

解説

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海外セッション『アジア各国における医学物理学・医学物理士の現状』

# Medical Physics in Palestine: A Hope for Better Prospective

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## 1. Introduction

Palestine is a country in the Middle East compromising the West Bank (including East Jerusalem) and the Gaza Strip which are occupied and under the control of Israel as shown in Fig. 1. The Israeli occupation of Palestine and the resulting political conditions make it difficult to objectively assess the situation of medical physics and many other related fields in Palestine. Medical physics is one of the main themes that is required to improve healthcare in Palestine. As a member of Middle East Federation of Medical Physics (MEFOMP) established in 2009, Palestine made great efforts to organize its regional medical physics society under the umbrella of International Organization for Medical Physics (IOMP) to further enhance and improve the status of medical physics across the Globe. In recent years, the International Organization for Medical Physics (IOMP) is providing assistance to developing part of the world on a country by country basis<sup>1-6)</sup>. Due to political reasons, Palestine faces many obstacles to increase the level of medical physics knowledge such as building the required infrastructures, acquiring the required equipment, and upgrading of qualified professionals in order to develop education, training programs, and national policies for providing an acceptable patient care within financial limits and boundaries.

## 2. Unit for radiation oncology in Palestine

Qualified medical physicists in Palestine are rare. There are only four practicing medical physicists in Palestine, three of them are females. Additionally, there are about seven academics who studied radiography then made postgraduate studies in medical physics. Although located in East Jerusalem, difficult to reach, with a need

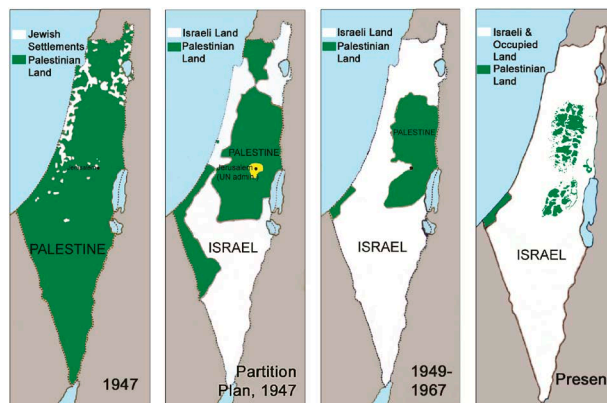


Fig. 1 Palestinian loss of land between 1947 until present<sup>7)</sup>

to get a permission beforehand, Augusta Victoria is the only hospital offering radiation therapy services for all Palestinian People in the West bank and Gaza. The radiotherapy division located at the Augusta Victoria hospital has a CT simulator along with two LINACs. First is Varian Trilogy, Varian Medical Systems, California, USA, capable of producing 6 and 15 MeV X-ray beams, and 4, 6, 9, 12, 16, 20 MeV electron beams. The other LINAC is Primus, Siemens Inc., USA, capable of producing 6 and 15 MeV X-ray beams, while electron beams are not commissioned and therefore not utilized for electron therapy. Since it is the only radiotherapy division serving Palestinians, the four medical physicists along with 11 radiotherapy technologists work together to carry out huge patient load. The Augusta Victoria radiotherapy division handles about 110 patients daily. Table 1 shows Palestinian medical physics and medical imaging facilities across the country.

## 3. Importance of education and training

It is unfortunate to note that most developing countries still rely on developed countries to provide educa-

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Table 1 Palestinian medical physics and medical imaging facilities

Item	Count
Hospitals and medical centers	210
Radiologic Technologists (RTs)	774
Medical physicists	11 = 4 (Practice) + 7 (Academic)
Radiotherapy dept	1 (East Jerusalem)
Nuclear Medicine	3
MRI	11
CT	33
Plain X-ray machines	146
Bone absorptiometry DXA	7
Dental radiography + CT	130
Mammography	30
Cath Lab	10
Fluoroscopy	31

tion and training programs whereas parts of the needed equipment are provided through international donation programs of used equipment, such as the one run by the IOMP. The technological aspect of medical physics development is not uniform across Palestine as well as within other Middle East developing countries. There is a wide difference between quality assurance and cost-benefit goals for developed countries in medical physics practice as compared to developing countries, in which the main goal is the availability of healthcare standards and initial installation of new technologies. There are some challenges facing the development of medical physics in Palestine, including: 1) Encouraging universities to open departments of medical physics, 2) Encouraging young graduates from scientific departments to join medical physics departments, 3) Encouraging governments to support the local medical physics societies, and 4) Raising medical physics awareness in the community.

#### 4. Role of international organizations

The main international organizations responsible for supporting and spreading the knowledge on medical physics and its conditions worldwide are:

- a. Governmental (e.g.: IAEA)
- b. Non-governmental (e.g.: IOMP)

International organizations should be realistic in knowing the best way to help and support developing countries, at which the conditions of medical physics might not be similar to other nearby developing countries. They help in improving the level of clinical physics support in developing countries. However, host countries should adopt the assistance that will best suit their own objectives. The receipt of any equipment

should be carefully considered by the developing country involved and accepted after assessing their needs.

The donation program offered by IOMP for used equipment in developing countries is a good example of collaboration with many developing countries. Usually, donating parties make tax deductions from donations to the developing world and also to clear space occupied by unemployed equipment in the developed country.

#### 5. Main concerns

The main concern about international organizations is that they only cooperate with governmental organizations in developing countries. They do not acknowledge qualified medical physicists or academics working in non-governmental bodies in the same manner. Additionally, an important issue is that the decision-makers in some developing countries have limited knowledge on medical physics and lack the deep understanding of international medical physics requirements and standards. Some of them have no idea about the requirements and needs for establishing medical imaging facilities and specialized radiation oncology centers. It was reported in many cases that some sponsored projects were not managed appropriately. The medical physics organizations in developing countries should consult the national medical physics societies and ask for their guidance. Moreover, many projects have come to an end due to unsuccessful running and administration. Such projects did not achieve their goals and ultimately fail. In order to have successful collaboration programs, the full support of decision-makers and the national medical physics association is required.

#### 6. Conclusion

It is important to develop a long-term policy that achieves the objectives of medical physics support in healthcare institutions. Related obstacles for making such policy include having an adequate budget for training support and equipment installations. In developing countries, the initial concern is having medical physics support in clinical practice. This can be provided in forms of lectures and support. The role of scientific societies and non-governmental organizations such as private universities should be emphasized in the collaboration with national and international bodies to make new and efficient medical physics policies. Also, many efforts should be done to bridge the gap between developing and developed countries for medical physics edu-

cation and clinical support.

### References

- 1) Hanson GP, Stjernsward J, Nofal M, et al.: An overview of the situation in radiotherapy with emphasis on the developing countries. *Int. J. Radiat. Oncol. Biol. Phys.* 19: 1257–1261, 1990
- 2) Levin CV, El Gueddari B, Meghzifene A: Radiation therapy in Africa: Distribution and equipment. *Radiother. Oncol.* 52: 79–84, 1999
- 3) Zubizarreta EH, Poitevin A, Levin CV: Overview of radiotherapy resources in Latin America: A survey by the International Atomic Energy Agency (IAEA) *Radiother. Oncol.* 73: 97–100, 2004
- 4) Tatsuzaki H, Levin CV: Quantitative status of resources for radiation therapy in Asia and Pacific region. *Radiother. Oncol.* 60: 81–89, 2001
- 5) Zaidi H. Reflections on International collaboration in medical physics. *Physica Medica.* XIII: 417–419, 1997
- 6) Ng K, Pirabul R, Peralta A, et al.: Medical physics is alive and well and growing in South East Asia. *Australas. Phys. Eng. Sci. Med.* 20: 27–32, 1997
- 7) Wazwaz F: Fighting for survival, not destruction of Israel. *Star Tribune*, 2014

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<https://www.alquds.edu/en/staff-profiles/faculty-of-health-professions/57-department-of-medical-imaging/138923-hussein-y-al-masri.html>