CLINICAL TRAINING - MEDICAL PHYSICS

PROGRESS REPORT -01

Detailed Progress Update | 07 July – 18 August 2026

First Affiliated Hospital of Wenzhou Medical University

T.L.M. Peiris, MSc Medical Physics
Clinical Trainee(Sri Lanka)

Clinical Training Supervisor: Prof. Jin Xiance

18 August 2026

1. Purpose and Overall Progress

This report provides a detailed record of the clinical medical physics training activities completed from 7 July to 18 August 2026 at the First Affiliated Hospital of Wenzhou Medical University. It is prepared for Prof. Jin Xiance and the clinical training arrangement committee to review practical exposure, competencies developed, equipment encountered and areas where additional supervised hands-on training would be valuable.

The CT simulation rotation involved direct supervised patient setup and CT operation rather than observation-only training. LINAC training also included supervised machine operation, treatment workflow participation and QA activities within the responsibilities permitted by the clinical team.

Area	Progress
CT simulation	Extensive hands-on experience with Siemens SOMATOM go.sim and Philips Brilliance CT machines.
LINAC	Experience with Elekta Infinity, Elekta Synergy, Varian Edge and United Imaging uLinac Halos TX.
QA	Daily QA exposure and repeated Elekta Synergy weekly QA with mechanical, geometric, dosimetric and patient-specific checks.
Brachytherapy	Three clinical sessions plus five cervical brachytherapy CT Scans for adjestment of applicator.
TPS	Elekta Monaco: DICOM import, CT/MRI fusion, OAR contouring and basic cost-function planning.

2. Training Schedule (Planned)

Date日期	Activities 活动内容
2026/7/1-2026/7/15	Preparatory Training准备行培训
2026/7/16-2026/7/31	radiotherapy CT simulation 放疗模拟定位
2026/8/1-2026/8/15	image fusion 物理师图像融合
2026/8/16-2026/8/31	Treatment plan design 物理师计划设计
2026/9/1-2026/9/15	Treatment plan design 物理师计划设计
2026/9/16-2026/9/30	Treatment plan design 物理师计划设计
2026/10/1-2026/10/15	Radiotherapy quality assurance物理师质量保证
2026/10/16-2026/10/31	Radiotherapy quality assurance物理师质量保证
2026/11/1-2026/11/15	Daily positioning for radiotherapy加速器下日常摆位
2026/11/16-2026/11/30	Physicist Clinical Research 物理师临床研究
2026/12/1-2026/12/15	Physicist Clinical Research 物理师临床研究
2026/12/16-2026/12/28	Subsequent scientific research cooperation 后续科研合作

3. CT Simulation Clinical Training

Primary rotation: 7–17 July 2026. This was the strongest hands-on clinical component of the reporting period. I was directly involved in patient CT setup and image acquisition under supervision and operated the CT systems for the reported cases.

Date	Session / focus	Activities and competencies
07 Jul	CT simulation orientation	Clinical workflow, patient preparation, immobilization and positioning.
08 Jul	Immobilization	Thermoplastic mask handling, Klarity devices, reproducible positioning, skin marking and LAP laser alignment.
09 Jul	CT protocols	Protocol selection according to tumour localization; patient setup and CT acquisition/reconstruction.
10 Jul	Contrast CT	Contrast-enhanced CT workflow, injector handling and enhanced CT protocols.
13 Jul	Ultrasound	Ultrasound assessment of bladder status; continued patient setup and CT simulation.
14 Jul	4D CT / respiratory	4D CT acquisition, respiratory gating and breath-control device handling.
15 Jul	SGRT / advanced simulation	SGRT motion-management workflow and positioning for SBRT/SRS/SRT.
16 Jul	Integrated CT workflow	Immobilization, marking, laser alignment, protocol selection, acquisition and image review.
17 Jul	Rotation consolidation	Consolidated hands-on CT simulation skills and supervised patient workflow.

3.1 CT Clinical Activity Summary

Activity	Exposure
Siemens SOMATOM go.sim	149 patient CT simulation cases
Philips Brilliance	18 IGRT offline correction/repositioning cases
Cervical brachytherapy CT	5 CT cases for applicator adjustment
Reported activity total	172 activities (149 + 18 + 5; not necessarily 172 unique patients)

3.2 CT Equipment and Competencies

Equipment / system	Learning obtained
Siemens SOMATOM go.sim	Direct CT simulation operation, patient setup, protocol selection, image acquisition and advanced CT workflows.
Philips Brilliance CT	IGRT offline correction/repositioning and cervical brachytherapy CT imaging.
Klarity products	Thermoplastic masks, immobilization devices and reproducible positioning.
LAP laser system	Skin marking, patient alignment and laser positioning/adjustment.
Ultrasound scanner	Bladder-status assessment and localization support.
SGRT	Surface-guided motion-management concepts.
4D CT / respiratory gating	Respiratory-phase imaging and motion management.
Breath-control device	Patient respiratory-control workflow.
Contrast injector	Contrast-enhanced CT preparation and injection workflow.

✶ **The CT simulation teachers, nurses and brachytherapy staff were highly supportive. They explained procedures in detail, answered questions patiently and guided me through clinical workflows. Despite language/communication challenges, they made a strong effort to ensure that I understood the procedures. I am very satisfied with the teaching and support received.**



Figure 1. CT simulation workstation during the CT simulation 。



Figure 2. Patient positioning on the CT simulation table SBRT .



Figure 3. CT simulation room and scanner during a supervised patient setup and imaging session.

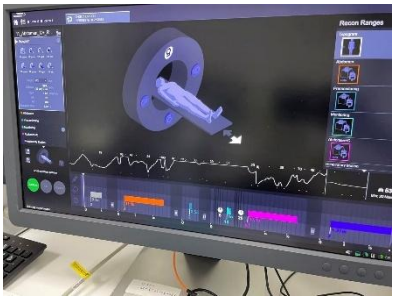


Figure 4. CT simulation interface

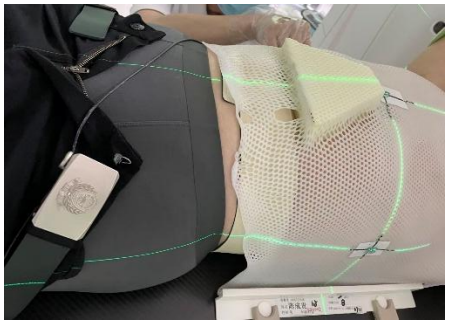


Figure 5. Thermoplastic immobilization mask and patient-positioning setup used to support reproducible radiotherapy

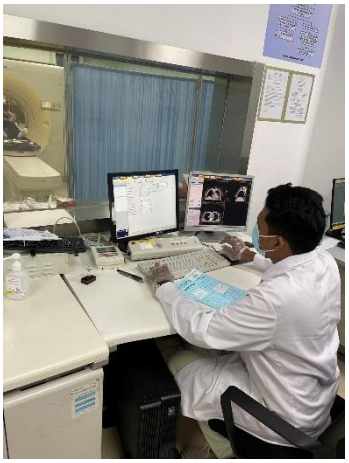


Figure 6 Philips CT Machine workstation



Figure 7. CT image-Somato go workstation showing acquired CT simulation images for clinical review.



Figure 8. Patient undergoing CT simulation with immobilization and positioning equipment in place.



Figure 9. Ultrasound Scanner



Figure 10. CT Stimulation team



Figure 11. Respiratory Gating machine



Figure 12.Contrast Medium （IOHEXO ）



Figure 13. SGRT Interface – Klarity

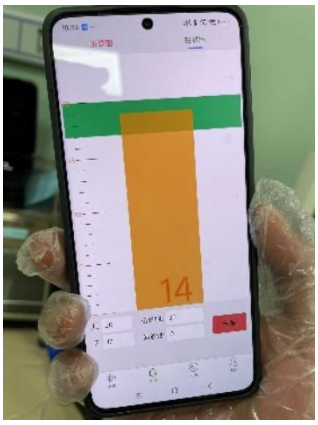


Figure 14. – Klarity breath monitoring app interface



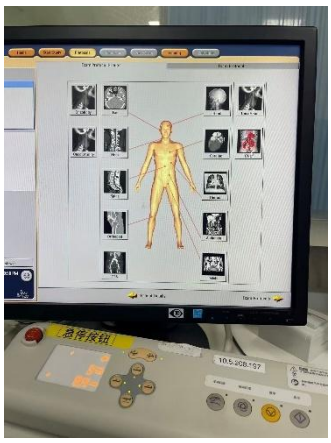




Figure 15-17. IGRT Patient position correction & verification using brilliance CT interface

4. Linear Accelerator Clinical Training

Main LINAC rotation: 20–31 July 2026, with additional United Imaging and Elekta Synergy QA sessions in August. The rotation provided multi-platform treatment, image-guidance and QA exposure.

Date	Session / focus	Activities and competencies
20 Jul	Elekta Infinity – Room 2	Daily calibration with phantom/EPID; breast VMAT, CBCT,/ MOSAIQ plan import and delivery workflow.
21 Jul	Elekta Infinity	Dynamic VMAT, CBCT, MOSAIQ workflow and MLC function.
22 Jul	Elekta Infinity	Further supervised operation; approximately 5 patient workflows; calibration-report review.
23 Jul	Elekta Synergy – Room 1	Morning daily calibration and SGRT-assisted VMAT workflow.
24 Jul	United Imaging uLinac Halos TX – Room 5	Calibration/introduction session.
25 Jul	Varian Edge – Room 3	Dynamic IMRT, SRT, SBRT and CBCT image guidance.
26 Jul	Elekta Synergy weekly QA	Laser, gantry, MLC, isocentre, water-phantom dose calibration, 2D beam check and ~40 patient-specific 3D RayDose checks.
27 Jul	Varian / multi-room	CBCT and clearance-override function introduced; treatment not independently delivered for this activity.
28 Jul	Varian Edge	Machine/application details: ~2400 MU/min specification as presented, 2.5 mm precision specification; SRS/SBRT/IGRT/VMAT/IMRT.
29 Jul	Varian Edge	Continued high-precision treatment and image-guidance learning.
30 Jul	Varian Edge daily QA	Participated in morning daily QA.
31 Jul	Elekta Infinity – Room 2	Supervised machine operation and approximately 18 patient treatment workflows.
31 Jul	Advanced cases	SRS 1 patient, DIBH 1 patient and SBRT 2 patients after 16:30.
04 Aug	United Imaging uLinac Halos TX	Second calibration/introduction session.
14 Aug	United Imaging uLinac Halos TX	Third calibration/introduction session.
16 Aug	Elekta Synergy weekly QA	Repeated weekly QA; approximately 45 patient-specific 3D RayDose dose-QA cases.

4.1 LINAC Treatment Techniques

- VMAT / dynamic VMAT
- Dynamic/Static IMRT
- SRS
- SRT
- SBRT
- DIBH Treatments
- CBCT-guided IGRT
- SGRT-assisted treatment
- MOSAIQ treatment-plan import
- MLC function
- Machine safety/interlock concepts

4.2 LINAC QA Experience

QA area	Experience
Daily QA	Participated in daily calibration/QA workflows on Elekta and Varian systems.
Mechanical/geometric QA	Laser/light, gantry angle, MLC angle and isocentre checks.
Dosimetric QA	Water-phantom dose calibration and 2D flat-panel beam/dose checking.
Patient-specific QA	3D RayDose equipment; approximately 40 cases on 26 Jul and 45 cases on 16 Aug.
United Imaging	Three calibration/introduction sessions: 24 Jul, 04 Aug and 14 Aug.

I would like to obtain substantially more hands-on experience in routine LINAC treatment, patient setup and verification, CBCT-guided positioning, treatment delivery, daily QA and weekly QA. Repeated supervised participation would help me develop stronger practical confidence, consistency and independent verification skills.



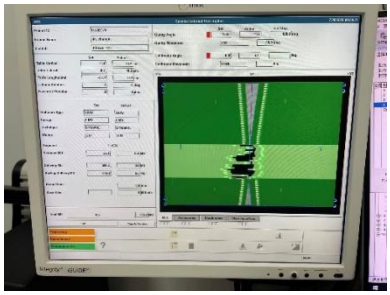
Elekta Synergy Linac



Linac Control room- Elekta



Elekta Infinity Linac



Elekta Synergy Linac interface



Elekta Synergy Linac -CBCT Unit



Elekta Synergy Linac-Couch Control

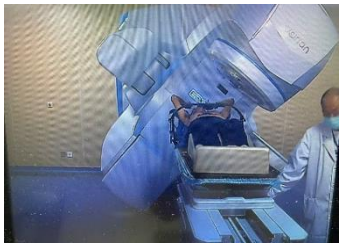


Elekta Synergy Linac – Phantom



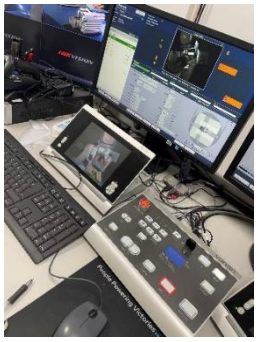
Elekta Synergy Linac- EPID







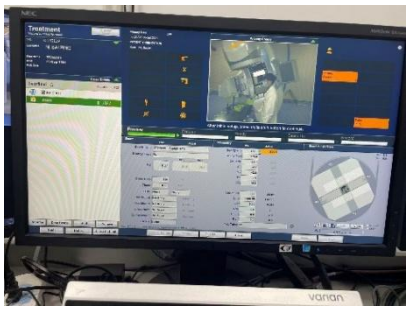
Varian Edge Linac



Varian Edge -Work station



Varian Edge- Control Panel



Varian Edge- Interface



Varian Edge- CBCT Unit

United Imagine – ULinac Machine







United Imagine – ULinac Machine Interface



United Imagine Body Phantom

5. Brachytherapy Clinical Training

Brachytherapy exposure has been obtained through multiple clinical sessions and CT imaging for cervical cancer brachytherapy applicator adjustment.

Date	Session / focus	Activities and competencies
23 Jul	Brachytherapy session 1	Applicator use, treatment workflow, physician contouring, Varian TPS planning and source/applicator dose delivery.
13 Aug	Brachytherapy session 2	Continued clinical brachytherapy workflow and planning exposure.
18 Aug	Brachytherapy session 3	Continued workflow learning and identification of further hands-on planning needs.
07–17 Jul	Brachytherapy-related CT	5 cervical cancer CT cases for applicator adjustment using Philips Brilliance CT.

5.1 Further Hands-on Brachytherapy Need

The sessions have introduced the complete clinical pathway, including applicator use, treatment workflow, physician contouring, treatment planning using a Varian TPS and source/applicator dose delivery. I would like substantially more hands-on experience in brachytherapy TPS, applicator reconstruction, image registration, contour review, optimization, dose evaluation, plan checking and QA.



Figure 11. HDR brachytherapy transfer tubes/catheter connections attached to the afterloading system, illustrating the channel connections used for source delivery.



Figure 12. Labeled brachytherapy transfer tubes and applicator-channel components used in the HDR treatment workflow.



Figure 13. GammaMedplus iX HDR brachytherapy afterloader with multiple connected transfer tubes ready for the treatment workflow.

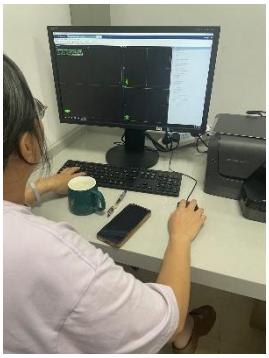


Figure 14. Brachytherapy planning workstation showing the treatment-planning environment used for CT-based applicator and dose-planning work.

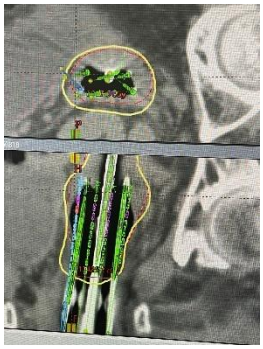


Figure 15. CT-based brachytherapy plan view showing reconstructed applicator channels, target/OAR contours and the planned dose distribution.

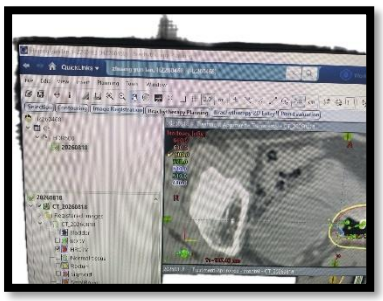


Figure 16. Brachytherapy treatment-planning interface displaying isodose distributions and contoured structures for plan evaluation.

6. Treatment Planning System Training

TPS training began on 3 August 2026, initially using Elekta Monaco. The rotation is connecting my previous CT, image-guidance, treatment-delivery and QA experience with treatment planning and optimization.

Date	Session / focus	Activities and competencies
03 Aug	Monaco introduction	Started Elekta Monaco TPS rotation and planning environment.
04 Aug	DICOM import	Imported/reviewed CT datasets in Monaco.
05 Aug	Image preparation	Continued CT dataset preparation and planning workflow.
06 Aug	CT/MRI fusion	Image fusion/registration using CT and MRI.
07 Aug	Contouring	OAR identification and contouring practice.
10 Aug	Structure review	Continued contouring and planning preparation.
11 Aug	Basic planning	Simple treatment plan creation using Monaco cost functions.
12 Aug	Optimization concepts	Continued plan construction and review of cost-function/optimization concepts.
13 Aug	TPS + brachytherapy	Continued Monaco learning and brachytherapy session 2.
14 Aug	TPS + United Imaging	Continued TPS learning and United Imaging session 3.
17 Aug	Monaco planning	Continued DICOM, fusion, contouring and basic optimization.
18 Aug	Monaco + brachytherapy	Continued Monaco training and brachytherapy session 3.

6.1 Monaco Skills Developed

- DICOM image import
- CT image review and preparation
- CT/MRI image fusion and registration
- OAR identification and contouring
- Target/OAR preparation for planning
- Simple plan creation using Monaco cost functions
- Initial understanding of optimization objectives
- Review and discussion of planning questions with teachers

6.2 Further TPS Hands-on Training Requested

Area	Further experience
Monaco	Complete clinical cases, optimization strategies, DVH evaluation, plan-quality improvement and supervised independent planning.
Varian Eclipse	Hands-on workflow from imaging/fusion and contours through planning, optimization and evaluation.
United Imaging TPS	Hands-on planning workflow and integration with treatment systems.
Brachytherapy TPS	Applicator reconstruction, optimization, dose evaluation, treatment-plan checking and QA.

7. Current Clinical Development

Domain	Development status	Main evidence
CT simulation	Strong practical foundation	149 SOMATOM go.sim cases plus Philips IGRT and brachytherapy CT activities.
Immobilization / positioning	Strong	Klarity, thermoplastic masks, skin marking and LAP laser.
4D CT / motion management	Developing	4D CT, respiratory gating, SGRT and breath-control.
LINAC treatment	Developing	Multiple machines and supervised treatment workflows.
LINAC QA	Developing	Daily QA and repeated comprehensive weekly QA.
Brachytherapy	Early developing	Three clinical sessions plus related CT imaging.
Monaco TPS	Early developing	DICOM, fusion, contouring and basic cost-function planning.
Eclipse / United Imaging TPS	Needs more hands-on training	Further supervised clinical cases required.

8. Appreciation of Clinical Teaching

I sincerely thank Prof. Jin Xiance and all medical physicists, **radiation oncologists, radiation therapists, CT staff, nurses and teachers who have supported my training.** The teachers have been very helpful and have taught me during actual clinical workflows. They have answered my questions and explained machine operation, patient setup, treatment delivery and QA in detail. Even with language differences, they have made a strong effort to teach me clearly. I am very satisfied with the teaching environment and the support provided by all sections.

9. Request for Continued Hands-on Clinical Training

- More supervised LINAC treatment sessions, including patient setup, image guidance, verification and treatment delivery.
- More regular participation in daily LINAC QA.
- More regular participation in weekly LINAC QA.
- More hands-on brachytherapy treatment-planning and medical physics activities.
- More Monaco planning and optimization cases.
- Hands-on training with Varian Eclipse TPS.
- Hands-on training with United Imaging TPS/workflows.
- Additional VMAT, IMRT, SRS, SRT, SBRT and DIBH clinical exposure where appropriate.

10. Willingness to Join Clinical Research

I would like to express my strong willingness to join a small clinical medical physics research or data-based research task with the research team from next month, if an appropriate opportunity is available during my TPS training and if it is suitable for the team's clinical workload.

Under **Prof. Jin Xiance's supervision**, and in **collaboration with Teacher Aiyao** if possible, I would like to learn how clinical research questions are developed, how clinical data are collected and managed, how analysis is performed, and how results are prepared for presentation or publication. **I would be very willing to contribute to a small, well-defined research task while continuing my TPS training.**

I believe that combining TPS clinical training with a small supervised research activity would help me develop both practical clinical medical physics competency and research skills.

10. Summery

The training from 7 July to 18 August 2026 has progressed from intensive CT simulation to multi-platform LINAC practice, QA, brachytherapy exposure and treatment planning. CT simulation has provided a strong hands-on foundation, while LINAC treatment and QA competency are continuing to develop. The TPS rotation is now connecting these clinical experiences with treatment planning and optimization. I sincerely appreciate the opportunity and look forward to continued supervised hands-on clinical practice and, if possible, participation in a small research activity with the team.