

General Programs of Specialized Education of Radiological Physicists in the Czech Republic

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The new system of education and training of radiological physicists in the Czech Republic has recently been defined by legislation of Ministry of Health (Ministry). Three following stages form the system: regulated university master program in radiological physics, Specialized Education and Continuous Professional Development (CPD). Radiological physicists have been recognized as full health professionals.

University master program in radiological physics is regulated by general curriculum declared in a Decree of Ministry which specifies the minimum requirements for university programs for professional qualifications to pursue the health profession.

The base of Specialized Education is formed by on-the-job training, however a full framework has to be built and issued in the bulletin of the Ministry. Description of current status and proposals of the Czech Association of Medical Physicists (CAMP) is subjected to this paper.

The CPD consists in regular renewals of registration in the National Register of Health Professionals in generally 6-year periods under conditions defined by the Law and relevant Decree of the Ministry.

Purpose of Specialized Education

Specialized Education of radiological physicists recognizes three specializations: radiological physics in diagnostic radiology (DR) or nuclear medicine (NM) or radiotherapy (RT). Specialized Education in either branch can be entered exclusively by persons having *the professional qualification to pursue the health profession of radiological physicist*. Specialized Education is terminated by the *Specialization Exam* in front of the in-specialization *Examining Board* of the Ministry. Graduates gain *the specialized qualification to pursue the health profession without professional supervision* and can be (first-time) registered in the *National Register of Health Professionals*.

As theoretical knowledge of a radiological physicist is obtained mainly during university master study, Specialized Education has to be focused mainly on practical training.

Legislative framework

Framework of structure of Specialized Education is given by the Law which is, however, to be reformed within a short time. Nevertheless, there are some general guidelines useful to establish rules of Specialized Education. For each branch, i.e. radiological physics in DR, NM or RT, a *General Program* has to be done and issued in the bulletin of the Ministry. *Accredited Institution(s)* will be approved to carry out Specialized Education of radiological physicists in either branch *in accord with a General Program* or its relevant part. Accredited institution carries then out (a part of) Specialized Education in a respective branch according to its own *Program* which is in agreement with (a relevant part of) a *General Program*. Agreement of a *Program* of an *Accredited Institution* with a *General Program* or its part is judged by an *Accreditation Commission* of the Ministry. There are no direct requirements on status of *Accredited Institutions*, however, for a part of a *General Program* devoted to practical training it is required that an *Accredited Institution* provides specific health-care to an extent specified by a *General Program*. Furthermore, appropriate personal, technical and material assurance of a *Program* is required. Specialized Education of each individual is supervised by a *Supervisor*, who is employed by an *Accredited Institution*. One of roles of a *Supervisor* is to verify regularly theoretical knowledge and practical skills of supervised radiological physicist.

The Law also specifies content of a *General Program*. A *General Program* has to contain following items:

- **number of CPD credit points** gained during 1 year of Specialized Education

- ***length of Specialized Education***
- ***extent and content of Specialized Education***, especially length of on-the-job training and „educational workplaces“ where training takes place
- ***theoretical knowledge and practical skills***
- ***educational activities***, courses, seminars, fellowships ***and next requirements for the specialized qualification***
- ***list of recommended reading***
- ***characteristics of activities of graduates from Specialized Education***

Proposals of CAMP

Although there are several uncertainties in legislative requirements, some general proposals related to content of a *General Program* as well as to a form and system of *Specialized Education* can be made regardless of the exact version of reformed Law.

General Programs are the only instruments which will define rules of Specialized Education over a framework given by the Law. Hence, they must be made very carefully with the aim to address both the accreditation process or guidelines, and a “general program” itself.

General Program should therefore contain:

- ***personal requirements for an Accredited Institution(s)*** - any institution carrying out a practical training must first assure perfectly clinical operation, i.e. number and qualification of radiological physicists should reflect e.g. guidelines of European Federation of Organisations for Medical Physics (EFOMP) „*Criteria for the staffing levels in a Medical Physics Department*“, 1997. Minimum individual work flow related exclusively to Specialized Education of each *Supervisor* should be defined.
- ***technical and material requirements for Accredited Institutions*** - overall equipment of all *Accredited Institutions* involved must cover all clinical routines provided in the Czech Republic.
- ***clinical requirements for an Accredited Institution(s) (which assures practical training/fellowship)***, e.g. it is insufficient a department to be capable of IMRT, a department must provide IMRT clinically.
- ***well defined system of regular verification*** of theoretical knowledge and practical skills of participants.
- ***complete list of practical competencies*** which have to be acquired by each participant before he/she takes final exam.

Furthermore we strongly recommend that the final in-specialization exam will take a form of practical demonstration that a participant acquired three practical skills selected from a complete list of practical competencies. This is in contrast with current practice that some kind of written project on relevant topic is accepted as a “practical exam”.

Essential knowledge which participants did not acquire during their university master study should be treated with attendance mandatory courses on specific topic lasting from several hours to several days.

Practical competencies could be acquired during on-the-job training in a “home-hospital” when a hospital and local supervisor are equipped and fully competent, respectively. In other case they should be acquired during practical training/fellowship in a relevant *Accredited Institution*. Regardless of training site, a participant should undertake regular verification of his/her skills by his/her *Supervisor*.

Next to “health legislation” governed by the Ministry, there exists also “nuclear legislation” governed by State Office for Nuclear Safety (SONS). Nuclear legislation treats e.g. conditions under which an individual is approved to act as a “radiation protection supervisor” and to manage and carry out “tests of sources of ionizing radiation” including health care. CAMP strongly recommends that relevant requirements for such competences are included in Specialized Education of radiological physicists.

The last but definitely not least is a question of funding of Specialized Education. It is practically impossible to build a system if essential rules of funding remain unknown!

Conclusion

Specialized Education of Czech radiological physicists in diagnostic radiology, nuclear medicine or radiotherapy follows-up to regulated university master program. A form and content of Specialized Education which will be defined by *General Programs* must therefore reflect previous step. Graduates from Specialized Education will be fully competent *clinical radiological physicists for DR, NM or RT* according to their branch. Therefore, we strongly recommend that *General Programs* are made very carefully reflecting requirements of Specialized Education and current status of the field in the Czech Republic. Currently, CAMP works on its own version of *General Program* for each branch. CAMP is ready to collaborate closely with all other bodies included in preparation of *General Programs* and with the Czech Ministry of Health.