

STATUS OF MEDICAL PHYSICS AND ACTIVITIES TO BOOST THE PROFESSIONAL DEVELOPMENT IN THE AFOMP REGION

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Abstract — The paper is part of the IOMP-IUPAP Workshop “MEDICAL PHYSICS PARTNERING WITH THE DEVELOPING WORLD” at the World Congress in Prague WC2018. The paper presents the status in the IOMP Regional Organization AFOMP (Asia Oceania Federation for Medical Physics).

Keywords— Medical Physics Professional Development, Medical Physics Education and Training.

I. INTRODUCTION

The Asia-Oceania Federation of Organizations for Medical Physics was founded on May 28, 2000 to promote Medical Physics in the Asia and Oceania regions, through the advancement in status and standard of practice of the medical physics profession. It is one of the regional organization for Medical Physics within the International Organization for Medical Physics with 21 member countries that are; Australia, Bangladesh, Cambodia, China, Hong Kong, India, Indonesia, Iran, Japan, S. Korea, Malaysia, Mongolia, Myanmar, Nepal, New Zealand, Pakistan, Philippines, Singapore, Taiwan, Thailand and Vietnam.

The role and status of Medical Physicists in the AFOMP continue to gain increasing recognition in scientific societies during the past few years. The AFOMP is striving to build a strong relationship between national organizations in the Asia-Oceania region and international bodies. The 17th AOCMP along with the 38th Annual Conference of Association of Medical Physicists of India (AMPI) was successfully organized at Jaipur, India. The active contribution from IOMP, ICTP, AAPM, MEFOMP, and EFOMP during the conference deserves special mention. Further Memorandum of Understanding (MoU) between MEFOMP and of AFOMP was signed on December 12, 2017 to foster more scientific, professional and educational collaboration. AFOMP published ‘The Code of Ethics for clinical Medical Physicists’ in the year 2017. These were the major achievements of last one year. AFOMP is actively involved in many activities in collaboration with international bodies such as IOMP, IAEA, IUPESM, WHO, ILO etc.

AFOMP newsletter started with its 1st issue in December 2007. It is the of AFOMP, released half-yearly with news about current activities, research outcomes and upcoming events.

The annual conference of AFOMP, Asia-Oceania Congress on Medical Physics (AOCMP) is held every year

to provide a platform for the medical physicists to share their research, knowledge, experience and problems so that each one of the member gets opportunity. The 1st AOCMP was held in Bangkok, Thailand in 2001 and since every year held regularly in different countries of AFOMP. The 18th AOCMP will be held in Kuala Lumpur, Malaysia during 11th to 14th November 2018.

One of the Founding members of AFOMP was the late Prof. Kiyonari Inamura who contributed significantly to the sustained development of AFOMP. He had served AFOMP at different capacities over the years. He was Professor Emeritus at Osaka University and longstanding member of the CARS Congress Organizing Committee and Deputy Editor of IJCARS. His pioneering contributions to Medical Physics and Medical Engineering include research and development in radiotherapy treatment planning systems and picture archiving and communication systems. It was always on the forefront of his ideology to educate and motivate the students to advance their understanding of Medical Physics. His efforts in advancing interdisciplinary and international cooperation is without any parallel and, his way of leading by example, has been of great benefit not only to the Medical Physicist community of AFOMP but also for the rest of the world. To recognize and appreciate the outstanding contributions of Prof. Inamura to Medical Physics in AFOMP region, an Oration Award by AFOMP in the name of Prof. Kiyonari Inamura was started during 2018 and Prof. Tomas Kron, Melbourne, Australia will be the first recipient of this oration award.

To take care of the enormous activities and work of the association for benefit of its members, AFOMP has five committees

1. Education and Training Committee [ETC]
2. Professional Development Committee [PDC]
3. Science Committee [SC]
4. Funding Committee [FC]
5. Awards and Honors Committee [AHC]

The chairs and members of each committee assiduously plan and meticulously execute various aspects to fulfill aim and objectives of respective committees.

Objectives, goals and accomplishments of each committee are as follows.

II. EDUCATION AND TRAINING COMMITTEE [ETC]

The major aims of this committee are to promote activities related to education and training of AFOMP Medical Physics by promoting the education, training and professional development of Medical Physicists, to develop AFOMP policy statement on education and training of medical physics in AFOMP countries to promote and advance the practice of medical physics with the highest quality of medical services for patients care, to support and collaborate with the education and training committees of Regional Chapters on matters relating to education and training, including development of training materials and training methodology, to organize workshops and seminars in conjunction with related international conference meetings, to promote and assist international education and training initiatives and to study ETC activities of other organizations to adapt to AFOMP societies for promoting high quality educational programs at the graduate and postgraduate levels as well as residency programs in medical physics.

III. PROFESSIONAL DEVELOPMENT COMMITTEE [PDC]

This committee aims to promote the professional development of AFOMP Medical Physicists by developing policy and strategic action plan on the promotion of the status and recognition of the Medical Physics profession in AFOMP countries. This committee's roles are pertaining to develop and make proposal for a registration and certification system for AFOMP Physicists, to develop standards, guidelines and protocols on Medical Physics procedures and services, including dosimetry and QA protocols, to develop AFOMP policy statements on definition and roles and responsibilities of Medical Physicists and the Physicist service manning scale for Medical Physics services, to develop codes of practice or standard on radiation safety and protection and to develop a system of Continuous Professional Development (CPD) for AFOMP.

The AFOMP definition of a Medical Physicist coined by PDC is as follows: "A qualified Medical Physicist is a person who possesses a university degree at master level or equivalent in physical science or engineering science and works in alliance with medical staff in hospitals, universities or research institutes. He/she shall also have received clinical training in the concepts and techniques of applying physics in medicine, including training in the medical application of both ionizing and non-ionizing radiation. This person shall have a thorough knowledge and be able to practice independently in one or more sub-fields of medical physics, including imaging physics, radiation therapy physics, nuclear medicine physics and radiation protection."

AFOMP Policy Statement No.1: The roles, responsibilities and status of the clinical Medical Physicists in AFOMP countries.

The main purpose was to give guidance to AFOMP member organizations on the role and responsibilities of clinical medical physicists. A definition of clinical medical physicist has also been provided. The professional aspects of education and training; responsibilities of the clinical medical physicist; status and organization of the clinical medical physics service and the need for clinical medical physics service were discussed in this document.

AFOMP Policy Statement No. 2: Manpower requirements for radiation therapy Physicists.

The main purpose of the document was to give guidance as to how many medical physicists are required to staff a radiation oncology department. Strict guidelines are difficult to define as work practices vary from country-to-country and from hospital-to-hospital. A calculation scheme is presented to aid in estimating medical physics staffing requirements that is primarily based on equipment levels and patient numbers but also with allowances for staff training, professional development and leave requirements.

AFOMP Policy Statement No. 3: Recommendations for the education and training of Medical Physicists in AFOMP countries.

AFOMP recognizes that clinical medical physicists should demonstrate that they are competent to practice their profession by obtaining appropriate education, training and supervised experience in the specialties of medical physics in which they practice, as well as having a basic knowledge of other specialties. To help its member countries to achieve this, AFOMP has developed this policy to provide guidance when developing medical physicist education and training programs. The policy is compatible with the standards being promoted by the International Organization for Medical Physics and the International Medical Physics Certification Board.

AFOMP Policy Statement No. 4: Recommendations for professional development systems for Medical Physicists in AFOMP countries.

Medical physicists need to undertake CPD to keep up-to date in their field. This is for the benefit of the individual, the institution that they work for, and in the case of those who are clinically involved, for the benefit of patients. This should be a legal requirement in all AFOMP countries where there is a legal requirement for physicists to be certified or licensed to practice clinically.

The requirements of a CPD system should equate to the equivalent of approximately one week of full-time equivalent continuing professional educational activity per year. This undertaking may consist of activities such as attending lectures, tutorials, seminars, workshops and self-directed learning.

It is recommended that member countries have points based system to quantify a physicist's CPD participation and achievements.

- Attending courses/seminars/lectures/workshops/scientific meetings etc.

- Formal on-the-job training, interactive learning with the internet or CD ROMs with evaluation, self-directed learning, visits to other institutions, study breaks etc.

- Teaching, lecturing, presenting at seminars and workshops, producing teaching materials and CD ROMs etc.

- Research publication at conferences, in journals, in books etc.

- Editing and reviewing

- Developing new technologies and procedures

- Professional service (i.e. membership in or chairing of task groups, professional society committees, conference committees, etc.)

- Supervision and mentoring of residents and research students

- Thesis examination

- Obtaining higher qualifications

- Employment

Actions to be taken if sufficient points are not achieved

- Become re-certified through the normal examination process or through an oral exam

- Be required to make up their points deficit within a specified period

- Be required to be supervised by a certified or licensed physicist

- Be required to undertake a specified remedial program

- Be given the opportunity to achieve, within a limited time, the minimum number of points normally required to be accumulated in one year

Sharing resources

- The production of training and education resources for CPD is costly.

- All AFOMP member countries shall, where possible, make their resources freely available to other countries.

AFOMP Policy Statement No. 5: Career progression for clinical Medical Physicists in AFOMP countries.

The career progression for clinical medical physicists in AFOMP countries depends on many factors like the status of the place of work whether it's private or Govt. or university and the type of appointment; academic with a hierarchy for promotion or not.

Education and training should be completed with appropriate assessment and written and oral examinations. Also, certification process should be completed. After this the career structure should be taken into consideration.

A career structure with four levels can be used as guidance and be chosen according to local terminology. A Level 1 medical physicist is one who has completed undergraduate degree and who is in clinical training or in the first few years of their career after completion of their

certification (first 5-8 years). Their work responsibilities would be of a general nature and shall be under the direction of a medical physicist employed at a higher level.

A Level 2 medical physicist is one who has completed a formal clinical medical physics training program of the duration and standard recommended by the International Medical Physics Certification Board or the International Atomic Energy Agency and has sufficient experience to act independently as a medical physicist (6-15years).

A Level 3 medical physicist is one who has extensive experience post-training, and has a significant level of responsibility, leadership and management in the department in which they are employed (12th years onwards). They would have extensive experience in their area of specialization and would be contributing to research and development.

A Level 4 medical physicist is one who has overall responsibility for planning, organizing and leading the medical physics staff in providing support for therapeutic and diagnostic medical procedures, calibrating and commissioning of equipment, education of medical physicists and other technical and clinical staff, research and development in a hospital or group of hospitals. They are recognized nationally, and possibly internationally, as an expert in all aspects of their specialization (15th Years onwards).

The future of professional development of medical physics in AFOMP region shall be through strengthening the educational, training and professional development of medical physicists through specially designed programmes, promoting research and disseminating knowledge and expertise through the official congress or symposium, developing infrastructure and resources to share information about useful publications, libraries, and data, promoting guidelines of practice standards and accreditation for medical physicists in collaboration with IMPCB and IAEA etc., strengthening a strong relationship and the exchange of information with other sub-regional organizations in Asia-Oceania and maintaining a close relationship with international bodies such as IOMP, IAEA, WHO etc.

IV. SCIENTIFIC COMMITTEE [SC]

The Scientific committee is to explore and identify the need for international scientific symposia, research meetings, regional meetings and/or research workshops and assist the individual medical physics organizations with effective preparation and management of these activities in AFOMP member countries, to enhance the cooperation of member state medical physics organizations in exchanging the information about scientific activities planned in their respective countries and putting this information in the AFOMP calendar of scientific activities, to promote co-operation and communication with other medical physics organizations outside Asia to support the quality of patient care through research, education and training, to organize

and/or sponsor regional and international conferences in the AFOMP region, to encourage research, education and training in medical physics in order to maintain quality of medical physics and patient care in the AFOMP region, to promote exchange of knowledge and research, to promote international cooperation in addressing the science needs in medical physics, including participation in the scientific programs of other organizations, to encourage medical physicists to share information about their research, publications so that the AFOMP members can get to know and benefit from each other, and to explore possibilities of exchange programmes for young medical physicists to increase their knowledge and skills.

V. FUNDING COMMITTEE [FD]

The funding committee recruits Corporate Members from industry for the purpose of providing funds to assist AFOMP activities. This committee aids to get grants from international organizations such as IOMP for AFOMP in its primary role of training and promotion of medical physics.

VI. AWARDS AND HONORS COMMITTEE [AHC]

The roles of awards and honors committee is to promote activities related to education and training of AFOMP medical physics by promoting the education, training and professional development of medical physicists, to develop AFOMP policy statement on education and training of medical physics in AFOMP countries to promote and advance the practice of medical physics with the highest quality of medical services for patients care, to support and collaborate with the education and training committees of Regional Chapters on matters relating to education and training, including development of training materials and training methodology, to organize workshops and seminars in conjunction with related international conference meetings, to promote and assist international education and training initiatives and to study ETC activities of other organizations to adapt to AFOMP societies for promoting high quality educational programs at the graduate and postgraduate levels as well as residency programs in medical physics.

VII. INTERNATIONAL MEDICAL PHYSICS CERTIFICATION BOARD (IMPCB)

With the goal to improve the quality of clinical medical physicists and the profession, the concept of formation of the International Medical Physics Certification Board (IMPCB) was originated and IOMP has established the

IMPCB on 23rd May 2010. The objectives and purposes were to establish minimum standards and improve the practice of medical physics, to develop standards and procedures for the certification of medical physicists, to establish the infrastructure, requirements and assessment procedures for the accreditation of medical physics certification programmes, to establish and evaluate qualifications of candidates requesting examination for certification in the field of medical physics, to arrange, and conduct examinations to test the competence of candidates for certification in the field of medical physics, to grant and issue certificates in the field of medical physics to applicants who have been found qualified by the Board and to maintain a registry of holders of such certificates. The IMPCB model programme, developed in accord with IOMP Policy Statement No. 2 include guidelines for basic requirements for education and training of medical physicists, minimum educational qualifications, professional training requirement, clinical training, professional certification and maintenance of certification.

The Table below lists the current number of medical physics educational courses in the AFOMP member countries

VIII. CONCLUSION

The economic, social, linguistic, cultural and educational backgrounds of AFOMP countries are substantially diverse and comprise more than half of the world population. As there are fewer medical physics training programmes, there is a shortage of qualified medical physics professionals in many of the AFOMP countries. Though the professional role of medical physicists in routine clinical practice increased and the status improved over the past years, there is still a long way to go. The activities of AFOMP are designed to bring solid and steady improvement to the professional status of medical physicists in Asia Oceania region. AFOMP activities could bring about heartening progress in the standard of practice of medical physics profession. Regional collaboration for education, training, research and sharing of knowledge and experience is established and fostered. Most countries are yet to establish professional certification/ accreditation system, and it will further boost the official recognition of the status of medical physicists.

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Below is listed the current number of medical physics educational courses in the AFOMP member countries

Australia- 06	Indonesia -01	Japan -03	Malaysia -02	India- 22
Mayanmar - 00	Mangolia - 00	Nepal -00	Hongkong -01	New Zealand -01
Pakistan -01	<u>Philippines</u> -01	China -07	Singapore - 00	South Korea -04
Taiwan -01	Bangladesh -01	Thailand -03	Vietnam -01	

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