The 15th Annual Scientific Meeting 1-3 March 2024, Trang, Thailand "Advanced Medical Physics Improves Patient Outcomes"

Thai Medical Physicist Society

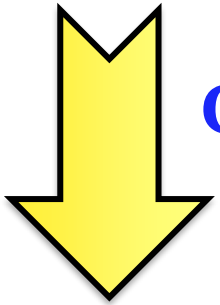
Clinically Qualified Medical Physicist in Thailand

(specializing in Radiation Oncology: ROMP)

Anchali Krisanachinda
Taweap Sanghangthum
Puangpen Tangboonduangjit

Radiation Oncology Medical Physicists (ROMPs)

ROMPs are medical physics residents in the radiotherapy field and joining the IAEA clinical training program



Graduated

Clinically Qualified Medical Physicist (CQMP)

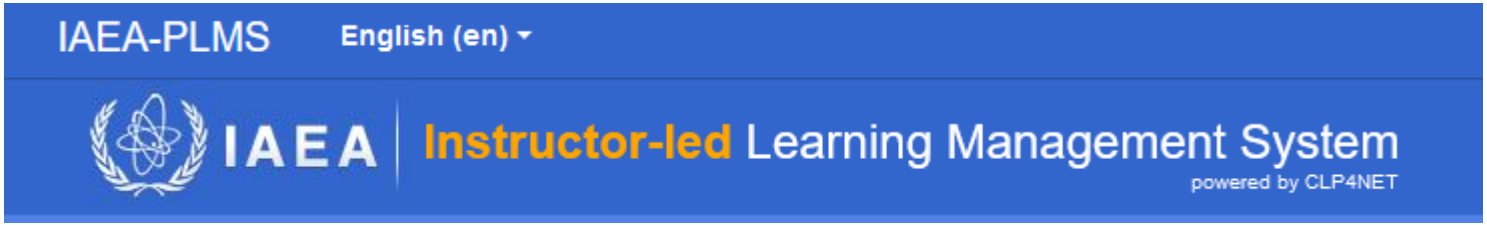
Clinical Training in Thailand

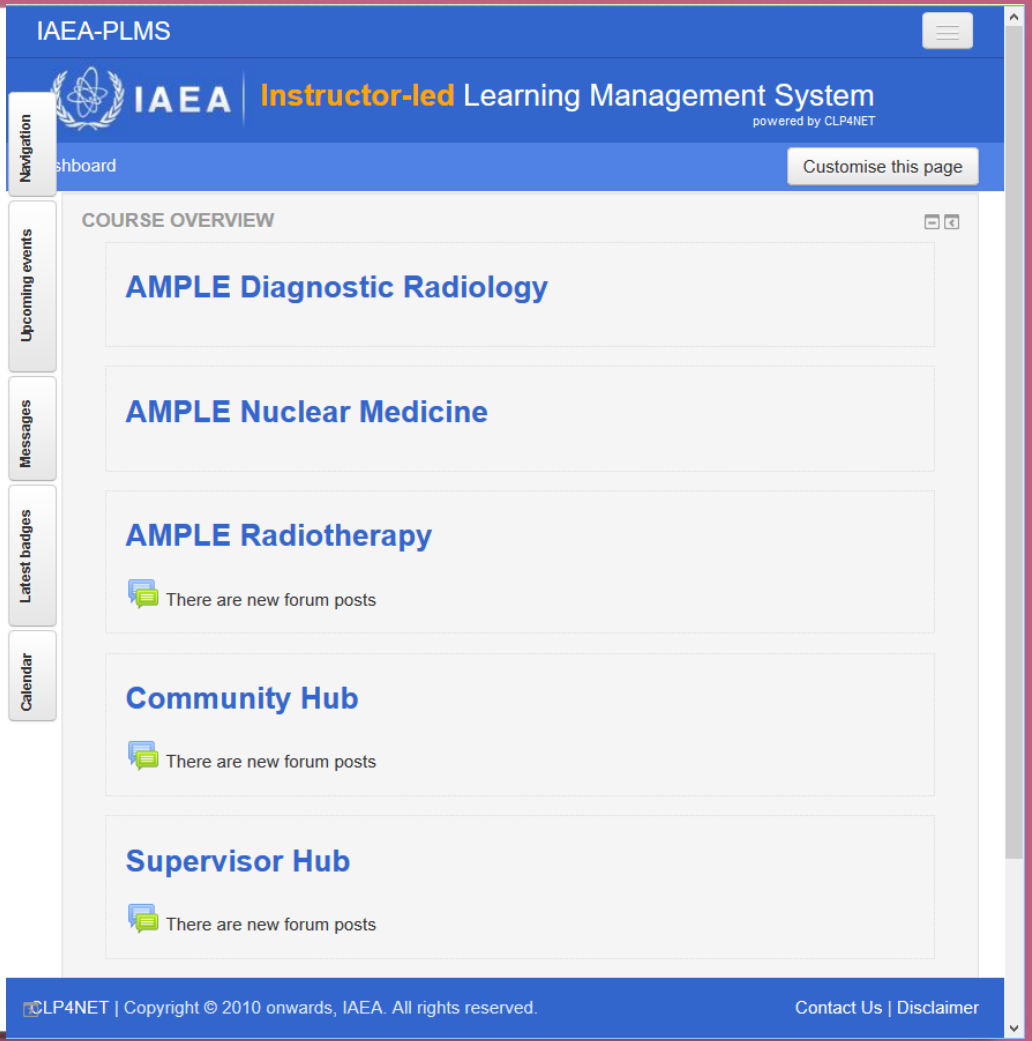
- IAEA RCA / RAS 6038 (paper-based)
- IAEA RCA / RAS 6077 (start using AMPLE)
- IAEA RCA / RAS 6087 (almost fully used AMPLE)
- IAEA RCA / RAS 6101 (expected fully used AMPLE)

IAEA Project RAS 6101: Improving the Quality and Safety of Radiation Medicine through Medical Physicist Education and Training (RCA)
Clinical Training Orientation Program: E-learning in clinical training of medical physicists in diagnostic radiology, radiation oncology and nuclear medicine.

AMPLE = Advanced Medical Physics Learning Environment

- Online learning management system for clinical training
- Based on IAEA Clinical Training Guides
- Covers diagnostic radiology, nuclear medicine and radiotherapy
- Hosted by the IAEA
- Thailand: 2-Yr Program (IAEA-TMPS)




IAEA-PLMS
IAEA
Instructor-led Learning Management System
powered by CLP4NET
Navigation
Upcoming events
Messages
Latest badges
Calendar
shboard
Customise this page
COURSE OVERVIEW
AMPLE Diagnostic Radiology
AMPLE Nuclear Medicine
AMPLE Radiotherapy
There are new forum posts
Community Hub
There are new forum posts
Supervisor Hub
There are new forum posts
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NAVIGATION

Dashboard
- Site home
- Site pages
- Current course
  - AMPLE-DR
    - Participants
    - Badges
    - General
    - Communication, forms and guides
    - Portfolio
    - Assessment
    - Module 1: Clinical Awareness
    - Module 2: Radiation Protection and Safety
    - Module 3: Research, Development and Teaching
    - Module 4: Professionalism and Communication
    - Module 5: Performance Testing of Imaging Equipment
    - Module 6: Technology Management
    - Module 7: Dosimetry, Instrumentation and Calibration
    - Module 8: Patient Dose Audit
    - Module 9: Image Quality Assessment
    - Module 10: Optimization
    - Thailand Workshop 2016

AMPLE - DR

Clinical Training of Medical Physicists specializing in Diagnostic Radiology

▶ Open all ▼ Close all

▼ Communication, forms and guides

Announcements

Forms

Handbooks & Guides

DR- Community Discussion Board

This forum or discussion board is for communication and collaboration with all peers regarding Diagnostic Radiology. It is NOT restricted by country.

Thailand- Discussion Board

Available to all Residents and Supervisors based in Thailand (and those supervised by Thai Supervisors) and the National Program Coordinator for Thailand.

Shared (Unofficial) Resources

ADMINISTRATION

- Course administration
  - Grades
  - Competencies

RESIDENT REPORTS

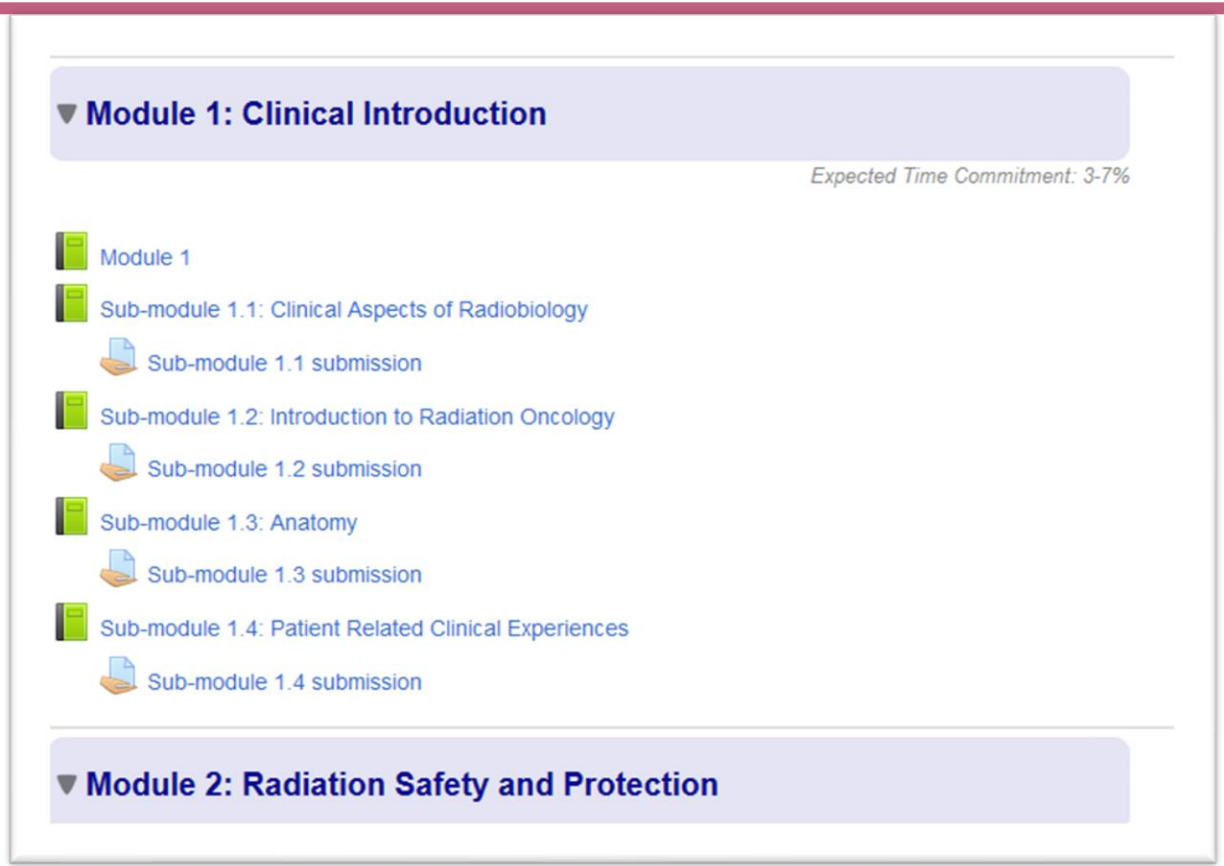
My course progress overview gives a high level overview of your progress in clinical training.

My submissions shows detailed information about your submissions in each sub-module, including the date of submission and your current grade.

ROMP Clinical Training

- Module 1: Clinical Introduction (Chulalongkorn)
- Module 2: Radiation Safety and Protection (Chulabhorn)
- Module 3: Radiation Dosimetry for EBT (Ramathibodi)
- Module 4: Radiation Therapy External Beam (Siriraj)
- Module 5: External Beam Treatment Planning (Chulalongkorn)
- Module 6: Brachytherapy (Chulabhorn)
- Module 7: Professional Studies and QM (Ramathibodi)
- Module 8: Research, Development and Teaching (Siriraj)

Sub-modules from Clinical Training Guides



Overview of sub-modules

TABLE OF CONTENTS

Sub-module 1.2: Introduction to Radiation Oncology

Overview

Objective: To develop a basic understanding of cancer disease and the use of radiation oncology.

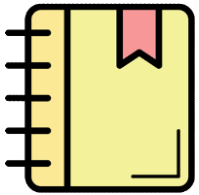
Competency Addressed: A basic understanding of cancer and radiation oncology suitable for medical physicists.

Recommended Items of Training:

- Role of RT in cancer treatment (vs. other modalities)
  - Aim of radiotherapy
  - Tissue tolerances
  - Required accuracy
  - Therapeutic gain
  - Palliative vs. curative
  - Clinical "target"
- Cancer disease and radiation oncology
  - Demonstrate an understanding of the nature and effects of a tumour on an organ and its function.

Learning resources

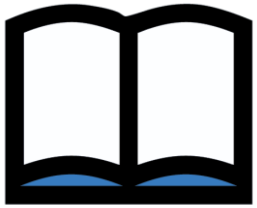
E-learning module (interactive)



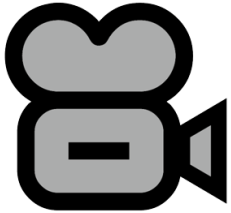
Instruction manual

Journal article

Code of practice, protocol



Textbook



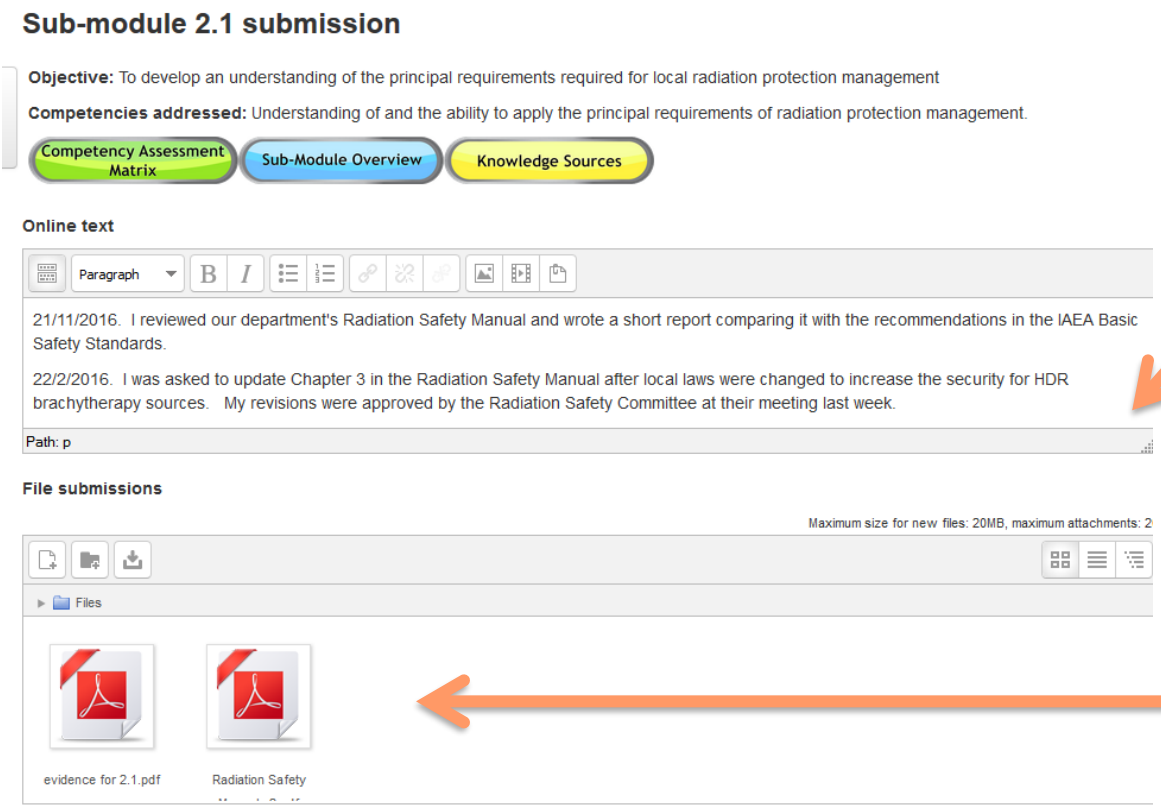
Video

Presentation with audio

Website

Slide set without audio

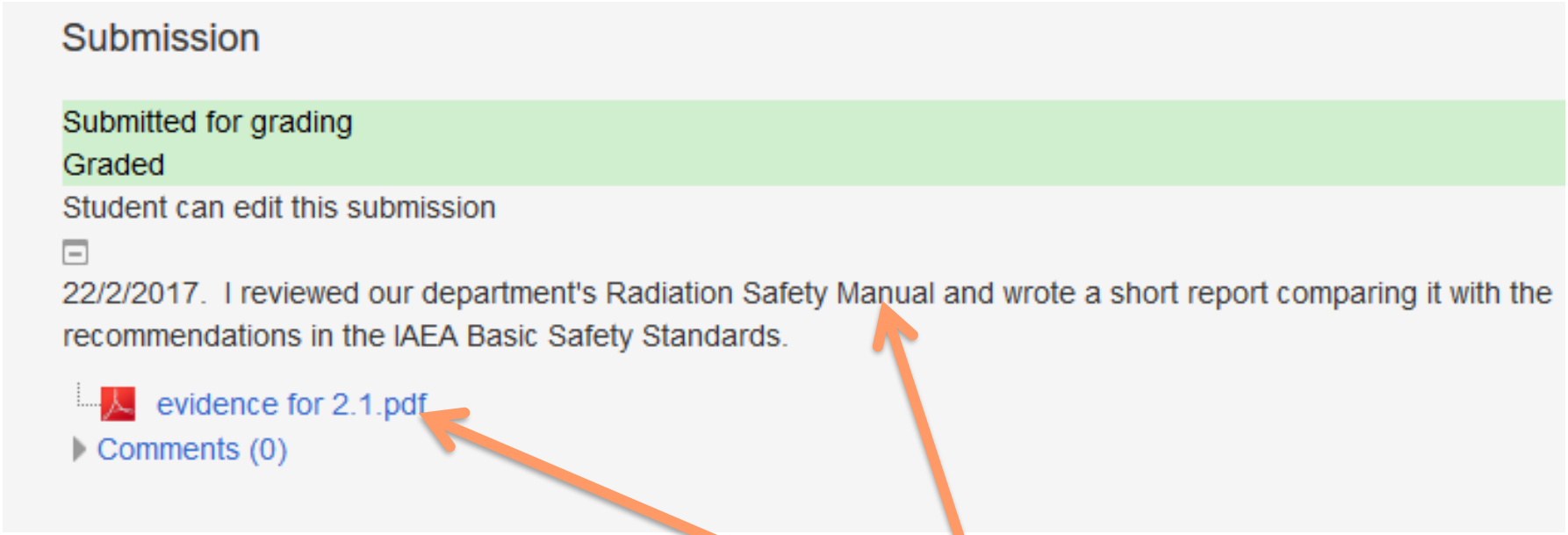
Resident submission of work



Use text box to describe training experience and work completed.

Upload files

Supervisor grading of work



Look at resident's submission, both text and files

Supervisor grading of work

Grade:

Understanding of and the ability to apply the principal requirements of radiation protection management.	Not Assessed/ Not Competent	Demonstrates a basic understanding of the local QA programme for radiation protection and is able to compare this with international standards.	Demonstrates a good understanding of the local QA programme for radiation protection. Has limited ability to interpret the relevant legislative requirements.	Demonstrates a good understanding of the local QA programme for radiation protection. Has the ability to interpret the relevant legislative requirements. Requires guidance with more difficult concepts.	Demonstrates an excellent understanding of the local QA programme for radiation protection. Has the ability to interpret the relevant legislative requirements including the more difficult concepts.	Is capable of independent assessment of the requirements of a radiation protection management plan.

Current grade

New grade

Submission and grading may be repeated several times as residents progress through training

ROMP Clinical Training in Thailand

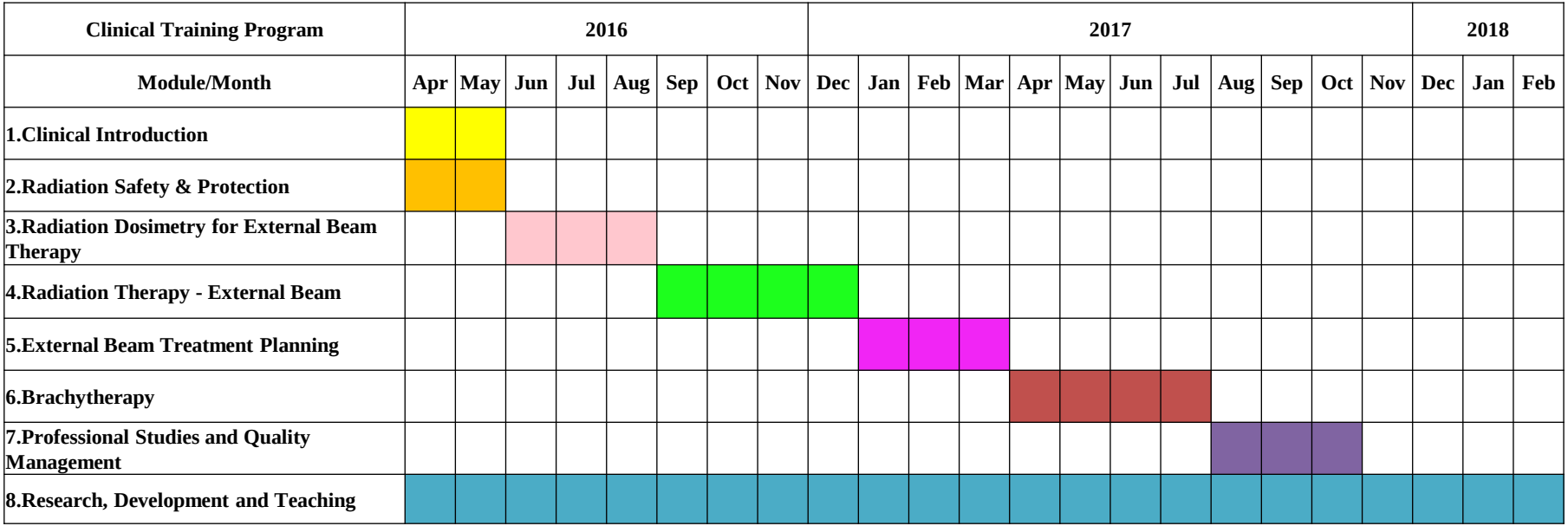
	ROMP#1	ROMP#2	ROMP#3	ROMP#4
Year of enrolment	2007	2016	2018	2023
No. Residents (apply)	12	19*	21$	24#
Year completed	2009	2018	2021	
No. Residents (graduated)	10	15	14	

*1 Vietnamese (withdrawn), 1 Myanmar

$1 Laos, 1 Myanmar, 1 Bhutan

#3 Cambodia, 7 Myanmar

ROMP Clinical Training Program



Module 1 & 5 : Chulalongkorn
Module 2 & 6 : Chulabhorn
Module 3 & 7 : Ramathibodi
Module 4 & 8 : Siriraj

NMMP Clinical Training Program

Clinical Training Program	2016										2017												2018	
Module/Month	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb
1.Clinical Awareness (3M)																								
2.Radiation Protection(6M)																								
3.Research,Development &Teaching (21M)																								
4.Prof Development & Management (4M)																								
5.Equipment Procurement, Acceptance Testing & Commissioning(21m)																								
6.Radioactivity Measurement & Internal Dosimetry																								
7. QC of NM Equipment																								
8. Radinuclide Therapy																								
9. Clinical Computing & Networking																								
10. Clinical Application																								
11. Preparation & QC of RPh																								
Total number of Modules/month	2	3	3	5	3	4	5	3	3	3	4	4	4	4	4	4	4	4	5	5	4	5	4	3

DRMP Clinical Training Program

Module/Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1.Clinical Awareness (3M)																								
2.Radiation Protection & Safety(6M)																								
3.Research,Development&Teaching (6M)																								
4.Professionalism & Communication (3M)																								
5.Performance Testing of Imaging Equipment(19M)																								
6.Technology Management (19M)																								
7.Dosimetry,Instrumentation&Calibration(5M)																								
8.Patient Dose Audit (6M)																								
9.Image Quality Assessment (8M)																								
10.Optimization (9M)																								
Total number of Modules/month	2	3	5	4	4	4	3	3	3	3	3	3	4	4	4	4	4	4	5	5	4	2	2	2

Clinical Training Programme in Radiation Oncology Medical Physics (ROMP IV)

Module 1-8 (2023-2025)

Module	Date	Task	Tutor	Place
	29 Apr 23	ROMP/DRMP/NMMP Orientation	Dr.Anchali	Chulalongkorn Hospital
1 (Clinical Introduction)	20 May 23	09.00-09.15: ROMP Orientation 09.15-11.30: Lecture Clinical in Radiation Oncology 13.00-15.00: Lecture Radiobiology	A.Chumpot Dr.Kanjana Dr.Danupol	Chulalongkorn Hospital
2 (Radiation Protection)	24 Jun 23	Radiation protection and safety Presentation and discussion	A.Chirapha A.Sangutid A.Chirasak	Chulabhorn Hospital

3 (Radiation Dosimetry for EBT)	15 Jul 23	9.00-11.00: Lecture: Dosimetry QA tools (Detectors & Check source) 11.00-12.00: Demonstration (P)	A.Sakchai (DMSC)	Ramathibodi Hospital
		13.00-16.00: Presentation and Discussion	A.Puangpen, A.Suphaluck A.Naulian A.Pimolpan, A.Daranee	
	19 Aug 23	Demonstrate Water tank setup, beam scanning	A.Puangpen, A.Suphaluck	
	20 Aug 23	Photon/ Electron dose calibration (P)	A.Naulian A.Pimolpan, A.Daranee	
	16 Dec 23	9.00-10.00: Discussion in beam scanning & calibration 10:00-12:00 Small field dosimetry (L) 13:00-16:00 Small field dosimetry (P)`	A.Sivalee A.Taweap A.Mananchaya	Chulalongkorn Hospital

8 (Research) 3 (Radiation Dosimetry For EBT)	20 Jan 24	9.00-12.00: Research Methodology 13.00-16.00: Discussion on dose measurement in small field presentation	Dr.Todsaporn A.Sivalee A.Taweap A.Mananchaya	Chulalongkorn Hospital
3 (Radiation Dosimetry for EBT)	16 Mar 24	Imaging dosimetry: AAPM TG-180 (L+P)	A.Sivalee A.Mintra A.Mananchaya A.Puangpen	Chulalongkorn Hospital
	~~18 May 24~~ 17 Mar 24	Proton absolute dose calibration (L+P)	A.Isra A.Sirinya A.Mintra	Chulalongkorn Hospital

4 (Radiation Therapy-External beam)	15 Jun 24	9.00-12.00: Radiation therapy machines-acceptance test, commissioning, and QA 13.00-15.00: Image registration	A.Chumpot A.Siwadol A.Tanwiwat	Siriraj Hospital
	13 Jul 24	Machine QA (P)/ Imaging QA (P)	A.Chumpot & Siriraj Staff	
5 (External beam treatment planning)	21 Sep 24	9.00-12.00: Presentation and discussion in treatment planning, acceptance test and commissioning 13.00-16.00: Discussion in patient specific QA (local)	A.Sivalee A.Taweap A.Mintra	Chulalongkorn Hospital
8 (Research)	9 Nov 24	Submit Proposal to all Supervisors	All Supervisors	
	16-17 Nov 24	Research Proposal presentation	All Supervisors	Chulalongkorn Hospital

6 (Brachytherapy)	21 Dec 24	Brachytherapy calibration (L+P)	A.Chirapha A.Sangutid A.Chirasak	Chulabhorn Hospital
7 (Professional study & QM	16 Jan 25	9:00-12.00: FMEA 13.00-16.00: Setting up new RT department	A.Saiful Huq A.Puangpen	Ramathibodi Hospital

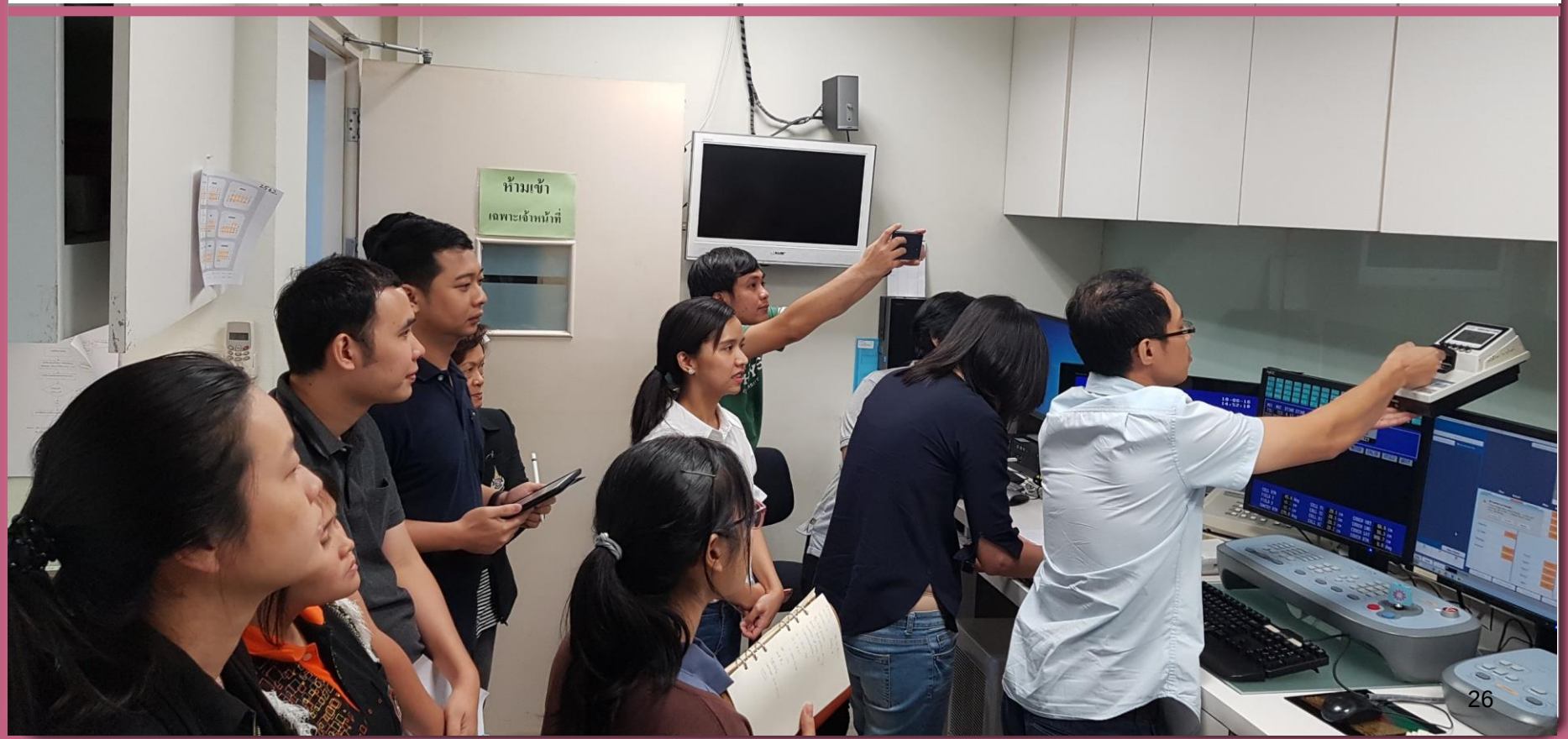
All Modules	15-16 Mar 25	ROMP Presentation	All Supervisors	Chulabhorn Hospital
Modules 2-6	23 Apr 25	Written Exam	All Supervisors	Chulalongkorn Hospital
All Modules	24-25 Apr 25	Oral Exam by IAEA Expert	All Supervisors	Chulalongkorn Hospital
All Modules	26-27 Apr 25	Practical Exam by IAEA Expert	All Supervisors	

ROMP #4 Orientation

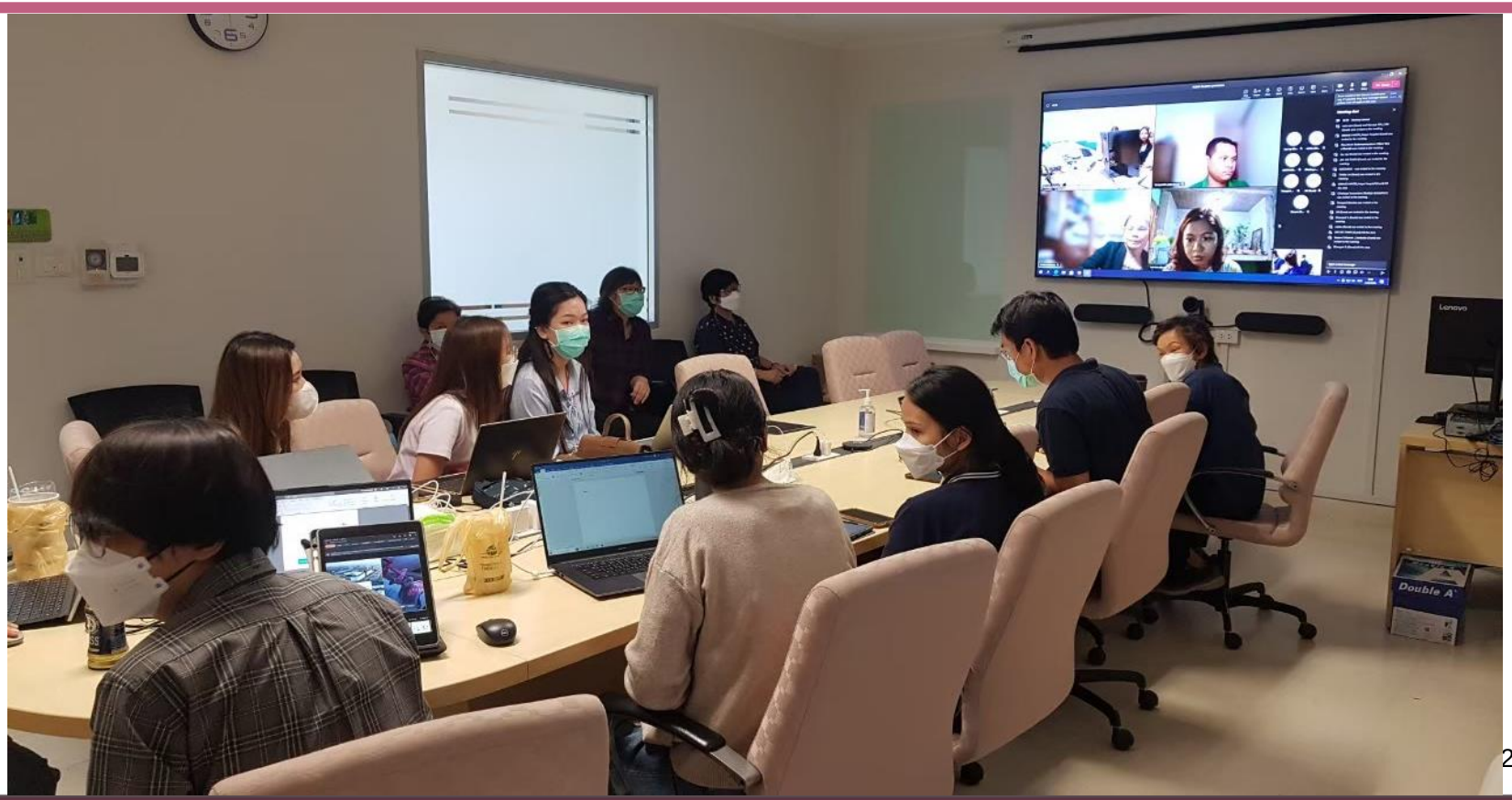
ROMP#4 Module 1

Lecture by Radiobiologist, Radiation Oncologist

Module 2



Module 2

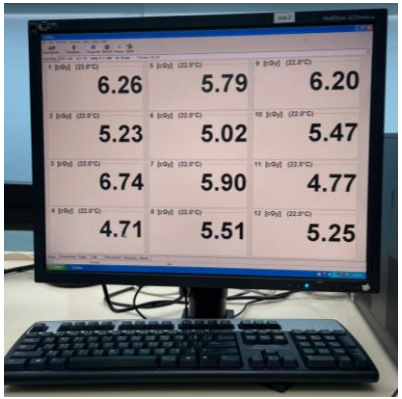


Module 3

Module 3

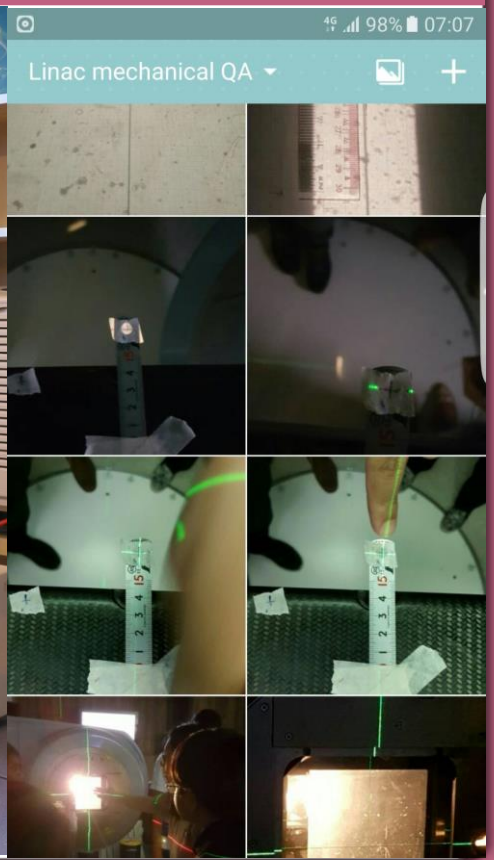
Module 3

Module 3



Module 4

Module 4



Module 4

Module 4

Module 7

Safety and Quality in Radiotherapy

IAEA E-learning program

REVIEW "PREVENTION OF ACCIDENTS AND INCIDENTS IN RADIOTHERAPY"

6-10 AUG 2018

ORGANIZED BY IAEA/ARGONNE USA

Failure Modes and Effects Analysis (FMEA)

Module 8

Research methodology
for
Medical Physicists

Jiraporn Setakornnukul, M.D.

Evaluation

Research Presentation

Written Exam

Publication

Practical

Oral

Port Folio

Assessment

Competency assessment

- Six month progress report
- Assignments
- Port Folio
- Final assessment
  - Written Examination (local supervisors)
  - Oral Examination (IAEA expert + local supervisors)
  - Practical Examination (IAEA expert + local supervisors)
- Research Presentation
- Publication

Competency Assessment

Thailand's minimum competency

3.2: Dosimetry operations using other methods

Competency	Level of Competency Achieved				
	5	4	3	2	1
Capable of performing dose measurements in radiotherapy beams using a range of dosimeters.	Demonstrates a **limited understanding of the physical principles of appropriate dosimeters** (e.g. TLDs, film or solid state dosimeters)	Demonstrates a **good understanding** of the physical principles of appropriate dosimeters. **Able to use available dosimeters** to perform dose measurements **with supervision.**	Demonstrates a good understanding of the physical principles of appropriate dosimeters. Able to perform dose measurements **without supervision** but **results require checking.**	Demonstrates a good understanding of the physical principles of appropriate dosimeters. **Able to perform dose measurements without supervision**. Makes only **minor errors** which **have no clinical significance**.	Demonstrates a good understanding of the physical principles of appropriate dosimeters. **Able to perform dose measurements to an acceptable clinical standard without supervision**.

3.3: Absolute absorbed dose measurements

Competency	Level of Competency Achieved				
	5	4	3	2	1
Capable to perform absorbed dose determination in external beam radiotherapy	Demonstrates a **limited understanding of the calibration** of ionisation chambers.	Demonstrates a **good understanding** of the calibration of ionisation chambers. **Able to calibrate** ionisation chambers **with supervision**.	Demonstrates a good understanding of the calibration of ionisation chambers. Able to calibrate ionisation chambers **without supervision**. **Results require checking**.	Demonstrates a good understanding of the calibration of ionisation chambers. Able to calibrate ionisation chambers without supervision. **Makes only minor errors** which have	Demonstrates a good understanding of the calibration of ionisation chambers. **Able to calibrate ionisation chambers to an acceptable clinical standard without**

Competency Assessment

4.5: Quality Assurance of External Beam Equipment III – Commissioning

Thailand's minimum competency

a. Orthovoltage therapy unit

Competency a	**Level of Competency Achieved**				
	5	**4**	**3**	**2**	**1**
Ability to design and perform quality control of an orthovoltage therapy unit.	Demonstrates a **limited understanding** of the variety of **tests, equipment, tolerance and action levels** used in the quality control of an orthovoltage unit:	Demonstrates a **good understanding** of the variety of tests, equipment, tolerance and action levels used in the quality control of an orthovoltage unit:	Demonstrates a **good understanding** of the variety of tests, equipment, tolerance and action levels used in the quality control of an orthovoltage unit. **Able to design and perform quality control tests with supervision. Makes significant errors.**	Able to perform the quality control tests **with supervision.** Makes **only minor errors.**	Able to **independently perform** the quality control tests **without supervision** and to **an acceptable standard.**

b. **Megavoltage therapy unit**

Competency b	**Level of Competency Achieved**				
	5	**4**	**3**	**2**	**1**
ability to design and perform quality control of a megavoltage therapy unit.	Demonstrates a **limited understanding** of the variety of **tests, equipment, tolerance and action levels** used in the quality control of a megavoltage unit:	Demonstrates a **good understanding** of the variety of tests, equipment, tolerance and action levels used in the quality control of a megavoltage unit:	Demonstrates a **good understanding** of the variety of tests, equipment, tolerance and action levels used in the quality control of a megavoltage unit. **Able to design and perform quality control tests with supervision. Makes significant errors.**	Able to perform the quality control tests **with supervision.** Makes **only minor errors.**	Able to **independently perform** the quality control tests **without supervision** and to **an acceptable standard.**

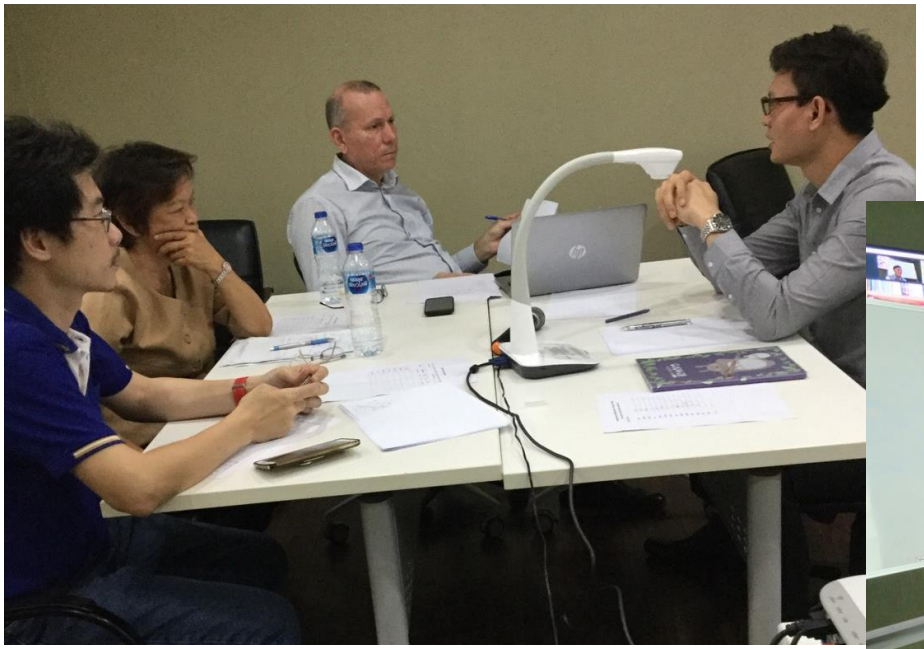
Proposal

ROPM Proposal Program

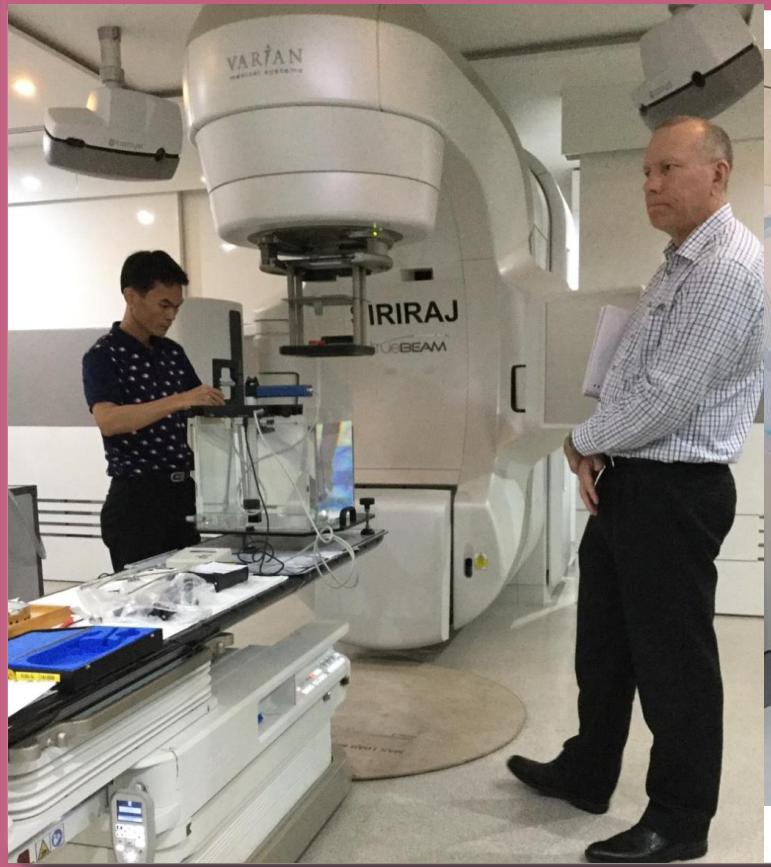
Time	Topics	Resident
08:15-08:45	The plan quality improvement using an integration of biological optimization and evaluation for prostate cancer	Tanwiwat Jaikuna
08:45-09:15	Comparison of manual reconstruction and applicator library in MRI 3D image-based dose planning of gynecological bra	Sakda Kingkaew
09:15-09:45	Dosimetic evaluation of photon beam-matching for two similar linear accelerators	Kanogpan Prasartvit
09:45-10:00	**Break**	
10:00-10:30	The accuracy of Monte Carlo dose calculation algorithm used in Cyberknife system	Rachawadee Trinate
10:30-11:00	Evaluation of detectors on relative dosimetric measurement for cyberknife M6 system	Wisawa Phongprapun
11:00-11:30	Acceptance test and commissioning of Tomotherapy Radixact X5 series at LBCH	Chonlathorn Pihusut
11:30-12:00	Effects of the pitch parameter on tomotherapy plan quality in head and neck cancer	Patchareewan Khadsiri
12:00-13:00	**Lunch**	
13:00-13:30	A dosimetric comparison of portal dosimetry and ArcCheck devices for patient specific VMAT QA	Kananan Utitsarn
13:30-14:00	Dosimetric comparison between 3D and IMRT treatment techniques for whole breast radiotherapy	Yin Yin Pyone
14:00-14:30	Determination of field output correction factor in elongated small fields	Mananchaya Vimolnoch
14:30-14:15	Influence of small field output factors on the dose accuracy of AAA and Acuros XB algorithms in SBRT	Supakiet Piasanthia
14:15-14:45	**Break**	
14:45-15:15	Influence of tissue heterogeneities in Monaco treatment planning system	Viphaphone Inphavong
15:15-15:45	Evaluation of Mobius and Portal dosimetry QA tools for IMRT and VMAT plans	Chulee Vannavijit
15:45-16:15	Dosimetric comparison of VMAT and IMPT in liver tumor	Mintra Keawsamur
16:15-16:45	A prediction of IMRT/VMAT quality assurance in head and neck using machine learning	Cheewarak Rodniam

Written Exam

Oral Exam



Practical Exam



Challenges

- No residency program (AMPLE can fullfill)
- Fully use AMPLE
- Lack of experience for clinical practice (remote centers)
- Busy in routine work
- Rapidly growth in RT centers
- High expectation from the hospital to cover MP work esp. at new center
- Lack of supervisors -> hard working
- Past students become supervisor (need experience)