- Esophageal cancer
- Liver metastasis of colon cancer etc.

## What are the cases the treatment at NIRS is not applicable?

### In case of metastasis

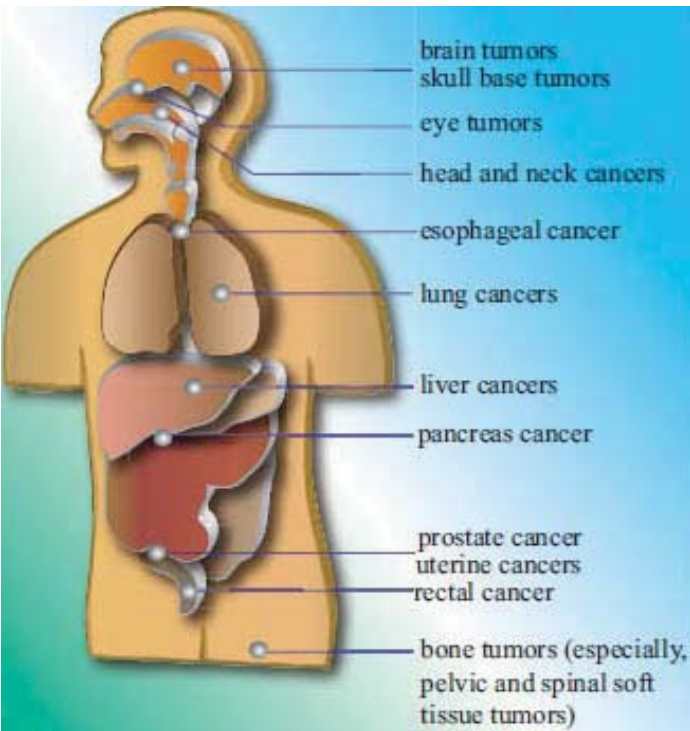
In principle, carbon ion radiotherapy is not applicable to metastasis to the lung etc., far from the primary region (distant metastasis). In the case of wide spread metastases in the whole body, carbon ion radiotherapy is not applicable for individual metastases either.

### In case of post-radiotherapy

At present it is not know what side effect will occur when we add carbon ion radiotherapy to region where any radiotherapy was applied before, even just once. In most of those cases carbon ion radiotherapy can not be applied.

### In case of cancers in bag-shaped hollow organs or the cases for which the therapies have been established by other methods

Stomach cancer, colon cancer (primary), breast cancer, ovarian cancer etc.



## How much is the patient's expense in the system of the "Advanced Medicine"?

Hospitalization is necessary for our carbon ion radiotherapy. The expense for treatment in this system is 3,140,000 Japanese yen.

## Understand Japan: Upon Arrival



Are you worried about transportation arrangements and your ability to communicate upon arrival in Japan? Rest assured that EAJ will be waiting for you in the arrivals hall and will see to it that all of your needs are met right up to your departure. We will accompany you from the airport to your place of stay, whether that is a hotel or a hospital.

If you wish to see more of Japan, we will also help you to make the necessary travel and accommodation arrangements, whether that involves travel by air, rail, coach, or hired automobile. As well as facilitating your access to

Japanese medical care, our goal is to make your stay in Japan enjoyable and memorable. And since you will also have 24-hour access to our language and concierge services hotline, help will always be just a phone call away.

Please keep in mind that standard electrical current in Japan is 100V. If you plan to bring electrical equipment with you for use in Japan, we recommend that you acquire an appropriate electrical adaptor. You can acquire Japanese yen by exchanging money at the airport or at foreign exchange counters at major banks.

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### “EAJ Saved My Life!”

Last year we were contacted from China by a Mr. “HH”. HH was faced with a recurrence of rectal cancer. We are pleased to have recently received the following report from him. A few years after undergoing surgery for cancer in China, I discovered that the cancer had returned. My very first thought was, “I don’t want to die.” I was desperate and looked everywhere for help. Eventually I discovered that there was something called heavy particle therapy that was available only in Japan. “Japan? But I don’t even know how to communicate with them!” This was my first reaction. But

luckily I discovered Emergency Assistance Japan. EAJ provided Chinese language support and medical interpretation. They also acted as the go-between and facilitator with the hospital and helped with travel and logistical arrangements. The fight for my life was greatly aided by their support. I found the hospital staff in Japan to be open-minded and genuinely caring. The doctor made sure that I understood the course of treatment and used pictures to explain when words were insufficient. The orderliness and cleanliness of the hospital was exceptional. A friend once told me, jokingly, that “hospitals in Japan are so clean that you can sleep on the floor!” I found this to be quite true. I have just recently completed the heavy particle course of treatment. When I learned that the size of my tumor has decreased, I cried. Without EAJ, just coping with my own fear and anxiety would have been very difficult. Now I know that I am not alone in my fight against this illness and that EAJ is always there to be called upon when I need help. I am looking forward to my next visit to Japan for my three-month follow-up evaluation.



## My Experience with Heavy-ion Radiation Therapy in Japan

Ms. "WS" is a Russian woman living in New Zealand. When she was diagnosed with cholangiocarcinoma, she decided to seek treatment in Japan. Ms. WS shared with us some of her impressions. When I was diagnosed with bile duct cancer, I was in shock. The shock was even worse, however, when the doctor informed me that there was nothing he could do for me in New Zealand. But despite this dismal state of affairs, I did not give up! My family and I searched the internet for any treatment available anywhere.

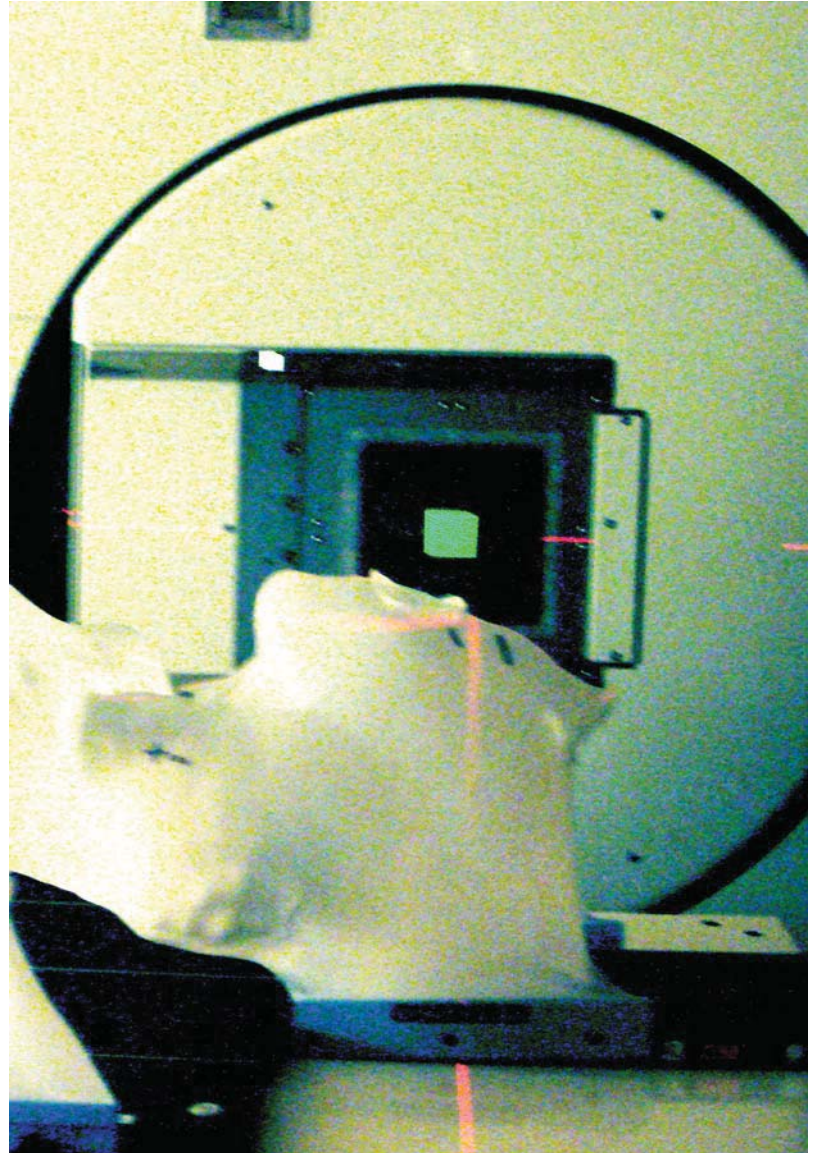
Both Japan and the U.S.A. offered possibilities, and we had difficulty deciding which to pursue. But we finally choose Japan because the therapies available there appeared to be the most advanced.

My family contacted the Japanese consulate regarding obtaining a visa. There, we were introduced to Emergency Assistance Japan as the organization assisting with all aspects of arrangements in Japan, including the "medical-stay" visa application process.

I was deeply impressed with EAJ's willingness and caring right from the day I called. They were able to recommend a hospital and therapy best suited to my particular type of cancer. Since contacting EAJ, everything has moved very quickly and smoothly. I am surer than ever that 'hope is not yet over'. I was right not to give up and to call EAJ.

Not only was the hospital that treated me extremely competent and advanced, but the hospital staff were excellent. I was deeply impressed and moved by their kindness toward me and their concern for me as a patient.

Furthermore, EAJ continued their support and assistance throughout the course of treatment. The level of care provided by EAJ's staff when I went into the hospital was unexpected. With EAJ standing by to interpret, the doctors, technicians, and nurses were able to answer all of my questions and explain to me everything that I needed to know about the treatment. As a result of this attention I was able to undergo treatment with very little anxiety and fear. I am much relieved to have just finished my course of heavy-ion radiation therapy and look forward to my follow-up evaluation.



## The 2012 Sakura Tour Health Package

Every year, tourists come from all over the world to witness the beauty of Japan's cherry blossoms. In April, 2012, a distinguished group of guests to Japan had the opportunity both to see the cherry trees in full bloom and to partake in a premium one-day health check-up program. Included in their tour arrangements were: medical-stay visa support services, medical facility arrangements, hotel arrangements, airport welcome and pick-up, one-day Tokyo sightseeing tour, mobile phone rental, personal attendant services, 24-hour hotline telephone support services, and individual tour add-ons.

Seven distinguished guests from Bangladesh arrived in Japan on April 5th, 2012 and stayed at the luxurious The New Otani Hotel. The guests began the next day with a full health check-up at the Tohto Clinic, followed by medical consultations in the afternoon and a dinner cruise on Tokyo bay in the evening. On the third day, the group visited Ueno Park, Sensoji Temple, and the Imperial palace for sightseeing, followed by shopping at the world-famous Nihonbashi-Mitsukoshi department store. The day ended with a sumptuous banquet at the Nadaman Japanese Restaurant. To enquire about medical check-up plans and to make your own health and sightseeing tour arrangements, contact Emergency Assistance Japan at +81-3-3811-8600.



## Health Tips: Japanese "Onsen"



An onsen is a natural hot spring or spa. During your stay in Japan, a trip to an onsen is something you do not want to miss! The waters in Japanese spas contain various types of minerals known to help circulation and to help the body overcome some dermatological ailments. Sulfur is the most common mineral to be found in spas, but each spa will also have its unique blend of other minerals that also gives it a unique color.

A study conducted by Dr. Junichi Oyama from Kyushu University found that a ten minute soak in a hot spring bath each day for a period of two weeks can significantly improve cardiovascular functions and reduce the incidence of inflammatory cytokines in patients with chronic heart conditions.

Some of the most well-known onsen near Tokyo are the Oedo Onsen Monogatari and the Hakone Kowakien Yunessun Spa in Hakone, as well as some sixteen Japanese-style inns, or ryokan, in Hakone that have natural hot spring baths.

If you wish to experience an onsen during your medically-related visit to Tokyo, please inform your EAJ attendant or call the 24-hour hotline so that we can assist you in making arrangements.



Prime Medical Alliance Japan

## Med in Japan

Prime Medical Alliance Japan provides international medical coordination to foreign patients who wish to visit Japan for advanced treatments. The service is operated by Emergency Assistance Japan Co., LTD.

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