



ESTRO

NEWSLETTER JULY - AUGUST

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SOCIETY LIFE

Jens Overgaard:
“I didn’t join ESTRO, I made it!”



RTT

Tribute to Mary Coffey



ESTRO SCHOOL

Interview with Jesper Eriksen,
director of the ESTRO School

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View of Glasgow, UK, where the 1st ESTRO Physics workshop will take place, 17-18 November 2017

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RESEARCH PROJECTS





Report from the third meeting of the European Particle Therapy Network

5 April 2017
Brussels, Belgium

Introduction

The aim of the European Particle Therapy Network (EPTN) is to promote clinical and research collaboration between the rapidly increasing numbers of European particle therapy (PT) centres and to ensure that PT becomes integrated in the overall radiation oncology community.

At the last meeting in 2016 it was decided to combine work packages (WPs) 1 and 3 as there was an overlap on tasks. The combined group is now WP1 clinical and is led by Hans Langendijk. The need to include a WP on education was also raised. EPTN's educational aspects will be covered in WP3.

Since the last meeting in 2016, there has been a change in the organisers of the EPTN. Michael Baumann has stepped down due to other engagements and has been replaced by Cai Grau.

Below are the reports from the work packages discussed at the third meeting in April 2017.

WP1: clinical

The overarching aim of WP1 is to establish a firm basis for evidence-based particle therapy at a European level. Next to this general aim are the following, more specific additional objectives:

1. to identify the methodological issues related to phase 1 and 2 studies as well as to randomised controlled trials comparing photons with particles, and to define general guidelines for the design of clinical trials to overcome these issues;

2. to establish an expert committee to advise and support researchers in Europe in the design of clinical trials in particle therapy;
3. to define the content of uniform prospective data registration programmes on a European level for the most common tumour types treated with particle therapy.

To achieve this, we will establish two tasks: First, all possible methodological problems related to clinical studies on particle therapy will be identified. To this end, an invitational conference has been organised with a number of experts in the field of particle therapy (radiation oncologists and medical physicists), methodology, epidemiology and statistics. Based on the outcome of this conference, a checklist with minimal requirements and quality points will be created that can be used to review future studies and trial protocols. An expert committee (EC) will be founded that can be consulted on the design of future clinical studies on particle therapy. The EC will also be responsible for setting up meetings where future studies can be discussed. It should be noted that ESTRO/EPTN is not going to conduct clinical trials but intends to use existing platforms and organisations, and that external funding is needed to run such trials.

Second, uniform prospective data registration programmes at a European level for the most common tumour types treated with particle therapy will be described. This task is divided into sub-tasks for nine patient groups frequently treated with particle therapy, including central nervous system, head and neck, breast, lung, oesophagus, lymphoma, sarcoma, prostate and ▼



DAMIEN C. WEBER



CAI GRAU



paediatric cancer. For each tumour type, different levels of assessments are defined:

- Level I: minimal dataset (routine basis, mandatory);
- Level II: extended dataset (routine basis, optional);
- Level III: research dataset (with framework of research project, requiring additional informed consent, optional).

Task leaders and sub-task leaders will be appointed very shortly.

WP2: dose assessment, quality assurance, dummy runs and technology inventory

As of March 2017, 14 centres in eight different countries confirmed their interest in contributing to WP2, with a total of 18 participants.

The first general WP2 workshop was held on the 28 March 2017 in the ESTRO office in Brussels. We had 14 representatives of 13 different institutes at the workshop. During the workshop six working groups (WG) were created to cover the different areas of interest of WP2. The focus of each working group was discussed and redefined. The following main changes have been made:

1. 'Reference dosimetry' WG: as the definition of standards for reference dosimetry and primary beam monitor calibration for particle therapy are currently being addressed by other committees outside EPTN, WP2 will gather primarily the experience from different centres by sharing results on this

topic to provide valuable inputs to the existing committees. We are also closely following the update of the Technical Reports Series (TRS), where members of the WG are involved.

2. Reference dosimetry audits and end-to-end audits are now combined in one WG.
3. Two additional working groups were created, one on ocular treatments and one on patient specific verifications.

The new configuration of the working groups is the following:

1. **Quality assurance/equipment survey:** preparation of a questionnaire to be sent to interested centres in Europe with the aim of collecting information regarding the dosimetric quality assurance tests performed on particle machines by the different centres, including the type of test, the frequency, the tolerance and the equipment used.
Action: to send out the questionnaire in the summer 2017.
2. **Reference dosimetry:** share results and experience between centres with respect to reference dosimetry and monitor calibration.
Action: to propose well-defined tests for a better interpretation of the results across institutes and to follow closely the update of TRS.
3. **Audits:** to create a network of centres interested in participating in reference dosimetry audits and end-to-end audits.
Action: to propose well defined end-to-end tests with anthropomorphic phantoms.
4. **Patient specific verifications:** to look at the equipment needed for patient specific verifications, and at the tools and criteria

for the comparison between measured and planned dose.

Action: to include patient-specific verifications in the survey.

5. **Dosimetry tools:** to create a database of dosimetry equipment in use in particle therapy. The specific needs for this WG will be addressed only after reviewing the results of the survey.
6. **Ocular treatment:** dedicated working group to address the topics of WG2-5 specifically for ocular treatments.

WP3: education

Coordinators have been defined after the Brussel's meeting for this WP (Marco Schwarz, Trento, Italy, and Morten Hoyer, Aarhus, Denmark). They will start working together with a longer list of key people. The initial task of the WP will be to map the need and availability of education in PT in Europe. ESTRO already has an online network of education courses in use. This can be taken advantage of. ESTRO has an annual budget for a certain number of mobility grants, staff needing training in PT can apply for those and if successful can have up to three weeks training in PT at a centre able to offer the training. Commercial companies also offer training on their own equipment. Training of radiation therapists could be a specific focus for ESTRO. Issues that need to be tackled include relations with the European Network for Light Ion Hadron Therapy (ENLIGHT) and potential collaborations with vendors. ▼



Discussion of WP4 in progress. At the front of the room are: Sairos Safai (left) and Cai Grau (right)

WP4: image guidance in particle therapy

WP4 focuses on the importance of imaging and image guidance in advanced particle therapy. Its first aim is to understand and investigate the merits and caveats of the use of image guided particle therapy (IGPT) in current practice within European particle therapy centres. Secondly, WP4 aims to identify current challenges, as well as ongoing and future research activities in this rapidly developing field.

WP4 has identified key people in 19 European PT centres. A questionnaire that has been sent out

to these centres has been analysed by the WP4 coordinators (Alessandra Bolsi, PSI Villigen, Switzerland; Aswin Hoffmann, OncoRay, Dresden, Germany). Preliminary results have been communicated to the key people. For a more detailed analysis, assistance was requested from the same group.

On February 17, the WP4 coordinators organised a first workshop at OncoRay, Dresden, Germany, to meet with all interested people from the group. The meeting was attended by 17 participants from 12 different centres around Europe. The following agenda points were discussed:

- specific aims of WP4,
- achievements so far,
- provisional analysis of the questionnaire results,
- organisation of sub-working groups based on interest and expertise.

Based on these discussions, the group agreed to put together a library of clinical practice, describing the current practice of IGPT in European centres. Furthermore, four sub-working groups have been defined based on interests and expertise of the participants. These sub-working groups are primarily categorised by body site:

1. brain, head and neck (Iuliana Toma-Dasu, Stockholm, Sweden; Dante Amelio, Trento, Italy)
2. thorax (Alexandru Dasu, Uppsala, Sweden)
3. abdomen and pelvis (Markus Stock, Wiener Neustadt, Austria)
4. extremities (to be discussed in May meeting)

These are subdivided into imaging workflow steps:

- simulation and planning
- image guidance
- treatment verification
- treatment evaluation and adaptation
- 4D imaging for treatment of moving targets

Coordinators of the sub-working groups will initiate further discussions on each of these steps.

Discussion on future meetings of WP4 took place in May at the ESTRO 36 conference and will continue in early 2018 at the Proton Therapy Centre Czech in Prague. ▼

WP5: treatment planning systems in particle therapy

A meeting of this working group took place once again in Brussels. Attendance was good, with 14 participants from different centres taking part. In the first meeting, a number of different tasks had been identified for this group, and each was reported on in this meeting.

Collective treatment planning system (TPS) specifications (Hakan Nystrom, Uppsala, Sweden)

- Various centres have been contacted to ask if they would provide their TPS specifications.
- The specifications submitted have been collated together into a common structure.
- However, legal issues prevented some institutes from being able to provide these.
- In the first version of the 'collective specifications', it has been noticed that the customer requests are often different to the acceptance procedures proposed by the vendor. This is an additional area that this task group could investigate.

Planning standards and case solutions (Tomasz Kajdrowicz, Krakow, Poland)

- A planning comparison has already been organised in collaboration with Italy, Poland, Austria, Czech Republic and Sweden (IPACS group), with different cases having been distributed and planned at different institutes within this consortium.
- A first paper on the results of this is in preparation and will be presented at the next WP5 meeting (to be organised in summer).
- It was stressed that the IPACS group is not closed and anybody can join, so these same

cases could be distributed to more groups.

- A next step could be the distribution of common beam data and machine parameters such that differences between optimisation/dose calculation engines could be studied. This, however, needs careful planning.

TPS commissioning and validation (Xavier Vermeren, Essen, Germany)

- A questionnaire is to be distributed to participants in preparation for putting together a recommended procedure for commissioning and validation of proton TPS.
- Existing photon recommendations will be used as a basis.
- The idea is to produce a best practice document, and not a legally binding document.

Alternatives to patient-specific verifications (Tony Lomax, Paul Scherrer Institute, Villigen, Switzerland)

- A questionnaire to be distributed to participants is being prepared with the aim of taking a snap shot of the patient-specific verification procedures in use in European centres at the moment.
- However, it was noted that this should be coordinated with WP2 (dosimetry).
- There is a general consensus within the group that patient-specific verifications are time-consuming and not particularly efficient or useful. As such, log file-based dose reconstructions could be an interesting alternative.
- A job of the WP therefore could be to encourage manufacturers to provide log

file data, and this should be included in the standardised TPS specifications being put together as part of this WP.

CT Hounsfield units calibration (Christian Richter, Dresden, Germany)

- This has been a very productive group, with a survey already written, distributed and the results analysed.
- Seven centres replied to the survey.
- Six use SECT for planning and one uses DECT.
- Five use the stoichiometric approach, two base the calibration directly on tissue substitutes.
- Three use a single curve, four centres use multiple curves.
- Metal artefact handling is performed in different ways, and there is room for standardisation here.
- The next step is to plan a calibration audit using a standard 'ground truth' phantom sent to different centres.

Robustness analysis (Frank van der Heuvel, Oxford, UK)

- A review of the current robustness metric was presented to the group.
- Six different methods were identified, which have all been implemented in Oxford and tested on a small number of clinical cases.
- The consensus in the group was that robustness should guide planning but should not be a strict goal.

Other points

- Relative biological effectiveness (RBE)/linear energy transfer (LET) evaluation and ▼

optimisation in TPS are not currently covered by the WP.

- The general consensus was that LET is currently more useful than RBE, and should be included in TPS systems. This is to be included as part of robustness analysis task.
- Four-dimensional planning is not presently covered but a new sub-group is to be defined.
- Vendor involvement could be achieved by inviting vendors to meetings on specific topics, but they should not be permanent members of the WP.
- More involvement from medical doctors in this WP would be appreciated.

WP6: radiobiology

The activities of the WP since the last EPTN meeting include reports in the ESTRO newsletter and presentations during recent meetings (ENLIGHT meeting 2016 and ESTRO 35). A dedicated talk on ‘The ESTRO initiative on biological effects of particle therapy’ was presented at the ESTRO 36 conference.

Radiobiology was the main topic of an expert workshop on radiobiology of proton therapy, which was held in November 2016 in Dresden, Germany. Here, the following topics were discussed:

- available RBE data, known RBE variability and dependencies;
- physics and biology for treatment planning;
- combining protons with systemic treatment;
- particularities of clinical trials testing biological effects of protons.

All groups involved in particle radiobiology have been invited to complete a questionnaire to determine the current and detailed status of radiobiological studies. So far, 11 institutions have responded: Aarhus (Denmark), National Centre of Oncological Hadrontherapy (Italy), Dresden (Germany), Essen (Germany), Heidelberg ion-beam therapy centre (Germany), Katholieke Universiteit Leuven (Belgium), Maastrro (Belgium), MedAustron (Austria), Paul Scherrer Institute (Switzerland), the Christie (UK) and the University of Gronigen (The Netherlands). The information from the questionnaire will help to guide future collaborative research and will be summarised in a forthcoming publication.

The next steps of the WP will be a face-to-face meeting. There is expectation that WP6 achieves progress on practical research cooperation for the next EPTN meeting in 2018. We are encouraged to organise a face-to-face meeting between coordinators and participating centres/institutions. WP6 also needs to explore how to form a network of distributed facilities for a common approach, sharing data and sufficient beam time as well discussing how to implement standardised research methodologies.

WP7: health economics

Yolande Lievens (ESTRO President and Ghent University Hospital, Belgium) presented the current status of WP7, which is dedicated to health economic aspects of proton therapy. Health economics can contribute to a better understanding of the cost-utility ratio of PT in the context of other commonly used radiation

modalities. This is an inevitable exercise as innovations (PT is still an innovation, despite its long history) have to demonstrate not only their clinical superiority but also their economic characteristics. The results generated, for instance in health technology assessments (HTAs), are used to make informed decisions about whether to adopt at all, or reimburse corresponding treatments. Accordingly, HTAs are critical for PT since the decision-makers, such as health insurers and government bodies, rely on the results of these structured evaluations.

The first challenge in this work package is to get some basic economic performance data on PT centres, in order to develop models that would give better insights with regard to overall operating cost. The aim is to align this work to other initiatives within ESTRO, in particular the costing model developed in the ESTRO-HERO project. In order to capture the necessary data, last year we developed and sent out a survey with this intention. However, the response from PT centres was reluctant, as a result of which more detailed modelling efforts are delayed. The conclusion on the first survey was that it might have been too detailed. Accordingly, the WP7 team, which has been enriched by Dr Ulrike Kliebisch who joined from the Paul Scherrer Institute, is working on a more focused survey.

In addition to these efforts aiming at basic economic data, we are working on a connection between clinical outcome (including side effects) and cost data. This will allow us to deploy data in various health economic assessment formats including cost-effectiveness and cost-utility, ▼

EPTN WPs

WP	Title	Coordinators
1	Clinical	Hans Langendijk (Groningen, The Netherlands), <i>Leader</i> Roberto Orecchia (Milano, Italy) Karin Haustermans (Leuven, Belgium) Daniel Zips (Tuebingen, Germany) Jacques Balosso (Grenoble, France) Esther Troost (Dresden, Germany)
2	Dose assessment, quality assurance, dummy runs, technology inventory	Oliver Jäckel (Heidelberg, Germany) Sairos Safai (Villigen, Switzerland) Stefan Menkel (Dresden, Germany)
3	Education	Morten Høyer (Aarhus, Denmark) Marco Schwarz (Trento, Italy)
4	Image guidance in particle therapy	Aswin Hoffmann (Dresden, Germany) Alessandra Bolsi (Villigen, Switzerland)
5	TPS in particle therapy	Håkan Nyström (Uppsala, Sweden) Tony Lomax (Villigen, Switzerland)
6	Radiobiology, RBE	Manjit Dosanjh (Geneva, Switzerland) Bleddyn Jones (Oxford, UK) Jörg Pawelke (Dresden, Germany) Martin Prutschy (Zurich, Switzerland) Brita S. Sørensen (Aarhus, Denmark)
7	Health economy	Yolande Lievens (Ghent, Belgium) Klaus Nagels (Bayreuth, Germany)

or comprehensive formats such as HTA and comparative effectiveness research. Health economic profiles of innovative technologies such as PT are important means to establish them as valuable therapeutic approaches within the global landscape of already established radiation therapy modalities.

General discussions

EPTN and ESTRO

EPTN is now a task force of ESTRO. It falls under the remit of the scientific council of ESTRO and is expected to report annually on its activities to the ESTRO Board. As a task force it will be evaluated at a certain point either to become embedded in the ESTRO structure or to plan an alternative way forward.

EPTN and the Particle Therapy Co-operative Group (PTCOG)

EPTN activities are complementary to those of the PTCOG. Partners in EPTN are free to take part in PTCOG activities, committees or the Board. PTCOG has held its annual 2017 meeting, and discussions have been initiated between PTCOG executive committee and ESTRO/EPTN to have a memorandum of understanding between the parties.

EPTN and the European Organisation for Research and Treatment of Cancer (EORTC)

The participants supported a continued and stronger collaboration with the EORTC, in order to utilise the expertise and infrastructure for conducting radiotherapy trials in a multi-institutional setting. A meeting between key ▼

people in EPTN/ESTRO and EORTC has been arranged in July.

Research funding

Karen Kirkby (University of Manchester, UK) shared her experience in submitting two proposals on PT – INTREPID and INSPIRE – to the European Commission (EC) for funding. In such applications, it is not possible to include all centres of EPTN. However, she had approached some member institutes depending on the skills needed for the projects. Other would-be partners are from industry, a small business, and international institutes outside the European Union (EU). The two proposals had been submitted and decisions on funding would be known by June 2017.

There is no specific research funding for PT in Europe. The EC, including the Directorate Generals for Health and Research, seem to have either little interest or a negative impression of PT. There is a need to lobby members of the European Parliament to ensure that PT is included in descriptions of calls for funding. ESTRO uses its stakeholder council to lobby EU institutions and promote radiotherapy, and PT can be included. The EORTC is willing to help and be involved in the search for funding. The EPTN organisers, Cai Grau and Damien Weber, together with the ESTRO leadership and WP1 leader, Hans Langendijk, will include this aspect in their discussions with EORTC.

Industry should also be approached via ESTRO, though caution must be exercised to avoid conflict of interest. It is advisable to first publish

data before sharing with industry. Private companies are also organising their own PT meetings. EPTN does not endorse such meetings.

Next meeting

The next meeting of the EPTN in 2018 will be organised back-to-back with the ENLIGHT annual meeting in London.

On behalf of EPTN

Damien C. Weber (Villigen, Switzerland)

Cai Grau (Aarhus, Denmark)

EPTN organisers

For more information on EPTN visit:
estro.org/about-us/governance-organisation/scientific-council/task-forces/european-particle-therapy-network

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