Results of the 2016 elections for President-elect and Board members

Meet with Jesper Eriksen, elected-chair of the Education and Training Council

ESTRO 35 is around the corner, plan your days by reviewing the programme
## CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Editorial</td>
<td>3</td>
</tr>
<tr>
<td>Society Life</td>
<td>6</td>
</tr>
<tr>
<td>Read it before your patients</td>
<td>13</td>
</tr>
<tr>
<td>Clinical</td>
<td>42</td>
</tr>
<tr>
<td>Brachytherapy</td>
<td>47</td>
</tr>
<tr>
<td>Physics</td>
<td>61</td>
</tr>
<tr>
<td>RTT</td>
<td>73</td>
</tr>
<tr>
<td>ESTRO School</td>
<td>82</td>
</tr>
<tr>
<td>Young ESTRO</td>
<td>104</td>
</tr>
<tr>
<td>Health Economics</td>
<td>120</td>
</tr>
<tr>
<td>Conferences</td>
<td>124</td>
</tr>
<tr>
<td>Calendar of events</td>
<td>161</td>
</tr>
</tbody>
</table>
Dear colleagues and friends,

Spring is in the air, and with it nature begins its renewal into colour. In ESTRO we follow suit, and the recent elections have also helped refresh our Society. ESTRO was privileged to count on a dedicated and committed membership, and we are extremely thankful to all the candidates who took this challenge. Nearly 700 members voted, and I am pleased to announce the name of our new President-elect, Umberto Ricardi. Umberto has been an active member of ESTRO for many years, and he will surely do a wonderful job at the helm of our Society. We also elected four new Board members, Matthias Guckenberger and Marianne Nordsmark who will represent clinicians in the new Board, Claudio Fiorino who will represent physicists, and Conchita Vens who will represent radiobiologists for another three years. We wish them luck in their new roles with ESTRO and we thank all those who volunteered to participate in this election. It is truly rewarding for me to see so much interest including among the young members, in the future of ESTRO.
The new season also brings us the year’s biggest European event in radiation therapy, ESTRO 35. Not long to go now, and if you haven’t yet, please make sure to register very soon. Turin will certainly be a great location to welcome us all and we will have a multi-level record-breaking conference, with a high attendance, a great company presence, and high-level scientific presentations and discussions. Something for us all to look forward to.

Don’t forget to also register for the second super run. Participation is limited to 500 runners, and there aren’t many places left. The Super Run first happened at the 3rd Forum last year in Barcelona, and it was a great success. Help to make it a great day again, by joining us and supporting the ESTRO Cancer Foundation (ECF) in its goal of showing that it is possible to stay physically active during and after treatment.

The ESTRO Board recently decided that a clarification was needed in the branding of ESTRO’s annual meeting. The format of the ESTRO Forum in three editions grew successfully to the same size as the biennial ESTRO congress. In order to focus on the consistency of the two meetings and retain the idea of creating continuity year by year in the work of the Society for disseminating science, it was agreed to hold an annual meeting, always labelled with the meeting number, but still structured in such a way that it respects the separate tracks and allows for interaction between disciplines, while also foreseeing time and space for each discipline individually. Thus, I am very pleased to let you know that our conference next year will be ESTRO 36 and it will be held in Vienna.

There is more good news that I would like to share with you, our membership continues to grow, and at the end of January 2016 we had already more institutional members than last year. This is a great indicator of ESTRO’s prospects for the future, as engagement with those who are active in our field is of extreme importance. Another great development is that the Board has just approved the creation of an intraoperative radiation therapy (IORT) task group. This group will lead the writing of multidisciplinary guidelines for indications and technical aspects for IORT. There is an urgent need for IORT guidelines, and we want to help fill this gap.

Enjoy reading your newsletter and see you in Turin.

Philip Poortmans
ESTRO President
SOCIETY LIFE
It is with great pleasure that I can inform you about the results of the recent election that took place between 25 January and 14 February 2016, in order to elect the new President-elect and the new ESTRO Board members. The results are shown below and they will also be presented officially at the ESTRO general assembly on 2 May in Turin, during ESTRO 35. We congratulate the successful candidates who will start their roles after ESTRO 35. I would also like to take this opportunity to express our appreciation and gratitude to all the candidates who took part in the elections. It is of utmost importance for our Society that a well-balanced ballot can be offered to the members and in allowing their names to go forward they ensured that this was the case.

For the first time since the establishment of the Advisory Committee on Radiation Oncology Practice (ACROP), the committee responsible for guidelines, we are happy to share with you the first guideline published in the Green Journal following the ACROP procedure. Our aim for the future is to feature any such guidelines in this corner.

Best wishes and see you soon in Turin.

*Philip Poortmans*
*ESTRO President*
PRESIDENT-ELECT

Umberto Ricardi
Universita di Torino
Turin, Italy

ELECTED BOARD MEMBERS

Clinicians

Matthias Guckenberger
University Hospital Zurich
Zurich, Switzerland

Physicist

Claudio Fiorino
Istituto Scientifico San Raffaele
Milan, Italy

Radiobiologist

Marianne Nordsmark
Aarhus University Hospital
Aarhus, Denmark

Conchita Vens
Netherlands Cancer Institute
Amsterdam, The Netherlands
The guideline on the target delineation of glioblastomas (GBM) is the first guideline published in the *Green Journal* following the ACROP procedure. ACROP hopes that this guideline will pave the way for many other guidelines in the future. In addition, this first guideline was a pilot that enabled the members of the ACROP committee to readjust and fine tune the SOP and the procedures in the ESTRO office.

Max Niyazi, the coordinator of the target delineation guideline of GBM, shares with us his experience and talks about the recently published guideline.

Professor Claus Belka, chair of ACROP, supported the initiation of the guideline on target volumes in GBM. Setting up the group of experts, the content framework and defining the time schedule were monitored by ACROP, that gave suggestions and indications, based on feedback received from the ESTRO committees and the editors of the *Green Journal*. The writing committee is extremely important and it should consist of experts in the field with reasonable and documented expertise (publications, study protocols and wide acceptance in the field), and provide a reasonable variety of geographical areas across Europe.

Peer review is clearly a central step. The proposed guideline text is peer reviewed by members of the reviewing committee, and feedback is integrated into the manuscript. All steps are monitored and documented by ACROP. Therefore, submission and publication in the *Green Journal* were quick since only editorial work remained.

During this process, ACROP streamlines the reviewing process, and the final submission procedure.

In the end, although it was a considerable amount of work the writing committee managed to draft the first ACROP guideline: http://www.thegreen-journal.com/article/S0167-8140%2815%2900661-1/abstract

More accurate and precise target delineation guidelines for GBM should help to promote standardisation and uniformity. Currently there is a lot of variation in the target delineation of GBM between different institutions and several consensus statements are available. Therefore, 14 European experts in the field were part of the group that aimed at developing a joint European consensus on the delineation of the clinical target volume in GBM patients.
The writing committee discussed and analysed the body of evidence concerning GBM target delineation, and several key issues were identified and discussed, including:

i) Pre-treatment steps and immobilisation

ii) Target delineation and the use of standard and novel imaging techniques

iii) Technical aspects of treatment including planning techniques, and fractionation.

Based on the EORTC recommendation focusing on the resection cavity and residual enhancing regions on T1-sequences with the addition of a 20mm margin, special situations are presented with corresponding potential adaptations depending on the specific clinical situation.

The guideline concludes that currently, based on the EORTC consensus, a single clinical target volume definition based on postoperative T1/T2 FLAIR abnormalities is recommended, using isotropic margins without the need to cone down. A PTV margin based on the individual mask system and IGRT procedures available is advised, usually in the order of 3-5mm.

The GBM guideline has already received a positive review by Glenn Bauman the ACR Journal Advisor Editor for Radiation Oncology February 2016. He said “This is a comprehensive, pragmatic, practical guideline for treatment planning for glioblastoma. An excellent guide for residents and anyone looking for a succinct document covering all the major salient aspects of radiotherapy planning for malignant glioma. Which is to say they recommend what I do in my practice. Seriously, it is a great overview with excellent tips.”

From my perspective as a coordinator, I really appreciated the ACROP initiative due to its scientific impact. I am grateful for this opportunity as well as the support from ACROP, and I hope for further fruitful initiatives in the future.

Maximilian Niyazi
LMU Klinikum der Universität München
Munich, Germany

HOW TO PREPARE AN ESTRO-ACROP GUIDELINE

Roughly three years ago ESTRO set up a new committee known as the Advisory Committee on Radiation Oncology Practice (ACROP). The new committee was started and shaped by Donal Hollywood (Ireland), Vincenzo Valentini (Italy) and Claus Belka (Germany). The main aim of ACROP is to organise the development of guidelines within ESTRO as well as harmonise the guideline process with other scientific societies. In addition, ACROP acts as a forward looking “trend scout” seeking out new developments in research, health economics and health politics that impact on radiation oncology practice. Every standing committee has a representative within ACROP.

You can find the ACROP SOP for the development of guidelines here: http://www.estro.org/about/governance-organisation/policies/acrop-procedures-policy
All readers of ESTRO Flash, the monthly information letter sent to ESTRO contacts, members and non members, will receive complimentary access to Radiotherapy & Oncology as a flip book. The flip book format, which gives readers access to the latest issue of the journal for one month, is great for reading on-screen. Jump between articles, search for articles by keywords or phrases, zoom in and out of articles, tables and figures, and bookmark favourite articles.

Each issue of Radiotherapy & Oncology will be made available in the Quick Links section of the ESTRO Flash. The flip book will be accessible to everyone. However, after 31 days, the link will expire.
2016 ESTRO MEMBERSHIP

Discover the opportunities that only the ESTRO membership can bring to you, your career, your practice, your profession, and ultimately, your patients.

ESTRO is devoted to advancing the goals of radiation oncology. This includes providing its members with outstanding science and education in order to support them in their career advancement.

Join ESTRO and gain access to exclusive member benefits such as:
• Online subscription to Radiotherapy and Oncology
• Reduced fees for attending ESTRO courses, conferences and joint events
• Online access to scientific material (events webcasts, delineation cases, etc.) through the e-library (DOVE)
• Eligibility for grants, awards, faculties and governance positions.

ESTRO offers several categories of membership to fit your professional needs.
Check them online on www.estro.org/members
READ IT BEFORE YOUR PATIENTS
Too important to miss…

A digest of essential reading for all radiation oncologists

BY PHILIPPE LAMBIN, DIRK DE RUYSSCHER AND HANS KAANDERS
BACKGROUND
The role of locoregional treatment in women with metastatic breast cancer at first presentation is unclear. Preclinical evidence suggests that such treatment might help the growth of metastatic disease, whereas many retrospective analyses in clinical cohorts have suggested a favourable effect of locoregional treatment in these patients. We aimed to compare the effect of locoregional treatment with no treatment on outcome in women with metastatic breast cancer at initial presentation.

METHODS
In this open-label, randomised controlled trial, we recruited previously untreated patients (≤65 years of age with an estimated remaining life expectancy of at least 1 year) presenting with de-novo metastatic breast cancer from Tata Memorial Centre, Mumbai, India. Patients were randomly assigned (1:1) to receive locoregional treatment directed at their primary breast tumour and axillary lymph nodes, or no locoregional treatment, by a computer-generated block randomisation sequence (block size of four). Randomisation was stratified by site of distant metastases, number of metastatic lesions, and hormone receptor status. Patients with resectable primary tumour in the breast that could be treated with endocrine therapy were randomly assigned upfront, whereas those with an unresectable primary tumour were planned for chemotherapy before randomisation. Of the patients who had chemotherapy before randomisation, we randomly assigned patients who had an objective tumour response after six to eight cycles of chemotherapy.

The primary endpoint was overall survival analysed by intention to treat. This study is registered with ClinicalTrials.gov, NCT00193778.

FINDINGS
Between Feb 7, 2005, and Jan 18, 2013, of the 716 women presenting with de-novo metastatic breast cancer, we randomly assigned 350 patients: 173 to locoregional treatment and 177 to no locoregional treatment. At data cut-off of Nov 1, 2013, median follow-up was 23 months (IQR 12.2-38.7) with 235 deaths (locoregional treatment n=118, no locoregional treatment n=117). Median overall survival was 19.2 months (95% CI 15.98-22.46) in the locoregional treatment group and 20.5 months (16.96-23.98) in the no-locoregional treatment group (HR 1.04, 95% CI 0.81-1.34; p=0.79), and the corresponding 2-year overall survival was 41.9% (95% CI 33.9-49.7) in the locoregional treatment group and 43.0% (35.2-50.8) in the no locoregional treatment group. The only adverse event noted was wound infection related to surgery in one patient in the locoregional treatment group.

INTERPRETATION
There is no evidence to suggest that locoregional treatment of the primary tumour affects overall survival in patients with metastatic breast cancer at initial presentation who have responded to frontline chemotherapy, and this procedure should not be part of routine practice.
Hypofractionated radiotherapy versus conventionally fractionated radiotherapy for patients with intermediate-risk localised prostate cancer: 2-year patient-reported outcomes of the randomised, non-inferiority, phase 3 CHHiP trial.


The Lancet Oncology 2015 Dec;16(16):1605-16.
small bother in 26 (6%), 28 (7%), and 38 (9%) men; moderate bother in 19 (5%), 23 (6%), and 21 (5%) men, and severe bother in four (<1%), three (<1%) and three (<1%) men respectively (74 Gy vs 60 Gy, ptrend=0.64, 74 Gy vs 57 Gy, ptrend=0.59). We saw no differences between treatment groups in change of bowel bother score from baseline or pre-radiotherapy to 24 months.

**INTERPRETATION**

The incidence of patient-reported bowel symptoms was low and similar between patients in the 74 Gy control group and the hypofractionated groups up to 24 months after radiotherapy. If efficacy outcomes from CHHiP show non-inferiority for hypofractionated treatments, these findings will add to the growing evidence for moderately hypofractionated radiotherapy schedules becoming the standard treatment for localised prostate cancer.
PURPOSE
Hypofractionated treatment might increase the radiobiological tumour dose without increasing toxicity due to the reported high radiation-fraction sensitivity of prostate cancer. Here, we present the first results on oncologic outcome from the Dutch randomised hypofractionation trial (HYPRO).

MATERIALS/METHODS
Between March 2007 and December 2010, we conducted a multicentre, randomised phase 3 superiority trial, including intermediate- to high-risk patients with localised T1b-4NX-0MX-0 prostate cancer. Inclusion criteria were a prostate-specific antigen (PSA) concentration of ≤60ng/mL and a WHO performance status of <3. Patients were randomly assigned (1:1) to receive conventional treatment with 39 fractions of 2 Gy in 8 weeks (five fractions per week) or hypofractionated treatment with 19 fractions of 3.4 Gy in 6.5 weeks (three fractions per week). Randomisation was done with a minimisation procedure, stratified by risk group and treatment centre. The primary endpoint is relapse-free survival (RFS) after treatment. Relapse is defined as biochemical relapse (Phoenix definition), clinical relapse, loco-regional or distant relapse, or start of hormonal therapy, whichever occurs first. The aim of this trial was to detect an absolute reduction of 10% of the relapse rate at 5 years in the hypofractionation arm. The Kaplan-Meier method was used to calculate RFS probabilities, and Cox regression analysis was applied to compare the RFS between the treatment arms. Analyses were based on intention-to-treat. An α of 0.05 was considered the level of statistical significance.

RESULTS
Of the enrolled 820 patients, 804 men were included in this analysis. Median follow-up was 60 months. Androgen deprivation therapy (ADT) was prescribed to 534 patients (66%). The 5-year RFS rates were 77% for conventional treatment and 80% for hypofractionated treatment (P=0.36). The adjusted hazard ratio (HR) was 0.86 (95% confidence interval [CI] 0.63-1.16). Factors associated with RFS in multivariate analysis were Gleason score ≤7 (HR=0.46, 95% CI 0.32-0.66, P<0.001), long-term ADT (≥12 months) versus none (HR=0.50, 95% CI 0.31-0.80, P=0.004), and high risk (>25%) of seminal vesicle involvement according to the updated Partin tables (HR=2.59, 95% CI 1.36-4.93, P=0.004).

CONCLUSION
Hypofractionated radiation therapy (19 fractions of 3.4 Gy) resulted in higher RFS rates, but the difference was not statistically significant. These results show no evidence of superiority of hypofractionation over conventional treatment.
PROSTATE
Addition of docetaxel, zoledronic acid, or both to first-line long-term hormone therapy in prostate cancer (STAMPEDE): survival results from an adaptive, multiarm, multistage, platform randomised controlled trial.


BACKGROUND
Long-term hormone therapy has been the standard of care for advanced prostate cancer since the 1940s. STAMPEDE is a randomised controlled trial using a multi-arm, multistage platform design. It recruits men with high risk, locally advanced, metastatic or recurrent prostate cancer who are starting first-line long-term hormone therapy. We report primary survival results for three research comparisons testing the addition of zoledronic acid, docetaxel, or their combination to standard of care versus standard of care alone.

METHODS
Standard of care was hormone therapy for at least 2 years; radiotherapy was encouraged for men with N0M0 disease to November, 2011, then mandated; radiotherapy was optional for men with node-positive non-metastatic (N+M0) disease. Stratified randomisation (via minimisation) allocated men 2:1:1:1 to standard of care only (SOC-only; control), standard of care plus zoledronic acid (SOC + ZA), standard of care plus docetaxel (SOC + Doc), or standard of care with both zoledronic acid and docetaxel (SOC + ZA + Doc). Zoledronic acid (4 mg) was given for six 3-weekly cycles, then 4-weekly until 2 years, and docetaxel (75 mg/m²) for six 3-weekly cycles with prednisolone 10 mg daily. There was no blinding to treatment allocation. The primary outcome measure was overall survival. Pairwise comparisons of research versus control had 90% power at 2.5% one-sided α for hazard ratio (HR) 0.75, requiring roughly 400 control arm deaths. Statistical analyses were undertaken with standard log rank-type methods for time-to-event data, with hazard ratios (HRs) and 95% CIs derived from adjusted Cox models. This trial is registered at ClinicalTrials.gov (NCT00268476) and ControlledTrials.com (ISRCTN78818544).

FINDINGS
A total of 2,962 men were randomly assigned to four groups between Oct 5, 2005, and March 31, 2013. Median age was 65 years (IQR 60–71). 1817 (61%) men had M+ disease, 448 (15%) had N+/X M0, and 697 (24%) had N0M0. Of 165 (6%) men who were previously treated with local therapy, the median prostate-specific antigen was 65 ng/mL (IQR 23–184). Median follow-up was 43 months (IQR 30–60). There were 415 deaths in the control group (347 [84%] prostate cancer). Median overall survival was 71 months (IQR 32 to not reached) for SOC-only, not reached (32 to not reached) for SOC + ZA (HR 0.94, 95% CI 0.79–1.11; p=0.450), 81 months (41 to not reached) for SOC + Doc (0.78, 0.66–0.93; p=0.006), and 76 months (39 to not reached) for SOC + ZA + Doc (0.82, 0.69–0.97; p=0.022). There was no evidence of heterogeneity in treatment effect (for any of the treatments) across prespecified subsets. Grade 3–5 adverse events were reported for 399 (32%) patients receiving...
SOC, 197 (32%) receiving SOC + ZA, 288 (52%) receiving SOC + Doc, and 269 (52%) receiving SOC + ZA + Doc.

**INTERPRETATION**
Zoledronic acid showed no evidence of survival improvement and should not be part of standard of care for this population. Docetaxel chemotherapy, given at the time of long-term hormone therapy initiation, showed evidence of improved survival accompanied by an increase in adverse events. Docetaxel treatment should become part of standard of care for adequately fit men commencing long-term hormone therapy.
PROSTATE

Addition of docetaxel or bisphosphonates to standard of care in men with localised or metastatic, hormone-sensitive prostate cancer: a systematic review and meta-analyses of aggregate data.


BACKGROUND

Results from large randomised controlled trials combining docetaxel or bisphosphonates with standard of care in hormone-sensitive prostate cancer have emerged. In order to investigate the effects of these therapies and to respond to emerging evidence, we aimed to systematically review all relevant trials using a framework for adaptive meta-analysis.

METHODS

For this systematic review and meta-analysis, we searched MEDLINE, Embase, LILACS, and the Cochrane Central Register of Controlled Trials, trial registers, conference proceedings, review articles, and reference lists of trial publications for all relevant randomised controlled trials (published, unpublished, and ongoing) comparing either standard of care with or without docetaxel or standard of care with or without bisphosphonates for men with high-risk localised or metastatic hormone-sensitive prostate cancer. For each trial, we extracted hazard ratios (HRs) of the effects of docetaxel or bisphosphonates on survival (time from randomisation until death from any cause) and failure-free survival (time from randomisation to biochemical or clinical failure or death from any cause) from published trial reports or presentations or obtained them directly from trial investigators. HRs were combined using the fixed-effect model (Mantel-Haenszel).

FINDINGS

We identified five eligible randomised controlled trials of docetaxel in men with metastatic (M1) disease. Results from three (CHAARTED, GETUG-15, STAMPEDE) of these trials (2992 [93%] of 3206 men randomised) showed that the addition of docetaxel to standard of care improved survival. The HR of 0.77 (95% CI 0.68–0.87; p<0.0001) translates to an absolute improvement in 4-year survival of 9% (95% CI 5–14). Docetaxel in addition to standard of care also improved failure-free survival, with the HR of 0.64 (0.58–0.70; p<0.0001) translating into a reduction in absolute 4-year failure rates of 16% (95% CI 12–19). We identified 11 trials of docetaxel for men with locally advanced disease (M0). Survival results from three (GETUG-12, RTOG 0521, STAMPEDE) of these trials (2121 [53%] of 3978 men) showed no evidence of a benefit from the addition of docetaxel (HR 0.87 [95% CI 0.69–1.09]; p=0.218), whereas failure-free survival data from four (GETUG-12, RTOG 0521, STAMPEDE, TAX 3501) of these trials (2348 [59%] of 3978 men) showed that docetaxel improved failure-free survival (0.70 [0.61–0.81]; p<0.0001), which translates into a reduced absolute 4-year failure rate of 8% (5–10). We identified seven eligible randomised controlled trials of bisphosphonates for men with M1 disease. Survival results from three of these trials (2740 [88%] of 3109 men) showed that addition of bisphosphonates improved survival (0.88 [0.79–0.98]; p=0.025), which translates to 5% (1–8) absolute
improvement, but this result was influenced by the positive result of one trial of sodium clodronate, and we found no evidence of a benefit from the addition of zoledronic acid (0.94 [0.83–1.07]; p=0.323), which translates to an absolute improvement in survival of 2% (−3 to 7). Of 17 trials of bisphosphonates for men with M0 disease, survival results from four trials (4079 [66%] of 6220 men) showed no evidence of benefit from the addition of bisphosphonates (1.03 [0.89–1.18]; p=0.724) or zoledronic acid (0.98 [0.82–1.16]; p=0.782). Failure-free survival definitions were too inconsistent for formal meta-analyses for the bisphosphonate trials.

**INTERPRETATION**

The addition of docetaxel to standard of care should be considered standard care for men with M1 hormone-sensitive prostate cancer who are starting treatment for the first time. More evidence on the effects of docetaxel on survival is needed in the M0 disease setting. No evidence exists to suggest that zoledronic acid improves survival in men with M1 or M0 disease, and any potential benefit is probably small.
Phase III study of surgery versus definitive concurrent chemoradiotherapy boost in patients with resectable stage IIIA(N2) and selected IIIB non-small-cell lung cancer after induction chemotherapy and concurrent chemoradiotherapy (ESPATUE).


**PURPOSE**
Concurrent chemoradiotherapy with or without surgery are options for stage IIIA(N2) non-small-cell lung cancer. The previous phase II study of the group had shown the efficacy of induction chemotherapy followed by chemoradiotherapy and surgery in patients with IIIA(N2) disease and with selected IIIB disease. Here, the authors compared surgery with definitive chemoradiotherapy in resectable Stage III disease after induction.

**PATIENTS AND METHODS**
Patients with pathologically proven IIIA(N2) and selected patients with IIIB disease that had medical/functional operability received induction chemotherapy, which consisted of three cycles of cisplatin 50 mg/m² on days 1 and 8 and paclitaxel 175 mg/m² on day 1 every 21 days, as well as concurrent chemoradiotherapy to 45 Gy given as 1.5 Gy twice daily, concurrent cisplatin 50 mg/m² on days 2 and 9, and concurrent vinorelbine 20 mg/m² on days 2 and 9. Those patients whose tumours were re-evaluated and deemed resectable in the last week of radiotherapy were randomly assigned to receive a chemoradiotherapy boost that was risk adapted to between 65 and 71 Gy in arm A or to undergo surgery (arm B). The primary end point was overall survival (OS).

**RESULTS**
When 246 of 500 planned patients had been enrolled, the trial was closed after the second scheduled interim analysis because of slow accrual and the end of funding, which left the study underpowered relative to its primary study end point. Seventy-five patients had stage IIIA disease and 171 had stage IIIB disease according to the Union for International Cancer Control TNM classification, sixth edition. The median age was 59 years (range, 33 to 74 years). After induction, 161 (65.4%) of 246 patients with resectable tumours were randomly assigned; strata were tumour-node group, prophylactic cranial irradiation policy, and region. Patient characteristics were balanced between arms, in which 81 were assigned to surgery and 80 were assigned to a chemoradiotherapy boost. In arm B, 81% underwent R0 resection. With a median follow-up after random assignment of 78 months, 5-year OS and progression-free survival (PFS) did not differ between arms. Results were OS rates of 44% for arm B and 40% for arm A (log-rank p=0.34) and PFS rates of 32% for arm B and 35% for arm A (log-rank p=0.75). Overall survival at 5 years was 34.1% (95% CI, 27.6-40.8) in all 246 patients, and 216 patients (87.8%) received definitive local treatment.

**CONCLUSION**
The 5-year OS and PFS rates in randomly-assigned patients with resectable stage III non-small-cell lung cancer were excellent with both treatments. Both are acceptable strategies for this good prognosis group.
LUNG

Induction chemoradiation in stage IIIA/N2 non-small-cell lung cancer: a phase 3 randomised trial.


The Lancet. 2015;386(9998):1049-56.

BACKGROUND

One of the standard options in the treatment of stage IIIA/N2 non-small-cell lung cancer is neoadjuvant chemotherapy and surgery. The authors did a randomised trial to investigate whether the addition of neoadjuvant radiotherapy improves outcomes.

METHODS

The study group enrolled patients in 23 centres in Switzerland, Germany and Serbia. Eligible patients had pathologically proven, stage IIIA/N2 non-small-cell lung cancer and were randomly assigned to treatment groups in a 1:1 ratio. Those in the chemoradiotherapy group received three cycles of neoadjuvant chemotherapy (100 mg/m² cisplatin and 85 mg/m² docetaxel) followed by radiotherapy with 44 Gy in 22 fractions over 3 weeks, and those in the control group received neoadjuvant chemotherapy alone. All patients were scheduled to undergo surgery. Randomisation was stratified by centre, mediastinal bulk (less than 5cm vs 5cm or more), and weight loss (5% or more vs less than 5% in the previous 6 months). The primary endpoint was event-free survival. Analyses were done by intention to treat.

RESULTS

From 2001 to 2012, 232 patients were enrolled, of whom 117 were allocated to the chemoradiotherapy group and 115 to the chemotherapy group. Median event-free survival was similar in the two groups at 12.8 months (95% CI 9.7-22.9) in the chemoradiotherapy group and 11.6 months (8.4-15.2) in the chemotherapy group (p=0.67). Median overall survival was 37.1 months (95% CI 22.6-50.0) with radiotherapy, compared with 26.2 months (19.9-52.1) in the control group. Chemotherapy-related toxic effects were reported in most patients, but 91% of patients completed three cycles of chemotherapy. Radiotherapy-induced grade 3 dysphagia was seen in seven (7%) patients. Three patients died in the control group within 30 days after surgery.

CONCLUSION

Radiotherapy did not add any benefit to induction chemotherapy followed by surgery. The authors suggest that one definitive local treatment modality combined with neoadjuvant chemotherapy is adequate to treat resectable stage IIIA/N2 non-small-cell lung cancer.
The optimal treatment of stage III non-small cell lung cancer (NSCLC) continues to be debated. This is partly due to the heterogeneity of the disease presentation, the important co-morbidities of these patients and the paucity of randomised studies. After the seminal meta-analysis of Auperin et al., it became clear that concurrent chemotherapy and radiotherapy was better than the sequential combination in fit patients. The role of surgery was investigated in two phase III trials, the European Organisation for Research and Treatment of Cancer (EORTC) 0841 trial and the North American Intergroup (INT) 0139/Radiation Therapy Oncology Group (RTOG) 9309 trial. In the EORTC 0841 trial, induction chemotherapy was followed by either surgery or radiotherapy (60 Gy of 30 fractions) in responding patients. There was no difference in overall survival (OS). In the INT/RTOG study, concurrent cisplatin-etoposide with radiotherapy to a dose of 45 Gy of 25 fractions followed by surgery was compared to so-called full dose chemoradiotherapy (61 Gy). Again, no difference in OS was observed, but due to the better disease-free survival in the surgery arm, the exceptionally high mortality in right-sided pneumonectomy patients and the higher OS in the unplanned “matched” lobectomy subgroup, the debate on the role of surgery in the treatment of stage III disease continues.

The two recent randomised studies investigated two different questions. Firstly, does radiotherapy plus chemotherapy before surgery improve event-free survival compared to induction chemotherapy followed by surgery (Swiss study) or does surgery improve OS when added to concurrent chemoradiotherapy (ESPATUE trial).

Both studies did not show a difference between treatment arms. At first glance, this would imply that for patients with operable and resectable stage III NSCLC, either induction chemotherapy followed by surgery or concurrent chemoradiotherapy without surgery are equal options. In irresectable or inoperable disease, definitive concurrent chemoradiotherapy remains the first choice. However, a major drawback of both studies is their limited size: The Swiss trial included 232 patients and the ESPATUE study was closed after enrolling 246 patients. Both studies could therefore only detect a difference in their primary endpoint with a hazard ratio (HR) of about 0.67. This is not realistic, as all treatments in stage III disease (concurrent chemoradiotherapy, adjuvant chemotherapy after surgery, and accelerated radiotherapy) all improve OS with a HR ranging between 0.85 and 0.87. Significant and clinically relevant differences in the outcome could therefore remain undetected. If pathological complete remission (pCR) would be used as a surrogate for efficacy, the Swiss trial that did not use concurrent chemoradiotherapy but sequential chemotherapy and radiotherapy, achieved a pCR of 12% in the chemotherapy arm and 16% in the chemoradiotherapy arm, which is clearly lower than the 33% pCR rate in the ESPATUE trial. The pCR rates in both studies are similar to that reported in other studies with the same induction therapy. Importantly, although the ESPATUE trial included patients with more advanced local disease than the Swiss study, the 5-year OS are amongst the best ever achieved in a multicentre randomised study, being 34% for all patients, and about 40% in randomised patients. ESPATUE used an individualised iso-toxic dose-escalated strategy. Acknowledging
all caveats, the latter results may be better than those achieved in the SAKK study as well as in surgical series that analysed their results in an intention to treat manner.

The available evidence is therefore supportive for non-surgical bi-modality therapy in both operable and inoperable NSCLC, except for some patients, those with large, necrotic tumours or excavated cancers. For the future, the challenge will be to increase local and distant tumour control further, preferentially with less toxicity.

Dirk De Ruysscher
Radiation Oncologist
Maastro clinic
Maastricht, The Netherlands

REFERENCES


BACKGROUND
Local excision is an organ-preserving treatment alternative to transabdominal resection for patients with stage I rectal cancer. However, local excision alone is associated with a high risk of local recurrence and inferior survival compared with transabdominal rectal resection. We investigated the oncological and functional outcomes of neoadjuvant chemoradiotherapy and local excision for patients with stage T2N0 rectal cancer.

METHODS
We did a multi-institutional, single-arm, open-label, non-randomised, phase 2 trial of patients with clinically staged T2N0 distal rectal cancer treated with neoadjuvant chemoradiotherapy at 26 American College of Surgeons Oncology Group institutions. Patients with clinical T2N0 rectal adenocarcinoma staged by endorectal ultrasound or endorectal coil MRI, measuring less than 4 cm in greatest diameter, involving less than 40% of the circumference of the rectum, located within 8 cm of the anal verge, and with an Eastern Cooperative Oncology Group performance status of at least 2 were included in the study. Neoadjuvant chemoradiotherapy consisted of capecitabine (original dose 825 mg/m² twice daily on days 1-14 and 22-35), oxaliplatin (50 mg/m² on weeks 1, 2, 4, and 5), and radiation (5 days a week at 1.8 Gy per day for 5 weeks to a dose of 45 Gy, followed by a boost of 9 Gy, for a total dose of 54 Gy) followed by local excision. Because of adverse events during chemoradiotherapy, the dose of capecitabine was reduced to 725 mg/m² twice-daily, 5 days per week, for 5 weeks, and the boost of radiation was reduced to 5.4 Gy, for a total dose of 50.4 Gy. The primary endpoint was 3-year disease-free survival for all eligible patients (intention-to-treat population) and for patients who completed chemotherapy and radiation, and had ypT0, ypT1, or ypT2 tumours, and negative resection margins (per-protocol group). This study is registered with ClinicalTrials.gov, number NCT00114231.

FINDINGS
Between May 25, 2006, and Oct 22, 2009, 79 eligible patients were recruited to the trial and started neoadjuvant chemoradiotherapy. Two patients had no surgery and one had a total mesorectal excision. Four additional patients completed protocol treatment, but one had a positive margin and three had ypT3 tumours. Thus, the per-protocol population consisted of 72 patients. Median follow-up was 56 months (IQR 46-63) for all patients. The estimated 3-year disease-free survival for the intention-to-treat group was 88.2% (95% CI 81.3-95.8), and for the per-protocol group was 86.9% (79.3-95.3). Of 79 eligible patients, 23 (29%) had grade 3 gastrointestinal adverse events, 12 (15%) had grade 3-4 pain, and 12 (15%) had grade 3-4 haematological adverse events during chemoradiation. Of the 77 patients who had surgery, six (8%) had grade 3 pain, three (4%) had grade 3-4 haemorrhage, and three (4%) had gastrointestinal adverse events.
INTERPRETATION
Although the observed 3-year disease free survival was not as high as anticipated, our data suggest that neoadjuvant chemoradiotherapy followed by local excision might be considered as an organ-preserving alternative in carefully selected patients with clinically staged T2N0 tumours who refuse, or are not candidates for, transabdominal resection.
Dexamethasone in the prophylaxis of radiation-induced pain flare after palliative radiotherapy for bone metastases: a double-blind, randomised placebo-controlled, phase 3 trial.


The Lancet Oncology 2015;16(15):1463-72. DOI: http://dx.doi.org/10.1016/S1470-2045(15)00199-0. Epub 2015 October 18
The National Cancer Institute of Canada (NCIC) Clinical Trials Group succeeded in completing the first randomised phase III trial on the effectiveness of dexamethasone in the prevention of a pain flare after a single fraction of 8 Gy for painful bone metastases. In 23 Canadian centres a total of 298 patients were randomised to receive 8mg dexamethasone for five days or placebo. The outcome was in favour of the active drug 26% vs 35% of patients experienced a pain flare (difference of 8.9%, lower 95% confidence bound 0.0, one-sided p=0.05). Most pain flares occurred within the first five days after radiotherapy. Two grade 3 and one grade 4 biochemical hyperglycaemic events occurred in the dexamethasone group compared with none after placebo. The most common other adverse events were mild grade 1 or 2. This is the first randomised trial on the topic of prevention of a pain flare, and although the absolute difference (about 9%) was smaller than the expected 20% the outcome of the study is very important for our patients. Additional benefits for patients receiving dexamethasone were reduced nausea and increased appetite and functional activity. The authors calculated a numbers needed to treat (NNT) of 11, but, since increasing pain leads to worse overall functioning and a decrease in quality of life, the burden of an oral intake of dexamethasone seems worthwhile. It will be interesting to see what the results will be of the second randomised trial on the topic of pain flare, which is currently ongoing in The Netherlands (Westhoff et al). In this three armed trial, the dose regimens 8mg dexamethasone for four days, versus 8mg dexamethasone for one day followed by three days of placebo, versus four days of placebo are being studied. Where Chow et al suggest in their discussion a possible further lowering of the percentage of pain flare after doubling the dose of dexamethasone to 16mg, perhaps, the Dutch trial will show that lower doses for four days or even one day are as good as the outcome of the Canadian trial. The Dutch trial is expected to complete its accrual in April 2016.

Yvette van der Linden
Radiation oncologist
University Medical Centre Leiden
Leiden, The Netherlands

REFERENCES
**BACKGROUND**

Adjuvant radiotherapy is recommended for patients with melanoma after lymphadenectomy. We previously showed this treatment reduced risk of repeat lymph-node field cancer in patients with a high risk of recurrence but had no effect on overall survival. Here, we aim to update the relapse and survival data from that trial and assess quality of life and toxic effects.

**METHODS**

In the ANZMTG 01.02/TROG 02.01 randomised controlled trial, we enrolled patients who had undergone lymphadenectomy for a palpable lymph-node field relapse and were at high risk of recurrence at 16 hospitals (11 in Australia, three in New Zealand, one in Netherlands, and one in Brazil). We randomly assigned patients (1:1) to adjuvant radiotherapy (48 Gy in 20 fractions, given over a maximum of 30 days) or observation, stratified by institution, areas of lymph-node field (parotid and cervical, axilla, or groin), number of involved nodes (≤3 vs >3), maximum involved node diameter (≤4 cm vs >4 cm), and extent of extracapsular extension (none, limited, or extensive). Participants, those giving treatment, and those assessing outcomes were not masked to treatment allocation, but participants were unaware of each other’s treatment allocation. In this follow-up, we assessed outcomes every 3 months from randomisation for the first 2 years, then every 6 months up to 5 years, then annually. The primary endpoint was lymph-node field relapse as a first relapse, assessed in patients without major eligibility infringements (determined by an independent data monitoring committee). We assessed late adverse effects (occurring >90 days after surgery or start of radiotherapy) with standard criteria in the as-treated population. This study is registered with ClinicalTrials.gov, number NCT00287196.

**FINDINGS**

Between March 21, 2003, and Nov 15, 2007, we randomly assigned 123 patients to adjuvant radiotherapy (109 eligible for efficacy assessments) and 127 to observation (108 eligible). The final follow-up date was Nov 15, 2011. Median follow-up was 73 months (IQR 61-91) and 23 (21%) relapses occurred in the adjuvant radiotherapy group compared with 39 (36%) in the observation group (adjusted hazard ratio [HR] 0.52 [95% CI 0.31-0.88], p=0.023). Overall survival (HR 1.27 [95% CI 0.89-1.79], p=0.21) and relapse-free survival (0.89 [0.65-1.22], p=0.51) did not differ between groups. Minor, long-term toxic effects from radiotherapy (predominantly pain, and fibrosis of the skin or subcutaneous tissue) were common, and 20 (22%) of 90 patients receiving adjuvant radiotherapy developed grade 3-4 toxic effects. 18 (20%) of 90 patients had grade 3 toxic effects, mainly affecting skin (nine [10%] patients) and subcutaneous tissue (six [7%] patients). Over 5 years, a significant increase in lower limb volumes was noted after adjuvant radiotherapy (mean volume ratio 15.0%) compared with observation (7.7%; difference 7.3% [95% CI 1.5-13.1], p=0.014). No significant differences in upper limb volume were noted between groups.
**INTERPRETATION**

Long-term follow-up supports our previous findings. Adjuvant radiotherapy could be useful for patients for whom lymph-node field control is a major issue, but entry to an adjuvant systemic therapy trial might be a preferable first option. Alternatively, observation, reserving surgery and radiotherapy for a further recurrence, might be an acceptable strategy.
PURPOSE
Children receiving CNS-directed therapy for cancer are at risk for cognitive problems, with few available empirically supported interventions. Cognitive problems indicate neurodevelopmental disruption that may be modifiable with intervention. This study evaluated short-term efficacy of a computerised cognitive training program and neural correlates of cognitive change.

PATIENT AND METHODS
A total of 68 survivors of childhood acute lymphoblastic leukaemia (ALL) or brain tumour (BT) with identified cognitive deficits were randomly assigned to computerised cognitive intervention (male, n = 18; female, n = 16; ALL, n = 23; BT, n = 11; mean age ± standard deviation, 12.21 ± 2.47 years) or waitlist (male, n = 18; female, n = 16; ALL, n = 24; BT, n = 10; median age ± standard deviation, 11.82 ± 2.42 years). Intervention participants were asked to complete 25 training sessions at home with weekly, telephone-based coaching. Cognitive assessments and functional magnetic resonance imaging scans (intervention group) were completed pre- and post-intervention, with immediate change in spatial span backward as the primary outcome.

RESULTS
Survivors completing the intervention (n = 30; 88%) demonstrated greater improvement than controls on measures of working memory (mean ± SEM; eg, Wechsler Intelligence Scale for Children [fourth edition; WISC-IV] spatial span backward, 3.13 ± 0.58 v 0.75 ± 0.43; P = 0.002; effect size [ES], 0.84), attention (eg, WISC-IV spatial span forward, 3.30 ± 0.71 v 1.25 ± 0.39; P=0.01; ES, 0.65), and processing speed (eg, Conners’ Continuous Performance Test hit reaction time, −2.10 ± 1.47 v 2.54 ± 1.25; P =0.002; ES, .61) and showed greater reductions in reported executive dysfunction (eg, Conners’ Parent Rating Scale III, −6.73 ± 1.51 v 0.41 ± 1.53; P = 0.002; ES, 0.84). Functional magnetic resonance imaging revealed significant pre- to post-training reduction in activation of left lateral prefrontal and bilateral medial frontal areas.

CONCLUSION
The study findings show computerised cognitive training is feasible and efficacious for childhood cancer survivors, with evidence for training-related neuroplasticity.
ABSTRACT
Neoplasms occur naturally in invertebrates but are not known to develop in tapeworms. We observed nests of monomorphic, undifferentiated cells in samples from lymph-node and lung biopsies in a man infected with the human immunodeficiency virus (HIV). The morphologic features and invasive behaviour of the cells were characteristic of cancer, but their small size suggested a nonhuman origin. A polymerase-chain-reaction (PCR) assay targeting eukaryotes identified *Hymenolepis nana* DNA. Although the cells were unrecognisable as tapeworm tissue, immunohistochemical staining and probe hybridisation labelled the cells *in situ.* Comparative deep sequencing identified *H. nana* structural genomic variants that are compatible with mutations described in cancer. Invasion of human tissue by abnormal, proliferating, genetically altered tapeworm cells is a novel disease mechanism that links infection and cancer.
BACKGROUND
Hyperbaric oxygen has been used as a therapy for patients experiencing chronic intestinal syndromes after pelvic radiotherapy for decades, yet the evidence to support the use of this therapy is based almost exclusively on non-randomised studies. We aimed to provide conclusive results for the clinical benefits of hyperbaric oxygen in patients with chronic bowel dysfunction after radiotherapy for pelvic malignancies.

METHODS
HOT2 was a double-blind, sham-controlled, phase 3 randomised study of patients (≥18 years) with chronic gastrointestinal symptoms for 12 months or more after radiotherapy and which persisted despite at least 3 months of optimal medical therapy and no evidence of cancer recurrence. Participants were stratified by participating hyperbaric centre and randomly assigned (2:1) by a computer-generated list (block size nine or 12) to receive treatment with hyperbaric oxygen therapy or sham. Participants in the active treatment group breathed 100% oxygen at 2.4 atmospheres of absolute pressure (ATA) and the control group breathed 21% oxygen at 1.3 ATA; both treatment groups received 90-min air pressure exposures once daily for 5 days per week for a total of 8 weeks (total of 40 exposures). Staff at the participating hyperbaric medicine facilities knew the allocated treatment, but patients, clinicians, nurse practitioners, and other health-care professionals associated with patients’ care were masked to treatment allocation. Primary endpoints were changes in the bowel component of the modified Inflammatory Bowel Disease Questionnaire (IBDQ) score and the IBDQ rectal bleeding score 12 months after start of treatment relative to baseline. The primary outcome was analysed in a modified intention-to-treat population, excluding patients who did not provide IBDQ scores within a predetermined time-frame. All patients have completed 12 months of follow-up and the final analysis is complete. The trial is registered with the ISRCTN registry, number ISRCTN86894066.

FINDINGS
Between Aug 14, 2009, and Oct 23, 2012, 84 participants were randomly assigned: 55 to hyperbaric oxygen and 29 to sham control. A total of 75 (89%) participants received 40 pressure exposures; all participants returned the IBDQ at baseline, 75 (89%) participants returned the IBDQ at 2 weeks post-treatment, and 79 (94%) participants returned the IBDQ at 12 months post-start of treatment. Patients were excluded from analyses of co-primary endpoints if they had missing IBDQ scores for intestinal function or rectal bleeding at baseline or at 12 months. In an analysis of 46 participants in the active treatment group and 23 participants in the control group, we found no significant differences in the change of IBDQ bowel component score (median change from baseline to 12 months of 4 (IQR -3 to 11) in the treatment group vs 4 (-6 to 9) in the control group.
the sham group; Mann-Whitney U score 0.67, p=0.50). In an analysis of 29 participants in the active treatment group and 11 participants in the sham group with rectal bleeding at baseline, we also found no significant differences in the change of IBDQ rectal bleeding score (median change from baseline to 12 months of 3 [1 to 3] in the treatment group vs 1 [1 to 2] in the sham group; U score 1.69, p=0.092). Common adverse events in both groups were eye refractive changes (three [11%] of 28 patients in the control group vs 16 [30%] of 53 patients in the treatment group), increased fatigue (three [11%] vs two [4%]), and ear pain (six [21%] vs 15 [28%]). Eight serious adverse events were reported in eight patients: two were reported in two patients in the control group (tonsillitis requiring surgery [grade 3]; recurrent cancer of the vulva [grade 4]) and six serious adverse events were reported in six patients in the treatment group (malignant spinal cord compression requiring surgery [grade 3]; malignant paraortic lymph node involvement requiring surgery [grade 3]; recurrence of vomiting and dehydration [grade 3]; diarrhoea and fever associated with Campylobacter infection [grade 3]; recurrence of abdominal pain, bloating, diarrhoea, and urinary tract infection [grade 3]; aneurysm [grade 4]), none of which were deemed treatment-related.

**INTERPRETATION**

We found no evidence that patients with radiation-induced chronic gastrointestinal symptoms, including those patients with rectal bleeding, benefit from hyperbaric oxygen therapy. These findings contrast with evidence used to justify current practices, and further level 1 evidence is urgently needed.
Many patients with gynaecological cancers, colorectal cancers, and genitourinary cancers receive radiation therapy as primary or adjuvant treatment. Despite improvements in radiation techniques, a substantial subgroup of these patients have chronic radiation-induced gastrointestinal symptoms that strongly affect their daily lives. Hyperbaric oxygen therapy is one of the few treatments for patients with severe radiation-induced symptoms, which include proctitis and cystitis with bleeding. However, evidence of its efficacy is weak and is based almost solely on small retrospective studies. One randomised trial (HORTIS), in which hyperbaric oxygen therapy is compared with sham treatment in 120 evaluable patients with chronic radiation-induced proctitis, included crossover of patients who had sham treatment to hyperbaric oxygen therapy shortly after completion of initial treatment. Although a significant (albeit modest) improvement on the Late Effects Normal Tissue scoring system (LENT SOMA) and on a bowel bother scale was noted in patients who received hyperbaric oxygen therapy, no data on long-term benefit are available because of the early crossover. Results of a small, randomised study of hyperbaric oxygen therapy versus argon plasma coagulation for patients with radiation proctopathy suggested a better and faster response with argon plasma coagulation than with hyperbaric oxygen. Sucralfate enemas and antibiotics are other therapies for radiation proctitis with some evidence of efficacy. Systematic assessment and treatment of chronic radiation-induced bowel dysfunction using a comprehensive management algorithm, has proven to be effective in a randomised trial. This algorithm suggests the use of hyperbaric oxygen therapy for patients with rectal bleeding. However, the authors of two systematic reviews of hyperbaric oxygen therapy for patients with radiation-related tissue injuries concluded that evidence was too limited and that more clinical trials were needed to assess both its long-term benefit and cost-effectiveness.

In The Lancet Oncology, Mark Glover and colleagues report the results of the randomised HOT2 trial of hyperbaric oxygen therapy versus sham treatment for patients with chronic bowel dysfunction after pelvic radiotherapy. A total of 84 patients was randomly assigned (2:1) to receive 40 exposures of hyperbaric oxygen therapy or sham treatment in 8 weeks. With changes in the bowel component and rectal bleeding score of the Inflammatory Bowel Disease Questionnaire from baseline to 12 months after start of treatment set as the primary endpoint measures, the investigators found no evidence of a benefit from hyperbaric oxygen therapy.

Mark Glover and colleagues are to be applauded for the sham-controlled study design and 12-month follow-up in what has been a long-awaited confirmatory trial of the efficacy of hyperbaric oxygen therapy in this setting. The strength of this study is the standardised analysis and treatment guided by the Royal Marsden algorithm for all the included patients, ensuring that patients with other causes of bowel symptoms were excluded and given relevant treatments. This approach may have led to a highly selected study population of patients with long-lasting, difficult symptoms, but these are the typical patients who would qualify for referral for hyperbaric oxygen therapy. The negative results of the HOT2 trial are disappointing for clinicians and patients who had hoped for proof of the efficacy of hyperbaric oxygen therapy, a form of therapy that is often tried as a last re-
Yet the publication of negative trial results are important in order to avoid publication bias of efficacy and to give a compelling rationale to plan future phase 3 trials. The results are especially relevant with respect to the burden that undergoing hyperbaric oxygen therapy can be for patients (at least 6–8 weeks of daily treatments, with risk of [transient] vision changes and ear problems) and for health-care providers, given the significant cost of hyperbaric oxygen therapy.

The mechanism by which hyperbaric oxygen therapy is thought to promote the repair of damaged tissue is by restoring oxygen tension, which stimulates angiogenesis and improves tissue function in chronic hypoxic, atrophic, fibrotic, and damaged mucosal tissue. One of the secondary endpoints in the HOT2 trial was photographic evidence of changes in images of rectal mucosa taken through flexible sigmoidoscopy; assessment of this endpoint would have added essential information about the degree of tissue healing and allowed a direct assessment of changes in response to hyperbaric oxygen. The question remains whether the results of the HOT2 trial should be understood as hyperbaric oxygen therapy having a transient and too weak an effect on the atrophic and vulnerable mucosa to result in measurable improvement, or whether the results seem to refute the putative mechanism by which oxygen therapy is thought to promote tissue healing. The results of the HOT2 trial do, however, give compelling and urgent rationale for further well-designed clinical trials of hyperbaric oxygen therapy. Random assignment of patients with chronic radiation-induced bowel dysfunction to a sham treatment is difficult, whereas a comparison of hyperbaric oxygen therapy to other treatment approaches might be more acceptable and enable larger trials. All patients with serious chronic radiation-induced bowel problems should be assessed and managed by an expert multidisciplinary team. Both symptom-related endpoints and endpoints related to tissue healing would be essential in further trials of hyperbaric oxygen therapy for radiation proctopathy, as symptoms can relapse and remit, and proof of the mechanism and degree of tissue improvement with hyperbaric oxygen therapy is needed.

Carien L Creutzberg
Department of Radiation Oncology
Leiden University Medical Centre
Leiden, The Netherlands
ABSTRACT
The SPine response assessment In Neuro-Oncology (SPINO) group is a committee of the Response Assessment in Neuro-Oncology working group and comprises a panel of international experts in spine stereotactic body radiotherapy (SBRT). Here, we present the group’s first report on the challenges in standardising imaging-based assessment of local control and pain for spinal metastases. We review current imaging modalities used in SBRT treatment planning and tumour assessment and review the criteria for pain and local control in registered clinical trials specific to spine SBRT. We summarise the results of an international survey of the panel to establish the range of current practices in assessing tumour response to spine SBRT. The ultimate goal of the SPINO group is to report consensus criteria for tumour imaging, clinical assessment, and symptom-based response criteria to help standardise future clinical trials.
PURPOSE
To determine the 12-year risk of developing an ipsilateral breast event (IBE) for women with ductal carcinoma in situ (DCIS) of the breast treated with surgical excision (lumpectomy) without radiation.

PATIENTS AND METHODS
A prospective clinical trial was performed for women with DCIS who were selected for low-risk clinical and pathologic characteristics. Patients were enrolled onto one of two study cohorts (not randomly assigned): cohort 1: low-or intermediate-grade DCIS, tumour size 2.5 cm or smaller (n = 561); or cohort 2: high-grade DCIS, tumour size 1 cm or smaller (n = 104). Protocol specifications included excision of the DCIS tumour with a minimum negative margin width of at least 3 mm. Tamoxifen (not randomly assigned) was given to 30% of the patients. An IBE was defined as local recurrence of DCIS or invasive carcinoma in the treated breast. Median follow-up time was 12.3 years.

RESULTS
There were 99 IBEs, of which 51 (52%) were invasive. The IBE and invasive IBE rates increased over time in both cohorts. The 12-year rates of developing an IBE were 14.4% for cohort 1 and 24.6% for cohort 2 (P=0.003). The 12-year rates of developing an invasive IBE were 7.5% and 13.4%, respectively (P=0.08). On multivariable analysis, study cohort and tumour size were both significantly associated with developing an IBE (P=0.009 and P =0.03, respectively).

CONCLUSION
For patients with DCIS selected for favourable clinical and pathologic characteristics and treated with excision without radiation, the risks of developing an IBE and an invasive IBE increased through 12 years of follow-up, without plateau. These data help inform the treatment decision-making process for patients and their physicians.
DOVE is the e-library developed by ESTRO giving you access to educational and scientific material, produced and disseminated by the Society: the Green Journal articles, conference abstracts, webcasts, e-posters, slides, access to FALCON (our delineation tool), guidelines, our newsletter, etc.

HOW DOES IT WORK?
DOVE works as a search engine encompassing all kinds of data in radiation oncology. Just type in your key words and then refine your search by ticking the boxes if you are looking for a particular type of support (abstract, webcast, etc.). Or simply type a key word to see all the information available linked to the topic.

HOW TO ACCESS DOVE?
Simply go to www.estro.org: DOVE appears on the welcome page. The level of free access to the content you searched will depend on your membership type.
INTRODUCTION

REPORT ON ASTRO’S 57TH ANNUAL MEETING

CLINICAL
“The use of hypofractionated radiotherapy appears to be increasing with data from large phase III trials in prostate cancer”

Here Professor Morten Hoyer shares with you his personal reflections from the 2015 annual ASTRO meeting. As you will see from the news report, the use of hypofractionated radiotherapy appears to be increasing with data from large phase III trials in prostate cancer presented as late breaking abstracts. Several presentations evaluated the use of stereotactic body radiation therapy (SBRT) for central lung tumours and the ability of radiotherapy to stimulate the immunresponse was also discussed.

Enjoy reading the news from ASTRO’s 57th annual meeting and if you want to discuss anything, please send me an email: daniel.zips@med.uni-tuebingen.de

Daniel Zips
Chair of the clinical committee
The 57th annual ASTRO meeting was held between 18-21 October 2015 in San Antonio, Texas. It attracted more than 11,000 participants and more than 2,100 abstracts were presented at the meeting, covering a broad spectrum of topics including clinical studies, biomarkers, physics, health economics and patient care. The theme of the meeting was ”Technology meets patient care”. The meeting aimed to highlight recent technological advances while emphasising the importance of the clinical and non-clinical skills needed to provide cancer patients with the full benefit of radiotherapy. As emphasised by the ASTRO president, Bruce D Minsky, in his presidential address, the advances in technology are central to our continued success, but we should not forget to focus on the patient and on clinical medicine.

Immune responses to large doses of irradiation was one of the highlights of the meeting. Local and abscopal responses with the combination of radiotherapy and PD-1 (programmed cell death protein 1) checkpoint blockage received high attention. It is an interesting thought that the immune system can be stimulated by radiotherapy and it provides an exciting new therapeutic target in terms of PD-1 directed therapies. The evidence for radiotherapy induced immune stimulation is sparse. It is primarily based on a few published cases of patients who received palliative radiotherapy and achieved
considerable responses in additional metastases outside the irradiated volume. There are a growing number of activities within this field in terms of preclinical and clinical research as pointed out by Andy Minn (University of Pennsylvania) in his talk on responses and biomarkers in radiotherapy and immune checkpoint blockade.

There were several presentations on stereotactic body radiation therapy (SBRT) targeting the lung and liver. The Radiation Therapy Oncology Group (RTOG) trial RTOG0813, which is a large phase I/II study of centrally located non-small cell lung cancer (NSCLC) with more than 100 patients from multiple institutions, was presented by Andrea Bezjak (University of Toronto). In this trial, their definition of centrally located tumours included tumours attached to the mediastinal pleura and the heart is different to that which we use in Europe. RTOG0813 investigated dose levels from 10 Gy times five with incremental steps of 0.5 Gy to a maximum of 12 Gy times five. Dose limiting toxicity (DLT) was any grade >3 toxicity related to SBRT within one year. The highest dose level was reached with a probability of a DLT of 7.2%. Longer follow-up will allow for an evaluation of late effects and efficacy. The Scandinavian Hilus study is investigating a dose scheme of eight fractions in a phase II setting and it will be interesting to compare the results of the Scandinavian study with the RTOG0813.

Two important randomised non-inferiority phase III studies in localised prostate cancer comparing moderate hypofractionation with conventional fractionated radiotherapy were presented as late breaking abstracts. The Dutch hypofractionated versus conventionally fractionated radiotherapy in prostate cancer (HYPRO) trial, presented by Luca Incrocci from Rotterdam, randomised 820 intermediate- and high-risk patients with prostate cancer between 19 fractions of 3.4 Gy (64.6 Gy) and 39 fractions of 2 Gy (78 Gy). With a median follow-up of 60 months, the primary end-point, relapse free survival was 80% and 77% [HR 0.86 (CI. 0.63-1.16)] in favour of hypofractionated, but not statistically different from the conventional arm. Preliminary results from the toxicity analysis revealed no differences in early and late toxicity between the two arms. The RTOG0415 trial, presented by Robert Lee from Duke University, randomised 1092 low-risk patients between 28 fractions of 2.5 Gy (70 Gy) versus the conventional 41 fractions of 1.8 Gy (73.8 Gy). The two study arms were designed to be biologically isoeffective at the α/β-ratio of 10 Gy. The primary end-point, disease free survival (DFS) with a median follow-up of 5.8 years, was 86% and 85% which was not statistically different in the hypofractionated and conventional arms, respectively. Late genitourinary and gastrointestinal side effects were slightly more prevalent in the hypofractionated arm.

The UK/Canadian Conventional or Hypofractionated High Dose Intensity Modulated Radiotherapy in Prostate Cancer (CHHiP) trial randomised 3216 prostate cancer patients with a <30% risk of vesicular invasion into a 3-arm study with 19 fractions of 3 Gy, 20 fractions of 3 Gy or 37 fractions of 2 Gy, respectively. The results of the CHHiP trial were presented by David Dearnaley (London) at the European Cancer Congress 2015 (ECC2015) in Vienna. It demonstrated non-inferiority of moderate hypofractionation (20 fractions of 3 Gy) compared to normofractionation (37 fractions of 2 Gy), but 19 fractions of 3 Gy was inferior to the normofractionated scheme. Fairly consistently, all these trials demonstrate non-inferiority and relatively low toxicity profile of moderate hypofractionation compared to conventional fractionation schedules. However, where previous trials such as the Lukka (1), Yeoh (2) and Arcangeli (3) studies indicate a low α/β-ratio (<2 Gy), these more recent studies which also include the Pollack (4) study, indicate a somewhat larger α/β-ratio. These trials
therefore open a new discussion on the $\alpha/\beta$-ratio of prostate cancer and results on more extreme hypofractionation of prostate cancer are therefore awaited. Until the release of the results from the extreme hypofractionation studies, we should consider the differences between the studies already published with respect to the broad range of risk groups, Gleason grades, hormonal therapy, radiation techniques, doses and study designs.


Morten Høyer
Department of Oncology,
Aarhus University Hospital
Denmark

REFERENCES


Read the interview with Yolande Lievens, chair of the track, in the Conferences Corner (p. 128)
BRACHYTHERAPY
In November 2015 the third GEC-ESTRO workshop was held. For the first time the set-up of the workshop was different. Instead of filling the day with lectures, a more practical approach was followed. You can read about the topics discussed and the experience of a participant in this Corner.

In the editor’s pick section we have three articles. Two articles on gynaecological brachytherapy were chosen. Stephanie de Boer discusses the long-term health-related quality of life from the well-known postoperative radiation therapy for endometrial carcinoma (PORTEC-2) study. The second study, from Renaud Mazeron investigated which external beam radiotherapy schedule could be considered optimal in combination with brachytherapy for cervical carcinoma to allow the highest dose to reach the tumour and the least dose to the organs at risk. In the third article, Alexandra Stewart discusses the focus on new guidelines for thoracic brachytherapy.

Last but not the least, Arthur Sun Myint, chair of the GEC-ESTRO rectal and anal working group (RECTANGO) shares with us the activities that were carried out by the group in 2015.

We hope you enjoy reading this edition of the brachytherapy Corner.

*Peter Hoskin, Bradley Pieters and Kari Tanderup*
The 3rd GEC-ESTRO workshop called “Tips and tricks for expanding the role of brachytherapy”, took place in Brussels on 19 November 2015. Approximately 150 people attended. At the time that the workshop took place in Belgium, unfortunately Brussels faced a terror alert. This prevented several ESTRO members from attending.

After a warm welcome by Jacob Lindegaard, the chair of GEC-ESTRO committee, the different working groups split up for parallel meetings. UroGEC, braphyqs, head and neck, gynaecological, breast and ano-rectal brachytherapy working groups ran practical sessions that were repeated four times. This enabled the delegates to take part in four different topical and practical sessions.

During the UroGEC session, the importance of the use of multiparametric MRI was stressed, to achieve optimal gross tumour volume (GTV) delineations to use for focal (boost) treatments. Furthermore, a live bladder brachytherapy implantation was shown. During the gynaecological workshop, the new GEC-ESTRO guidelines for gynaecological tumours were presented. Also a live gynaecological...
During the braphyqs session, the TG-43 based commissioning and quality assurance for LDR and HDR brachytherapy and applicator commissioning was presented. The breast brachytherapy workshop highlighted implantation techniques, and facts and myths regarding partial breast irradiation. These practical sessions were much appreciated by the attendees. It gave them an opportunity to participate in the specific fields of interest and ‘hot topics’ and new developments in the specific fields were highlighted. Due to the groups being small, this resulted in many lively discussions. During the last part of the day, several important issues were presented and discussed. Christian Kirisits raised a topical issue “Is brachytherapy in danger of being obsolete?”, as globally, brachytherapy numbers seem to be declining rapidly. As brachytherapy delivers extremely high doses to the tumour itself, with a steep dose fall off, the opinion of the attendees was that brachytherapy is a strong product that really can compete with other therapies and benefit patients. Next, Kari Tanderup discussed how to revitalise brachytherapy in the radiotherapy community. Christian and Kari discussed the topics in a ‘good cop/bad cop’ session. With striking numbers based on literature in favour of brachytherapy and plenty of new or renewed indications in the brachytherapy field, for example salvage HDR brachytherapy in prostate cancer, they convinced the audience that brachytherapy is far from being obsolete.

Eric van ’t Hooft showed a possible business case for brachytherapy. Cai Grau discussed how to investigate the health economics of brachytherapy, as brachytherapy has relatively low costs per quality-adjusted life-year (QUALY). Finally, the current ESTRO President, Philip Poortmans, showed that brachytherapy still has a promising position on the ESTRO oncopolicy agenda.

For me, the 3rd GEC-ESTRO workshop was very interesting. It showed that, at ESTRO, brachytherapy is very much alive and continuing to utilise brachytherapist’s knowledge, indications and enthusiasm.

Metha Maenhout, MD
Department of Radiation Oncology
University Medical Centre Utrecht
The Netherlands
Long-term impact of endometrial cancer diagnosis and treatment on health-related quality of life and cancer survivorship: results from the randomized PORTEC-2 trial.

Stéphanie M. de Boer

45 or 50 Gy, which is the optimal radiotherapy pelvic dose in locally advanced cervical cancer in the perspective of reaching magnetic resonance image-guided adaptive brachytherapy planning aims?

Renaud Mazeron

Focus on new guidelines for thoracic brachytherapy

Alexandra Stewart
Long-term impact of endometrial cancer diagnosis and treatment on health-related quality of life and cancer survivorship: results from the randomized PORTEC-2 trial.


CORRESPONDING AUTHOR
Stephanie M. de Boer
Department of Radiation Oncology
Leiden University Medical Center
Leiden, The Netherlands

What was your motivation for initiating this study?
In patients with intermediate risk endometrial cancer (EC), randomised trials have shown that pelvic external beam radiotherapy (EBRT) significantly reduced locoregional relapse compared to observation, but without survival benefit, and at the cost of more adverse events, mostly of gastrointestinal origin [1-4]. Vaginal brachytherapy (VBT) has become standard treatment for high-intermediate risk endometrial cancer (HIR-EC), since the randomised Post Operative Radiation Therapy in Endometrial Carcinoma (PORTEC)-2 trial reported similar vaginal control and survival, with better health-related quality of life (HRQL) compared to external beam radiation therapy (EBRT) [5-6]. Five year HRQL analysis among PORTEC-2 trial patients showed that significantly more women treated with EBRT reported gastrointestinal symptoms, often with limitations to daily activities, than those who underwent VBT [6]. Previously, long-term (15 year) HRQL analysis of the PORTEC-1 trial, in which patients were randomly allocated to EBRT or no additional treatment, had shown more urinary symptoms and use of incontinence materials reported by women who underwent EBRT. However, in the PORTEC-1 trial 29% of the patients in the EBRT arm were treated with parallel opposed fields, which was associated with an increased risk of morbidity compared to a four-field technique [7]. With improvement of survival and local control rates for EC, together with aging of the population, quality of life and the impact of cancer are becoming more important and late treatment-related morbidity is increasingly relevant. The current analysis was done to evaluate long-term HRQL, bowel and bladder symptoms and cancer survivorship issues among PORTEC-2 patients.

What were the main challenges during the work?
The main challenge for this analysis was to ensure maximal response rates to all questionnaires, case report forms (CRFs) and queries in order to complete follow up information at this late time point. Therefore, a lot of effort was put into chasing and checking all the data.

What are the most important findings of your study?
For HRQL analysis the EORTC-QLQ C30 questionnaire and additional questions for bowel, bladder and sexual symptoms from EORTC modules were used. Longitudinal HRQL analy-
sis showed higher rates of bowel symptoms with EBRT, without significant differences in global health and general functioning. At seven years, clinically relevant (‘quite a bit’ or ‘very much’ as reported by patients) bowel urgency was reported by 23.3% of patients treated with EBRT versus 6.6% of patients treated with VBT (p<0.001); limitations in daily activities due to bowel symptoms was reported by 10.5% versus 1.8% (p=0.001); faecal leakage by 10.6% versus 1.8% (p=0.03) and diarrhoea by 8.4% versus 0.9% (p=0.04). Urinary urgency was reported 39.3% of EBRT-patients, 25.5% for VBT, p=0.05. No difference in sexual activity was seen between treatment arms. Symptoms ratings of vaginal dryness, shortening, or pain were not significantly different between the treatment arms. Furthermore, the impact of cancer diagnosis and treatment was measured with the Impact of Cancer Questionnaire (IOC).

This is a questionnaire measuring the positive and negative impact of cancer experience among long-term survivors [8]. No differences in IOC scores between the two treatment groups were seen. However, the long-term impact of cancer scores was higher among the patients who had an EC recurrence or second cancer.

What are the implications of this research?
Pelvic EBRT has a long-term clinically relevant, mostly bowel symptom-related negative impact on HRQL, with moderate or severe limitation of daily activities reported by 10% of the patients, seven to ten years after treatment. VBT has become the treatment of choice, although EBRT is still warranted in high-risk patients to improve locoregional control. The results of this trial provide important information regarding long-term toxicities and the benefits of adjuvant treatment. For shared decision making, both health care providers and patients should be aware of long-term treatment sequelae. Future studies should be aimed at methods to minimise or improve these symptoms. The reduction of such long-term symptoms might be achieved by using new radiation techniques such as IMRT and adaptive IGRT or implementation of preventive measures.

REFERENCES
What was your motivation for initiating this study?
The treatment of locally advanced cervical cancer relies on a combination of pelvic chemoradiation and brachytherapy. The first part of the treatment can be performed in every radiotherapy department according to the patient’s place of residence, whereas brachytherapy is delivered in a limited number of centres especially since image-guided brachytherapy, which requires sophisticated resources and knowledge, has emerged. The choice of splitting the treatment between two different places can be justified by the costs and the fatigue induced by daily going and comings to radiotherapy centres. However, as a reference brachytherapy centre we have to face multiple external beam radiotherapy (EBRT) pelvic fractionations such as 45 Gy in 25 fractions (our standard) or 50.4 Gy in 28 fractions, and even in some cases plans including a simultaneous integrated boost to the cervix up to 55 Gy. These fractionations can be limiting to dose escalation during the planning process as we consider that the studied volumes of the organs at risk (OAR) have already received the planned EBRT dose (D₀.₁cm³ and D₂cm³). Classical data based on point-A prescriptions showed that low EBRT doses are associated with better outcomes and lower morbidity [1]. We wondered if significant differences could be demonstrated between two standard fractionations, 45 Gy in 25 fractions versus 50.4 Gy in 28 fractions.

What were the main challenges during the work?
The main challenge was to establish a method to compare these two regimens with a limited number of biases. We used former optimised plans and adapted the number of pulses according to several planning aims (called scenarios in the paper). Then we tried, in the few plans where 50.4 Gy seemed more advantageous, to identify some explanatory factors.

What are the most important findings of your study?
Based on 120 plans, we demonstrated that delivering 45 Gy in 25 fractions in the pelvis gives a better chance of reaching the brachytherapy planning aims than 50.4 Gy in 28 fractions. Using the current planning aims (D₉₀ HR-CTV ≥ 85-90 Gy, with D₂cm³ of the bladder, rectum, and sigmoid ≤ 90 Gy, 75, 75 Gy in EQD2) 45 Gy in 25 fractions showed no superiority in terms of D₉₀ HR-CTV. However, the D₂cm³ of the OAR were significantly decreased on average.
by 1.6 to 2.9 Gy (EQD2). Applying more severe dose constraints, such as those proposed in the EMBRACE II study, 45 Gy in 25 fractions allows the delivery of a higher HR-CTV D90, in addition to its advantages over the doses delivered to the OAR (D90: +1.1±1.7 Gy; D2cm³: –0.9 to –2.3 Gy).

What are the implications of this research?
The choice of the EBRT pelvic dose has been a topic of schools for a long time and this study will justify its harmonisation in the treatment of cervical cancer. With the demonstration of clear dose-effect relationships between the D90 HR-CTV and the probability of achieving local control and the D2cm³ of the bladder and rectum and the risk of late morbidity, it seems crucial to give the maximum chance of achieving optimal planning objectives. Delivering 45 Gy in 25 fractions is superior to 50.4 Gy in 28 fractions and this fractionation should be the preferred option.

REFERENCES
Focus on new guidelines for thoracic brachytherapy

American Brachytherapy Society consensus guidelines for thoracic brachytherapy for lung cancer
Stewart A, Parashar B, Patel M, O’Farrell D, Biagioli M, Devlin P and Mutyala S.

CORRESPONDING AUTHOR
Alexandra Stewart
Royal Surrey County Hospital
University of Surrey
Guildford, UK

What were the main challenges during the work?
One of the main challenges in updating these guidelines was the lack of clinical trial data in thoracic brachytherapy, particularly randomised trials. Many of the previous recommendations were based primarily on clinical experience rather than trial data. These demonstrate safe practice and have improved treatment standards in general, but it is important to incorporate all published data to cover a variety of potential scenarios.

What is your motivation for initiating this study?
Similar to GEC-ESTRO, the American Brachytherapy Society (ABS) are committed to improving standards in brachytherapy and hope to achieve this with their long history of publishing guidelines for brachytherapy. The ABS has updated their existing guidelines using the following criteria; prior published guidelines, results from clinical trials, published peer reviewed literature and the clinical experience of committee members. The modern ABS guidelines focus on the following five areas, patient evaluation, patient selection, contraindications, dosimetry and areas of controversy [1]. Previous ABS guidelines relating to thoracic brachytherapy were published in 1993 [2] and 2001 [3]. Therefore, the time had come to update these guidelines.

What are the most important findings of your study?
In the 14 years since the publication of the previous guidelines for thoracic brachytherapy the landscape of this treatment modality has changed dramatically. The guidelines were split into endobronchial treatment and interstitial thoracic seed brachytherapy. For endobronchial brachytherapy it is advised to perform treatment simulation using CT scanning and to plan treatment individually using 3-D dose optimisation. As such, low dose rate brachytherapy is no longer recommended for treatment. Generally, external beam radiotherapy has been found to be the most effective method of palliation for patients with lung cancer. However, endobronchial brachytherapy is effective for palliation in selected patients, particularly those who may benefit from a shorter treatment course. As radical treatment, it is recommended that brachytherapy is only used within the confines of clinical trials. A range of acceptable doses is recommended.

Interstitial seed brachytherapy has been used in thoracic cancer since the 1950s. Seed technol-
ogy has improved and dosimetry enhanced with the use of CT scanning. Despite promising phase II results, a recent phase III randomised trial has shown no benefit to the use of iodine-125 brachytherapy in addition to sublobar resection in patients with non-small cell lung cancer who are not fit for lobectomy. There may be a role for brachytherapy at the sites of close or positive surgical margins since phase II studies have shown rates of local control better than those predicted with surgery alone. Iodine-125 has the largest data on safety and efficacy. Palladium-103 has some data but decreased availability. The more recent use of caesium-131 was examined and the potential radiobiological advantage of its comparatively shorter half-life is appealing in tumours with a high alpha beta ratio. Again, a range of potential doses is presented.

What are the implications of this publication?
It is hoped that these guidelines will encourage the use of brachytherapy in thoracic cancer and standardise the techniques used and the doses selected. Further research is required and the publication of case series with detailed toxicity analysis is encouraged.

REFERENCES


The rectal and anal working group (RECTANGO) was formed following the GEC-ESTRO conference in May 2011 in London. Professor Arthur Sun Myint was asked to lead and facilitate the activities of the group. A proposal to adopt the international contact radiotherapy network (ICONE) into the GEC-ESTRO RECTANGO was made and accepted at the GEC-ESTRO Barcelona meeting in 2012. In Rome, at the first world rectal cancer conference in May 2013, Prof Sun Myint was elected as the president of ICONE. In May 2014, he was re-elected as chair for RECTANGO.

**ANNUAL MEETING**

The last annual meeting of RECTANGO/ICONE was held on 25 April 2015 in Barcelona. The application for the UK National Institute for Health and Care Excellence (NICE) to review contact X-ray brachytherapy (Papillon) has progressed well. Feedback from the patients’ survey by NICE was discussed at the last NICE interventional procedure meeting in February 2015. The final recommendations on Papillon were published by NICE on 25 September 2015. NICE regards the toxicity for Papillon as acceptable and recommended Papillon for patients not suitable for surgery. However, for patients who are fit but refuse surgery, Papillon should be offered as part of a clinical trial. We have set up the OPERA (organ preservation in early rectal adenocarcinoma) trial for this. The next annual meeting will take place in Turin on 30 April 2016. Those who wish to attend can contact Prof Sun Myint (arthur@sunmyint.co.uk) or Professor Jean-Pierre Gérard (pierre.gerard@nice.unicancer.fr).

**BACKGROUND**

The proposal for the randomised phase III trial known as OPERA was discussed at the meeting held at the Royal College of Radiologists in London on 14 December 2015. Prof Gérard was granted approval to open OPERA in France. Prof Sun Myint applied to the Clinical Trials Awards and Advisory Committee (CTAAC) in the UK to get financial support for this trial but he did not get approval for this. We are exploring the possibility of getting CTAAC approval without financial support. In the OPERA trial, patients with rectal adenocarcinoma cT2/cT3a/cT3b/No/N1/M0 < 5cm in diameter will be randomised to receive either external beam chemoradiotherapy (45Gy/25/35 plus boost 5.4Gy/3/3) or external beam radiothera-
(45Gy/25/35 plus Papillon boost 90Gy/3/4 weeks). The primary end point is organ preservation with local control at three years. Secondary end points will include overall survival, disease-free survival, pathological complete response (pCR) rates and quality of life. A total of 110 patients are planned to be randomised to each treatment arm. OPERA has started recruiting patients in France and 11 patients have been recruited so far in the last six months. Those interested in participating in this trial should contact Prof Gérard or Prof Sun Myint for more information.

Prof Gérard has set up the Papillon database in Nice and we should be able to publish the results from our CONTEMS (CONtact radiotherapy and Trans-anal Endoscopic Micro Surgery [TEMS]) observational studies from our database later this year.

**COURSES AND TRAINING**

Prof Sun Myint has been organising Papillon training courses in collaboration with Prof Gérard at Clatterbridge since 2010. Our next Clatterbridge Papillon training course will be held between 11-12 October 2016. Four new centres will be attending to learn the technique. The GEC-ESTRO rectal and anal brachytherapy course was given as part of the GEC-ESTRO brachytherapy ‘Tips and tricks’ meeting in Brussels on 19 November 2015. The feedback from the attendees was very encouraging.

**The aims of GEC-ESTRO RECTANGO are:**

- To stimulate the revival of interest in rectal and anal brachytherapy
- To establish the role of brachytherapy in rectal and anal cancers
- To organise multicentre phase II and III clinical trials
- To organise training courses
- To set up databases for rectal and anal cancer brachytherapy
- To publish GEC-ESTRO guidelines for rectal and anal brachytherapy.

We have fulfilled some of our ambitious aims, as there has been a revival of interest in contact X-ray brachytherapy. There are now ten centres operating around the world and four centres in the UK. Hull has had this facility for the past four years and presented their results at the world gastrointestinal (GI) congress in Barcelona in June 2014. Guildford started treatment before Easter 2014 and so far they have treated nearly 40 patients. In May 2014, Nottingham started their Papillon facility and nearly 25 patients have received Papillon treatment to date. In Europe, since 2009, France has three centres in Nice, Lyon and Macon. Professor Jean-Claude Horiot has started treating patients in Genolier. Professor Bengt Glimelius together with Dr Carlin Radu and their team started treating patients in Uppsala in October. More centres in Europe are likely to set up Papillon facilities.

**PUBLICATIONS RELATED TO RECTAL AND ANAL BRACHYTHERAPY**


2. Low energy x-ray brachytherapy (the Papillon technique) for early stage rectal cancer. NICE interventional procedure guidance [IPG532] Published date: September 2015.

3. Preoperative high dose rate brachytherapy for rectal cancer NICE interventional procedure guidance [IPG531] Published date: August 2015.


Arthur Sun Myint
Chair (RECTANGO)
Rectal and anal working group (GEC-ESTRO)
Clatterbridge Cancer Centre, Liverpool, UK

Anyone wishing to join the rectal and anal brachytherapy group should contact Prof Sun Myint to express their interest.
Dear colleagues,

This edition of the Physics Corner touches upon some fundamental aspects of our profession which include small-field dosimetry and imaging for treatment planning by PET/CT scan or MRI. A recent paper authored by Hugo Bouchard and his colleagues is highlighted to explain the physics of small field dosimetry. The use of MRI in radiation therapy treatment planning is the topic of the second featured paper. Daniela Thorwarth introduces the PERTAIN (PEt RadioTherApy IN-ternational) study. This is an international study aiming to improve the experience of hospitals in middle and low income countries using PET/CT in the radiation therapy treatment planning for stage III non-small lung cancer and to study the potential of PET/CT in staging. The first results of the study will be presented at the ESTRO 35 meeting in Turin. Finally, this edition includes a conference report of the very successful 4D workshop on treatment planning and dose delivery that was held in November in Dresden.

Mischa Hoogeman (m.hoogeman@erasmusmc.nl)
Brendan Mclean (Brendan.McClean@slh.ie)
and Christian Richter
(christian.richter@oncorayde)
New series on PhD thesis reports in the Physics section – call for nominations

In future editions of the Physics Corner we would like to start a new series on outstanding PhD theses. We think that it would be of interest to the whole medical physics community to be informed about excellent and comprehensive PhD theses in our field. This can be a useful addition to the Editors’ Picks of published papers.

In each newsletter there will be one thesis presented together with a short introduction about the author. To be able to do this, we need your help. We are asking you to identify outstanding PhD theses that you are aware of. It does not matter if you are the author or the supervisor of the work, or if you just have heard about it.

The main requirements for the PhD thesis nominations are:
- Outstanding work with relevant impact to the field of medical physics
- The PhD thesis is available to the public and has been defended or will be defended in the near future
- The thesis is written in English
- The author of the work agrees to the presentation in the ESTRO newsletter and to contribute by providing a short summary and answers to some questions about the work.

The editors of the Physics Corner will then select one nomination for each newsletter. Please send your nominations together with a brief recommendation to Christian.richter@oncoray.de

No deadline applies – nominations can be submitted any time.

We very much look forward to your suggestions.

Mischa Hoogeman (m.hoogeman@erasmusmc.nl), Brendan Mclean (Brendan.McClean@slh.ie) and Christian Richter (christian.richter@oncoray.de)
PERTAIN: a coordinated research project of the International Atomic Energy Agency (IAEA)

Daniela Thorwarth
ESTRO Physics committee observer
Eberhard Karls University
Tübingen, Germany

PERTAIN is an international study on the use of PET/CT for stage III non-small cell lung cancer (NSCLC) radiotherapy planning in low and middle income countries (PEt RadioTherApy INternational). The study is being carried out in the context of a coordinated research project (CRP) initiated by the International Atomic Energy Agency (IAEA) in 2014 (NCT02247713). The CRP is a joint initiative of the Section of Nuclear Medicine and Diagnostic Imaging and Applied Radiation Biology and Radiotherapy Section, both belonging to the IAEA Division of Human Health. The clinical study and the scientific aims of this CRP were proposed by an international group of researchers who are experts (clinicians and physicists) in the fields of nuclear medicine (NM) and/or radiation oncology. Moreover, this multicentre study involves couples of NM and RT specialists from hospitals in low and middle income countries (LMIC) which have access to combined PET/CT and modern radiotherapy (RT) equipment (3D-CRT and/or IMRT).

The aim of the study is two-fold: 1) to help hospitals in LMIC to gain expertise in the use of PET/CT for RT planning and 2) to investigate the potential of PET/CT for staging, RT treatment and target volume delineation (TVD) in NSCLC.

In recent years, LMIC have managed to establish NM in clinical practice, next to radiation oncology [1]. The installation of hybrid PET/CT systems in these countries opened new doors, although it takes time to obtain expertise in a new technique. An earlier study initiated by the IAEA [1] about current trends in NM in developing countries showed that there is still a lack of knowledge, equipment and human resources to gain benefit from this imaging technique. In radiation oncology causes of current problems are related to inadequate training of staff, lack of expertise in new treatment planning software, radiation techniques and lack of screening and diagnostic tools.

Consequently, the PERTAIN study involves a retrospective cohort study, multiple training interventions, and a prospective cohort study, in order to determine the impact on the use of FDG PET/CT RTP in two year overall survival in patients with stage III NSCLC referred for RT with or without chemotherapy in LMIC. The first intervention took place in July 2014 in Vienna and was a five-day training course consisting of various lectures, the introduction of a practical guideline [2], and three contouring assignments that formed the basis of a teaching discussion. The lectures focused on standard FDG PET/CT.
acquisition, FDG PET/CT image quality, staging procedure for FDG PET/CT acquisition and FDG PET/CT for RT treatment planning. Before starting with the prospective clinical study, each participating centre will undergo the EANM Research Ltd (EARL) accreditation recommended by the European Association of Nuclear Medicine (EANM) in order to standardise and harmonise all PET/CT data included in the study [3].

The second intervention involved a webinar on PET/CT based TVD in NSCLC, and providing detailed individual feedback reports about previously performed contouring assignments. The impact of a standardised delineation protocol [2] and multiple training interventions on PET/CT based TVD in NSCLC was investigated and this will be presented in full at the ESTRO 35 meeting in Turin. Teams delineated gross tumour volume (GTV) of the primary tumour in six cases according to the provided delineation protocol before, during and after training interventions. The concordance of all delineated GTVs measured at the different time points showed impressively that PET/CT based TVD in NSCLC RT planning using a standardised delineation protocol led to significant improvement in delineation performance. However, a greater improvement in TVD with the use of multiple training events as compared to a single training event was observed.

Currently, all participating centres from LMIC have obtained EARL accreditation, two centres have already started recruitment for the prospective part of this multi-centre study on the use of PET/CT for RT planning in NSCLC.

We are looking forward to the results of this joint initiative between NM and radiation oncology, clinicians and physicists, and from the various participating centres.

**REFERENCES**


In November 2015, the 4D workshop, dedicated to planning and delivery of radiotherapy to non-static tumours, was held for the seventh time. With strong associations with the Paul-Scherrer-Institute in Switzerland and the Gesellschaft für Schwerionenforschung (GSI) in Germany, the workshop has been held at several locations throughout Europe in the last few years. This time, about 70 participants, mostly from Europe, but also from the USA and Japan, met for two days at the OncoRay in Dresden (Germany) to discuss cutting-edge research in topics related to radiotherapy of non-static tumours and its translation into clinical practice.

In the early years, the workshop focused mostly on particle therapy, but it is now becoming more open to the photon world. About one third of the participants were from institutions where clinical particle therapy is available and another 20% were from institutions that will have a particle therapy facility in the near future. From the 31 posters, about 65% were not specifically related to particle therapy. The sessions covered a broad range of motion related topics like current clinical practice in the treatment of tumours possessing intra- and inter-fractional motion, 4D and robust treatment planning, motion monitoring and IGRT, motion modelling and deformable image registration as well as 4D in vivo dosimetry in particle therapy.

A unique feature of the workshop is its informal spirit. The number of participants is intentionally restricted with a maximum of three participants per institution. This is meant to ensure fruitful discussions and to promote new collaborations. Extended time for discussion of the invited-only oral presentations, a two and a half hour poster session and the conference dinner gave numer-
ous opportunities for lively exchange and discussion.

A small number of industry representatives were also invited to attend the workshop to participate in the scientific discussions. This enabled the reporting of the needs of the community directly to industry and to promote a fast clinical implementation of research results. For the 4D workshop 2016, short oral, scientific-oriented presentations of the industry representatives are planned to close the feedback loop between research and implementation.

The location of the 2016 workshop will be either Sapporo (Hokkaido, Japan) or Groningen (The Netherlands). The location will be determined in an online election of the 4D workshop community.

For more information, and if you would like to be added to the 4D workshop mailing list, please contact 4Dworkshop.aknopf@gmail.com

The 2015 conference website including the scientific program can be found here: http://www.oncoray.de/announcements/4d-treatment-planning-workshop-2015/

Christian Richter, Dresden
Antje-Christin Knopf, London
Kristin Stützer, Dresden
Christoph Bert, Erlangen

The poster from Maxim Makhinya and Orcun Göksel from ETH Zürich was awarded the 4D workshop poster prize. It included a live demonstration of their method as shown on an electronic display in the middle of the poster.

Daniel Low from the University of California, Los Angeles (UCLA) during his talk on the relationship of internal motion to external surrogates.

The poster from Maxim Makhinya and Orcun Göksel from ETH Zürich was awarded the 4D workshop poster prize. It included a live demonstration of their method as shown on an electronic display in the middle of the poster.

CHRISTIAN RICHTER
ANTJE-CHRISTIN KNOPF
KRISTIN STÜTZER
CHRISTOPH BERT
Detector dose response in megavoltage small photon beams. I. Theoretical concepts

Hugo Bouchard


Topical review: Radiotherapy planning using MRI

Schmidt MA, Payne GS

Detector dose response in megavoltage small photon beams. I. Theoretical concepts

Bouchard H, Seuntjens J, Duane S, Kamio Y and Palmans H.


CORRESPONDING AUTHOR
Hugo Bouchard
Département de Physique
Université de Montréal
Canada

What was your motivation for initiating this study?
Small field dosimetry recently became a hot topic. While the community awaits the publication of a new Code of Practice dealing with such conditions, small field dosimetry remains challenging to clinical physicists and also to researchers. The new Code of Practice should provide clear guidelines to clinical physicists to define, characterise and calibrate these nonstandard beams, but its role should not be to explain in detail the background of its guidelines. This can be frustrating for curious scientists who wish to understand why physicists should do things the way protocols recommend them. Before our investigation, I couldn’t find anything entirely satisfactory in the literature to explain the physics of small fields, even though most of my research to date has been on nonstandard beam dosimetry. Despite key publications available on the topic, such as the IAEA-AAPM formalism [1] our work on IMRT perturbation factors [2], the effects of the detector density [3] and other interesting studies, I found that most papers in the literature dealing with Monte Carlo correction factors are highly specialised and perhaps not easily accessible to clinical physicists. What motivated our present work was the need for clarification on the key concepts behind the physics of small field dosimetry, in this way preparing the minds of clinical physicists for changes expected in future dosimetry protocols. My team of collaborators was perfect for combining ideas, experience and practicality.

What were the main challenges during the work?
There were several challenges related to our work. The first one was to actually summarise the key concepts themselves and present them in a clear and concise manner. Almost from the beginning, radiation dosimetry was based on Bragg-Gray concepts and Fano’s theorem, and even today, these are fundamental ideas in typical graduate level courses on radiation dosimetry. But this knowledge needs to keep its proper meaning. Unfortunately, there are several misinterpretations of this subject in the literature, and the new generation taking over were brought up with dosimetry protocols based on absorbed dose to water standards, which do not require such a deep understanding of radiation dosimetry. But this knowledge needs to keep its proper meaning. Unfortunately, there are several misinterpretations of this subject in the literature, and the new generation taking over were brought up with dosimetry protocols based on absorbed dose to water standards, which do not require such a deep understanding of radiation dosimetry. To fulfil our objectives, we had to question the validity of these concepts in an intuitive manner, as they cannot be applied the same way in small fields as in reference fields. For instance, the meaning and role of charged particle equi-
librium (CPE), which is a useful way of defining a perturbation-free detector in cavity theory, had to be clarified in this new context. The role of cavity theory also needed to be questioned, which required summarising historical papers in a modern context. Moreover, we had to support all our theoretical findings with Monte Carlo simulations (in the second paper, part II) to provide examples and to show that our theoretical approach is correct.

What is the most important finding of your study?
The paper has, in my opinion, lots of interesting parts. But I believe the most important finding is the interplay between the detector density and the lack of CPE. In the section on perturbation effects (section 4), the density perturbation effect is explained using Fano’s theorem and illustrated with a practical example. A similar approach is used to explain perturbation effects caused by extracamerel detector components and the atomic properties of the detection material. These examples are, in my opinion, useful in order to understand correction factors intuitively and I think we provide good “take home” messages for clinical physicists without their having to go through detailed mathematics.

What are the implications of this research?
Physicists have a natural curiosity and a need to understand what they are doing. I think our paper provides a good summary of the physics necessary to understand why small fields do not comply with standard reference dosimetry protocols. Radiation dosimetry is entering a new era and the theoretical concepts governing it must follow suit. Our paper helps a lot in that sense, as one can no longer rely entirely on Bragg-Gray dosimetry to explain (or teach) the physics of radiation dosimetry in disequilibrium conditions. The community now uses Monte Carlo methods quite extensively, and if there is still a need for a cavity theory, we suggest (in paper II) a simple formalism supporting this numerical approach, independently of Bragg-Gray dosimetry and requirements for CPE. In this way, I hope we provide the missing link between reference and nonstandard dosimetry, which could have been a source of misconceptions. On a personal level, this paper is a career achievement as it is the apoee of several papers I authored (often with collaborators) on the topic of nonstandard beams, notably on IMRT correction and perturbation factors, on CPE violation and on a cavity theory compatible with the Monte Carlo method.

REFERENCES
Topical review: radiotherapy planning using MRI

What motivated you to write a review on this topic?
At the Royal Marsden NHS Foundation Trust we have been employing magnetic resonance imaging (MRI) in radiotherapy planning for about ten years and have accumulated substantial experience. We often provide information and protocols to other sites within the healthcare sector. We find that MRI for radiotherapy planning can be undertaken by MRI-trained personnel with a very superficial understanding of radiotherapy, at the request of radiotherapy-trained personnel who know very little about MRI. The review addresses the gap between the training of MRI and radiotherapy physicists.

What were the main challenges during the work?
When the work started at the Royal Marsden there was no market in MRI for radiotherapy planning needs. All equipment for radiotherapy planning was home-built and we relied heavily on our workshops. In addition, the distortion correction was also undertaken by in-house software, offline. Today distortion correction software is included in all clinical MRI systems and a vast range of equipment is available in MR-compatible form: flat beds, head boards, wing boards, neck rests, thermoplastic masks, etc. Although MRI is still mainly used in conjunction with CT, MR-only radiotherapy planning is in development.

Is it getting easier to perform MRI for radiotherapy Planning?
The main challenges used to be technical and relate to the development and purchase of MR-compatible radiotherapy equipment. The current challenge is the workflow, how to integrate radiotherapy planning with other MR examinations, for example, or how to ensure that the patient preparation and positioning is consistent between MR, CT and radiotherapy delivery. The MRI manufacturer’s post-processing software ensures that geometric integrity is sufficiently maintained for most purposes in the central volume, if the imaging parameters are chosen adequately. Faster imaging has addressed motion to a certain extent, and estimation of electron density is currently being addressed in a clinical setting.

What does the future hold for MRI in radiotherapy planning?
Planning systems will become friendlier towards MRI, and will allow integration of functional images to the treatment planning. MR-only
planning is being introduced; gynaecological brachytherapy is probably one of the most developed examples of this. In addition, real-time MR-guided radiotherapy has been demonstrated as a proof-of-principle. We expect this technology to become more widespread, to be validated and, eventually, to become cheaper.

Read the interview with Ben Heijmen, chair of the track, in the Conferences Corner (p. 130)
Welcome to the RTT Corner of the March-April issue of the ESTRO newsletter, the last issue before we hope to meet each other in person at ESTRO 35 in Turin, Italy, from 29 April to 3 May. Therefore, as you may have already noticed, this newsletter will focus somewhat on our forthcoming meeting.

You probably have already read or skimmed through the interviews with the scientific chairs in the Conferences Corner of this issue. Although these interviews, as well as the sneak peek into the RTT programme and the pre-meeting course in the last RTT Corner gave you information on the things to look forward to in this meeting, we asked the RTT chairs and co-chairs of the scientific programme (Annette Boejen and Miriam Mast) and of the pre-meeting course (Danilo Pasini and Michelle Leech) to give you an even deeper insight into the respective programmes.

Furthermore, you will find a review of an EORTC Radiation Oncology and Radiation Therapist Group meeting and delineation workshop held in Las Palmas written by Bartos Bak. This report shows the importance of accurate delineation of target volumes and organs at risk (OAR) in modern radiotherapy.

Last but not least, Sanja Gaspar presents a great report on the last South East Europe Technology in Radiation Oncology (SEETRO) meeting which took place in Zagreb last November. This was a great and fruitful meeting which also offered an excellent forum for networking. We will have to wait nearly two years for the next meeting to be held in Sofia, Bulgaria.

We hope you will enjoy reading our RTT Corner and we are looking forward to meeting you in Turin. If you have any suggestions for inclusion in the RTT Corner, or are interested to contribute to ESTRO or just want to have a chat with us, you can contact us or visit us at the meeting in Turin – for example at the “RTT Meet and Greet” that we are planning during the 2016 ESTRO Conference.

*Philipp Scherer and Danilo Pasini*

p.scherer@salk.at - danilopasini@yahoo.it
Dear colleagues,

We are looking forward to welcoming you at the ESTRO 2016 conference from 29 April to 3 May in Turin. The Scientific Advisory Group (SAG) for the radiation therapists (RTTs) track has scheduled an interesting programme aimed at our profession and science, based on representation from a wide spread of departments in Europe (and some from outside). The main topics in our programme are connected to daily practice in busy high-tech clinics and include technical aspects, preparation for and delivery of radiotherapy, and supportive care to patients. Attendance at the teaching lessons and symposia gives the possibility to be updated by clinical experts, and in the proffered paper sessions, results from the newest clinical research and development programmes will be presented.

The meeting will start with a course on “Contouring of organs at risk: theory and practice”. The course directors Michelle Leech and Danilo Pasini will give more information on the next page.

The main programme of the RTT track will deal with the following topics:
- Balancing toxicity and disease control in the evolution of radiotherapy technology
- Strategies for treatment planning and additional tools for contouring
- General introduction to head and neck radiotherapy, reductions of margins and side effects, guidelines and late effects
- The elderly and radiation therapy
- Focus on the pelvic region including brachytherapy and adaptive treatments
- Optimisation and management of daily workflow in a radiotherapy department
- A concluding debate about accuracy and adaption in radiation therapy.

Don’t forget that participation in the ESTRO conference is an excellent opportunity to meet, discuss, and exchange experiences and network with colleagues in the field of radiation therapy.

We hope to meet many of you in Turin.

Annette Boejen  
Chair, scientific advisory group for the RTT meeting

Mirjam Mast  
Co-chair, scientific advisory group for the RTT meeting

Read the interview with Annette Boejen, chair of the track, in the Conferences Corner (p. 134)
Dear colleagues,

As usual each profession within the ESTRO community organises a premeeting event focused on an interesting and current topic relevant to each of the radiotherapy professionals.

For ESTRO 35, the radiation therapists (RTTs) one day course will be focused on organs at risk (OAR) delineation. This is always a hot topic for RTTs all over Europe. In many countries they are involved in the delineation of normal structures either autonomously or with the radiation oncologist’s supervision, and in the past, many courses and workshops have been organised to develop competences and skills in this matter.

Following the huge success of the first, overbooked, premeeting on the same topic held in Barcelona in 2012, the RTT Committee decided to propose a revised version with new teachers, tutors and new content.

This one-day course will specifically focus on the anatomical definition of normal structures in the head and neck, thorax and pelvis.

In order to achieve the best level of accuracy in the delineation of OAR we need to improve knowledge of the anatomical limits of selected structures. During the course a series of lectures will be provided, by an expert faculty, giving general information as well as pointing out particular aspects of each structure, such as physiological structure, without neglecting the organ dose-volume tolerance. It is also important to become familiar with contouring on CT and different imaging modalities implemented in treatment planning systems.

All the lectures will be followed by hands-on contouring using FALCON software, an e-learning software tool based on EDUCASE platform, with the help of tutors.

FALCON will allow us to compare master contours with the participants’ contours, both through visual modality and quantitative data. Both during and especially at the end of each session, it will be possible to interact with teachers and tutors. We are sure that these live discussions are something that will add value to this kind of course by giving the possibility to immediately deepen topics, ask for extra explanations and clarify doubts.

You can register for the pre-meeting course here: http://www.estro.org/congresses-meetings/articles/estro-35-registration
We are sure that at the end of this one-day course, you will be able to critically evaluate your own daily clinical practice in accordance with the evidence shown during the lectures.

What can we say about the target group that the course is designed for? The course is primarily focused on the needs of RTTs involved in contouring, virtual simulation and treatment planning, but radiation oncologists and physicists in training who want to improve and upgrade their skills in the delineation of normal structures are also warmly welcomed to join the course.

Overall, we hope to repeat the success of the previous course and to deliver an interesting and useful scientific programme to improve our daily clinical practice.

Michelle Leech and Danilo Pasini  
Course directors, RTT pre-meeting course

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Presenter(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.30 - 8.45</td>
<td>Welcome and introduction</td>
<td>D. Pasini, M. Leech</td>
</tr>
<tr>
<td>8.45 - 9.15</td>
<td>Introduction to the concepts of OAR contouring</td>
<td>J. Eriksen</td>
</tr>
<tr>
<td>9.15 - 9.45</td>
<td>Theory: the OAR in head and neck (parotids, cochlea, pharynx muscles)</td>
<td>N. Dinapoli</td>
</tr>
<tr>
<td>9.45 - 10.00</td>
<td>Delineation and dose tolerance</td>
<td>N. Andratschke</td>
</tr>
<tr>
<td>10.00 - 10.30</td>
<td>Practice in OAR delineation: head and neck contouring session (1)</td>
<td>Teachers and Tutors</td>
</tr>
<tr>
<td>10:30 - 11:00</td>
<td>COFFEE BREAK</td>
<td></td>
</tr>
<tr>
<td>11.00 - 11.30</td>
<td>Practice in OAR delineation: head and neck contouring session (2)</td>
<td>Teachers and Tutors</td>
</tr>
<tr>
<td>11.30 - 12.00</td>
<td>Verification and discussion</td>
<td>N. Dinapoli and tutors</td>
</tr>
<tr>
<td>12.00 - 12.30</td>
<td>Theory: the OAR in thorax (heart, brachial plexus, trachea and large bronchi)</td>
<td>Andratschke</td>
</tr>
<tr>
<td>12.30 - 13.00</td>
<td>Delineation and dose tolerance</td>
<td></td>
</tr>
<tr>
<td>13.00 - 14.00</td>
<td>Practice in OAR delineation: thorax contouring session (1)</td>
<td>Teachers and Tutors</td>
</tr>
<tr>
<td>14.00 - 14.30</td>
<td>Verification and discussion</td>
<td>N. Andratschke and tutors</td>
</tr>
<tr>
<td>14.30 - 15.00</td>
<td>Theory: the OAR in upper abdomen and pelvis: (small bowel, rectum, penile bulb)</td>
<td>A. Mendez Romero</td>
</tr>
<tr>
<td>15.00 - 15.30</td>
<td>Delineation and dose tolerance</td>
<td></td>
</tr>
<tr>
<td>15.30 - 16.00</td>
<td>COFFEE BREAK</td>
<td></td>
</tr>
<tr>
<td>16.00 - 17.00</td>
<td>Practice in OAR delineation: upper abdomen and pelvis contouring session</td>
<td>Teachers and Tutors</td>
</tr>
<tr>
<td>17.00 - 17.30</td>
<td>Verification and discussion</td>
<td>A. Mendez Romero and tutors</td>
</tr>
<tr>
<td>17.30 - 17.45</td>
<td>Conclusions</td>
<td>D. Pasini, M. Leech</td>
</tr>
</tbody>
</table>

**ESTRO 35**

The radiation therapists (RTT) committee looks forward to welcoming you to ESTRO 35. Join us to get to know each other and find out more about the activities of the committee.

**RTT Meet and Greet**

Monday 2 May 2016  
13.30 to 14.30 | Parigi room
The European Organisation for Research and Treatment of Cancer (EORTC) Radiation Oncology Group (ROG) meeting was held between 8-10 October 2015 in Las Palmas University Hospital in Spain. The local organiser of the meeting was Professor Pedro C Lara. It was dedicated to radiation oncologists and radiation therapists (RTT) in separate and joint sessions. Also for the first time the EORTC ROG organised the radiation oncologists and RTT delineation workshop.

The 11th one-day parallel symposium for RTTs took place on 9 October 2015. The subject of this meeting was “Report, predict and prevent radiation induced toxicity”, and it was opened by the chairs Hans Paul van der Laan and Michal Walczak. The following presentations were included:

- Towards optimised breast adaptive radiotherapy (ART) (Arije van Dijk, The Netherlands)
- Percussion Assisted RadioTherapy (PART): a challenge for the RTTs to treat patients with continuous breath holding to prevent cardio pulmonary toxicity (Frederic Duclos, Lausanne, Switzerland)
- Predict and prevent radiation induced toxicity in the treatment of locally advanced non-small cell lung cancer: experience of Campus Bio-medico University of Rome (Patrizia Cornacchione, Rome, Italy)
- Use of a composite plan with dose effective tool to optimise lung SBRT in re-irradiation setting (Joao Luis Soares Rodrigues, Switzerland)
- Implementation of a bladder plan-of-the-day procedure (Christa Visser, The Netherlands)
- The use of a bladder minimum contour during IMRT treatment planning to improve patient comfort and efficiency (Morgan Brown, Romford, UK).

In the delineation workshop, the teachers included radiation oncologists and RTTs involved in the LungTech trial. The aim of the workshop was to individually delineate one to two cases, and was followed by a plenary discussion on any difficulties or misinterpretations of the guidelines. The workshop was primarily intended for LungTech study participants but it was also open to all RTOG members, particularly for RTTs, who play a more significant role in delineation of the organs at risk (OARs) in most institutions.
The workshop focused on the chest area. OARs for delineation were: spinal cord, oesophagus, brachial plexus, heart (divided into AA = ascending aorta; DA = descending aorta; SVC = superior vena cava; PA = pulmonary artery; IVC = inferior vena cava), trachea and proximal bronchial tree, lung, chest wall and vertebrae. The boundaries of each organ were described in detail. Delineations held on independent workstations (each participant worked individually) were based on the contouring program developed by the EORTC.

The first delineation workshop was a success. The organisers have already announced a continuation of this workshop this year. Personally, I think that this type of multidisciplinary meeting not only allows us to consolidate our knowledge but also gives us the possibility of a deeper mutual understanding.

Bartos Bak  
RTT Committee observer  
Greater Poland Cancer Center  
University of Medical Sciences  
Poznan, Poland
A report from the South East Europe Technology in Radiation Oncology (SEETRO) congress

6-8 November 2015
Zagreb, Croatia

The congress was organised in collaboration with the ESTRO/IAEA project “Train the RTT trainers - best practice in radiation oncology”

In November 2015, the South East Europe Technology in Radiation Oncology (SEETRO) international congress of radiation therapists (RTTs) and other radiation technology professionals in the field of oncology and radiotherapy, was held in the Hotel Dubrovnik, Zagreb.

This regional concept of collaboration called SEETRO was organised by the Croatian Association of RTTs, the host and seven national societies (Bulgarian Society of Radiation Therapy Technicians, Društvo Radioloških Inženirjev Slovenije, Komora Diplomiranih Inženjera Medicinske Radiologije F BIH, Macedonian Society of Radiological Technologists, Ogólnopolski Związek Zawodowy Techników Medycznych Radioterapii, Serbian Society of Radiotherapy Technicians and the Society of Radiation Therapy Technologists in Turkey). The congress was organised in collaboration with the ESTRO/IAEA project “Train the RTT trainers - best practice in radiation oncology”, and all of the countries involved in the organisation were included in this project. Members of the organising board were Damir Cipric, Ilija Curic, Vedrit Ibushoski, Mustafa Jacevic, Velimir Karadza, Aleksandar Kostovski, Gokhan Ozuynuk, Ivet Paianova, Boris Sekeres and Jacek Zingler.

The main topics were related to imaging, radiotherapy treatment, planning and delivery, and nuclear medicine. There were over 140 registered...
participants, who participated in the lectures, presentations and workshops. The presenters came from countries including Austria, Bulgaria, Bosnia and Herzegovina, Croatia, Ireland, Italy, Macedonia, Poland, Serbia, Slovenia and Turkey. There were 39 oral presentations and 15 poster presentations.

After registration on Friday 6 November, the congress was opened with welcoming and introductory speeches by the organisers, and representatives from the national and state authorities who supported this congress. The Ministry of Health, the State Office for Radiologic and Nuclear Safety, the European Commission Office in Croatia, the University Of Split – University Department for Health Studies, the University of Applied Health Sciences in Zagreb and the Croatian Chamber of Health Professionals all supported the congress.

The scientific programme included imaging modalities in oncology, treatment planning, treatment positioning and verification, IMRT and SBRT. Three invited lectures covering IGRT (Philippe Scherer), adaptive radiotherapy (Danilo Pasini) and role development (Michelle Leech) were also included.

The congress also had social events and refreshment corners in the pleasant atmosphere of the Hotel Dubrovnik. The social dinner was organised in the restaurant “Maksimir”, at Maksimir City Park where all colleagues and guests enjoyed traditional food, drink and dancing until late in the night. On Sunday, the programme continued with sessions on patient care in radiotherapy followed by education and role development of RTTs. The congress finished on Sunday with the closing ceremony where all the representatives from the national societies involved in the organisation thanked the participants, guests and sponsors for their attendance and support. They announced that the next international congress, SEETRO 2017 will be held in Sofia, Bulgaria, in September 2017.

Any additional information about SEETRO presentations, as well as the web gallery can be found on: http://seetro.org

Sanja Gaspar
Radiation therapist
University Hospital Center Zagreb
Zagreb, Croatia
sgaspar@kbc-zagreb.hr
This year will see some very important changes in the ESTRO School. Our new Director of Education, Jesper Eriksen will formally take over from Richard Pötter at the Turin meeting in April.

Another important milestone will be the restructuring of the education pillar within the Society. This restructuring means that the Education and Training Committee, previously under the Scientific Council, will become an Education Council with direct links to the ESTRO Board.

There is an interview with Jesper Eriksen, where he explains his vision for the future of education within ESTRO.

Each year in early February the Education Committee comes together with course directors to review the School’s activities of the previous year and to plan the next year’s activities. This year we also had a very interesting workshop on the “State of the art educational methods and team collaboration”. Read on for a short report of this workshop.

The programme for all FALCON workshops is now available online, so check this out and start planning which courses you would like to participate in.

Fiona Stewart, Christine Verfaillie and Richard Pötter
During the EMUC congress last November in Barcelona, a contouring workshop was organised by ESTRO. The topic was MRI-based delineation in prostate cancer treatment with a focus on focal therapy.

This fully-booked workshop was a great opportunity to share with the participants the “tips and tricks” of MRI for the focal therapy of prostate cancer. The workshop followed the already well-defined structure of an ESTRO workshop: the participants performed the first round of contouring on a real clinical case, then a lecture was given by the two co-chairs of the workshops, Dr Carl Salembier from Brussels and Berardino de Bari from Lausanne, and then a second round of contouring was performed in order to assess the impact of the teaching. After this contouring session, the participants had the possibility of discussing their performances with the co-chairs and with Dr Vincent Khoo, the panelist of the session.

Although the largest number of the participants was devoted to the treatment of prostate cancer in their daily clinical practice, most of them did not perform focal therapy. Six out of 18 participants were not radiation oncologists. It was interesting to receive comments from oncologists and surgeons, as it gave the whole classroom a different point of view.

The final evaluation given by the participants was positive, with an overall significant improvement of the conformity between the contours of the participants and the contours of the chairs. Some good ideas were also collected in order to optimise the structure of the next workshop, and for new topics to be developed next year.

See you in November at EMUC 2016, for the new ESTRO contouring workshop in Milan.

Berardino de Bari and Carl Salembier
Workshop leaders and panelists
E-CONTOURING
Join a FALCON online workshop
Check out the 2016 dates

ESTRO members can:
- Access for free the FALCON cases available on the ESTRO website
- Benefit from a discount on the registration fee to attend an online workshop.

2016 FALCON ONLINE SCHEDULE

<table>
<thead>
<tr>
<th>Workshop Topic</th>
<th>Dates</th>
<th>Time CET</th>
<th>Faculty</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breast cancer</td>
<td>21 March 2016</td>
<td>18.00-19.00 hrs</td>
<td>Workshop director: Birgitte Offersen</td>
</tr>
<tr>
<td></td>
<td>4 April 2016</td>
<td>18.00-20.00 hrs</td>
<td>Cancer specialist: Philip Poortmans</td>
</tr>
<tr>
<td></td>
<td>11 April 2016</td>
<td>18.00-20.30 hrs</td>
<td></td>
</tr>
<tr>
<td>OAR - Thorax</td>
<td>17 May 2016</td>
<td>18.00-19.00 hrs</td>
<td>Workshop director: Sofia Rivera</td>
</tr>
<tr>
<td></td>
<td>23 May 2016</td>
<td>18.00-20.00 hrs</td>
<td>Cancer specialist: Ursula Nestle</td>
</tr>
<tr>
<td></td>
<td>30 May 2016</td>
<td>18.00-20.00 hrs</td>
<td></td>
</tr>
<tr>
<td>Paediatric cancer</td>
<td>24 May 2016</td>
<td>18.00-19.00 hrs</td>
<td>Workshop director: Umberto Ricardi</td>
</tr>
<tr>
<td></td>
<td>31 May 2016</td>
<td>19.00-20.00 hrs</td>
<td>Cancer specialists: Rolf-Dieter Kortmann, Silvia Scoccianti</td>
</tr>
<tr>
<td></td>
<td>7 June 2016</td>
<td>18.00-19.00 hrs</td>
<td></td>
</tr>
<tr>
<td>Oesophagus Cancer</td>
<td>5 September 2016</td>
<td>18.00-19.00 hrs</td>
<td>Workshop director: Berardino De Bari</td>
</tr>
<tr>
<td></td>
<td>12 September 2016</td>
<td>18.00-20.00 hrs</td>
<td>Cancer specialist: Oscar Matzinger</td>
</tr>
<tr>
<td></td>
<td>19 September 2016</td>
<td>18.00-19.30 hrs</td>
<td></td>
</tr>
</tbody>
</table>

CONTOURING SESSIONS AT ESTRO 35
Eight contouring sessions will take place between 29 April - 3 May 2016 in Turin (prostate, OAR for the upper abdomen, anal canal and spine SBRT). Have a look at the programme in the Conferences Corner and on www.estro.org. Also, don't miss the free FALCON demonstrations on at the ESTRO booth in the exhibition area (booth #3000).

Register on http://www.estro.org/school/articles/online-workshops/2016-online-workshops
Image-guided radiotherapy and chemotherapy in gynaecological cancer - with a special focus on adaptive brachytherapy
1-5 November 2015, Utrecht, The Netherlands

Combined drug-radiation treatment: biological basis, current applications and perspectives
15-18 November 2015, Vienna, Austria

Quantitative Research in Radiation Oncology
6-9 December 2015, Brussels, Belgium
Image-guided radiotherapy and chemotherapy in gynaecological cancer - with a special focus on adaptive brachytherapy

1-5 November 2015
Utrecht, The Netherlands

Course directors: Christine Haie-Meder, Radiation Oncologist, Institut Gustave Roussy, Villejuif (France)
Richard Pötter, Radiation Oncologist, Medical University Hospital, Vienna (Austria)

What a course!

This was the 16th ESTRO teaching course on image guided radiotherapy and adaptive brachytherapy, which was previously named 3D brachytherapy. Most gynaecological-oncologists in and outside Europe will have been to this course at some point. Unlike a number of international courses which tend to be repetitive, this one has developed alongside current progress in technology and knowledge.

Over a period of five days the course provided an overview of the radiology, pathology and radiobiology of gynaecological cancers. There were in-depth lectures on external beam radiotherapy, including all the developments in IMRT and VMAT. There were also in-depth lectures on image guided brachytherapy, including organs at risk and target volume contouring. Both external beam and brachytherapy were linked to fruitful workshops for clinicians and others for physicists.

There were 82 participants this year, and the mixed audience of physicists and clinicians produced real-life clinical discussions. The course’s faculty are well known for their educational and practical experience. They were approachable and the time allocated for questions after lectures was invaluable, allowing delegates to tap into their wealth of experience. Having the whole faculty present throughout the days, stirred up the discussions and also meant all questions raised by candidates could be answered in a very informative yet informal way.

This course is a useful resource for both those who are starting in the field, and those who have already taken steps into it. I am already using image guided brachytherapy in Bristol and I previously attended this course in 2009 when we had just moved into image guidance. This year we are planning to introduce interstitial needles to allow for more conformal planning, and to meet the GEC-ESTRO recommendation of planned high target doses with low doses to organs at risk. We moved over the last 12 months from conformal to IMRT and finally VMAT technique in our external radiotherapy. I was impressed with the progress and development of the course as it covered all aspects of the new developments, a reassurance clinicians like myself appreciate from time to time. My advice is not to shy away from attending this course even if you have already developed the required experience. Tips and tricks from experienced centres are always reassuring for safe practice.
This year marked an end of an era. Dr Christine Haie-Meder is stepping down from being a course director. Those who had the thirst for brachytherapy from the 90's like myself, will agree that she is an icon in this specialty. I am lucky to have started my brachytherapy training under Dr Dan Ash in Leeds, and have attended many lectures over the years from both Christine Haie-Meder and Richard Pötter. An exciting change ahead is the arrival of Kari Tanderup as a course director. This is the first time that a physicist will hold this position, but it’s not surprising, given Kari’s leading effort in this subject and in the EM-BRACE trial. I think this is the birth of a vibrant era.

Utrecht was a brilliant choice for this year’s course. Dr Astrid de Leeuw and Dr Ina Jürgenliemk-Shultz hosted the course at the UMC Utrecht, which is well equipped with a modern lecture theatre with breathtaking views overlooking several acres of green fields and horses, which turned out to be the horses of the adjacent veterinary school. A great setting. The social event was a well chosen Dutch museum “Speelklok”, with a great display of musical organs, definitely a must see if you are ever in Utrecht.

Hoda Al-Booz
Consultant in clinical oncology
Bristol Haematology & Oncology Centre, Bristol
UK
During a one-year stay in Spain, I had the opportunity to be introduced to ESTRO and its mission. Instantly, I was attracted to the ESTRO School. Every course seemed to embrace the most relevant topics addressed to radiation oncologists. Beyond integrating knowledge from assorted centres in Europe, it also seemed a pleasant way to keep up to date. After my immersion, I realised that ESTRO is much more than that.

I felt that it would be a once in a lifetime opportunity to enjoy this geographical advantage. Without any hesitation, I registered for all the live courses I could attend.

“Combined drug-radiation treatment”, was the fourth ESTRO course I attended in such a short period of time. This course seduced me because of its emphasis on the importance of integrating knowledge into radiation and drugs.

And then another unexpected scenario happened, unlike the other ESTRO meetings I attended, this one had a much smaller audience. What seemed unusual at first turned out to be a fascinating experience. Interaction was unavoidable. Participants were mostly physicians from Europe, some were still in training and others were more experienced in their careers, but all of them were sharing the aim to get connected.
We started our journey with the introduction from the course director, Dr Barbara Jereczek-Fossa, who encouraged participation from the audience.

The first section was composed of two remarkable lectures from Dr Martin Pruschy. He pointed out the novelty of targeting molecules and the role of hypoxia with overwhelming charisma.

Following that we had many other brilliant presentations from experts coming from France, Italy, Denmark, UK and Switzerland all with impressive backgrounds. All lectures comprised a high level of evidence, leaving pause for discussion. The use of a voting pad made a big difference, it was an easy way to get some contribution from the shyest participant.

But shyness was not exactly the best word to describe the audience. Questions and comments were constantly present as we were provoked to deal with realistic challenging situations from honoured centres. Inevitably, discussions also took place at the coffee break.

The group was gradually becoming very close because of a number of reasons, being smaller, the exciting exchanges, but mostly due to the superlative qualifications of the teachers.

As we were getting closer to each other, the so-called “ESTRO team”, naturally went out to stroll in the magnificent city of Vienna. The social event was no different, we all had a delightful moment, with tasty dinner and enjoyable beers, as a group of friends becoming part of a family.

Unfortunately, the course took place during a week of great sorrow in Europe. In Vienna, we felt grief for France, which was combined with Christmas decorations and many calls for peace.

As the sole representative of Latin America at this course, I would like to encourage people who are far from Europe to become ESTRO members. I recommend all the courses in which I enrolled in 2015, and this one particularly. I am looking forward to disseminating this initiative in my country and I very much want to come back if possible, even knowing the obstacles posed by geographical distance.

Carolina Goradesky was one of the greatest surprises. Her kindness and promptness to respond to all participants and professors could certainly be justification enough for the reason we became friends. But she was also from Brazil, and it was a perfect excuse to speak a little Portuguese in Vienna.

I would also like to thank the organisers, directors and teachers from the ESTRO School, for their contribution in inspiring my career. See you in Turin.

Raquel Guimarães
Radiation Oncologist
Instituto Nacional do Câncer
Rio de Janeiro, Brazil
rgsilva@inca.gov.br
Over the past few years there have been many exciting developments in radiation oncology. The introduction of new techniques, like intensity modulated radiotherapy and proton therapy, image guidance, and advanced treatment planning, enable the delivery of increasingly conformal radiotherapy. Inevitably, the new technology has expanded the research landscape and mandates a need to conduct intelligent research, so that we can get the most out of these developments and define their place in clinical practice.

Research in radiation oncology requires special considerations that usually do not apply to drug trials. The technology is different across institutions, the work needed for quality assessment is significant and the expertise and expense required is greater, whilst funding tends to be more limited. Often the research produces a wide range of data that is difficult to interpret and requires not only statistical knowledge, but also clinical and radiobiological correlates.

This course addressed the challenges of quantitative research in radiation oncology in a systematic way, presenting established methods and discussing their use and limitations in a way that provoked participants to reflect on their own practice and, to quote the course director, be "critical consumers".
The course was divided into themes that included statistics, imaging, dose-response and normal tissue complication models, as well as more clinical sessions on treatment endpoints, clinical trials and integrating research into clinical practice. Each theme concluded with an interactive discussion, often with practice sessions, that were useful in reiterating key points. At the start of each day we had a short introduction and summary session that brought the concepts already discussed together, introduced subsequent themes and allowed for questions.

The faculty teachers were enthusiastic about their subjects with extensive experience in radiation oncology research and from varied backgrounds, both scientific and clinical. They interacted well with participants and often added to each other’s sessions, in a way that was constructive and useful in highlighting the issues at hand. This also encouraged discussion amongst participants. There were two guest lecturers who fitted well into the relevant themes, whilst adding variety to the course.

A particularly useful concept was a "Meet-the-professor", session at the end of the third day. Participants could sign up for 15 separate sessions with one or more members of the faculty to address issues of particular interest or get specific advice relevant to their work. Quite a few of us took advantage of this and came out with good ideas to help with our own work, whether it would be analysis of an existing data set, modeling or trial design.

This was an intensive course, but well thought out. Participants included physicists, clinicians and radiographers who all found it useful. I would recommend it to anyone involved in radiotherapy research, but I think it would be particularly useful to those doing a higher degree, either when they are planning their research or at the analysis and write-up stage. Early career independent researchers would also find this very relevant.

Finally I would like to mention the work of the ESTRO staff in making us feel comfortable and organising a lovely dinner at the end of the second day.

Dr Andriana Michaelidou
Research Fellow in Clinical Oncology
Guys’ & St Thomas’ NHS Foundation Trust
London, UK
andriana.michaelidou@gstt.nhs.uk

Summer 2016
UNDERGRADUATE TRAINING FOR MEDICAL STUDENTS
Spread the word to your students!

MEDICAL SCIENCE SUMMER SCHOOL ONCOLOGY FOR MEDICAL STUDENTS
4 - 15 July 2016 | Groningen, The Netherlands

ESO-ESSO-ESTRO MULTIDISCIPLINARY COURSE IN ONCOLOGY FOR MEDICAL STUDENTS
29 August - 9 September 2016 | Poznan, Poland
It’s the fourth time ESTRO and the European School of Oncology (ESO) have collaborated on the Masterclass in radiation oncology. Why has this Masterclass been created?
The activity has been a joint effort of ESTRO and ESO since 2008. The concept of this Masterclass was to bring together young oncologists or medical physicists planning a career in radiation oncology with a focus on research and development and senior oncologists (recognised leaders in clinical and translational research) within a favourable, small scale educational and social setting enabling intensive discussions and elaborations on hot topics. Such a forum has so far been rarely available in the international radiation oncology community and this type of Masterclass has proven to be very successful in ESO’s experience. Therefore, the Masterclass format emphasises close interaction between senior and junior oncologists and/or medical physicists with a special interest in innovation, in the context of advanced education. Lively discussions of research projects are integrated with indepth lectures on state of the art and current and future research questions.

What is the concept of the Masterclass?
The Masterclass is a special course which brings together a significant number of international experts into a unique teaching format providing great opportunities for candidates with high potential at the early stage of their career. As the core faculty of the Masterclass (eight people) remains with the juniors (a maximum of 45) for the whole course, the Masterclass provides exposure to the interactive development of research projects in groups based on proposals from the participants for 50% of the time. Advanced knowledge in essential and hot topic areas of clinical and scientific radiation oncology is provided through comprehensive expert lectures for the other 50% of the time.

The major areas of current research and development in the Masterclass include physics/technology; biology; clinical and translational research; multidisciplinarity and advanced research methodology. The Masterclass provides a deeper look into comprehensive research and innovation strategies in the whole field of clinical and scientific radiation oncology, focusing on the integration of various research fields and methodologies.
The themes for the lectures and for research proposals to be presented by participants are as follows:
- Oncology research design
- Technology research and innovations (oncotechnology)
- Biology and translational oncological research
- Multidisciplinary oncology research approach.

How long did it take to organise and prepare the programme for the Masterclass?
It has been a long continuous process with much evaluation and re-evaluation and adaptation for improvement since the Masterclass was initiated eight years ago. During the previous three Masterclass courses we have tried to select the best content, and include favourable experience from the Masterclass, new ideas from faculty members and participants from similar educational events. A major focus for continuous improvement has been to emphasise and enhance opportunities for interaction between senior and junior participants.

For the previous Masterclass in 2014 in Portugal, we found an outstanding format based on feedback from both, the faculty and the participants – as described for this Masterclass – which seems to fit best the needs of young potential candidates aiming at promoting research and development in radiation oncology. In order to better meet the needs of our target group we have also included a young participant from the last Masterclass to be integrated into the preparation and performance of the next Masterclass, known as the academic coordinator.

Since the last Masterclass, more than one year of continuous communication has taken place in order to prepare the forthcoming 4th Masterclass in Prague this year.

How did you select the large faculty (14 teachers)?
The selection is based on content and methodology expertise as well as teaching experience and availability. Teachers are a key part of the programme and the majority of the faculty have been with us since the start of the Masterclass in 2008. We try to select researchers with varying profiles who are well recognised for expertise in different fields of research and methodology with a long lasting experience in scientific education and training to participate in the Masterclass. We have found a core faculty of eight outstanding researchers and teachers in our major fields of interest (clinical and translational radiation and medical oncology, and cancer pathology), who are able to spend the whole time of the course with the participants. We have found an additional faculty of six outstanding researchers and teachers from clinical and translational radiation, and medical and surgical oncology as well as from methodology and statistics who are able to spend up to two days with the participants. All these teachers are passionate scientists with proven leadership in cancer care and/or cancer research. The organising efforts are centred around reaching a balanced core of teachers who have expertise, are participative, accessible, have an
interactive personality, are able to communicate their knowledge with passion and have a major interest in supporting young people in their early research and development careers.

The Masterclass is upon application. What are the selection criteria?
Participants presenting a challenging research project for discussion during the Masterclass are priority candidates. Projects are evaluated to assess the relevance, level of development and methodology, interdisciplinarity, feasibility and potential impact on clinical practice and research. Initial experience in clinical and/or translational research is also taken into account. ESTRO and ESO have a long tradition in promoting equity and diversity when accessing advanced educational activities and that is also respected in the Masterclass selection process.

What should the profile of the candidates be?
Junior staff in radiation and/or clinical (medical) oncology, or medical physics with a strong interest in promoting cancer research and development. Candidates with a research and innovation start-up status (e.g. last year residents with academic promise) will also be considered.

Our target group should fulfill these criteria:
- Aged between 30 and 45 years old
- Have knowledge and experience (at least three years as a resident or as a specialist) in radiation oncology, clinical oncology, medical oncology or medical physics (with minimum, basic knowledge in radiotherapy)
- Be actively involved in scientific activities
- Be fluent in English.
AIMS AND EXPECTED LEARNING OUTCOMES OF THE MASTERCLASS

The major course aims of the Masterclass of radiation oncology are two-fold:

- To provide an overview on state of the art advances in current research in the different fields of radiation and multidisciplinary oncology, including technology and biology oriented research
- To provide practical skills for active participation in the various fields of radiation and multidisciplinary oncology research and development.

In order to reach these course aims the Masterclass is divided in two parts:

- Interactive group sessions (50%) are dedicated to open discussions of research project proposals presented by the junior participants. The performance of these sessions (two hours) has to be dynamic (participative), structured (agenda of interventions), critical (in respect to free hypothetical thinking based on scientific evidence) and they are moderated by advanced juniors and facilitated by seniors
- Expert lectures (50%) are devoted to update interdisciplinary science in radiation oncology by experts.

Plenary discussions are coordinated to extend into a summarised format the debate of the research projects re-developed from the discussion in small working groups for all participants.

Expected learning outcomes can be summarised as follows.

By the end of this Masterclass the participant should:
- Know about the current research scenarios in clinical radiation oncology, in technology oriented research, in biology and translational related research and in multidisciplinary research
- Have improved skills in the definition of research endpoints and their assessment
- Have improved skills to identify appropriate research methodologies for different research questions
- Be able to design and develop a research proposal in one of the major fields of radiation and multidisciplinary oncology
- Be able to critically assess research proposals in his/her major field of interest.

DEADLINE FOR APPLICATION: 14 MAY 2016

More information on the programme and on how to apply: www.estro.org

Further reading in the ESTRO guide 2016, page 98.
Interview with Jesper Grau Eriksen
Chair of the Educational Council *

Jesper Eriksen, in a few words, who are you?
I am 47 years old and live with my family in Odense, Denmark. I was trained as a clinical oncologist (combined medical oncology and radiation oncology) at Aarhus and Odense University Hospitals and became a specialist in 2008. My main focus is head and neck cancer and I am an active member of the Danish Head and Neck Cancer group (DAHANCA). I have been lucky to work in the laboratory of Jens Overgaard for five years and obtained my PhD degree in 2004. I have been involved in medical teaching and training since my early years at the university and have been involved in postgraduate training on a national level for more than a decade.

What has been your involvement within ESTRO?
I have been a member of ESTRO for more than 15 years, and I first became involved in ESTRO activities in 2007 when I joined the working group for the third revision of the core curriculum (CC) for radiation oncologists. The work with the revision was a great experience and I really enjoyed the international perspectives and discussions that took place over a period of three years. When the CC was finalised I got the

*The ESTRO ETC will become the Education Council at the end of April, at ESTRO 35.

After ten years as the head of the Education and Training Committee (ETC), Richard Pötter is leaving the position. During the past few months, ESTRO launched a recruitment campaign through the newsletter, ESTRO Flashes, the website, Facebook and Twitter. A couple of highly qualified candidates were finally interviewed with selected members of the ETC representing all disciplines. Richard Pötter and the ESTRO School are pleased to announce that they have appointed the new chair of the Educational Council with Jesper Grau Eriksen. Jesper has been involved with ESTRO and more specifically with the ESTRO School for the previous five years and with his skills, dedication and friendliness, we are confident that the ESTRO community will be delighted to welcome him to this new position.
chance to join the newly formed FALCON group in 2010, and later on the Education and Training Committee, the webpage group (DOVE) and the UEMS section of Radiation Oncology and Radiotherapy which works closely together with ESTRO. I have for some years now also been in the faculty for the “Combined drug-radiation treatment”, course and the “Multidisciplinary management of head and neck oncology”, course as well as the online FALCON workshop in head and neck delineation.

**What do you like the most about your work at ESTRO?**
I really like the idea of what can be achieved with regard to science dissemination, education and oncopolicy when we, on an international basis, join forces. On top of that, you get to know a lot of good friends and colleagues throughout Europe and beyond, and you learn that although we seem different at first glance, we all share the same goals in our professional life.

**And in your institute?**
Head and neck cancer patients are often quite complex with a lot of different issues that need to be solved for delivering an optimal service. When you are able to deliver the best possible cancer treatment within a short time and also solve or help find solutions for the patients’ other medical, social and psychological problems then it is really a good day at work.

**You have been a (core) member of the ETC for five years. Can you briefly describe for us the scope of activities and the remit of the ETC?**
The primary task of the ETC is to govern and develop the ESTRO School of Radiotherapy and Oncology. Briefly, the School aims to improve, professionalise and standardise knowledge and practice in radiation oncology and associated professions in Europe and beyond. To accomplish this, the School promotes a large scope of educational activities with the live courses being the core activity. At the moment, 35 annual live teaching courses covering basic and continuous medical educational needs for all professionals working in the field of oncology are provided. The majority of those are held in Europe, but with an increasing focus world-wide, especially in the Asia-Pacific area. Besides this, pre-meeting teaching courses, workshops, teaching lectures and multidisciplinary tumour board sessions during congresses are arranged as well as an increasing number of online teaching activities. The School also facilitates hands-on competencies through a mobility grants programme and develops and updates the European CC which is the framework that the programme of the School is built upon.

**What will be the biggest challenge for the ESTRO School in the coming years?**
The School has expanded successfully during the last ten years, both in terms of the number of courses and participants as well as in the variety of educational activities. We can expect that the number and variety of educational activities will grow even more, in order to cover all areas of the ESTRO CC. We are close to doing this but some important competences still need to be addressed.

Further expansion must be done with a strong focus on maintaining the high quality of the educational courses which is the trademark of the School. This high quality is due to the commitment of all the teachers and staff in the School and the expansion must be at a pace that does not affect the fun and dedication to teaching for ESTRO.
Another important challenge is the decision to integrate different ways of learning into the School (blended learning) as well as the decision to focus more on the pedagogical development. This will be strengthened in the new ESTRO School structure with the creation of a blended learning programme and with Christine Verfaillie being appointed as co-director for pedagogy and management.

Finally, from the ESTRO Strategy meeting in 2014, it was decided to pursue the internationalisation of the ESTRO School with a strong focus on the Asia-Pacific region. This will be another exciting challenge.

**And for you, personally, what will be the most challenging as Chair of the Education Council?**
In the May-June 2015 edition of the ESTRO newsletter, the editorial in the ESTRO School section mentioned that “After ten years of chairing the Education and Training Committee......Richard Pötter is retiring from this role. His successor will have a really hard act to follow...”, this sentence really summarises it all. The School has developed very successfully with Richard Pötter as chair and it will be a hard task to follow in his footsteps. Luckily, there is a transition period and I will try to learn as much as possible from Richard Pötter and Christine Verfaillie. The good news is that the Educational Council and the programme groups involved are very committed and experienced people from all disciplines in the radiation oncology community as well as the dedicated school staff.

**What will be the first actions or decisions you will take once you have started your position?**
The first important step will be to restructure the Education and Training Committee into the new Educational Council according to the new ESTRO governance structure. This process is already taking place in the transition period.

**What would you like to see achieved in a few years at the end of your term?**
At the end of my term I hope to see a School that has evolved in every way, based on success to date. I hope that our educational activities will cover all the competences in the CC and that the School will reach out even further than today. I hope we will have integrated blended learning, where appropriate, in all parts of the School and that we will have been able to strengthen the pedagogical performances as well as integrating young ESTRO members more into the School activities. Most of all I hope that we will succeed in supporting the commitment of all the teachers, because this is what makes this School so unique and is the basis for the high educational qualities.

**And if after your work and your commitment at the ESTRO School you still have some spare time, what do you like to do?**
Things that reset my mind and refuel me with energy, like spending time with my family and friends, cooking, reading books and hiking.
Jesper Grau Eriksen is 47 years old and became a specialist in clinical oncology from Odense and Aarhus University Hospitals in 2008. His present position is as a consultant at the Department of Oncology, Odense University Hospital in the head and neck cancer team.

He defended his PhD thesis in 2004 investigating the role of epidermal growth factor receptor (EGFR) for accelerated repopulation in squamous cell carcinomas of the head and neck. Since then, a central part of his research has focused on EGFR, EGFR-inhibition and side-effects of EGFR-inhibition. Recently, the focus has changed towards recurrences after IMRT and avoidance of side-effects to curative radiotherapy in the head and neck region.

He is an active member of the Danish Head and Neck Cancer group (DAHANCA) and serves as chair for the Danish Society for Head and Neck Oncology (DSHHO).

He has for many years been involved in post-graduate training at a national level and is at present chair of the PhD-training programme in Haematology and Oncology at the University of Southern Denmark (SDU). In ESTRO he participated in the last revision of the core curriculum for clinicians and at present he is a member of the ETC/Educational Council, the FALCON and DOVE task forces and also president of the UEMS Section of Radiation Oncology and Radiotherapy.
In early February the Education and Training Committee (ETC) came together with the course directors to review the School’s activities of the previous year and to plan the next year’s activities. This year we also had a very interesting workshop on “State of the art educational methods and team collaboration”.

This workshop was lead by Professor Fedde Scheele and Dr Irene Slootweg from Amsterdam. The first part of the workshop focused on creating successful education teams, based on a model of collaboration (D’Amour) and the concept of personality colours (De Caluwe) where:

- Blue = planning and efficiency
- Yellow = political and strategic motivation
- Red = motivation based on trust and shared interests
- Green = collaborative learning and education
- White = vision and creativity.

By working in groups and using these concepts to address specific case questions relevant to ESTRO, we learned how it was important to have a mix of personality colours within a group to cooperate as a team.

In the second part of the workshop, individual groups were asked to examine the concepts of Vleuten and Driessen, and relate them to medical education and the relevant importance of factors such as cooperative learning, mentoring, feedback and engagement.

The workshop was highly informative and educational. Now we need to put into practice some of the concepts we learned.

Fiona Stewart
Member of the ETC
PHYSICS FOR MODERN RADIOTHERAPY
A JOINT COURSE FOR CLINICIANS AND PHYSICISTS
11-15 September 2016 | Athens, Greece

COURSE AIM
The lectures aim to:
• Provide physics knowledge relevant to clinical radiotherapy
• Provide comprehensive overviews of imaging and volume concepts in radiotherapy
• Discuss modern dose delivery techniques, such as IMRT, rotational therapy (VMAT, helical tomotherapy), S(B)RT, IGRT, adaptive therapy (ART), and brachytherapy
• Discuss safety issues in lectures on commissioning and QA/QC, radiation protection, in vivo dosimetry and induction of secondary tumours.
• Complimentary to the lectures, this course has clinical case discussions as an important component, discussing planned homework submitted by the participants (see below for details) regarding selected treatment techniques, planning solutions, constraints and objectives, choice of margins, protocols for image guidance, QA, etc.

LEARNING OUTCOMES
By the end of this course participants should be able to:
• Apply, together with the treatment team from your department, modern physics principles and techniques in clinical practice
• Select modern treatment techniques based on their pros and cons
• Select physics and technical measures that enhance accurate and safe application of radiation therapy.

EARLY REGISTRATION DEADLINE ON 13 JUNE 2016
### POSTGRADUATE COURSES IN EUROPE

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Dates</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BASIC CLINICAL RADIOBIOLOGY</strong></td>
<td>27 February - 2 March 2016</td>
<td>Budapest, Hungary</td>
</tr>
<tr>
<td><strong>DOSE MODELLING AND VERIFICATION FOR EXTERNAL BEAM RADIOThERAPY</strong></td>
<td>6 - 10 March 2016</td>
<td>Utrecht, The Netherlands</td>
</tr>
<tr>
<td><strong>MODERN BRACHYThERAPY TECHNIQUES</strong></td>
<td>13 - 16 March 2016</td>
<td>Florence, Italy</td>
</tr>
<tr>
<td><strong>PARTICLE THERAPY</strong></td>
<td>14 - 18 March 2016</td>
<td>Krakow, Poland</td>
</tr>
<tr>
<td><strong>IMRT AND OTHER CONFORMAL TECHNIQUES IN PRACTICE</strong></td>
<td>3 - 7 April 2016</td>
<td>London, UK</td>
</tr>
<tr>
<td><strong>TARGET VOLUME DETERMINATION - FROM IMAGING TO MARGINS</strong></td>
<td>10 - 13 April 2016</td>
<td>Barcelona, Spain</td>
</tr>
<tr>
<td><strong>ESTRO 35 PRE-MEETING COURSES</strong></td>
<td>29 April 2016</td>
<td>Turin, Italy</td>
</tr>
<tr>
<td><strong>ESNM/ESTRO COURSE ON MOLECULAR IMAGING AND RADIATION ONCOLOGY</strong></td>
<td>19 - 22 May 2016</td>
<td>Lisbon, Portugal</td>
</tr>
<tr>
<td><strong>MULTIDISCIPLINARY MANAGEMENT OF PROSTATE CANCER</strong></td>
<td>22 - 26 May 2016</td>
<td>Istanbul, Turkey</td>
</tr>
<tr>
<td><strong>LOWER GI: TECHNICAL AND CLINICAL CHALLENGES FOR RADIATION ONCOLOGISTS</strong></td>
<td>25 - 27 May 2016</td>
<td>Brussels, Belgium</td>
</tr>
<tr>
<td><strong>UPPER GI: TECHNICAL AND CLINICAL CHALLENGES FOR RADIATION ONCOLOGISTS</strong></td>
<td>28 - 31 May 2016</td>
<td>Brussels, Belgium</td>
</tr>
<tr>
<td><strong>ADVANCED BRACHYThERAPY PHYSICS</strong></td>
<td>29 May - 1 June 2016</td>
<td>Vienna, Austria</td>
</tr>
<tr>
<td><strong>BRACHYThERAPY FOR PROSTATE CANCER</strong></td>
<td>5 - 7 June 2016</td>
<td>Brussels, Belgium</td>
</tr>
<tr>
<td><strong>CLINICAL PRACTICE AND IMPLEMENTATION OF IMAGE-GUIDED STEREOTACTIC BODY RADIOThERAPY</strong></td>
<td>5 - 9 June 2016</td>
<td>Athens, Greece</td>
</tr>
<tr>
<td><strong>EVIDENCE BASED RADIATION ONCOLOGY</strong></td>
<td>12 - 17 June 2016</td>
<td>Porto, Portugal</td>
</tr>
<tr>
<td><strong>ADVANCED SKILLS IN MODERN RADIOThERAPY</strong></td>
<td>19 - 23 June 2016</td>
<td>Dublin, Ireland</td>
</tr>
<tr>
<td><strong>MULTIDISCIPLINARY MANAGEMENT OF HEAD AND NECK ONCOLOGY</strong></td>
<td>26 - 29 June 2016</td>
<td>Florence, Italy</td>
</tr>
<tr>
<td><strong>HAEMATOLOGICAL MALIGNANCIES</strong></td>
<td>1 - 3 September 2016</td>
<td>Vienna, Austria</td>
</tr>
<tr>
<td><strong>PALLIATIVE CARE AND RADIOThERAPY</strong></td>
<td>8 - 10 September 2016</td>
<td>Brussels, Belgium</td>
</tr>
<tr>
<td><strong>PHYSICS FOR MODERN RADIOThERAPY</strong></td>
<td>11 - 15 September 2016</td>
<td>Athens, Greece</td>
</tr>
</tbody>
</table>

### POSTGRADUATE COURSES OUTSIDE EUROPE

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Dates</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>IMAGE-GUIDED CERVIX CANCER RADIOThERAPY - WITH A SPECIAL FOCUS ON ADAPTIVE BRACHYThERAPY</strong></td>
<td>4 - 6 April 2016</td>
<td>Toronto, Canada</td>
</tr>
<tr>
<td><strong>MULTIDISCIPLINARY MANAGEMENT OF BREAST CANCER</strong></td>
<td>20 - 22 May 2016</td>
<td>Tokyo, Japan</td>
</tr>
<tr>
<td><strong>MULTIDISCIPLINARY MANAGEMENT OF LUNG CANCER</strong></td>
<td>26 - 28 June 2016</td>
<td>Moscow, Russia</td>
</tr>
<tr>
<td><strong>BASIC CLINICAL RADIOBIOLOGY</strong></td>
<td>3 - 7 July 2016</td>
<td>Chengdu, China</td>
</tr>
<tr>
<td><strong>EVIDENCE BASED RADIATION ONCOLOGY</strong></td>
<td>20 - 25 November 2016</td>
<td>Sydney, Australia</td>
</tr>
<tr>
<td><strong>PAEDIATRIC RADIATION ONCOLOGY</strong></td>
<td>3 - 5 December 2016</td>
<td>Bangkok, Thailand</td>
</tr>
<tr>
<td><strong>ADVANCED TECHNOLOGIES</strong></td>
<td>6 - 10 December 2016</td>
<td>Pune, India</td>
</tr>
<tr>
<td><strong>MEDICAL SCIENCE SUMMER SCHOOL ONCOLOGY FOR MEDICAL STUDENTS</strong></td>
<td>4 - 15 July 2016</td>
<td>Groningen, The Netherlands</td>
</tr>
<tr>
<td><strong>ESO-ESSO-ESTRO MULTIDISCIPLINARY COURSE IN ONCOLOGY FOR MEDICAL STUDENTS</strong></td>
<td>29 August - 9 September 2016</td>
<td>Poznan, Poland</td>
</tr>
</tbody>
</table>
YOUNG ESTRO
Welcome back to the March-April 2016 issue of the Young Corner.

ESTRO 35, which will take place in Turin, Italy, is approaching and in this issue we present an overview of the Young Track programme at the 2016 ESTRO congress. A full day is dedicated to the young members and we hope to see you there. You will also find interviews with the chairs of the young track programme.

We present reports from the Young Scientists’ Forum held in Poznan, Poland, and the Young Track session at the Italian National Society AIRO (Associazione Italiana Radioterapia Oncologica), held in Rimini, Italy, both of which occurred at the end of 2015.

Our Corner also features two mobility reports. Mladen Solarić, Irena Šeb and Juraj Bibić from Zagreb in Croatia visited the National Institute of Oncology in Budapest, Hungary, to learn about intensity-modulated radiotherapy (IMRT) in prostate cancer. Moustafa Al Daly from Cairo in Egypt, visited the Cliniques Universitaires Saint-Luc in Belgium to learn about advanced imaging modalities for the purpose of volume determination and verification of treatment delivery.

We hope to see you at ESTRO 35, this year’s main event for young radiation oncology professionals. We encourage you to follow the updates on the Young ESTRO Facebook page in order to receive the latest congress news before, during and after the event, and also for news from the ESTRO School and other radiotherapy events across Europe.

Pierfrancesco Franco and Kathrine Røe Redalen
The young track at ESTRO 35 is scheduled for Sunday 1 May at 8.00 hrs. During the whole day, the young scientists on site at ESTRO 35 will be able to follow a very broad programme specially tailored for radiation oncologists, medical physicists, radiation therapists (RTTs) and radiobiologists starting their career in radiation oncology.

Every ESTRO annual congress includes a young track. Can you remind us about this concept?

The Young committee is responsible for the organisation, contribution and promotion of the young scientist session/track at all ESTRO congresses. Each year, a young track is held with symposia and teaching lectures aimed at the young radiation oncology professionals, with subjects such as “How to build a career” and “How to write a good article/abstract”. We also organise a young reception at the end of the track, which is always a nice moment to meet other young Europeans and network with each other.

Can you explain how this track has become a key element of the programme?

We are always trying to create a programme that will appeal to all young radiation oncology professionals, with a focus on networking, career and practical themes. We have seen interest for the young track growing each year and we believe that it has progressively become a key element of the programme, because the young represent the future of ESTRO.

There is a session on publishing with speakers Professor Overgaard and Professor Anthony Zietman, respectively editors-in-chief of the Green and Red journals (respectively Radiotherapy and Oncology and International Journal of Radiation Oncology*Biology*Physics). Why do you think that, despite an extremely busy agenda on site, they accepted your invitation?

We are very grateful and happy to have Jens Overgaard and Anthony Zietman in our track. We think this session will be very interesting for the young who want to understand more the selection criteria for publishing in the Green and Red journals. Dissemination of knowledge is im-
important, especially because a lot of research and studies are performed by young people early in their academic and clinical career. It will also be an opportunity to present and discuss ESTRO’s and ASTRO’s new journals.

The young track will also be the opportunity to highlight the work of the young ESTRO committee. Can you already tell us at this stage, in a few words, what you, Jean-Emmanuel, as chair of the young ESTRO committee, will present?
I will be talking about the history and evolution of the Young task force into the Young committee. I will also present what the Young committee is trying to achieve and how everyone can contribute. Besides future projects, we will also discuss the next Agora meeting that will take place later this year. More information about the Agora meeting will be communicated soon but it will be a meeting for young people who want to be engaged in ESTRO and the future of radiation oncology.

“Planning ahead: how to finish residency/PhD project with a job offer”. This session seems to be concretely tackling the job market issue. What will be discussed there?
We really try to keep a focus on practical issues for young radiation oncology professionals. This session is directed at residents, RTTs, physicists and radiobiologists who wish to get advice and hints on how to better manage the next step in their career, do’s and don’ts and advice on how to define a coherent project between clinical and research activities within a department or institution with a few examples given for each field of radiation oncology.

Finally, there is a joint session with young radiation oncology national societies and the Young Radiation Oncology Group (YROG). What do you think these young national societies, YROG and ESTRO have in common?
We wanted to have this session to present the activities of the Young Radiation Oncology Group (YROG) of the EORTC and several young national societies. We would like to exchange ideas on how to better connect young European radiation oncology professionals and define common goals and collaborate to achieve them. We will also gather new ideas, projects and suggestions on how the Young committee can better serve young radiation oncology professionals across Europe.
A Joint Session of Young Radiation Oncologists National Societies and YROG

1 May 2016, 13.00-15.45 hrs

Interview with Dr Jean-Emmanuel Bibault and Dr Orit Person, chairs of the session

What is the concept of the session?
In this session, we will present the activities of yESTRO (ESTRO Young Committee); the Young Radiation Oncologists Group (YROG), a working party within the Radiation Oncology Group (ROG) of the EORTC; and several young national societies. We will discuss how to better connect young European radiation oncology professionals and define common goals. This session was inspired by a previous fruitful collaboration between us at the ROG meeting in Paris in 2014 where we held a joint session of SFjRO (young French national society of Radiotherapy and Oncology) and YROG.

Why create this session?
Collaboration between young societies is key to promoting young professionals in various aspects including education, working, research and more. We will also define new projects and suggestions on how the Young committee can better serve the young radiation oncology professionals across Europe.

Why young scientists shouldn’t miss this session?
This session will be a great opportunity to meet other young radiation oncology professionals and network with them. It is important to all radiation oncologists and those who don’t have young national societies in their countries can benefit from the experiences of others and may also get assistance in the process of creating such a society. The session will allow collaboration between yESTRO, YROG and various national societies across Europe, including those societies that are not actively presenting at the session, thus it is imperative that all national societies in Europe send representatives to the session to achieve such collaboration. The presence of the YROG and young national societies at the session opens the door for young radiation oncologists to be involved in research at early stages of their career, something that is an important investment for the future. Involvement in the YROG will benefit the young radiation oncologist on a personal level, and also be beneficial to institution/national society to have a young radiation oncologist active in a big research group such as the ROG-EORTC. Moreover, in our view, this session is the best platform to promote mutual goals, especially with all that is happening under the strong umbrella of ESTRO as part of ESTRO’s support and efforts to promote young professionals.
08.00 - 08.40

E-LEARNING FOR PROFESSIONALS IN RADIATION ONCOLOGY
What, why and how?
Chair: C. Belka (Denmark)
Speaker: A. Berlanga (The Netherlands)

08.45 - 10.00

SCIENTIFIC SYMPOSIUM
The future of radiation oncology publishing: views through the Green and Red telescopes
Chair: P. Mancosu (Italy)
Chair: M. Schmid (Austria)

Green Journal
Speaker: J. Overgaard (Denmark)

Publishing the science of radiation oncology: the perspective of the Red Journal’s editor
Speaker: A. Zietman (USA)

How to do a good manuscript review
Speaker: L. Muren (Denmark)

13.00 - 14.15

LUNCH SYMPOSIUM
Planning ahead: how to finish residency / PhD project with a job offer
Chair: D. Verellen (Belgium)
Co-chair: TBC

Radiation Oncologist
Speaker: S. Rivera (France)

Radiobiologist
Speaker: M-C Vozenin (Switzerland)

Physicist
Speaker: D. Verellen (Belgium)

Researcher
Speaker: U. Oelfke (UK)

14:15-15:30

SYMPOSIUM
A joint session of young radiation oncologists national societies & YROG
Chair: J-E Bibault (France)
Co-chair: O. Person (Israel)
What is the Young ESTRO Committee and what can it do for young radiation oncology professionals?
Speaker: J-E Bibault (France)

The Young Radiation Oncology Group of EORTC
Speaker: O. Person (Israel)

The French Society of Young Radiation Oncologists
Speaker: T. Leroy (France)

The Young AIRO (Italian Association of Radiation Oncology) Group
Speaker: D. Greto (Italy)

The British Institute of Radiology
Speaker: S. Hafeez (UK)

Round table with present young national societies

16.15 - 17.15

YOUNG RECEPTION AND REPORT FROM THE YOUNG ESTRO COMMITTEE

More information on ESTRO 35 is available in the Conference Corner

And check out the latest available information on:

ESTRO APP will be available a few weeks before the congress

www.facebook.com/ESTRO.org

#ESTRO35

WWW.ESTRO.ORG
“Science is a collaborative enterprise, spanning the generations”, this is a famous quote from Carl Sagan. On the basis of that message, on 26 November 2015 in Poznan, the Young Scientists’ Forum (YSF) took place. The aim of the event was to promote the achievements of young scientists, to help in their professional development, and to create a strong platform to exchange professional experiences. This conference was open to radiation oncologists, medical physicists and radiobiologists aged 35 years or younger.

Participants had to send abstracts, which were evaluated by an international jury consisting of leading experts in radiotherapy, radiobiology, and medical physics:

- Joanna Kaźmierska - Scientific Chair (Poland)
- Julian Malicki - Honorary Chair (Poland)
- Mechthild Krause (Germany)
- Michelle Leech (Ireland)
- Ludvig Muren (Denmark)
- François Paris (France)
- Conchita Vens (The Netherlands)
- Daniel Zips (Germany).
The abstract, if accepted, was classified into one of two categories as an oral presentation or a poster. Oral presentations consisted of a ten-minute presentation followed by a ten-minute discussion, and posters had to be presented in front of the jury within five minutes. From the presentations, five young scientists received awards, including amongst others free registrations at ESTRO courses or conferences, or subscription to the *Radiotherapy and Oncology* journal.

To sum up, I would like to congratulate the chair, Dr Joanna Kazimierska, the honorary chair, Professor Julian Malicki and the whole YSF Organising Committee for an excellent conference, for their willingness to collaborate with the young radiation oncology professionals, and for showing that science is accessible to everyone regardless of age, titles and experience.

When I was there I saw the future of modern European radiation oncology. On behalf of the yESTRO Committee, I would like to thank all young scientists for coming and encourage more young radiation oncology professionals to participate in such events.

*Mateusz Spałek*

*Department of Radiotherapy*  
*The Maria Skłodowska-Curie Memorial Cancer Center and Institute of Oncology*  
*Warsaw, Poland*
AIRO (Associazione Italiana Radioterapia Oncologica), is the Italian National Society of Radiation Oncology, which links all board certified radiation oncologists and residents throughout Italy. The society has a strong and persistent mission in promoting radiation oncology as a medical discipline, also enhancing education and multidisciplinary in radiotherapy with connections to other branches of clinical oncology and cancer imaging.

AIRO organises an annual national meeting, which is the main event to join the life of the society for all members. This event is also an important occasion to share scientific knowledge and education as well as to increase collaborations with other scientific societies in the multimodality approach towards cancer cure.

The opening slots of the national congress are usually dedicated to the Young Track session, which is an important opportunity for young members to take an active part in the society, to get to know colleagues working in other parts of the country and to present their original work during a dedicated scientific session.

The XXV national AIRO Congress was held in Rimini, Italy from 7-10 November in the welcoming venue of the Palacongressi. Rimini is a notable touristic city in the seaside of Emilia Romagna, well-known for its warm hospitality, culinary attractions and amusement possibilities.

The Young Track included two dedicated sessions regarding the combination of radiotherapy with new biological drugs in different clinical
settings and treatment-related toxicity in head and neck cancer. Invited speakers were selected among young radiation oncologists to give extensive talks on the two selected topics. All lectures were followed by a thorough and interactive discussion. A total of 20 selected oral communications were selected by the scientific committee and discussed at the end of each session. This part of the session is particularly appreciated since it allows young members to display the results of scientific activities performed in their own departments.

Overall, the Young Track was a very well received part of the AIRO National Congress, fully integrating young members within the society and providing an opportunity for sharing experiences, building up collaborations and enhancing scientific knowledge.

*Pierfrancesco Franco*

*Department of Oncology - Radiation Oncology*

*University of Turin*

*Turin, Italy*
Implementation of intensity-modulated radiotherapy (IMRT) for prostate cancer treatment

Mladen Solari - Irena Šeb - Juraj Bibi

Utilisation of advanced imaging modalities for better volume determination and treatment delivery verification

Moustafa Al Daly
MOBILITY REPORT
Implementation of intensity-modulated radiotherapy (IMRT) for prostate cancer treatment

Mladen Solari
Irena Šeb
Juraj Bibi

HOST INSTITUTE:
National Institute of Oncology
Budapest, Hungary

DATE OF VISIT:
12 - 18 October 2015

In the last few decades, significant progress has been made in the area of radiotherapy, with IMRT being a crucial innovation. The implementation of these modern radiotherapy techniques in Croatia has begun, however, there is limited knowledge and experience for the irradiation of the pelvic area which has a significant impact on the quality of treatment. Our goal for the visit to the National Institute of Oncology in Budapest was to expand our experience within this field. The National Institute of Oncology in Budapest has similar equipment to our hospital and it was also chosen because of its vicinity.

Optimising a plan at the treatment planning station and discussing the outcome
During the visit we had the chance to see the whole process of radiotherapy, including IMRT specific information. The physicist in the group (Juraj Bibić) was mostly involved in the IMRT planning process and dosimetry of the IMRT plans, as well as overseeing the whole process. Our radiation oncologist (Mladen Solarić) had a chance to compare our techniques for delineation of organs and tumour volumes to the techniques of our host institute. In addition, special attention was paid to the margin determination in cases when fiducial markers are used. Our radiation therapist (Irena Šeb) was mainly involved in the practical setup of patients, and fixation and verification using both fiducial seeds and bones.

As a result of our visit to National Institute of Oncology in Budapest, we decided to change some details in our department workflow, both for conventional radiotherapy and IMRT. We decided to copy the way that our host institution organises the tumour volume and organ at risk (OAR) data. We also gained new knowledge about the prescriptions they are using and dose constraints for OARs. In the next few months after a final check that our machine is modelled for IMRT, we should be ready to start treating patients. This visit gave us the confidence that we are able to implement this and manage it in a relatively short time.

In addition to the planned part of our visit we also had the chance to see prostate cancer brachytherapy, a treatment still not used in our country, and we also had an opportunity to compare head and neck IMRT techniques.

Once again, we would like to thank our hosts, especially Dr Csilla Pesznyak, Dr Péter Ágoston, Dr Tibor Major and Professor Csaba Polgár, Director of the Radiotherapy Centre, for the effort and time they spent on our visit. We would also like to thank ESTRO for making this visit possible.
The advances in imaging modalities have consistently changed the framework of modern radiation oncology, improving anatomical and functional selection and definition of treatment volumes and allowing for a more interactive approach, which employs new techniques such as adaptive and dose-painted radiotherapy.

The aim of my stay was to gain knowledge and practical skills on the use of PET-CT for radiotherapy planning and to get a glimpse on 4D image acquisition for lung and other thoracic malignancies. This visit was really important to me as we have just installed a new PET-CT scanner in my home centre and we have a special interest in PET-based radiotherapy.

Saint-Luc University Hospital and its related laboratory, Molecular Imaging Radiotherapy and Oncology (MIRO), in Brussels, are well recognised worldwide for the use of functional imaging with seminal works on dose-painting based on different tracers as a surrogate for clonogenic capacity, metabolism and hypoxia.

I had the chance to attend many contouring classes with Professor Vincent Grégoire, focusing on different case scenarios, with and without the aid of a PET scan. I learned a robust and very helpful workflow in head and neck cancer volume contouring, proper clinical assessment as a first step in 3D visualisation of tumour extension, followed by contrast-enhanced CT scan and finally MR imaging to better visualise soft tissues and detect possible intracranial extension. The PET scan was a subsequent imaging option, useful whenever CT or MRI were blurred for any reason.

I was also able to join an ongoing research project on dose painting by numbers using PET image processing by MIM software. Using this technique, the gross tumour volume (GTV) was automatically delineated (gradient based) to seven levels of doses from 86 Gy to 70 Gy and FDG uptake was converted to dose.

The second important step of my visit was the use of 4D PET-CT. I had the chance to follow the whole process starting from initial patient respiratory pattern recording (rate and amplitude of respiration) under CT acquisition, followed by the use of infrared camera-based surface matching (VISION radiotherapy).

Moreover, I also saw how a receded audio was created by a computer similar to a patients’ respiratory pattern and then used to help patients
to maintain the same pattern of breathing during 4D CT acquisition (ten image phases are acquired) and PET imaging (five image phases). The same audio was also used during daily treatment delivery. With this approach and the use of a 4D concept, the mid-position phase was created by home-made software and daily tumour to tumour matching was performed on MVCT to treat lung lesions with stereotactic approaches on free breathing with no need of fiducial markers.

I also attended an ongoing research project using FDG- and FASA-PET performed before, during and after treatment for locally advanced lung cancers. The image de-noising (more difficult in FASA-PET) and de-blurring (by proper motion control) were very important points to have suitable images for dose painting approaches.

Lastly, I was lucky enough to work on a recently installed VISION radiotherapy on a linear accelerator. It is an infrared camera-based system that allows patient external contour to match with initial CT for better setup verification, also monitoring intra-fractional chest wall position and allowing for gated radiotherapy.

Finally, I am so grateful to Professor Pierre Scalliet for his invitation and his welcoming support as well as to his warm and friendly team at Saint -Luc. I also thank ESTRO for making this important and pleasant visit possible.

Moustafa Al Daly
Department of Clinical Oncology
Cairo University
Cairo, Egypt
moustafadaly@yahoo.com/moustafa.aldaly@kasralainy.edu.eg

Are you aware of outstanding PhD theses?
In future editions of the newsletter, the Physics Corner would like to start a new series on outstanding PhD theses of interest to the medical physics community and beyond.

More information is available in the Physics Corner of this issue (p. 61)
INTRODUCTION

COSTS OF CANCER CARE FOR USE IN ECONOMIC EVALUATION: A UK ANALYSIS OF PATIENT-LEVEL ROUTINE HEALTH SYSTEM DATA.
COSTS OF CANCER CARE FOR USE IN ECONOMIC EVALUATION
A UK analysis of patient-level routine health system data

With a National Health Service (NHS), the UK is in a favoured position to both advise and, in some cases, to mandate the type and extent of clinical, cost and patient related data to be collected across the nation. In this corner we highlight a study that was published in 2015.
With a National Health Service (NHS), the United Kingdom is in a favoured position to both advise and, in some cases, to mandate the type and extent of clinical, cost and patient related data to be collected across the nation.

Furthermore, with such a health care delivery system, reimbursement levels can easily be established nationally, for example, by a body such as the National Institute for Health and Care Excellence (NICE). Reimbursement bodies, such as NICE, are increasingly requiring patient quality adjusted life year data as well as cost data in arriving at their funding decisions. Dr. Hall and colleagues have recently mined subsets of the extensive databases available both locally and nationally to explore the relationships between clinical and demographic data, costs of hospital based care and outcome for 15 month disease free survivors of breast, colorectal and prostate cancer.

The study was based around two NHS Hospital Trusts in the north of England. The study population encompassed 223 breast cancer patients, 145 colorectal and 104 prostate cancer patients recruited between November 2010 and September 2011. All patients included in the study were disease free 15 months after diagnosis. Three databases contributed to the analysis. A locally implemented Patient Pathway Manager includes patient demographics as well as pathology and the medical interventions employed. Cost data were obtained from the Patient Level Information and Costing System (PLICS) which has been developed for national use and is currently being piloted in one of the two Trusts participating in the study. The NHS routinely collects Quality of Life (QoL) data from selected groups of patients through its Patient Reported Outcomes Measures initiative. A development version of this, designed for use in cancer services, was used in this study. Patients self reported selected dimensions of quality of life using the validated EQ-5D questionnaire at 6, 9 and 15 months post diagnosis. Utility scores were derived by comparison with preferences for health status of the UK general public. Through the patient’s unique ID, it was possible to link these three sources of data and explore relationships between the different variables.

Hospital costs for breast and colorectal cancer were considerably higher than those for prostate cancer at £12,595, £12,643 and £3,722 respectively at 15 months. Note, these costs are averaged over all patients in the specific disease group irrespective of other variables including treatment strategy.
With such a wealth of data, the authors were able to identify many linkages, some intuitive and some not. The strongest predictor of cost was the disease stage and related clinical characteristics for all three sites. The rolling mean daily cost decreased from time of diagnosis showing small bumps around the 6 and 12-month follow-up visits. In terms of Quality of Life scores, breast cancer patients had the worst utility scores with younger patients having lower utility than older patients. The authors hypothesize that this latter observation may be associated with a higher disease stage and more aggressive therapy for younger breast cancer patients. This suggestion is supported by the observation that average hospital based costs were approximately 50% higher in the younger group than the older. Surprisingly, prostate cancer patients exhibited a higher Quality of Life than the reference population. There was no statistically significant relationship between cost and QoL at 15 months. From the data, there was no clear association between hospital based costs, or staging, and Index of Multiple Deprivation although, as the authors point out, consent to participate in the study was significantly lower in the more deprived areas.

Of particular interest to the radiotherapy community are the cost data presented in graphical form in this paper. For breast cancer patients the average cost of hospital-based care, employing radiotherapy, is in the region of £8,000, whereas for chemotherapy it was £15,000. Meanwhile for prostate cancer, hospital based costs were about £3,500 for radiotherapy and close to £6,000 for surgery. Given the relatively small numbers of patients it was not possible to relate QoL to the medical intervention so the efficiency of the intervention cannot be ascertained.

The authors are explicit about the shortcomings of this study including bias associated with voluntary reporting being influenced by age and deprivation status. They also add the caution that “care should be taken when attempting to apply these cost results in a non-UK context.”

However, this is one of the more extensive studies linking costs and other factors to QoL following treatment. As such, it demonstrates the power of linked, well-designed databases in addressing the challenges presented by a resource constrained health care environment.

Peter Dunscombe
University of Calgary,
Calgary, Alberta, Canada

**REFERENCE**

Hall PS, Hamilton P, Hume CT, *et al.*
Costs of cancer care for use in economic evaluation: a UK analysis of patient-level routine health system data.
introduction interviews with the chairs not to be missed in the scientific programme at estro 35

mark your calendar estro cancer pavilion

CONFERENCES
Here we have, the last issue of the newsletter before ESTRO 35, the annual conference. In this special corner, we have prepared an overview of all the important events planned to take place on site. The chairs of the programme and the local organising committee have highlighted for us what is not to be missed at ESTRO 35.

We are also pleased to introduce a new initiative at ESTRO 35 known as the ESTRO Cancer Pavilion, where institutes and participants will be able to meet and network. Here the representatives of these institutes will tell us more about why individuals would be interested in meeting them.

This year, there will be WiFi in all the meeting rooms and with the hashtag #ESTRO35, you are free to exchange the latest advances on social media. The ESTRO 35 app will be available in the middle of April. In the meantime, you can visit www.estro.org to access the searchable programme.

In less than two months we will be meeting each other in Turin to attend top scientific sessions, exciting social events and networking activities. Awards, pre-meeting courses and contouring workshops are some of the events. The programme is broad and as you will see in the following pages, the days will be more than busy as always in the welcoming atmosphere of the ESTRO conferences.

Start training for the Super Run and see you in Turin.

Agostino Barrasso and Eralda Azizaj
INTERVIEWS WITH THE CHAIRS

Scientific programme - Yolande Lievens and Ben Heijmen
Clinical track – Yolande Lievens
Physics track – Ben Heijmen
Brachytherapy track - Jacob Lindegaard
Radiation therapists (RTT) track – Annette Boejen
Radiobiology track – Conchita Vens
Local organising committee – Umberto Ricardi
The abstract meeting took place on 10 and 11 December 2015 at the ESTRO office. What is the importance of such a meeting in the development of the scientific programme for ESTRO 35?

The aims of the abstract meeting are to finalise the selection of abstracts and to allocate them to the most relevant session in order to build a high quality scientific programme. The topics covered in the scientific programme need to be well-balanced between different tracks while avoiding overlap. For instance, if we include oligometastatic disease in the clinical track, we need to ensure that it is not repeated in the physics track at the same time.

How is the abstract scoring established?

The final scoring of the abstracts is based on the contributions from the 320 reviewers involved in the process, as well as the input from the Scientific Advisory Groups and also the chairs of the previous ESTRO annual meeting. This is to ensure homogeneity in the selection of topics from one year to another in order to avoid overlap and to ascertain the smooth evolution of a topic. Contributions from the local hosts in Turin as well as the editors in chief of the Green Journal are also taken into consideration. The chairs of the different tracks take all this information into account to develop the final programme. This includes the well-known proffered paper sessions, posters, electronic posters, as well as the poster viewing sessions. The latter is new and has been developed to highlight a selection of posters, organised into a specific topic and grouped in the poster viewing area. In allocated time slots, attendants of a poster viewing session will move from one poster to the next, and at each poster, the first author will briefly summarise the poster, followed by a discussion.
A record number of 2,200 abstracts have been received for ESTRO 35. How many were submitted to the clinical track and do you observe a trend among these abstracts?

A total of 1,003 abstracts were submitted to the clinical track, of which, 878 were finally scored for the clinical track.

The reason for this re-categorisation is that before embarking into the formal scoring, all abstracts were checked for consistency in terms of submission into the right track. About 100 of the clinical abstracts were identified as limited to dose planning studies, without any clinical outcome reported. These abstracts were re-categorised to the physics track. In addition, some were re-categorised to the radiobiology track, thus safeguarding the clinical outcome data for the clinical track.

As usual, many abstracts were submitted on the main clinical indications category, reflecting the typical tumour types (breast, head and neck, upper and lower gastrointestinal, lung and prostate). A large number of abstracts were also submitted in some less typical tumour types such as gynaecology, haematology, central nervous system and paediatrics. These types of cancers typically take up a lesser part of the daily activity in our radiotherapy departments, which makes the abstracts an interesting mix.

Also some other topics, such as SBRT for oligometastatic disease, protons and particles and adaptive treatment strategies represented a recurrent topic in the submissions. Furthermore, we saw quite a lot of strong data related to long-term follow-up, toxicity evaluation in cancer survivors, and adverse effects after radiotherapy.

Finally, there was a lot more interest in submitting abstracts to the health economics category. There was an interesting selection of abstracts related to health services research investigating access to radiotherapy, its cost-effectiveness, as well as the place of research in radiotherapy departments and the introduction of technological innovations into clinical practice.

Do the abstracts received reflect the international aspect of the meeting? In other words, what can you say about the geographical spread of the abstracts submitted to your track?

As expected, most of the abstracts came from...
Europe and also a lot came from Italy, our host country (350, all tracks included, which is a record). We also received many from North America, especially from Canada, which may be a consequence of the Memorandum of Understanding (MoU) ESTRO has with the Canadian Association of Radiation Oncology (CARO). Interestingly, we received quite a large number of abstracts from the Asia Pacific region. We have always had a good representation from Japan and Australia/New Zealand, but this year South Korea, China and India also submitted several abstracts which reflects the close collaboration we have with these countries, especially since MoUs were signed in 2015.

**Coming back to the reviewing process, how many people were involved in the evaluation?**

For the clinical track, 137 reviewers were involved with each abstract reviewed by at least six reviewers who are experts in the category the abstract has been submitted to. This is a large number of reviewers giving input for the abstract meeting, which took place at the end of the reviewing process. Although it is a long process, it highlights the extreme care with which scientific programmes are developed for ESTRO congresses. As mentioned, based on the quality and the scores given by the reviewers, the abstracts were allocated to the different types of sessions. They are combined into sessions that will focus on prospective clinical studies as well as on more cutting-edge and novel approaches emerging into the clinic.

**What were your main criteria when evaluating an abstract?**

The priority criterion is the quality, that determines whether the abstract is accepted for oral presentation or for poster viewing, as a paper poster or an electronic poster. More specifically, we pay attention to the scientific strength and rigour, the size of the study, its potential clinical impact and its novelty.

**Are there any randomised trials?**

Of course. Apart from some randomised trials being included in the sessions, there will be a session on selected randomised trials on Monday 2 May which will include two studies on rectal cancer and one on breast cancer. In addition, there were randomised trials submitted as late braking abstracts, which will be presented in a specific session.
A record number of 2,200 abstracts have been received for ESTRO 35. How many were submitted to the physics track?

Initially, 786 abstracts were submitted to the physics track. After re-categorisation of all the abstracts received for ESTRO 35, the number increased to 900 which was more than that received for the clinical track. This is the first time the physics track received more abstracts than the clinical track.

Among the 900 abstracts received in the physics track, could you say that there is a trend emerging, or a specific topic that has been quite broadly covered in the abstracts received?

There is a lot of interest in protons, particle therapy in general and MR guided therapy. A lot of the abstracts received were on new detectors and as expected there were many on treatment planning. Unexpectedly, we only received a few abstracts on adaptive therapy about 40. We had expected a higher number of abstracts on this subject. My interpretation of this is two-fold: normally you need software tools to do adaptive therapy and maybe the tools were not as developed commercially. Another reason is perhaps we are reaching some limits for cone beam CT so maybe we need better imaging quality to further develop adaptive radiotherapy.

How many people were involved in the evaluation of the abstracts? What is the aim of the abstract meeting, where all the reviewers met at the ESTRO office?

All the abstracts were evaluated by at least five to eight reviewers. I am really proud of the reviewing process which focuses on quality. More than 100 people were involved in this reviewing process for the physics track and not all of them could be present at the abstract meeting. The people at the abstract meeting included representatives from the physics SAG, the past chair and the chair elect. We specifically discussed the scoring of the abstracts by the reviewers and if there were abstracts with equal scores, we have to make a selection because of the limited space for orals, posters and poster viewing. At the abstract meeting we also identified chairs for the various physics sessions chairs.
What were your main criteria when evaluating an abstract?
Originality, patient number, enough data, clinical relevance, scientific methodology, scientific methodology and whether the results support the conclusion are the main criteria that we use to evaluate an abstract.

Is there any other aspect of the track or of the congress that you would like to draw attention to?
More than in other years, the symposia and also the proffered paper sessions are dedicating more attention to biological and functional imaging. Beyond the physics track, in the interdisciplinary track, more attention has been paid to standardisation of treatment and also to particle therapy.
A record number of 2,200 abstracts have been received for ESTRO 35. How many were submitted to the brachytherapy track?

One hundred and fifty one abstracts were submitted to the brachytherapy track. This is actually a good number because the World Congress of Brachytherapy (WBC) is taking place two months after ESTRO 35.

Do the abstracts received reflect the international aspect of the meeting?

The geographical spread is indeed very international. We have ten of 24 oral presentations from outside Europe, ten are from India and some more are from Canada, China, Japan and the USA, to name a few. Good connections with the GEC-ESTRO working groups could explain this geographical input. For instance, the European study on MRI-guided brachytherapy in locally advanced cervical cancer (EMBRACE), has a broad international spread, with contributors from all around the world. Perhaps some of them are also involved in the ESTRO courses taking place in Asia, and this could raise awareness of GEC-ESTRO.

Among the 151 abstracts received in your track, could you say that there is a trend emerging, or a specific topic that has been quite broadly covered in the abstracts received?

We have two main topics. One is brachytherapy physics and it is about miniature detectors in vivo dose verification. If you treat a patient, you need to be sure that the dose received is what was planned. These new techniques have the potential to give us the tools to achieve this. The second topic is definitive radiotherapy for rectal cancer. Rectal cancer is normally treated with surgery. For the last five to ten years, there has been an increasing interest in giving definitive/curative radiotherapy and then watching and waiting to try to avoid mutilating surgery. Several of these studies have paved the way for a new randomised phase III trial, called organ preservation of early rectal adenocarcinoma (OPERA), which may establish a high level of evidence for this new way of treating rectal cancer.

What is the aim of the abstract meeting, where all the reviewers met at the ESTRO office?

About 25 volunteer reviewers were involved and...
four attended the abstract meeting in December 2015 at the ESTRO office. The chair, the past chair, a representative of the scientific committee advisory group and the chair elect were also present at the abstract meeting.

**What were your main criteria when evaluating an abstract?**
The scientific merit of the abstract is extremely important. We look to see if there is a clear aim and a method in the abstract. Are they clearly described? Are they developed enough? Are the results analysed correctly? Do the results support the conclusion? If all these criteria match then the abstract receives a high score. All abstracts are scored anonymously by the reviewers.

**Are there any randomised trials?**
There is a large randomised phase III trial called APBI (accelerated partial breast irradiation), which has been submitted by the GEC-ESTRO breast working group. The first part of the study was presented at ASTRO and published in the *Lancet Oncology*. This time, the morbidity component of the study will be presented at ESTRO 35. These results will definitely be of interest to the congress delegates.
RADIATION THERAPISTS (RTT) TRACK

Interview with Annette Boejen, chair

A record number of 2,200 abstracts have been received for ESTRO 35. How many were submitted to the RTT track? Overall, 144 abstracts were uploaded for the RTT track for ESTRO 35. This is not a new record for the RTT track because the abstract numbers at the 3rd ESTRO Forum were around 200.

Do the abstracts received reflect the international aspect of the meeting? In other words, what can you say about the geographical spread of the abstracts submitted to your track?

An overall evaluation of the abstracts showed a wide range of interesting aspects representing the field of RTTs. Of course the majority of abstracts uploaded were from Europe. New Zealand, Asia and North America also submitted abstracts. I am happy to welcome a large number of abstracts from the host nation, Italy, who form part of the top three countries together with The Netherlands and the UK. Most of the countries in Europe are represented, but with varying numbers of abstracts. Scientific research conducted by RTTs is not yet possible in all clinics and countries. It will be interesting to follow the development of this area in the future.

Among the 144 abstracts received in your track, would you say that there is a trend emerging or a specific topic that has been quite broadly covered in the abstracts received?

The recent years have focused on image guided radiotherapy and adaptive strategies which are also reflected in the RTT profession with more interesting research results presented at the congress. In addition, treatment preparation, planning and delivery, image guided techniques, patient care with follow up and quality assurance are represented, along with, patient education, and development of staff competence and work flow.

How many people were involved in the evaluation? What is the aim of the abstract meeting, where all the reviewers meet at the ESTRO office?

Before the abstract meeting all the abstracts were evaluated and scored by a group at six to eight experts covering each topic, overall 16 RTT were involved. At the meeting at the ESTRO office the chair (Annette Boejen), the co-chair (Mirjam Mast) and the past-chair (Martijn Kampuis) participated. The aim of the abstract meeting was...
to organise the proffered paper presentations, the poster viewing and poster presentations, based on earlier evaluations regarding the teaching lectures and symposia, which were planned at an earlier stage.

**What was your main criteria in evaluating an abstract?**
The ESTRO Congress is a scientific meeting and the reviewers follow strong criteria for evaluation regarding clarity, supporting data, scientific rigour, potential significance, interest in the topic, innovation and usefulness. The scientific results are important, therefore, authors and clinical departments are anonymous to the reviewers.

**Is there any other aspect of the track that you would like to draw attention to?**
I have participated in ESTRO Congresses for the last 18 years and it has been interesting to follow the development of research activities and presentations in the RTT field. The scientific level has strengthened from congress to congress, and I am happy to announce that we have a strong scientific RTT track to present at the ESTRO 35 Congress in Turin.
A record number of 2,200 abstracts have been received for ESTRO 35. How many were submitted to the radiobiology track? Similar to the other tracks, we also saw an increase in the number of radiobiology abstracts and about 120 abstracts were submitted. A few abstracts had to be re-allocated to the physics track and some that were originally submitted to the clinical track were better placed in the radiobiology track. The category with the largest number of submitted abstracts was the biomarker and biological imaging topic, which was followed by the molecular targeted agent combination with radiation therapy. This showed the strong translational focus of the abstracts that we received this year. Overall, we noted a good distribution of abstracts that allowed us to complement the programme with excellent proffered papers in all aspects of radiobiology.

Do the abstracts received reflect the international aspect of the meeting? In other words, what can you say about the geographical spread of the abstracts submitted your track? Compared to the large number of abstracts in the other tracks it was difficult to draw any conclusions on geographical distribution, but we received submissions from most European countries. Reflecting our membership there has been a strong contribution of abstracts from Germany and The Netherlands. This year we also received an unusually high number of abstracts from Italy, as a result of the conference location. We were also happy to see a number of high quality abstract contributions from the US and from our new partner society in Korea, demonstrating the increasingly international character of our conference.

Among the 120 abstracts received in your track, could you say that there is a trend emerging, or a specific topic that has been quite broadly covered in the abstracts received? As mentioned above, all topics were well represented. This year there were more abstracts related to imaging in preclinical models than I recall from past conferences. This shows both the interest and also the technical advances in small animal imaging that allow us as radiobiologists to address relevant questions in the preclinical setting. In addition, I noticed that many studies...
were testing novel molecular targeted agent radiation therapy combination strategies preclinically. Many of the studies were at an advanced stage and showed promising results in different animal models which were underlined by mechanistic studies too. Together, the presentations, proffered papers and posters will give a good reflection of possible new avenues in radiation therapy that will soon be tested in the clinic. I believe that this year our radiobiology programme and abstracts are closer to the clinic than ever before. We will present data from early clinical trials and the results may soon be of broader interest and application. We are looking forward to the discussions that these studies will raise.

**How many people were involved in the evaluation of the abstracts? What is the aim of the abstract meeting, where all the reviewers met at the ESTRO office?**

We thank all the reviewers who helped us to grade the radiobiology abstracts. Due to their help we were able to have a minimum of ten experienced reviewers scoring each abstract in the different topics of our track. This, in my opinion, provides a fair estimate of the quality of the individual abstracts. Often, however, like in our case we had many high quality abstracts to choose from for proffered papers. During the abstract meeting we ultimately had to select abstracts that were equally graded or differed only in the decimals of the average score. In this case it was helpful to also consider the coverage of the individual topics to make sure that all interests were covered. Contributions and trends in other tracks, for example the interdisciplinary track, can also help to achieve a balanced programme without repetition or competing sessions. At the abstract meeting we also discussed which abstracts of our track could be proposed for awards and highlight sessions in other tracks. Within our track we also tried to place abstracts together in sessions in which they would complement each other.

**What were your main criteria when evaluating an abstract?**

The main criterion is always the quality of the abstract. By that we mean the scientific quality and quantity of the data that is presented. This can at times be difficult when the authors are not able to describe their study well. In these cases it is difficult to simply assume high scientific rigour and quality. If no data were presented we had to reject the abstract. We also considered the novelty of the data and the conclusions of the study. Novel and interesting results usually achieved higher scores. It was also helpful if the authors were able to present the relevance of their study and data well. Authors’ names and affiliations were removed from all the abstracts prior to review and we therefore were unable to consider other factors such as geographical distribution. Still, we did not see much of a bias in the scoring of the abstracts. The submissions mostly reflected our ESTRO radiobiology membership in terms of geographical distribution. This is true for the individual topics as well. Having said that, the radiobiology abstracts are traditionally of very high quality, and this can be confirmed this year too. We are proud to say that compared to other tracks, the radiobiology track does show a very high average score for all the abstracts and a low rejection rate.

**Is there any other aspect of the track that you would like to draw attention to?**

Many of the submitted abstracts addressed strong translational aspects in radiobiology. The last year’s conferences have revealed an increasing number of studies that are often hypothesis driven and based on earlier mechanistic studies, and thoroughly novel tested strategies or biomarkers. As mentioned above, the radiobiology programme this year, including the presented abstracts, gives us a very good glimpse of how personalised radiotherapy will look in the future.
What are the duties of the LOC?
The LOC, for which I am working as a co-chair together with Michele Stasi, has 16 other members from different parts of Italy, representing all the different professions within radiation oncology. So far, we have concentrated our efforts on promoting ESTRO 35 at a national level (and the Italian community was certainly very active in terms of abstracts submission), sharing with the scientific committee proposals for the national session chair and organising events such as the opening ceremony (I don’t want to reveal too much, but it will be something very special). We have also advised ESTRO on suitable places for the presidential reception and social event, as well as promoting ESTRO 35 with some local press activities. We are really trying to do our best to promote two special events; the Super Run (1 May at 19 hrs) and the patients’ day (30 April, 17.30-19.30 hrs) by contacting patient associations, informing patients through the appropriate channels and building the programme.

What can we expect at the opening ceremony?
We wanted to propose something special for the opening ceremony, and we will be welcoming Kataklo, a band of acrobatic dancers. The Kataklo dancers participated in the opening ceremony of the XX Olympic winter games in Turin in 2006 and we can expect that at ESTRO 35 they will provide a spectacular mix of body movements, dance steps, acrobatic athleticism, mime, humour, sound, lights and costumes.

The congress will take place at Lingotto Fiere. It’s a place that is quite close to the heart of the Turin people, isn’t it?
Lingotto Fiere is a futuristic congress venue with a very peculiar structure where one can breathe history, as it is an exceptional post-industrial monument (it was the original FIAT Factory). Lingotto is a versatile facility. Its modern conference centre (Lingotto Congressi) has a vast impressive fair complex (Lingotto Fiere, with more than 60,000 square metres of exhibition areas), some hotels, a multiplex, the “8Gallery” shopping mall, and many refreshment areas and restaurants. This area is part of normal life for people living in Turin and its surroundings. In September 2002, the Giovanni and Marella Agnelli Art Gallery was inaugurated in the Lingotto area. In this permanent art collection, you can admire works by Tiepolo, Canaletto, Canova,
Monet, Renoir, Matisse, Balla, Severini, Picasso and Modigliani. The Lingotto venue is quite close to the heart of the city, and is easily connected to downtown by the new underground (Line 1: nine stops to Porta Susa and six stops to Porta Nuova, the two railway stations).

What are the “must sees” of Turin?
Turin was the first capital of Italy in 1851, before Florence and Rome, and it was a great industrial centre. Turin was a leading hub for art and culture and each period corresponds to a different identity that has left its mark on the city’s portrait, as well as in its cultural and architectonic background. The transformation that has taken place in our city, especially after the XX Olympic winter games, held exactly 10 years ago, will be clear to everyone who comes here. From being a large industrial metropolis, with one main purpose, Turin has become multifaceted and it is now home to universities, banking foundations, great museums and exhibitions, cultural events, technology centres and excellent training. Therefore, there are many important reasons to visit the city, apart from ESTRO 35.

Among the many things to see, I would suggest some museums like the Egyptian museum, which is the second biggest in the world and was “re-born” in 2015, and the National Cinema museum, inside the Mole Antonelliana, the most iconic building of the town. There are beautiful churches, including the cathedral where the Holy Shroud is conserved and the Royal Residences (Savoy Dynasty) which were declared by UNESCO to be a human heritage site, as well as beautiful squares like Piazza San Carlo and Piazza Castello.

The city is a capital of contemporary art, with the famous Gallery of Modern Art (GAM), and it also has plenty of famous historical cafés and pâtisseries. Turin being the capital of taste, offers chocolate and aperitifs, as well as 10 km of arcades for beautiful shopping. With the pretty hill on which it stands (including the beautiful Superga cathedral), its rivers, its 17 parks, and 320 km of tree-lined avenues, Turin is one of the greenest Italian cities, with many possibilities for cycling, rowing, jogging and walking. You only need some spare time.

And for the participants wishing to stay a bit longer who wish to visit the surroundings, what would you recommend in the area?
Turin is the capital of the Piedmont region, which has an area of 25,400 square kilometres. The name Piedmont comes from the medieval Latin Pedemontium or Pedemontis, i.e., ad pedem montium, meaning “at the foot of the mountains”, the Alps and the Olympic mountains are indeed quite close to Turin. In the north-eastern part of the region there are beautiful lakes such as Lake Maggiore (with its picturesque Borromean is-
NOT TO BE MISSED IN THE SCIENTIFIC PROGRAMME AT ESTRO 35

**Poster viewing**

Posters selected for the poster viewing sessions will be highlighted in the conference final programme and will be displayed in a central section of the poster area.

Posters on a similar topic will be grouped together. The presenting authors of the selected posters in the group will visit all the posters within each group, along with the audience. At each poster, the presenting author will present his/her poster in five minutes, and then there will be three minutes for discussion, which will be lead by two chairpersons for the group.

Poster viewing is a new feature replacing the former poster discussion, which will provide an even more interactive way of exploring the data presented.

**Highlight session**

The highlights session in the interdisciplinary track will present the best abstract selected from each separate track. This session aims to be well balanced among the different professional groups and tailored to a global audience of clinicians, physicists, brachytherapists, radiobiologists and radiation therapists.

**Multidisciplinary tumour board sessions**

The concept of these ESTRO multidisciplinary tumour board sessions has been proposed a few years ago in order to discuss clinical cases where experts from different oncology and diagnostic disciplines share their experience including the treatment decision-making process with the audience.
The ESTRO Cancer Centres Pavilion will gather institutes from all over Europe who will welcome attendees to dedicated booths in the exhibition area, in order to discuss science, potential projects and collaborations as well as job opportunities and mutual interests.

MEET WITH THESE INSTITUTES

In the following pages, we meet the representatives of the institutes participating in the ESTRO Cancer Centres Pavilion. This is a preview of what you can expect from meeting them on site.

- Gemelli ART - Policlinico Universitario "A. Gemelli", Università Cattolica del Sacro Cuore, Rome, Italy
- University and Spedali Civili Brescia, Brescia, Italy
- Affidea Poland, Warsaw, Poland
- Greater Poland Cancer Centre (GPCC), Poznan, Poland
- Medical University of Vienna/AKH Vienna, Vienna, Austria
- VU University Medical Center, Amsterdam, The Netherlands.

PRACTICAL INFORMATION

Entrance to the ESTRO Cancer Centres Pavilion is free to all the ESTRO 35 participants. No pre-registration is needed.

It is located in the exhibition area.

Opening hours:
Starting at 19.30 hrs at the welcome reception on Friday 29 April and continuing during the exhibition opening times

Exhibition opening times will be 9.30-17.00 hrs until 2 May 2016.

29 April – 2 May 2016
Exhibition area
For the first time ESTRO is organising the ESTRO Cancer Pavilion. Why did you decide to join this initiative?

Our institution is an ESTRO institutional member and we think that the only way to really share knowledge and collaborate with our colleagues from all over the world is to get to know each other. We are eager to discuss things with them and receive their precious advice about how to better organise our daily workload and research plans.

What is the main asset of the Cancer Pavilion concept for an institute like yours?

Sharing ideas and planning new projects together with a dedicated and well organised platform will enrich our experience at ESTRO 35, and help to ensure future networking with scientists and skilled colleagues for our institution.

Who are you most specifically looking forward to welcoming at your booth?

We will welcome all the different professional people involved in our discipline, from senior radiation oncologists and medical physicists, to young residents or radiation therapists (RTTs), looking to learn at our institution or for job opportunities at our organisation, or those who want to collaborate with projects or suggest ideas.

What are the types of topics you intend to tackle with them?

We would like to collect suggestions on how to better exploit innovative technologies, like MRI-cobalt, that we are going to use in clinical practice at our institution this year. We will also be pleased to present our Knowledge Based Oncology Laboratories (KBO Labs) for advanced data/process mining analysis and radiomics and, of course, speak about our brand new treatment machines.
UNIVERSITY AND SPEDALI CIVILI BRESCIA, BRESCIA, ITALY

Interview with Dr Michela Buglione, Radiation Oncologist

For the first time ESTRO is organising the ESTRO Cancer Pavilion. Why did you decide to join this initiative?

We think that ESTRO 35 in Turin is a perfect occasion to exchange opinions and knowledge with other radiation oncologists. It could also be a great opportunity for young people. The multi-professional feature of ESTRO 35 could increase the value of the ESTRO Cancer Pavilion too.

What is the main asset of the Cancer Pavilion concept for an institute like yours?

We think that it could be useful to consolidate current contacts and to increase the level of scientific and practice collaboration with other European radiation oncologists. It could increase multidisciplinary communication between radiation biologists, radiation oncologists and medical physicists. We also intend to open participation to the charity, which is supporting us to facilitate understanding patients’ point of view.

Who are you most specifically looking forward to welcoming at your booth?

We are looking forward to welcoming radiation oncologists, radiation biologists, physicists and trainees. Also if charities could let us know about their work in order to sustain research and at the same time to gain more detailed knowledge about the needs of modern clinical research.

What are the types of topics you intend to tackle with them?

We will present the activities of our institute and we are looking forward to expanding our collaborations with other institutions.
AFFIDEA POLAND, WARSAW, POLAND

Interview with Dr Andrzej Radkowski, Medical Director for Radiotherapy

For the first time ESTRO is organising the ESTRO Cancer Pavilion. Why did you decide to join this initiative?
As one of the major and most successful providers of radiology and radiotherapy services throughout 14 European countries, Affidea would like to introduce itself to ESTRO 35 participants. We would like to present our standards of care and achievements in the field of radiation therapy, as well as look for new opportunities for collaboration.

What is the main asset of the Cancer Pavilion concept for an institute like yours?
Affidea has more than a 20 year legacy of successful public-private partnership (PPP) projects in healthcare as well as a defined strategy for scientific and professional development. A three year affiliation with the Houston Methodist Hospital from Texas, USA (2012-2015) resulted in the development of an IMRT protocol handbook that provides the Affidea medical staff with the evidence-based medicine standards necessary to achieve the best possible outcome for each of our patients. Furthermore, Affidea has devoted a major part of its activities to CT dose excellence, MRI excellence and Kaizen activities, all aimed at standardisation, optimisation, quality control and risk management. The ESTRO Cancer Pavilion concept is a perfect place to make our achievements known to radiotherapy professionals.

Who are you most specifically looking forward to welcoming at your booth?
We are looking forward to welcoming radiation oncologists, medical physicists and radiotherapy technicians. The managers of radiation therapy departments and or hospitals and other profiles of participants are welcome as well. Those interested in imaging will be introduced to the advanced diagnostic services for cancer provided by Affidea. We will also be showing an example of PET-CT excellence during ESTRO 35 in Turin.

What are the types of topics you intend to tackle with them?
We would like to discuss the latest developments in radiation therapy as well as share Affidea’s achievements. In addition, we would like to establish contacts with other institutions with a focus on developing individual projects, conducting clinical trials and starting regional collaboration, and discuss job opportunities with Affidea.
For the first time ESTRO is organising the ESTRO Cancer Pavilion. Why did you decide to join this initiative?

Our centre takes great pride in long-lasting relationships with ESTRO and therefore, we decided to extend it on yet another level where ESTRO provides a platform to foster collaboration with various Europe-based institutes. We believe that the Cancer Pavilion will become an innovative hub, where scientists, congress members and many more will be able to discuss potential projects and cooperation perspectives. Moreover, a number of our associates (radiation oncologists, medical physicists and radiation therapists [RTTs]) have long been present during ESTRO initiatives.

What is the main asset of the Cancer Pavilion concept for an institute like yours?

The main advantages are the exchange of new ideas among congress members and the formation of new clusters. We believe that ESTRO’s initiative will create a space for discussion at a top-notch level. Due to the fact that the Cancer Pavilion will be located in the exhibition area it creates a perfect opportunity for industry to meet science, all under the same roof. It also provides an excellent opportunity for our associates to get acquainted with the latest equipment developments.

Who are you most specifically looking forward to welcoming at your booth?

We are looking forward to welcoming everyone who is interested in our Cancer Centre’s activity, both scientific and medical. Our centre is preparing a video about GPCC’s activity, which will have its première during ESTRO 35 in Turin.

What are the types of topics you intend to tackle with them?

Radiation oncology and health economics are potential projects stemming from the disciplines. We would like to foster and instil the idea of forming and facilitating new projects between teams from cancer centres.
For the first time ESTRO is organising the ESTRO Cancer Pavilion. Why did you decide to join this initiative?
For the team at the Department of Radiation Oncology at the Medical University of Vienna it is a great opportunity to present ongoing research and development activities, as well as training and educational opportunities, at an event like ESTRO 35. It is an ideal environment for networking with coworkers from Europe and from all over the world.

What is the main asset of the Cancer Pavilion concept for an institute like yours?
Our department has many research and training opportunities to offer, in the field of clinical and educational conventional and advanced external radiation therapy, image guided brachytherapy, ion beam therapy, imaging physics and radiation biology. While image guided brachytherapy and high precision external beam therapy have a long tradition at our clinic, new research has focused recently on ion-beam therapy due to the close cooperation with the ion beam therapy centre MedAustron. Raising awareness of ongoing clinical and translational research projects in the different disciplines is therefore the main asset of our institute.
Who (profile of participants) are you most specifically looking forward to welcoming at your booth?

All the activities in our department are inspired by an interdisciplinary spirit. High level clinical practice, research and education are not only based on excellent cooperation between the various disciplines and professions involved, but also on collaborations with other departments, like radiology, nuclear medicine, and surgical and medical oncology. We would like to meet motivated medical residents, medical physicists and radiation therapists (RTTs) as well as ambitious PhD students and post-doctoral researchers from the field of radiation oncology, medical physics and radiation biology.

What are the types of topics you intend to tackle with them?

We would like to present our clinical research and educational activities, as well as the translational research, education and developmental work that is being performed at our department on a daily basis. We would also like to raise the interest of the visitors to our booth with respect to job opportunities in our department as well as fellowship exchange opportunities and research co-operations.
**VU UNIVERSITY MEDICAL CENTER, AMSTERDAM, THE NETHERLANDS**

Interview with participating institutes Professor Ben J. Slotman, chair of the Department of Radiation Oncology

For the first time ESTRO is organising the ESTRO Cancer Pavilion. Why did you decide to join this initiative?
The Cancer Pavilion will provide an additional opportunity to promote the department and share research results and new developments.

What is the main asset of the Cancer Pavilion concept for an institute like yours?
We will mainly use this as a show case and a new opportunity to interact with colleagues.

Who are you most specifically looking forward to welcoming at your booth?
We are looking forward to meeting colleagues interested in stereotactic body radiation therapy (SBRT) and the use of new techniques in radiotherapy, including MR-guided radiotherapy. We are currently implementing SMART (stereotactic MR guided adaptive RT) using the ViewRay MRIdian system and we will be able to present the latest developments.

What are the types of topics you intend to tackle with them?
We will use the booth as an additional opportunity to demonstrate and discuss first experiences and the possibilities and limitations of MR-guided radiotherapy.
**introduction**

Interviews with the chairs not to be missed in the scientific programme at ESTRO 35

**CONFERENCES**

- 5,000 delegates
- **2,198 submitted abstracts**
  - Clinical: 878
  - Physics: 904
  - RTT: 143
  - Brachytherapy: 151
  - Radiobiology: 122
- **1,093 e-posters**
- **397 posters**
- **89 poster viewings during 12 sessions**
- **5 pre-meeting courses**
- **8 joint sessions**
- **6 e-posters**
- **266 oral presentations**
- **265 invited speakers**

**CONFERENCES**

- **8 contouring workshops**

**MARK YOUR CALENDAR**
INTRODUCTION

INTerviews with the chairs not to be missed in the scientific programme at ESTRO 35

MARK YOUR CALENDAR

SOCIAL ACTIVITIES

◆ Opening ceremony
Friday 29 April between 18.00 – 19.15 hrs in the main auditorium
All participants and company delegates are invited to the official opening ceremony which will be held in the main auditorium on Friday 29 April at 18.00 hrs. The opening ceremony will be followed by the welcome reception which will take place in the exhibition area.

Opening remarks
Philip Poortmans (The Netherlands), ESTRO President and ESTRO 35 Chair
Yolande Lievens (Belgium), Chair of Scientific Programme Committee of ESTRO 35
Ben Heijmen (The Netherlands), Chair of Scientific Programme Committee of ESTRO 35
Umberto Ricardi (Italy), Chair of Local Organising Committee
Michele Stasi (Italy), Chair of Local Organising Committee

Keynote speaker
Christian Greco (Italy), Keynote Speaker
The use of medical imaging for historical research in ancient Egypt.

Entertainment
Acrobatic dance with Kataklo.
Welcome reception
Friday 29 April at 19.15 hrs in the exhibition area. All registered participants and all company delegates are invited to the welcome reception which will take place in the exhibition area.

◆ Poster reception and poster awards
Saturday 30 April at 18.30 hrs in the poster area
All participants and company delegates are invited to the poster reception and poster awards, which will be held in the poster area at 18:30. Canapés and drinks will be served while participants view approximately 500 of the best posters. During the reception, three ESTRO awards of €1,000 each will be handed out to the best scored posters.

◆ Patients’ Day
Saturday 30 April between 17.30-19.30 hrs in the Londra room
Cancer patients have their own session dedicated to their needs with professionals answering their questions. The session will be held in Italian.

Check out the latest available information on www.estro.org
On the ESTRO website, you will be able to access one month prior to the congress:
- The searchable programme
- The programme book
- The abstract book.

And, of course, follow us on Facebook and Twitter (#ESTRO35) to be informed of the latest developments.
**Super Run**  
Sunday 1 May 2016 at the top of the Lingotto Fiere  
The Super run will start at 19.00 hrs on the roof on top of the Lingotto Fiere. The registration pack can be picked up at the ESTRO booth #3000 in the exhibition area.

**YOUNG PROGRAMME**  
Sunday 1 May between 08.00-17.15 hrs in the Madrid room  
View the full programme and the interviews with the chairs of the young programme in the Young Corner of this newsletter. The young scientists’ reception will take place from 16.15 to 17.15 hrs.

**Social event**  
Monday 2 May 2016 at 21.30  
All participants are invited to the special after dinner evening which will take place in an exclusive venue in Turin. Additional tickets for this event are available for purchase at €80 + VAT per person.

**RENDEZ-VOUS WITH COLLEAGUES**

- **GEC-ESTRO general assembly**  
  Saturday 30 April from 13.30 – 14.30 in the Madrid room  
The GEC-ESTRO assembly is open to anyone with an interest in GEC-ESTRO activities.

- **Physics general assembly**  
  Monday 2 May from 13.30 – 14.30 in the Madrid room  
The annual physics assembly is open to any physicist and will offer the opportunity to exchange ideas on current issues for the radiation physics community.

- **ESTRO general assembly**  
  Monday 2 May at 17.45 in room 2  
  An agenda will be sent to full members. However all ESTRO members are welcome to participate as long as they have renewed their membership by 25 April.

- **RTT Meet and Greet**  
  Monday 2 May 2016  
  13.30 to 14.30 in the Parigi room

**EXHIBITION**  
An exhibition featuring equipment and medical publishers will be held in the exhibition area. The opening of the exhibition will be on Friday 29 April 2015 at 19.15 hrs. It will remain open from Friday 29 April to Monday 2 May between 9.30 and 17.00 hrs each day. Entrance is free for all registered ESTRO 35 participants.

Visit the ESTRO booth #3000

**WIFI**  
WiFi will be available in all meeting rooms. Feel free to exchange information from the conference on social media and on Twitter using #ESTRO35.

**LUNCH AND REFRESHMENTS**  
The registration fee for the conference includes coffee breaks for all participants wearing their conference badges. Lunch will be available for purchase in the exhibition area and is not included in the registration fee.

**Super Run**  
Sunday 1 May 2016 at the top of the Lingotto Fiere  
The Super run will start at 19.00 hrs on the roof on top of the Lingotto Fiere. The registration pack can be picked up at the ESTRO booth #3000 in the exhibition area.
FREE ESTRO 35 APP

Maximise your time at the congress
Download the free ESTRO 35 mobile and tablet app and take advantage of the full event schedule, as well as the personalised agenda, networking function and exhibition listings.

Sessions
You can check out the sessions you wish to attend, view their summary and add them to your personal agenda.

Speakers
You can view biographies, select congress speakers, send them messages and add them to your own personal agenda.

My event
This is your personal agenda, displaying your selected sessions, speakers, exhibitors and much more.

Exhibition
Thanks to the interactive floor plan, you can easily access the information on the booths and exhibitors you wish to visit and save them to your personal agenda.

Networking
You can create your own profile, which gives you the opportunity to interact with other attendees at the event via the messaging service. You can send messages privately and arrange meetings that will be scheduled in your personal agenda.

Social media
Stay up-to-date with the latest congress news by using Twitter (#ESTRO35) and Facebook.

Abstract book
The abstract book will be directly downloadable from the app.

Download the app from www.estro.org

ESTRO 35 APP DOWNLOADABLE FROM MID-APRIL 2016
AWARDS

◆ Lifetime Achievement Award
Michael Brada (UK)
Mary Coffey (Ireland)
Jean-Pierre Gérard (France)
Ben Mijnheer (The Netherlands)

◆ ESTRO Award Lectures and academic awards
Emmanuel van der Schueren Award
Did I do it right? What was the result? Process and Outcomes in Radiotherapy
Ann Barrett (UK)
Saturday 30 April from 12.35-13.15 hrs

Donal Hollywood Award
FLAME randomised trial: 95Gy MRI-boost vs 77Gy prostate radiotherapy: toxicity and quality of life
Marco van Vulpen (The Netherlands)
Sunday 1 May 2016 from 12.00-12.15 hrs

Klaas Breur Award
Title to be confirmed
Peter Hoskin (UK)
Monday 2 May from 12.45-13.15 hrs

◆ Honorary member lectures
Evidence-based education: radiation oncology's forgotten foundation?
Sandra Turner (Australia)
Saturday 30 April from 17.45-18.00 hrs

The future of surgical oncology
Riccardo Audisio (UK)
Saturday 30 April from 18.00-18.15 hrs

Imaging in lung cancer radiotherapy: beyond the "pictures"
Lorenzo Bonomo (Italy)
Saturday 30 April from 18.15-18.30 hrs

◆ ESTRO Jack Fowler University of Wisconsin Award
Moving away from binary definition of PTVs: a novel probabilistic approach to PTV definition
Henry Shui-heng Tsang (UK)
Sunday 1 May 2016 from 17.30-17.40 hrs

COMPANY AWARDS

◆ GEC-ESTRO BEST JUNIOR PRESENTATION - SPONSORED BY ELEKTA BRACHYTHERAPY
Adaptive cone-beam CT planning improves progression-free survival for I-125 prostate brachytherapy
Daan Smit Duijzentkunst (The Netherlands)
Saturday 30 April 2016 from 11.35-11.45 hrs

◆ ESTRO- ELEKTA BRACHYTHERAPY AWARD
Electromagnetic tracking for error detection in interstitial brachytherapy
Christoph Bert (Germany)
Sunday 1 May 2016 from 10.45-10.55 hrs

◆ ESTRO-VARIAN AWARD
Perfusion SPECT can quantify radiation-induced changes in the lung after IMRT for NSCLC
Katherina Farr (Denmark)
Sunday 1 May 2016 from 17.40-17.50 hrs
**ESTRO-ACCURAY AWARD**

A novel concept to tumour targeting: inverse dose-painting or targeting the "low uptake drug volume"

Ala Yaromina (The Netherlands)

Sunday 1 May 2016 from 17.50-18.00 hrs

**EDUCATION**

**Five pre-meeting courses**

Friday 29 April 2016

Clinical application of new combinations: how to test and optimise novel biological agents in combination with radiotherapy

Course directors: Anthony Chalmers (UK) and Daniel Zips (Germany)

*Read the full programme on* [http://www.estro.org/congresses-meetings/articles/estro-35-pre-meeting--radiobiology](http://www.estro.org/congresses-meetings/articles/estro-35-pre-meeting--radiobiology)

Re-irradiation: background, state-of-the-art and perspectives for clinical practice

Course directors: Neil Burnet (UK) and Vincenzo Valenti (Italy)

*Read the full programme on* [http://www.estro.org/congresses-meetings/articles/estro-35-pre-meeting---clinical](http://www.estro.org/congresses-meetings/articles/estro-35-pre-meeting---clinical)

Multidimensional dosimetry systems

Course directors: Núria Jornet (Spain) and Jeroen van de Kamer (The Netherlands)

*Read the full programme on* [http://www.estro.org/congresses-meetings/articles/estro-35-pre-meeting--physics](http://www.estro.org/congresses-meetings/articles/estro-35-pre-meeting--physics)

Planning and delivering high-dose lung radiotherapy in clinical practice

Course directors: Dirk De Ruyscher (The Netherlands) and Marco Schwarz (Italy)

*Read the full programme on* [http://www.estro.org/congresses-meetings/articles/estro-35-pre-meeting--interdisciplinary](http://www.estro.org/congresses-meetings/articles/estro-35-pre-meeting--interdisciplinary)

Contouring of organs at risk: theory and practice

Course directors: Michelle Leech (Ireland) and Danilo Pasini (Italy)

*Read the full programme on* [http://www.estro.org/congresses-meetings/articles/estro-35-pre-meeting---rtt](http://www.estro.org/congresses-meetings/articles/estro-35-pre-meeting---rtt)

**Symposium ESTRO School**

Sunday 1 May from 16.15 – 17.15 hrs

Istanbul room

Chair: Richard Pötter

16.15  The ESTRO School: from 2016 to 2025
   Jesper Eriksen (Denmark)

16.50  New directions to go
   Michelle Leech (Ireland)

17.00  German undergraduate network of radiotherapy CLUB 100 - a European perspective
   Louisa Bolm (Germany)

17.10  Conclusion
   Jesper Eriksen (Denmark)

17.15  School reception
◆ Contouring workshops

Eight FALCON workshops have been planned for ESTRO 35 on the following organs:
- Spine SBRT
- OAR for the upper abdomen
- Anal canal
- Prostate cancer in the post-prostatectomy setting.

TARGET AUDIENCE
The delineation workshops are aimed at all radiation oncology professionals who want to improve their contouring skills.

Three types of cases are dedicated to radiation oncologists: a common case, a rare case and a more advanced case. The OAR case is especially targeted to RTTs and dosimetrists.

Read the full programme

FALCON demonstrations
ESTRO booth (#3000)
Would you like to test FALCON*, the multifunctional ESTRO platform for contouring and delineation? Free 15 minute demonstrations take place everyday at lunch time and during coffee breaks at the ESTRO booth:
- 10.15 – 10.30 hrs
- 13.45 – 14.00 hrs
- 16.00 – 16.15 hrs

For a deeper experience, register to one of the eight contouring workshops at ESTRO 35.

*Fellowship in anatomic delineation and CONtouring

---

ESTRO FELLOW
A prestigious mark of distinction powered by ESTRO

If you want to be acknowledged for your knowledge and activities in radiation oncology, consider becoming an ESTRO Fellow. Being appointed as an ESTRO Fellow will prove your dedication to the profession and to ESTRO and, in the future, will be seen as a pinnacle in a radiation oncologist’s career.

NEXT ESTRO FELLOW EXAM:
29 April 2016 at ESTRO 35 in Turin
Application deadline: 29 March 2016

---

Spine SBRT
Friday 29 April from 08.00-10.00 hrs
Repeated
Saturday 30 April 2016 from 14.30-16.30 hrs

OAR for the upper abdomen
Friday 29 April from 10.30-12.30 hrs
Repeated
Sunday 1 May 2016 from 14.15-16.15 hrs

Anal canal
Friday 29 April from 13.30-15.30 hrs
Repeated
Monday 2 May 2016 from 14.30-16.30 hrs

Prostate cancer in the post prostatectomy
Friday 29 April from 16.00-18.00 hrs
Repeated
Tuesday, 3 May 2016 from 08.30-10.30 hrs

2ND ESTRO SUPER RUN
A tribute to team spirit!
1 May | Lingotto Fiere, Turin

Join us for the 2nd ESTRO Super Run. The first Super Run last year in Barcelona was a great success: 500 of you gathered by the beautiful beach of Barcelona to run the 5 km lap. Resolute in its focus on patients, the 2nd Super Run will be supporting the ESTRO Cancer Foundation (ECF) again, and will show that staying physically active and doing sports during and after treatment is possible. However, expect a slightly different format of the run: this year team spirit will have the place of honour… What else could best symbolise the daily work of radiation oncology professionals?

PRINCIPLE
A relay of teams of three to five participants will run 5 km. Each participant will run a minimum of 1 km.

WHO
Everyone! Especially cancer patients.

WHEN
19.00 hrs on 1 May 2016.

WHERE
On the roof on top of Lingotto Fiere, the legendary Fiat factory, where cars used to be tested.

Already 300 participants registered
Limited to 500 runners so register online now!

DON’T FORGET TO PACK YOUR RUNNING SHOES.
Companies or third parties registering several groups should request an appointment at the ECF/Super Run desk to collect their bags.

*Participation fee is €10 per runner, but a bigger donation to the ECF can be made when registering if desired.

**ESTRO Cancer Foundation**
The ESTRO Cancer Foundation (ECF) was launched in 2012 to promote radiation oncology to target audiences such as patients and decision makers. HERO (Health Economics in Radiation Oncology) is the project supported by the ECF that aims to develop a model for health economic evaluation of radiation treatments at the European level. Through the collection and analysis of relevant data, the HERO outcomes will help to advocate for radiotherapy to European governments and other healthcare stakeholders, whose decisions ultimately affect the care of patients. Like last year, the money collected via the Super Run will contribute to moving the project forward.

---

**TEAM**
Each team needs to appoint a leader and find a creative name.

**PARTICIPATION FEE**
€10 per participant for the benefit of the ECF.

**HOW TO REGISTER?**
Registration will be made by the team leader online at [raceresult.com/46786/?&lang=en](http://raceresult.com/46786/?&lang=en). The Super Run is limited to 500 participants and running t-shirts will be given on a first registered first served basis. Therefore, we strongly advise you to register now.

Each team leader will have the responsibility to:
- Register the whole team
- Pay collectively for the team*
- Pick up the running bags at the ECF/Super Run desk (located at the ESTRO booth). One bag per participant will be delivered. Please note that the bags will be delivered to the team leaders only.

*Participation fee is €10 per runner, but a bigger donation to the ECF can be made when registering if desired.

---

The 2nd Super Run will celebrate team spirit
# EVENTS DIRECTORY

## 2016 - 2017

ECCO - the European CanCer Organisation organises multidisciplinary meetings of excellence on behalf of its Members:

<table>
<thead>
<tr>
<th>EVENTS</th>
<th>SAVE THE DATE</th>
</tr>
</thead>
</table>
| ITOC3 | 21 – 23 March 2016  
*Munich, Germany*  
ITOC3  
3rd Immunotherapy of Cancer Conference |
| MCCR Workshop | 18 – 24 June 2016  
*Zeist, Netherlands*  
MCCRW  
Joint ECCO-AACR-EORTC-ESMO Workshop on Methods in Clinical Cancer Research |
| EACR24 | 9 – 12 July 2016  
*Manchester, United Kingdom*  
EACR24  
24th Biennial Congress of the European Association for Cancer Research |
| esso36 | 14 – 16 September 2016  
*Krakow, Poland*  
ESSO36  
in partnership with the Polish Society of Surgical Oncology |
| EORTC-NCI-AACR 2016 | 29 November – 2 December 2016  
*Munich, Germany*  
ENA2016  
28th EORTC-NCI-AACR Symposium on Molecular Targets and Cancer Therapeutics |
| ECCO | 27 – 30 January 2017  
*Amsterdam, The Netherlands*  
ECCO2017  
European Cancer Congress From Evidence to Practice in Multidisciplinary Cancer Care |

To discover more about ECCO, visit: [www.ecco-org.eu](http://www.ecco-org.eu)
FROM EVIDENCE TO PRACTICE IN MULTIDISCIPLINARY CANCER CARE
European Lung Cancer Conference

Abstract submission
7 January

Geneva, Switzerland

13-16 April 2016

Important Deadlines

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>7 January 2016</td>
<td>Abstract submission</td>
</tr>
<tr>
<td>3 February 2016</td>
<td>Early registration</td>
</tr>
<tr>
<td>23 March 2016</td>
<td>Late registration</td>
</tr>
<tr>
<td>EVENT</td>
<td>DATE</td>
</tr>
<tr>
<td>-------</td>
<td>------</td>
</tr>
<tr>
<td>3rd Symposium on Small Animal Radiotherapy</td>
<td>21 - 23 March 2016</td>
</tr>
<tr>
<td>1st International ecancer Symposium on Radiotherapy</td>
<td>6 - 7 May 2016</td>
</tr>
<tr>
<td>Event</td>
<td>Date</td>
</tr>
<tr>
<td>----------------------------------------------------------------------</td>
<td>-----------------------</td>
</tr>
<tr>
<td>Integration of new technologies in the clinical practice in radiation oncology</td>
<td>3 JUNE 2016</td>
</tr>
<tr>
<td>4th MR in RT event</td>
<td>18 - 19 JUNE 2016</td>
</tr>
<tr>
<td>More information: <a href="http://www.med.umich.edu/radonc/MRinRT2016">www.med.umich.edu/radonc/MRinRT2016</a></td>
<td></td>
</tr>
<tr>
<td>6th World Congress of Brachytherapy</td>
<td>27 - 29 JUNE 2016</td>
</tr>
<tr>
<td>More information: <a href="http://www.estro.org/congresses-meetings/items/wcb-2016">www.estro.org/congresses-meetings/items/wcb-2016</a></td>
<td></td>
</tr>
<tr>
<td>II International Congress on Re-irradiation</td>
<td>15 - 16 SEPTEMBER 2016</td>
</tr>
<tr>
<td>8th European Multidisciplinary Meeting on Urological Cancers (EMUC)</td>
<td>24 - 27 NOVEMBER 2016</td>
</tr>
<tr>
<td>More information: <a href="http://emuc16.org">http://emuc16.org</a></td>
<td></td>
</tr>
</tbody>
</table>
3rd Breast Cancer in Young Women Conference

10-12 November 2016
Lugano, Switzerland

Chair:
O. Pagani, CH

Scientific Committee:
H.A. Azim Jr, BE - F. Cardoso, PT - S. Loibl, DE

Important Deadlines
Abstracts: 3 July 2016
Early registration: 7 August 2016
Late registration: 16 October 2016

Further information available at:
WWW.ESO.NET

#BCYlugano
Opinions expressed in the ESTRO newsletter do not necessarily reflect those of the Society or of its officers.