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**Initial qualifications and acquisition of the required
knowledge of and/or skills in radiation protection
within the field of Medical Physics**

Statement by the German Commission on Radiological
Protection

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**Eingangsvoraussetzungen und Erwerb der erforderlichen Fachkunde bzw.
Kenntnisse im Strahlenschutz in der Medizinischen Physik**

Stellungnahme der Strahlenschutzkommission

This translation is for informational purposes only, and is not a substitute for the official statement. The original version of the statement, published on www.ssk.de, is the only definitive and official version.

1 Current situation

Science and technology contribute essentially to the development of imaging examination techniques and radiological methods of treatment.

Physicists play an increasingly important role both in clinical everyday life and in the research institutions working in biosciences. In some fields of medical care a particularly close cooperation between physicians, physicists and medical assistants has started to form in the course of this development. All fields applying ionising radiation can be cited as examples. The laws on radiation protection call for a responsible collaboration with a *Medical Physics Expert (MPE)* in radiotherapy, nuclear medicine, diagnostic and interventional radiology, thus highlighting the important role of the Medical Physicist as a partner of the physician. Since Medical Physicists are part of the clinical staff, it has to be ensured that they undergo a scientifically substantiated theoretical and practical vocational training, continuing education and professional development according to established standards, similar to the professional code of conduct for physicians. Regulated vocational training, continuing education and professional development enable Medical Physicists to assume their roles and responsibilities within the clinical team to the patient's benefit and with the aim of achieving radiation protection for patients, staff and the environment.

In order to ensure radiation protection according to the German X-ray Ordinance and Radiation Protection Ordinance, the acquisition and preservation of knowledge of and skills in medico-physical activities have to be regulated in a similar fashion as medical qualifications and skills. This includes both initial qualifications (education), acquisition of expert knowledge, successful participation in radiation protection courses and updating the knowledge of and skills in radiation protection at least every 5 years.

Following the Bologna Declaration [8] the German Diplom degrees will be replaced by Bachelor's and Master's degrees by 2010 so that Master's studies in Medical Physics will be increasingly available.

The initial qualifications and the acquisition of radiation protection qualifications will have to be adapted in the near future in order to accommodate this development.

The German X-ray Ordinance/Radiation Protection Ordinance stipulate that both a Master's and a Bachelor's degree (B.Sc. or B.Eng.) in the physical-technical field constitute the initial qualifications for the acquisition of the required knowledge of radiation protection for Medical Physics Experts

This means that a Bachelor's degree holder in the physical-technical field fulfils the requirements to acquire radiation protection skills in Medical Physics. A person with radiation protection skills in Medical Physics will thus be referred to as a *Medical Physics Assistant (MPA)* within Medical Physics training. This initial qualification enables MPAs to undergo further training (Master's studies) in order to qualify for the title of an MPE.

A person with the required radiation protection skills is allowed to perform medico-physical activities relating to radiological protection under constant supervision of an MPE. Medico-physical activities include e.g. dose measurements or technical assistance in radiation planning.

Different bodies, such as the German Federal Health Council, the German Commission on Radiological Protection, the World Health Organization and other national and international associations and organisations, have mentioned the importance of legally regulated vocational training and continuing education leading to a specified degree in Medical Physics. The following statements have to be cited in this context:

- the WHO recommendation on uniform legal regulations for training and education in Medical Physics and the acknowledgement of professional Medical Physicists [1],
- the fundamental principles for further training to obtain the degree of a fully accredited Medical Physicist, which were laid down according to the recommendations of the Federal Health Council in 1980 [2] and were published in 1986 in the form of guidelines on the performance of such further training [3],
- the Federal Health Council's statement as of June 1986 and that of the relevant Bundestag and Bundesrat committees as well as that of the conference of the Laenders' Ministers of Health on further training in Medical Physics [4]. This statement calls for the Laender to establish a number of centres for further training in Medical Physics at their universities and to create the legal conditions for verifying the foundation of a qualified degree in Medical Physics training.
- the recommendations of the Federal Commission for Radiological Protection as of 1990 for the state acknowledgement of further training in Medical Physics [5],
- the recommendations of the Federal Commission for Radiological Protection as of 1997 [7] on the vocational training and further education of Medical Physicists including a definition of the qualification and the training course,
- the Bologna criteria established by the European Ministers of Education [8],
- the EFOMP Policy Statement on the required number of Medical Physicists in hospitals [9],
- the recommendations of the Federal Commission for Radiological Protection including the concern voiced about the lack of Medical Physicists [10],
- the EFOMP Policy Statement on the advantages of and the required equipment for departments of Medical Physics [11],
- the declaration of the relevant scientific associations on the situation of Medical Physics in the field of radiotherapy [12],
- the declaration of the relevant scientific associations on the situation of Medical Physics in the field of diagnostic radiology and nuclear medicine [13],
- the statement of the German Society of Medical Physics (DGMP) on establishing Master's studies in Medical Physics / Biomedical Physics [14],
- the Malaga Declaration [15] and
- the accreditation of Bachelor's and Master's studies [16].

Research, examination and treatment in all medical fields must be characterised by a high level of quality and safety. To this end, Medical Physicists are closely integrated and their work is indispensable. State-regulated vocational training, continuing education and professional development are the most suitable means to obtain their vital and qualified work. Berlin is the only Land in which a law on the use of the occupational title Medical Physicist [6] exists, the Act was adopted in 1987. Countries such as the Netherlands, the United Kingdom, Sweden, Switzerland, Austria and Spain provide detailed state regulations on the vocational training, continuing education and professional development of Medical Physicists.

Bachelor's studies are aimed at teaching the theoretical and experimental background and providing a broad-based general education in physics. For certain activities the Bachelor's degree may suffice as a job qualification or it may serve as a qualification before changing to other disciplines. The occupation of a Bachelor's degree holder with the required radiation protection skills is meant to link with the Dosimetrist's occupation in the field of radiophysics, which exists in a large number of countries. An MPA is qualified and will be employed to assume specific radiation protection tasks in hospitals, public authorities and other institutions.

Large departments in particular will benefit from the introduction of a regulated job description for Medical Physics Assistants, which will make it possible to improve economically the organisational structure of radiation protection under the auspices of a Medical Physics Expert.

With the Bachelor's degree (B.Sc. or B.Eng.), e.g. in the biomedical, medico-physical or physical-technical field, Medical Physics Assistants with the required radiation protection skills are allowed to perform tasks e.g. in measuring technology, quality assurance, in parts of radiation planning, in contamination and incorporation measurements and radiation protection schemes under supervision of a Medical Physics Expert.

Only holders of a Master's degree (M.Sc. or M.Eng.) in the biomedical, medico-physical or physical-technical field, however, who have acquired the requisite expert knowledge, are allowed to assume autonomously clinical and scientific activities in the field of Medical Physics within the meaning of the German X-ray Ordinance and Radiation Protection Ordinance. The German Guideline on Radiation Protection in Medicine (based on the Radiation Protection Ordinance) lists a number of activities which may be performed by an MPE.

2 Recommendations

2.1 Initial qualifications for acquiring the requisite knowledge of and skills in radiation protection within the field of Medical Physics

According to the Bologna criteria the following degrees are considered as a qualification for occupation: Bachelor's degree (B.Sc. or B.Eng.) and Master's degree (M.Sc. or M.Eng.). The SSK recommends that the acquisition of the requisite knowledge of radiation protection for Medical Physics Experts shall be based on a Master's degree (M.Sc. or M.Eng.) together with a Bachelor's degree (B.Sc. or B.Eng.), both in the physical-technical field. The currently accepted Diplom degree following university studies (either at a *Hochschule* or a *Berufsakademie*), which is considered as a qualification for occupation, shall still be regarded as

initial qualification for the acquisition of the requisite knowledge of radiation protection for Medical Physics Experts under a temporary arrangement.

The SSK recommends furthermore that a Bachelor's degree (B.Sc. or B.Eng.) shall be the initial qualification for the acquisition of the required skills in the field of Medical Physics. A person who has successfully completed such further training will hold the title of a Medical Physics Assistant (MPA). Holders of a Master's degree who have shown proof of the required expert knowledge and provide the certificates of the required radiation protection courses may proceed to acquiring the requisite knowledge of radiation protection for Medical Physics Experts (MPE).

The requisite acquisition of the expert knowledge which is required for teaching the requisite knowledge of radiation protection for Medical Physics Experts may also be integrated into the curriculum of dedicated Master's studies if acknowledged by the competent authorities.

With respect to the anticipated changes in the German X-ray Ordinance and Radiation Protection Ordinance the SSK recommends to adjust the text about initial qualifications for Medical Physics Experts in the relevant definitions of terms accordingly.

2.2 Acquisition of the required radiation protection skills in Medical Physics

The SSK recommends that providing the initial qualification and certificates of courses acknowledged by the competent authorities will continue to be necessary in order to show proof of the required radiation protection skills in Medical Physics.

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