

DEVELOPING THE MEDICAL PHYSICS EDUCATION AND TRAINING PROGRAMME IN VIET NAM

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Abstract— This paper presents the recent activities and successes of developing education and training programme in medical physics in Viet Nam. The country has suffered from shortage of medical physicists in terms of quantity and quality for many years. This is because of the lack of a formal education and training programme for medical physics meeting the international requirements. Fully aware of this situation, Nguyen Tat Thanh University (NTTU), national counterpart of IAEA’s Technical Cooperation project VIE6030 “Developing an education and training programme for medical physics”, has built several medical physics education programmes based on the IAEA TCS 56 to meet national demand. One of these programme is the first formal education programme in medical physics in Viet Nam.

Keywords— Medical physics, education and training, IAEA TC Project VIE 6030, Viet Nam

I. INTRODUCTION

It has been more than 20 years since the first cobalt-60 teletherapy unit was installed in Viet Nam. This was marking the first demand of medical physics profession in the country. Unfortunately, until now not only the governmental recognition of roles and responsibilities of medical physicists does not exist, but also the education and training programme in medical physics for healthcare is still not well established.

Fully realizing the danger due to the absence of a standard education and training programme for medical physics in the era of rapidly changing in technology innovation, Nguyen Tat Thanh university (NTTU) has started to address these issues since 2015. Under the support from the International Atomic Energy Agency (IAEA)’s technical cooperation (TC) project VIE6030, the works of NTTU in this area has borne the first fruits in the last few years.

In 2015, Viet Nam had a total of 47 radiotherapy treatment devices, 6049 X-ray machines including conventional radiography, CT, angiography and 32 nuclear medicine departments to serve a population of 95.54 million. There are only 105 so called “medical physicists” [1], most of them are now working in radiotherapy departments. By 2018, the number of devices have been drastically increased while the rise of medical physicists is still limited. Moreover, among this employees, there are only less than 10 of medical physicists who graduated from dedicated academic programmes for medical physics abroad. The lack of such qualified personnel in Viet Nam

currently has detrimented the development of medical physics profession in patient care for a very long time.

As reported in [2][3], before 2018 almost all of “medical physicists” working in radiotherapy department have gained their knowledge via various undergraduate and master programmes, which are essentially physics courses with a few credits on application of radiation in medicine – so called “medical physics orientation”. The provided knowledge hardly satisfies the solid background knowledge requirements for medical physics, which were recommended in the IAEA document TCS 56 [4]. In 2015, the national workshop on “The roles and responsibilities of medical physicists and its training, education” was held at NTTU. The delegates from Ministry of Health, Ministry of Education and Training and Ministry of Science and Technology and Mr. Ahmed Meghzifene, Head of the Section of Dosimetry and Medical Radiation Physics – IAEA have participated in this event. The main outcome of this workshop is again to emphasise the importance of medical physics in the modern medicine, and proper education and training programme in medical physics should be developed urgently. IAEA recommended to support this issue via the TC channel.

II. IAEA TC PROJECT VIE6030

Recognizing the lack of medical physicist resource in medicine and the importance to have a standard education programme in medical physics, with an approval from the government, NTTU has been cooperating with IAEA to prepare the TC national project VIE 6030 “Developing an education and training programme for medical physics” for FY 2018-2019 . The overall objective of the project is to develop human resources in medical physics for radiation medicine and to generate a new generation of medical physicists, who will be equipped with professional knowledge to be able to enhance the effectiveness, efficiency and ensure radiation protection to meet IAEA new BSS [5]. For achieving this goal, The IAEA project VIE 6030 will provide with the following supports in:

- Expert missions.
- Train the trainers.
- Equipment for teaching purposes.

The expert missions are aimed to provide the essential evaluation and recommendation to the counterpart and various stakeholders of Viet Nam government and also to the IAEA regarding the issues addressed in the project; To

find the gaps that should be fulfilled. This will bring the great benefits guiding us to implement the project to the best possible approach. Besides, the experts also provide some training courses to participants from different hospitals, regulatory agencies on some issues related to medical physics and radiation protection in medicine.

Due to the lack of qualified medical physicists in Viet Nam and the importance of lecturer resource as the key contributor to the success in developing education programme and teaching in medical physics, NTTU has discussed with IAEA to proceed with the trainer training programme as soon as possible. University of Malaya – Malaysia has been selected by IAEA as the host university to train the trainer for us, in which the medical physics postgraduate course has been accredited by the Institute of Physics and Engineering in Medicine (IPEM) for 20 years. Besides academic education, clinical training is also provided in the qualified associated medical center of the university, in order to ensure competence for the trainers. Two young lecturers of NTTU were nominated for participating in the 2-year master course of medical physics in the University of Malaya. These two lecturers have acquired the master degree with distinction at the end of 2018 and now they are participating in the clinic training. With good success in study both of them have a chance to continue their study for PhD in conjunction with contributing to the workforce in NTTU.

In some hospitals, patient numbers are very high, medical physics staff time is limited and access to equipment to teach students will be limited or non-existent. With a desire for the students to have access to medical physics technologies in the labs and classroom as much as possible. We carried out an analysis of what medical physics equipment (e.g. QA equipment) and teaching aids will be needed. In the project VIE6030 some fund was allocated for purchasing basic equipment for teaching three sub-fields of radiotherapy, diagnostic imaging and nuclear medicine and radiation protection.

As it was mentioned above, the expert missions are very beneficial for developing the various education and training programmes in medical physics for different audiences. One of the important issues is to evaluate the quality of these education programmes.

During the period of 2016-2019, the NTTU has been preparing the following three programmes:

- NTTU Bachelor programme in medical physics
- Supplementary education programme for existing medical physicists
- National framework for Medical physics education and training programme

The following paragraphs will provide more detail information about these education programmes.

A. The first Bachelor medical physics academic programme

Through extensive study on IAEA TCS 56 document and referring to medical physics programme of the University of

Malaya – Malaysia, and of Chulalongkorn University – Thailand, NTTU has successfully developed the first academic medical physics programme in Viet Nam during 2016-2018 period. In August 2018, an IAEA's expert mission was held to evaluate the Programme.

“The medical physics syllabus developed by Nguyen Tat Thanh University was compared with IAEA's TCS 56 (Postgraduate medical physics academic programmes). The syllabus is very detailed and provides confidence that the syllabus has been prepared with great thought and after considerable research” [6], reported by the expert. The expert also noted that “the BSc degrees in Viet Nam are typically 4.5 – 5 years in duration. This results in BSc in medical physics of duration equivalent to that taken for a BSc in physics followed by an MSc in medical physics offered in other countries. The academic content in the proposed syllabus is also equivalent to what would normally be covered up to MSc level. The result is a BSc programme that fulfils the requirements of a typical MSc in medical physics. The difference is purely semantic”.

NTTU has to develop the medical physics Bachelor's degree programme instead of Master's degree programme because the national regulation [7] does not allow to conduct a Master programme in medical physics without conducting the undergraduate course in the same specialty.

In addition, to conduct MSc course in medical physics, the university needs to have at least five core lecturers with the title of professor or associate professor or with a doctoral degree in the same discipline or disciplines close to the disciplines of the training registration; of which at least one professor or associate professor in charge of the relevant specialty.

The bachelor programme consists of 15 trimesters to be delivered in 5 years, in which the first 3 years student will be provided with fundamental knowledge such as mathematics, physics, in the subsequent 2 years, they will acquire the academic knowledge equivalent to Master level of medical physics [3]. The Bachelor programme was submitted to the Ministry of Education and Training for approval. On 31st August, 2017 NTTU acquired the approval to carry out the pilot programme. The first batch is undergoing freshman year with 47 students.

Despite receiving positive assessment from the expert, NTTU aims to continue improving the programme to harmonise education programme to achieve the international level. In the future, we will upgrade our course to Master level and subsequently target to get an accreditation from international organisations

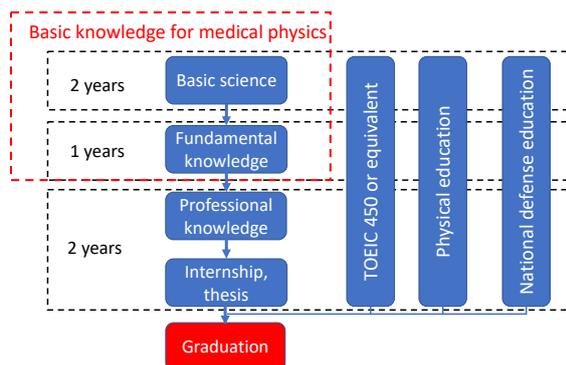


Fig 2. Schematic illustration of NTTU Medical physics education programme [3].

B. The supplementary programme and national framework for medical physics education and training programme

Since the BSc programme aims to the next generation of medical physics, another education programme for the existing medical physicists¹ needs to be developed. A quick survey on this workforce conducted by NTTU showed that they recognise their significant knowledge gaps and in need of a supplementary course to approach the global standard practice. Therefore, NTTU has prepared such a programme to provide them with core medical physics modules as recommended in IAEA TCS 56. This manuscript was assessed via the IAEA’s expert mission for the rationale and the quality and it was found that the syllabus is generally comprehensive and appropriate to the needs of the physicists in their daily clinical practice and it must be initiated with some urgency. The course is going to be submitted to the Ministry of Health for approval at the end of 2019.

For harmonising numerous orienting “medical physics” education programmes in other institutes, under TC project VIE 6030, the national framework for medical physics education and training programme will serve as the guideline for other institutions to develop their own medical physics programme. The national framework for medical physics education and training programme shall be approved by the Ministry of Education and Training in the near future. The education framework was assessed by the IAEA expert and it was reported to be consistent with the IAEA TCS 56.

¹ Personnel currently doing medical physicist’s job in medical centres

III. THE RECOGNITION OF MEDICAL PHYSICS AS A HEALTH CARE PROFESSION

Although not planned in the IAEA TC VIE6030 project, recognition of medical physics as an independent profession in health care in Viet Nam will serve as the main factor for evaluating the success in implementing of the project. Foreseeing the importance of this issue, NTTU attempts to raise the awareness amongst the regulatory bodies. Through various consultation to relevant stakeholders, a new decree on “regulations of conditions for conducting radiation work and conditions for conducting services supporting atomic energy application” is going to be enacted in 2019. In the Decree, an availability of medical physicist workforce resource is one of the conditions for the medical radiation practices to acquire license.

Furthermore, recently, the Ministry of Health in Viet Nam has circulated the amended Health Care Law for collecting suggestion, in which the Article 17 stipulated that medical physicist will be considered to grant a medical profession certificate. The Law will be passed by the National Assembly in next year. This will be great progress for the medical physics career in Viet Nam. The legal recognition will support not only in material but also spirit for medical physicist. This will form the foundation and the catalyst for education and training of medical physics in Viet Nam to gain further good results.

IV. CONCLUSION

For the last few years, the education in medical physics has achieved a certain success. The three main education and training programmes in medical physics prepared by NTTU following IAEA TCS 56 “Postgraduate medical physics academic programmes”, which is endorsed by the International Organization for Medical Physics (IOMP). Under these education programmes, the new generation of medical physicists are expected to be equipped with a solid medical physics knowledge to meet national and international requirements.

Having this results, the NTTU’s working team, was strongly supported not only by the NTTU management board but also from other ministries such as Ministry of Science and Technology, Ministry of Education and training and Ministry of Health. We also received the great assistance from IAEA under the TC project VIE6030.

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