

The NACP 2008 Symposium comes to Denmark

Not since its 14th meeting and general assembly in Reykjavik on June 26th 1992, has the Nordic Association for Clinical Physics (NACP) gathered its member organizations together. Sixteen years later, on June 4th 2008, Medical and Clinical Physicists from Northern Europe finally had the opportunity of getting together for the NACP 2008 Symposium, which was held over two days in the beautiful coastal city of Aarhus. Functioning both as the 6th annual symposium of the Danish Medical Physics Society (DSMF) and the 2008 meeting for the Norwegian Medical Physics Society (NFMF), the symposium also included participants from all other Nordic countries, as well as further afield. To support the international outlook of the symposium the official language of NACP is English, and with the meeting supported by a host of distinguished international speakers a high quality program was presented. Holding the symposium at the Helnan Marselis Hotel overlooking the bay of Aarhus, and with perfect weather for the occasion, the scene was set for a very enjoyable and profitable meeting.

The symposium was attended by just less than 200 participants from the Nordic countries, with 11 invited speakers and representatives from more than 20 companies. Five award presentations were also given during the meeting. The two day conference was dedicated to furthering the professional development of medical physicists in northern Europe, and included an interesting program encompassing historical overviews, presentations of new developments and technologies, and including a look at the future of medical physics in the fields of Diagnostic Imaging (DI), Radiotherapy (RT) and Nuclear Medicine (NM). To balance between these disciplines the meeting was organized with a mixture of joint presentations and parallel sessions, and with both invited and local speakers there was something for everyone. Even though the location of the conference room overlooking the blue sea of the Kattegat, and the perfect weather conditions for nipping down to the beach for a dip in the chilly sea were tempting, it was not enough to detract participants from the scientific program

- although ample opportunity to take advantage of these features was found during the breaks! Alongside which, with a pleasant conference dinner and the possibility of sharing a beer and a physics discussion with the other participants, there was many an opportunity to meet, in many cases for the first time, colleagues from the other Nordic countries.

The NACP 2008 symposium was officially opened by Ludvig Paul Muren, chairman of the scientific committee, and Søren Holm, president of the host country's medical physics society (DSMF). After bidding everyone a very warm welcome, and with the formalities over, the meeting got underway with the first invited speaker; Steve Webb (Royal Marsden Hospital, London). An interesting 45 minutes followed with the lecture covering the history, contribution, impact and possible future directions of physics as applied to medicine; from the dichotomous perspectives of "Big-Hit" science versus "Incremental" science. Even though there have been a few

discoveries which have revolutionized patient diagnosis and treatment, i.e. “big-hit breakthroughs”, such as Computer Tomography (CT), Magnetic Resonance Imaging (MRI) and Intensity-Modulated Radiotherapy (IMRT), the majority of work today falls under the category of “incremental” science; possibly laying down the groundwork for future important discoveries. However, due to the pressing clinical workloads for many medical physicists, many a truth was spoken when the idea was addressed: is there still physics in medical physics? As Steve Webb so succinctly noted: “if a medical physicist is not performing measurements and/or modeling data, then they are not doing physics!”

After setting the scene for interesting discussions later in the meeting, and the opening up of pertinent questions on the role of the medical physicist, it was good to see that with the second session the “physics” of “medical physics” was back, when we got back to basic physics and technology with a refresher course in optics and interference patterns – in this case as applied to the improvement of x-ray imaging. In this session Martin Bech (Niels Bohr Institute, Copenhagen) showed that by using grating interferometry and coherent radiation, and by utilizing both phase shift and incoherent scatter information from the detected x-rays, one has new and improved possibilities for displaying contrast in x-ray imaging.

Today the majority of medical physicists work in the field of RT. This dominance was clearly mirrored at the meeting, both in the distribution of the participants attending, and the splitting of the scientific content; with the afternoon sessions organized such that

three out of five proffered paper presentations, and three out of four award presentations, were given for contributions to the field of RT. Of the afternoons proffered papers, two major themes in RT were addressed: Intensity-Modulated (rotational) RT, (IMRT), and organ motion management; both from various dosimetric, technological and clinical perspectives. The accompanying diagnostic related topics underlined the current trend in DI, namely the merging of modalities, both digitally using images taken from different modalities, as well as methods for improving the quality of cardiac PET/CT scanning by utilizing both cardiac and respiratory gating simultaneously.

Alongside the formal scientific programme, to help promote professional development and excellence of medical physicists in northern Europe, a number of NACP and national award schemes are available. In total, five awards were presented during the meeting. Three 2007 awards: the Varian-NACP grant, NFMF PhD Award and DSMF Young Physicists Prize were rewarded respectively to: Flemming Kjær-Kristofersen (Rigshospitalet, Copenhagen), Åste Søvik (Rikshospitalet, Oslo) and Per Poulsen (Århus University Hospital), for their work in RT. Of the 23 posters presented, the winner of the NACP-2008 Best Poster award was given to Søren Kynde Nielsen from Århus for his work on in-vivo dosimetry during brachytherapy.

On a completely different note, the Norwegian Medical Physics (NFMF) grant for Professional Activity 2007 was awarded to Anne C.T. Martinsen from Ullevål University Hospital in

Oslo, for their setting up of a central Diagnostic Physics Centre. Their aim of collecting together a large team of multidisciplinary physicists to provide professional support for one another, whilst providing their services to the individual hospitals in the region of eastern Norway has been met with great success. For the diagnostic clinical physicists in other areas of Scandinavia, those working in small groups or even alone, this presentation opened up some interesting questions: is this a model that could be repeated in other countries?

On day two, the parallel meetings started with a good turnout for all the early-bird sessions, and (at least for the NM and DI groups), the overlapping interests of the participants for multimodality function was shown by a continual stream of audience members hopping between the individual presentations.

The radiotherapy parallel sessions were opened with an historical overview and current update on the status of normal tissue complication probability (NTCP) models, where Giovanna Gagliardi (Karolinska Hospital, Stockholm) informed on an important review project (QUANTEC) currently being undertaken by AAPM-ASTRO; the aim being to update the currently used Emami NTCP-parameters and to provide better predictions of the adverse effects of RT. Even though it has not proved possible to extract parameters to predict the majority of complications arising from normal tissue irradiation, there have been successes for pneumonitis, late rectal complications, xerostomia and radiation induced liver disease – the findings of which are soon to be published in IJROBP.

In an interesting twist, the future of the conventional structure of the proton therapy centre came under question when Rock Mackie (University of Wisconsin, Madison) took the floor to present a new concept for a proton treatment facility, namely the Dielectric Wall Accelerator (DWA) - a multistage inductive accelerator under development at Lawrence Livermore National Lab. Obviously, the hopes of those involved in this scheme are for the DWA to become a viable alternative to the larger conventional proton centres in the near future.

Following on from dreams about revolutions in proton therapy and potential upcoming “big hits”, the audience was rapidly brought back to reality for the proffered paper part of the RT sessions with a look at the various “incremental” science being performed at the local Nordic institutions. Although touching upon a wide variety of topics, all presentations concerned photon therapy, and again IMRT and organ motion management were key topics together with treatment approach comparison and dose verification.

The radiology parallel sessions presented a wide variety of topics ranging from MR and CT to digital image analysis and dosimetry, and provided the opportunity to get a glimpse of the range of activities currently being undertaken across the Nordic countries. Kjell Inge Gjesdal (Sunnmøre MR Clinic, Ålesund), introduced the devoted radiology programme with an overview of the history and future of MR technology. In the next session the focus changed completely from traditional radiology to looking at new ways of interpreting

scans through image analysis. Taken to extremes this development could provide a means of determining a person's physical abilities by analyzing the shapes of specific brain structures.

Overall a representative range of radiology topics was covered, from the application of advanced imaging techniques, such as perfusion, to the dose challenges introduced by CT due to the "double edged sword" of automatic exposure control. The proffered paper part of the radiology parallel session was devoted to the practicalities of measuring and documenting radiation protection criteria, from the challenges of measuring the correct and trustworthy Kerma Area Product (KAP) in hospitals countrywide, to a method for monitoring CT usage and risk through the existing Radiology Information (RIS) and the Picture Archiving and Communications (PACS) systems.

The nuclear medical parallel sessions were highlighted by two central themes, thus reflecting the current important issues for those working in the field: diagnostic quality for multimodality imaging and dosimetry. The focus was on back-to-basics with the early-bird session offering comprehensive reviews as well as covering practical issues, on subjects relevant for today's repertoire of patient examinations and treatments.

Providing a comprehensive "A-Z" of the pitfalls and artifacts in multimodality imaging, Gustav von Schulthess (University Hospital, Zurich), opened the session with an informative overview of what is, and what is not, important for interpreting PET-CT and SPECT-CT images. If one takes to heart the central message that an awareness of artifacts allows you to

deal with them; that they can be corrected and are not preventative of a good diagnosis, and that in order to avoid the pitfalls one needs to know what is normal before one can say what is pathological, then you will not go far wrong in interpreting your images. As a concluding remark, with other multimodality combinations such as PET-MR or SPECT-PET images and systems just around the corner, the interesting point was addressed: do we really need simultaneous imaging, and what does simultaneous mean anyway? Thus giving medical physicists pause for thought!

Changing track, the topic of radioimmunotherapy (RIT) was taken up by Katarina Gleisner (University of Lund), with an in-depth review of the current literature and dosimetric methods applied to ^{90}Y (Zevalin) treatment. With today's current interest in in-vivo cancer treatment, and with stricter requirements for providing individual patient dose plans for those undergoing RIT, it was a nice opportunity to refresh the basic concepts of internal dosimetry, from absorbed dose to the pharmacokinetics of β -emitters.

The final part of the meeting found all participants together again in the large conference hall for the roundup and conclusion to NACP 2008. Led by Steve Webb and a panel of expert physicists, the future of physics in medicine and biology was debated at some length, with interesting questions and discussions fielded in all areas of medical physics, with threads drawn from many of the earlier presentations. In the formal part of the session, a vision of the future was presented by Robert Jeraj (University Medical School, Wisconsin), not too far

removed from the realms of reality, with emphasis on personalized treatments and better prediction and detection of disease, and with technological advancements in diverse areas such as bioinformatics, computational biology and nanomedicine. Due to the huge technological, financial and multidisciplinary requirements for real advancement, it was stressed that the way forward must lie in research teams, clinical networks and with physicists being open to inclusion of non-traditional physics; training and stimulating research environments being the key to a successful future. Happily everyone was in agreement that there is still a future for physics and physicists in medicine; the medical physicists, instead of becoming obsolete, will have many interesting opportunities to rise to the challenge of understanding and implementing new developments of physics in the clinical workplace.

The meeting ended with a session devoted to "The past, the present and the future of NACP". Presented by Simo Hyödynmaa, a comparison and contrast was made of the various Continuing Professional Development (CPD) systems currently found across the Nordic countries. Interestingly it was shown that the majority of the countries have similar schemes in place, all with European recognition. However, there are still a few countries which have to get on board the "development train"—an important step if their medical physicists are to have the possibility of having their further educational activities and professional development recognized. The meeting was then officially closed by Rune Hafslund (president of NACP), with a

commentary on, and hope for, an active future for the society.

There is no doubt that the 2008 symposium has provided a firm foundation on which NACP can base future activities. Looking back over the meeting it is obviously an impossible task to please all of the people 100 percent of the time, especially when faced with the problem of finding a balance between the individual fields of diagnostics and RT, doubly difficult when one of these fields dominates both in man power and research resources, and even more so when the split and emphasis in these fields differs between the individual Nordic countries – a non-trivial problem addressed in the planning of NACP 2008. However, this challenge was taken very seriously and met with success by the organizers, and even though some of the open discussion sessions may have drifted a little towards an RT focus, due to the predominance of RT participants at the meeting, this does not distract from the conclusion that the NACP 2008 symposium was a huge success, professionally profitable, and enjoyed by all participants. Hopefully this success will be repeated, and the authors of this synopsis all look forward to attending regular NACP meetings in the future.

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