EDITORIALS

Discussion About the Future Medical Physics Education – Moving into the BSc Level?

Slavik Tabakov, Co-Editor

Medical Physics education is at the heart of the profession and a main topic of our Journal. It is excellent to see many articles in the MPI Journal about the education in various countries - new educational technologies, initiatives and courses worldwide. At the same time we all know that the volume of our profession is growing rapidly and those who are dealing with education can no longer include even half of the new content in the limited hours of one masters course.

What options do we have? One option, used in some places, is to include more information in the practical training linked to the educational university courses. This way, however, limits the academic coverage of the material transferred into training, which could affect the future research. Another option, used in other places, is early narrow specialization. This could provide the necessary classical and modern academic information in one sub-field of the profession (e.g. Radiotherapy), but would decrease the horizon of the graduates. Whatever we do, if we follow the existing post-graduate (masters) educational model, it will not be enough for our very dynamic profession.

At the same time there are fast growing new strands in the interface between medicine and exact sciences - the very interface where medical physicists and engineers are the pioneers.

We have to be ready to collaborate (and perhaps to lead) the new research in this direction. This means that, in addition to the enlarged volume of the classical medical physics fields, we have to increase the coverage of our profession. This can only happen with an increased volume of education – i.e. BSc + MSc in Medical Physics.

We obviously have to consider moving into the under-graduate (bachelors) educational field. If we should develop this new type of medical physics education, it would need to include a combination of undergraduate physics modules (those essential for our profession) plus an introduction to all branches of medical physics. The following masters course would then concentrate in depth in some of the professional sub-fields.

If we consider this model, we should also think about including, at both BSc and MSc levels, subjects related to modeling, as well as math and programming linked to better use of the vast medical imaging information. We have to consider such expansion of the scope of the profession, keeping in mind its future application in new areas - for example, personalized medicine.

BSc courses in medical physics already have been initiated in some countries. MPI would be very interested to hear about their experience, and we would support any discussion on the subject.

Children Are Not Just Small Adults

Perry Sprawls, Co-Editor

The fact that children, especially infants, are not just small adults presents a major challenge for x-ray imaging including computed tomography (CT). It also provides an opportunity for medical physicists to use their knowledge, experience, and leadership to contribute to more effective diagnostic imaging balanced with appropriate risk management.

The challenge with imaging children is a combination of three factors. Within the body differences among the tissues that form physical contrast is less developed. Also, many anatomical structures and features are small requiring more high detail imaging procedures. A second factor is the potential higher sensitivity to the biological effects of radiation. A third factor, especially a challenge for radiographers and technologists conducting the procedures, is minimizing motion during acquisition of images.

When children are imaged in dedicated pediatric hospitals and clinics there are an increased possibility that the procedures are more optimized because the staff is trained and experienced in the special requirements for appropriate x-ray imaging.

However, often children are imaged along with adults when there are no dedicated pediatric facilities and staff available.

A normal procedure in radiography is to reduce exposure (a combination of KV and MAS) in relation to body size. While this might produce what appears to be a good image it is not necessarily an optimized procedure with respect to all image quality characters and radiation dose to the patient.

Optimizing x-ray imaging procedures, including CT, for pediatric patients is a somewhat complex process. It requires the collaborative actions of medical physicists, radiologists and other physicians, radiographers and technologists, and especially radiological and medical imaging educators.

To address the complexity of the challenge and provide guidance and resources to be used for more appropriate and optimized pediatric x-ray procedures the Image Gently program was developed. We are pleased that the invited article for this edition, Image Gently Campaign: Making a World of Difference, provides medical physicists in all countries with an opportunity to provide leadership in their institutions and make a major contribution to improved imaging of children.