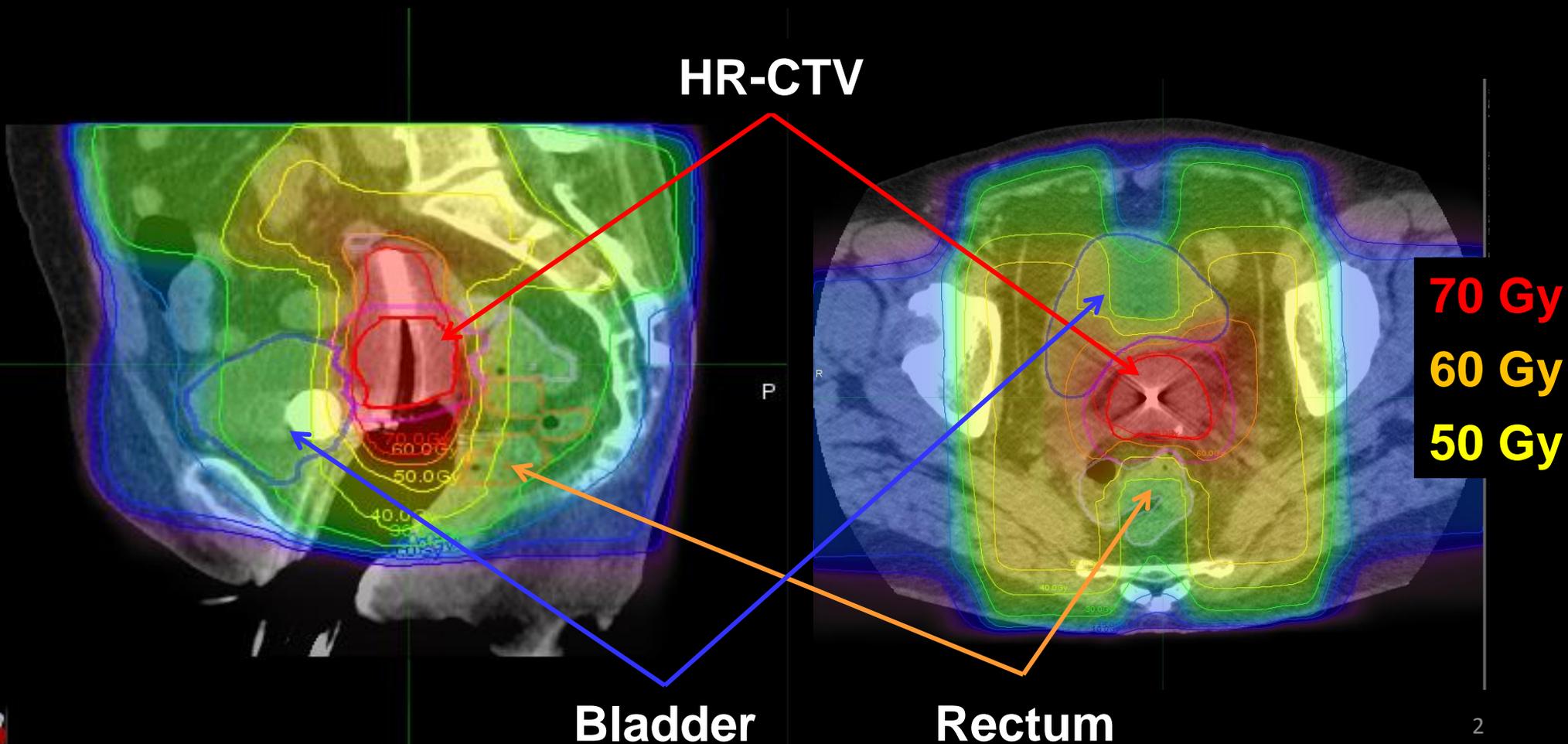


**IAEA/RCA RAS/6/062**  
**“Supporting 3D IGBT Services”**  
**(2012 - 2015)**

**Shingo Kato, Japan**  
**LCC of RAS/6/062**

# 3D Image-based (guided) brachytherapy

Treatment planning is performed using 3D images (MRI/CT) to deliver adequate dose to the whole tumor volume without unnecessary dose to the surrounding normal tissues.



# *Objective*

To Improve regional and national capacities for effective brachytherapy services by implementing 3D image-guided brachytherapy (3D-IGBT).

## *Expected outcomes*

- 1. Effective project management and coordination are conducted at both a regional and national level.**
- 2. ROs and MPs in RCA MSs are trained in the knowledge and techniques for 3D IGBT.**
- 3. Treatment guidelines for 3D IGBT are developed among RCA MSs.**

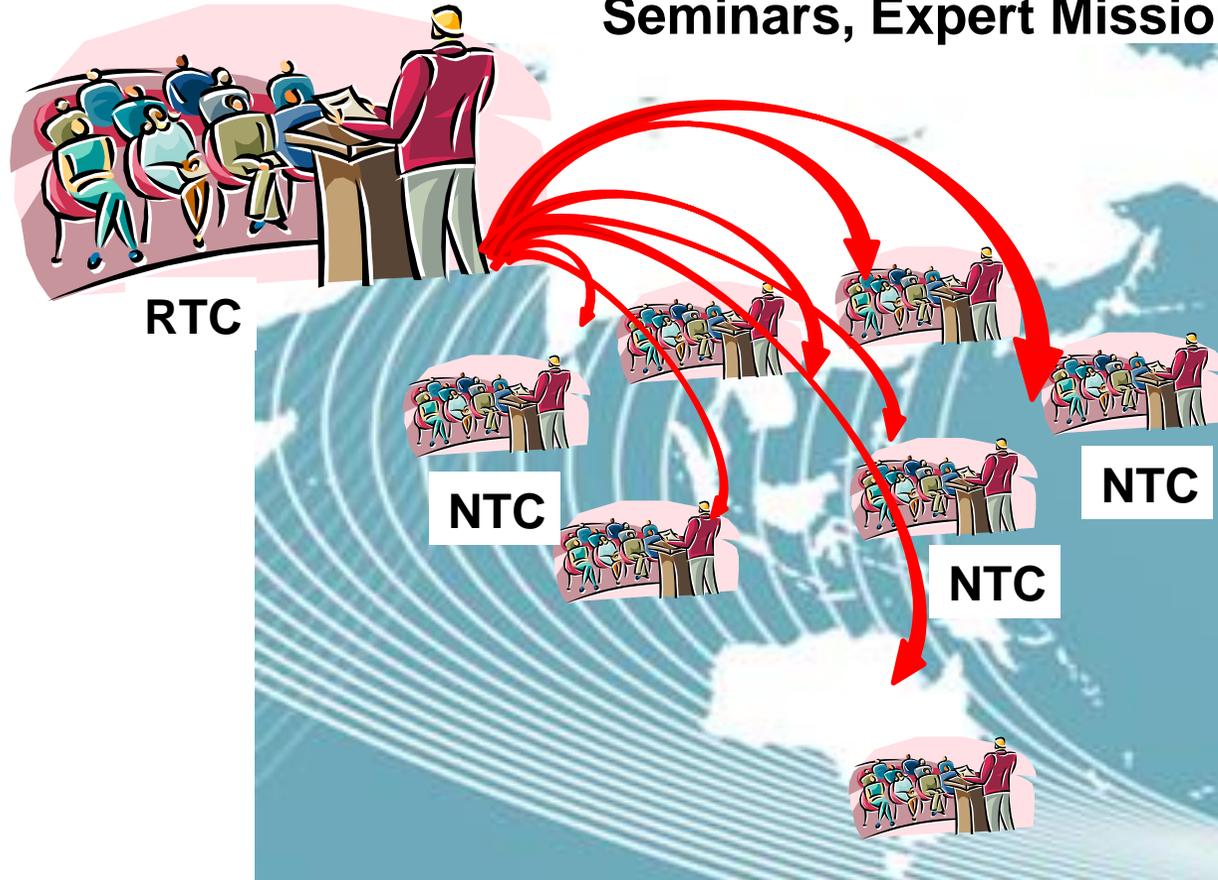
# *For training of ROs and MPs*

## *Regional Training Courses/National Work Plans*

**Regional Training Courses**

**National Work Plans**

**National Training Courses, Workshops,  
Seminars, Expert Missions, etc.**



# Summary of RAS/6/062 activities

1. Project Planning Meeting (Japan, 2012)
2. RTC #1 (India, 2012) (60 ROs & MPs trained)
3. RTC #2 (Thailand, 2013)
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# *Meetings*

- 1. Project Planning Meeting (27-30 Aug, 2012, Saitama, Japan)**
- 2. Midterm Review Meeting (28-31 Jan, 2014, Melbourne, Australia)**
- 3. Final Assessment Meeting (Nov, 2015, Gunma, Japan)**



# Midterm Review Meeting

## 28-31 January, 2014, Melbourne, Australia

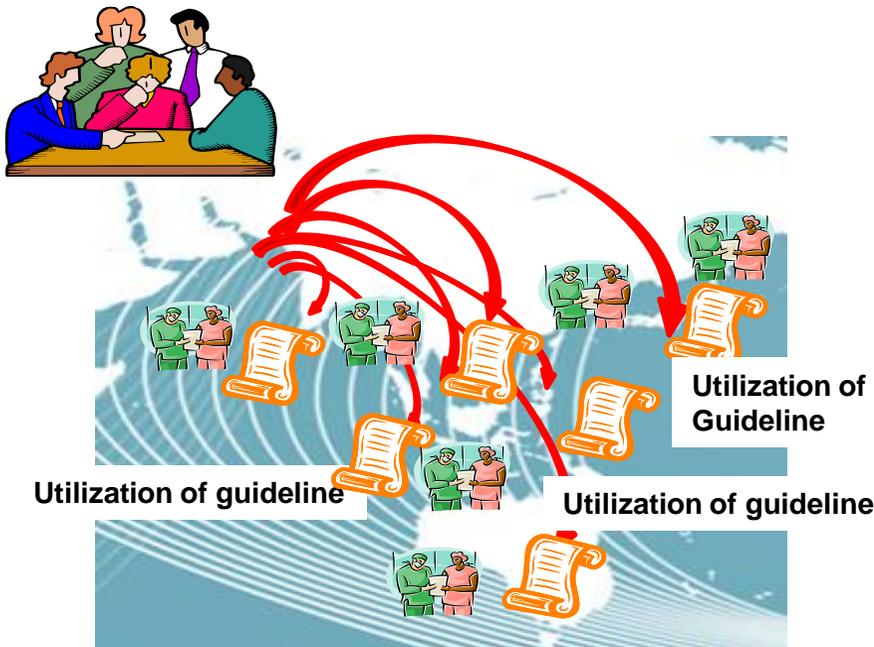
- Reviewed the first 2 RTCs and agreed that the RTCs were completed successfully.
- Reviewed the progress of national activities.
- Reviewed a guideline under draft by the working group recruited by the IAEA and provided comments and revisions. (next slide)
- Planned for the 2 RTCs to be held in 2014 and 2015.



# Development of guidelines

With the working group of the IAEA Applied Radiation Biology and Radiotherapy Section, the Guideline “Transitioning from 2D BT to 3D HDR Brachytherapy” was drafted and is under review.

The guideline will be published as an IAEA document in the future.



*Transitioning from 2-D  
Brachytherapy to 3-D High Dose  
Rate Brachytherapy*



INTERNATIONAL ATOMIC ENERGY **IAEA**

DRAFT 2014-01-09

# ***Regional Training Courses***

**RTC #1** Basic course

Mumbai, India, Dec. 10-14, 2012.

**RTC #2** Basic course

Chiang Mai, Thailand, Oct. 7-11, 2013.

**RTC #3** Advanced course

Saitama, Japan, Sep. 29-Oct. 3, 2014.

**RTC #4** Advanced course

Singapore, Mar. 2015.

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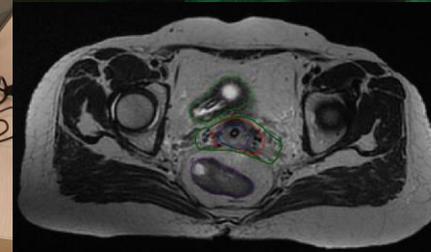
**RTC #4** Advanced course

Singapore, Mar. 2015.

# RTC #1: “Basic Concepts of 3D Image Guided Brachytherapy for Cervical Cancer”

10-14 December 2012: Tata Memorial Hospital, Mumbai

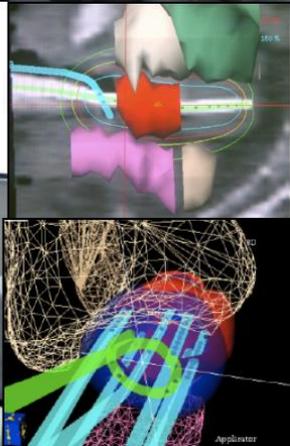
24 Participants from 13 Member States have attended the RTC.



# RTC #2: “Basic Concepts of 3D Image Guided Brachytherapy for Cervical Cancer”

7-11 October 2013: Chiang Mai University, Thailand

24 Participants from 13 Member States and 12 observers from Thailand have attended the RTC.



# Regional Activity in 2014

- **RTC: “3D Image-Guided Brachytherapy (IGBT) for Cervical Cancer”**
- **Venue: Saitama Medical University  
International Medical Center, Japan**
- **Date: 29 September - 3 October 2014**
- **Participants: 22 participants - 12 Member States (& 12 observers)**
- **Lecturers: 3 IAEA and 13 local lecturers**
- **Course director: Dr. Shingo Kato (PLCC)**

# RAS6062 IAEA/RCA Regional Training Course on 3D Image-Guided Brachytherapy for Cervical Cancer

## Saitama Medical University International Medical Center

### 29 September – 3 October 2014



# Contents of the RTC

- Lectures :

- Overview
- Gynecological surgery, pathology, diagnostic radiology
- Target Concept & Contouring
- Applicator Reconstruction
- Treatment Planning
- Optimization
- Plan Evaluation
- Clinical Outcomes
- EQD2 concept
- Adaptive Brachytherapy (Hybrid Brachytherapy)

- Hands-on :

- Target/OAR delineation
- Applicator Reconstruction
- Treatment Planning & Optimization
- Hybrid Brachytherapy

Using Oncentra system supported by ELEKTA company.

# Schedule

	Mon	Tue	Wed	Thu	Fri
AM	<p>Opening Ceremony</p> <p>Lectures Overview</p>	<p>Lectures (Surgery, pathology, diagnostic radiology)</p> <p>Target/OAR Delineation</p>	<p>Lectures Applicator Reconstruction</p> <p><b>Hands-on</b> Applicator Reconstruction</p>	<p>Lectures Adaptive Brachytherapy (Hybrid Brachytherapy)</p>	<p>Discussion Review</p>
PM	<p>Lectures Overview</p>	<p><b>Hands-on</b> Target/OAR Delineation</p>	<p>Lectures DVH Parameters</p> <p><b>Hands-on</b> Treatment planning, Optimization</p>	<p><b>Hands-on</b> Adaptive Brachytherapy (Hybrid Brachytherapy)</p>	<p>Evaluation Closing Ceremony</p>

# Lectures



# Hands-on Sessions



For treatment planning hands-on, 20 workstations (Oncentra system) were provided by ELEKTA company.

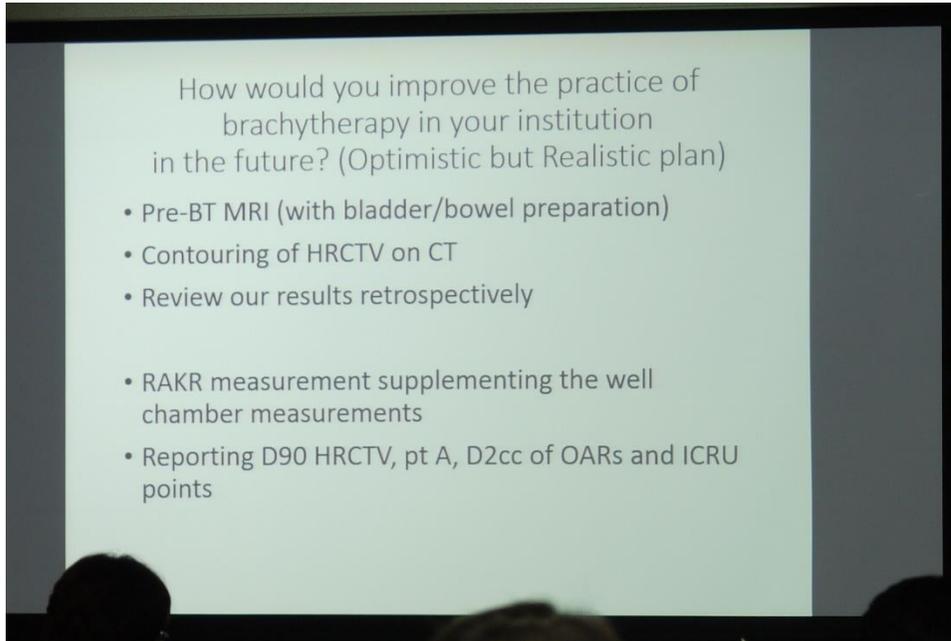
# Hands-on Sessions



# Hands-on Sessions



# Discussion, Closing Ceremony, Reception



# Evaluation

- The training course received good evaluation from the participants and lecturers.
- In the section of “Training Evaluation”, the scores were on average 4.33 ~ 4.70/5 for the items of Training Programme.
- In particular, the hands-on sessions were useful in receiving practical knowledge and experience in the use of IGBT program especially for those with limited experience.

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# National Activities in 2014

## Japan (NPC: Prof. Shingo Kato)

**National training course** of Image guided brachytherapy for cervical cancer was held at Gunma University on 20-21st February, 2014. There were over 30 participants from domestic and foreign institutions. Guest Lecturer were Prof. R potter and C. Kirisits from Vienna Medical University. There were 19 lectures dealing with diagnostic imaging, pathology, and radiation therapy and 4 sessions of hands on training. **Two educational lectures** were provided at the annual meeting of Japanese radiation oncology by the member of national work team on 12th December. **Clinical trial** has been started this quarter. This trial is a multi-institutional prospective trial of the 3D-image guided brachytherapy for cervical cancer. The results will be published for an international journal when patient registration and data collection finish.

# National Activities in 2014

## Mongolia (NPC: Dr. Enhbat Uchralbuyan)

Mongolia has sent two participants to the RTC #3, and they are **planning a national seminar** of 3D-IGBT for cervical cancer. **National Project Concept** of IAEA TC project that titled “To improve Brachytherapy Quality Assurance Through Introducing 3D Image-Guided Brachytherapy Service in Mongolia” in 2016-2017 was completed. This Project was **approved** by IAEA. Therefore 3D IGBT is expected to be started in the near future.

## Korea (NPC: Mr. Won Il Jang)

The Korean Society for Radiation Oncology (KOSRO) organized the **annual conference** in Seoul from 16 to 10 Oct 2014. **Academic exchanges and discussion** related to 3D Image Guided Brachytherapy Services were at the conference and Japan’s contribution was introduced. KIRAMS is planning to **provide radiotherapy fellowships** for Asian countries in 2015. During fellowships at KIRAMS, they intend to dissemination of knowledge from this project in the Asian-Pacific region.

# National Activities in 2014

## Philippines (NPC: Miriam Calaguas)

The first **National Training Course** on Image Guided Brachytherapy for cervical cancer was held in Jose R. Reyes Memorial Medical Center on December 10-12, 2014 in cooperation with the International Atomic Energy Agency (IAEA). **Experts from the IAEA**, Dr. Elena Fidarova, Dr. Umesh Mahantshetty and Dr. Daniel Berger were the distinguished teachers for the training course. A plenary session was organized during the first day which was attended by 96 participants composed of radiation oncologists, medical physicists, radiation technologists, and nurses coming from the different medical institutions and cancer centers in the Philippines. During the second day, a hands-on image guided brachytherapy with an actual cervical cancer patient was performed together with the gynecology department. During the third day, a hands-on contouring and treatment planning session was held wherein 10 treatment planning stations were available and 40 participants were able to apply what they have learned from the plenary session. The general opinion was that this NTC on IGBT was very successful. We are very grateful for the support of the IAEA specifically through the expert mission of our trainers.

# National Activities in 2014

## Pakistan (NPC: Mrs Naseem Akhtar)

Main achievements after receiving advance training by Dr Naseem Akhtar and Dr Ayesha Anees: **3D IGBT have been adopted** and patients are treated by this latest modality of treatment technique. So far 10 patients have been treated. Some technical and financial constraints are causing difficulties. Lack of equipment and huge number of patients is another issue. Many institutes participating in this project do not have CT simulators and CT compatible applicators.

## Singapore (NPC: Dr Richard Yeo)

**Two participants** from Singapore have participated in RTC #3. The **post-training course briefing** was done to the NPT, and **the RTC#4 is currently under preparation** in Singapore.

# National Activities in 2014

## Thailand (NPC: Ekkasit Tharavichitkul):

Two participants from Thailand have participated in RTC #3. All of Thai participants from the three RTCs **planned to start IGBT in their institutes** according to the capacities of the facilities. The participants of the 2nd RTC presented the contents/experiences of RTC in the **mid-year THASTRO Meeting** on 4th October 2014 at Rajavithi hospital. The participants of RTC#3 will present their experiences in future Meeting.

# Planned Activities in 2015

1. RAS6062 IAEA/RCA #4 Regional Training Course

Date: March 23-27, 2015

Venue: National University of Singapore;  
National University Hospital

Coordinator: CHOO, Bok Ai

2. Final Review Meeting

Date: November 2015

Venue: Gunma, Japan

# Summary

- The regional activities of the project has been implemented as planned: Meetings, RTCs, the development of guideline.
- The national project teams are making efforts to implement the project at the national level with different degrees of completion.