



ESTRO



NEWSLETTER JULY - AUGUST

ESTRO | EUROPEAN SOCIETY FOR RADIOTHERAPY & ONCOLOGY



BRACHYTHERAPY

Interview with Bradley Pieters,
chair of the
6th GEC-ESTRO workshop



PHYSICS

Interview with Núria Jornet,
chair of the
2nd ESTRO physics workshop



YOUNG

Interview with
Pierfrancesco Franco, new chair
of the young committee



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S
: ESTRO
ASIA
2018

7-9 December 2018
Singapore

DEADLINES

Early registration:
31 July 2018

Late registration:
5 November 2018

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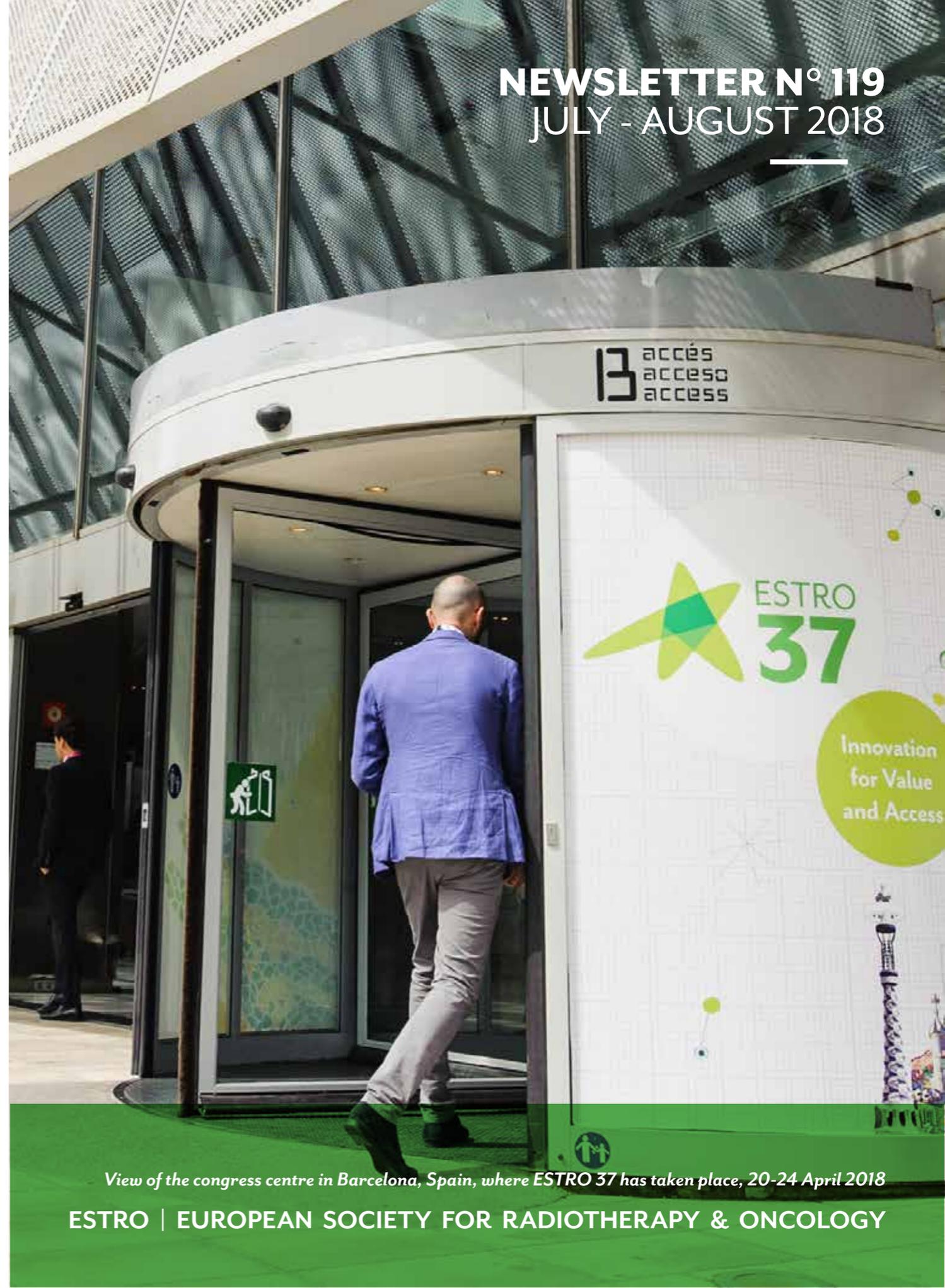
In scientific
collaboration
with:



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NEWSLETTER N° 119
JULY - AUGUST 2018



View of the congress centre in Barcelona, Spain, where ESTRO 37 has taken place, 20-24 April 2018



EDITORIAL

—

“It was our largest conference yet, with 6,211 participants”

—

Dear friends and colleagues,

Two months after ESTRO 37, I am delighted to share with you the final attendance numbers for this year’s annual meeting: it was our largest conference yet, with 6,211 participants, including 1,355 company delegates and 117 exhibitors. The exhibition, an important part of the conference both for the networking opportunities and the updates on the latest technological developments from our partners in industry, was also the largest ever, occupying 5,401m².

But ESTRO 37 was not only about numbers: it was also a qualitative success. I was very pleased to read the results of the evaluation survey, as a large majority of respondents rated the overall quality of the scientific sessions as very good. We realise that there is always room for improvement, but it was certainly motivating to see that the ESTRO annual conference is fulfilling its role of being the main vehicle for dissemination of the best science available in our field. ▼



Umberto Ricardi



Still on the topic of the annual conference, I would like to share with you something new, which has started already in advance of ESTRO 38: the national impact and legacy group (NILG). This group represents an evolution in the traditional role of the local organising committees, in a move towards having an impact at national level on the reality of radiation oncology. The ESTRO conference should leave a legacy and help launch national projects aimed at improving and supporting the national radiotherapy community long after the congress is over. The NILG will tackle issues specific to each country, focusing particularly on perception issues that influence the uptake of radiation oncology. For ESTRO 38 in Milan, work has already begun and the projects under discussion cover messages to be shared on social media, the positioning of the discipline, patient empowerment and engaging with decision-makers. We hope that this will be a real benefit for the national societies (Associazione Italiana Radioterapia Oncologica (AIRO), Associazione Italiana Fisica Medica (AIFM), and Associazione Italiana Tecnici Sanitari di Radioterapia e Fisica Sanitaria (AITRO), in this case) and look forward to replicating the model in all countries that host the annual conference in the future.

Let's not forget also that 2018 will bring one more ESTRO conference: registrations for "ESTRO meets Asia" are open, and the number of submitted abstracts has far surpassed our expectations (289), meaning that the scientific value of this conference will certainly be high. Make sure to check all the information on the

ESTRO website, and I hope to see many of you in Singapore in early December.

After the summer we hope to bring you further news on the implementation of the new ESTRO vision: "*Radiation oncology. Optimal health for all, together*". ESTRO's past-President, Yolande Lievens, has devoted a lot of her time to the incorporation of our new vision statement into a plan that will lead ESTRO's strategy for the coming years. In due course, this will be shared with all of you – every ESTRO member will have something to do in order to achieve this ambitious vision.

One final note goes to an exciting new project ESTRO is involved in, in partnership with the EORTC, called E2Radiate (E² RADIate: EORTC-ESTRO RADIOTHERAPY InfrAsTructure for Europe). The first part of this is the OligoCare trial, a pragmatic observational basket study on stereotactic body radiation therapy in oligometastatic disease, which was launched at the national societies meeting at ESTRO 36 and is now quite advanced, with more than 200 centres worldwide expressing their interest in participating. In the near future, and within the same infrastructure, the project will be extended to include research activities relating to particle therapy (EPTN task force). E2Radiate will encompass both these initiatives (OligoCare and EPTN research activities) for now, but may also include other radiation oncology research projects in the future.

One last note, to urge you to join ECCO's European Cancer Summit in Vienna on 7-9 September in Vienna, Austria, on the theme of "From science to real life oncology". This will be a fundamental meeting, bringing together worldwide leaders from the healthcare, patient advocacy and stakeholder communities.

This is all for now! I hope you enjoy the summer, and look forward to meeting you all again soon.

Warm regards,

Umberto Ricardi
ESTRO President



LET'S STAY
IN TOUCH!

ESTRO PRIVACY POLICY

Undoubtedly you will have received a number of emails following the application of the new data protection laws, and now you must expect an additional one from ESTRO. This new legislation is all about giving you greater security, transparency and control of your personal data online – a principle we couldn't agree with more.

This means that you need to tell us that you want to continue to receive information from us.

In the coming days you will receive an email from us asking if you want to continue receiving, what we hope is insightful, news on ESTRO activities and on the radiation oncology world.

If you don't subscribe to our mailing lists, then you won't get any emails from us anymore, and that would be a pity because, at ESTRO, we strongly believe that it's through joining forces, exchanging ideas, networking and meeting each other that we can continue doing the best for cancer patients.

So we hope to stay in touch with you.

The ESTRO team



READ IT BEFORE YOUR PATIENTS





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



PHILIPPE LAMBIN



DIRK DE RUYSSCHER



HANS KAANDERS



READ IT BEFORE
YOUR PATIENTS

BREAST

Quality-of-life results for accelerated partial breast irradiation with interstitial brachytherapy versus whole-breast irradiation in early breast cancer after breast-conserving surgery (GEC-ESTRO): five-year results of a randomised, phase 3 trial

Schäfer R, Strnad V, Polgár C, Uter W, Hildebrandt G, Ott OJ, Kauer-Dorner D, Knauerhase H, Major T, Lyczek J, Guinot JL, Dunst J, Miguelez CG, Slampa P, Allgauer M, Lössl K, Kovács G, Fishedick AR, Fietkau R, Resch A, Kulik A, Arribas L, Niehoff P, Guedea F, Schlamann A, Gall C, Polat B; Groupe Européen de Curiethérapie of European Society for Radiotherapy and Oncology (GEC-ESTRO).

Lancet Oncol. 2018 Apr 20. pii: S1470-2045(18)30195-5. doi: 10.1016/S1470-2045(18)30195-5. [Epub ahead of print]

Background

Previous results from the GEC-ESTRO trial showed that accelerated partial breast irradiation (APBI) using multicatheter brachytherapy in the treatment of early breast cancer after breast-conserving surgery was non-inferior to whole-breast irradiation in terms of local control and overall survival. Here, we present five-year results of patient-reported quality of life.

Methods

We did this randomised controlled phase 3 trial at 16 hospitals and medical centres in seven European countries. Patients aged 40 years or older with 0-IIA breast cancer were randomly assigned (1:1) after breast-conserving surgery (resection margins ≥ 2 mm) to receive either whole-breast irradiation of 50 Gy with a boost of 10 Gy or APBI using multicatheter brachytherapy. Randomisation was stratified by study centre, tumour type, and menopausal status, with a block size of ten and an automated dynamic algorithm. There was no masking of patients or investigators. The primary endpoint of the trial was ipsilateral local recurrence. Here, we present five-year results of quality of life (a pre-specified secondary endpoint). Quality-of-life questionnaires (European Organisation for Research and Treatment of Cancer QLQ-C30, breast cancer module QLQ-BR23) were completed before radiotherapy (baseline 1), immediately after radiotherapy (baseline 2), and during follow-up. We analysed the data according to treatment received (as-treated population). Recruitment was

completed in 2009, and long-term follow-up is continuing. The trial is registered at ClinicalTrials.gov, number NCT00402519.

Findings

Between 20 April 2004 and 30 July 2009, 633 patients had accelerated partial breast irradiation and 551 patients had whole-breast irradiation. Quality-of-life questionnaires at baseline 1 were available for 334 (53%) of 663 patients in the APBI group and 314 (57%) of 551 patients in the whole-breast irradiation group; the response rate was similar during follow-up. Global health status (range 0-100) was stable in both groups: at baseline 1, APBI group mean score 65.5 (SD 20.6) versus whole-breast irradiation group 64.6 (19.6), $p=0.37$; at five years, APBI group 66.2 (22.2) versus whole-breast irradiation group 66.0 (21.8), $p=0.94$. The only moderate, significant difference (difference of 10-20 points) between the groups was found in the breast symptoms scale. Breast symptom scores were significantly higher (i.e. worse) after whole-breast irradiation than after APBI at baseline 2 (difference of means 13.6, 95% CI 9.7-17.5; $p<0.0001$) and at three-month follow-up (difference of means 12.7, 95% CI 9.8-15.6; $p<0.0001$).

Interpretation

APBI with multicatheter brachytherapy was not associated with worse quality of life compared with whole-breast irradiation. This finding supports APBI as an alternative treatment option after breast-conserving surgery for patients with early breast cancer.



READ IT BEFORE
YOUR PATIENTS

ENDOMETRIAL

Adjuvant chemoradiotherapy versus radiotherapy alone for women with high-risk endometrial cancer (PORTEC-3): final results of an international, open-label, multicentre, randomised, phase 3 trial

de Boer SM, Powell ME, Mileskin L, Katsaros D, Bessette P, Haie-Meder C, Ottevanger PB, Ledermann JA, Khaw P, Colombo A, Fyles A, Baron MH, Jürgenliemk-Schulz IM, Kitchener HC, Nijman HW, Wilson G, Brooks S, Carinelli S, Provencher D, Hanzen C, Lutgens LCHW, Smit VTHBM, Singh N, Do V, D'Amico R, Nout RA, Feeney A, Verhoeven-Adema KW, Putter H, Creutzberg CL; PORTEC study group.

Lancet Oncol. 2018 Mar;19(3):295-309.

Background

Although women with endometrial cancer generally have a favourable prognosis, those with high-risk disease features are at increased risk of recurrence. The PORTEC-3 trial was initiated to investigate the benefit of adjuvant chemotherapy during and after radiotherapy (chemoradiotherapy) versus pelvic radiotherapy alone for women with high-risk endometrial cancer.

Methods

PORTEC-3 was an open-label, international, randomised, phase 3 trial involving 103 centres in six clinical trials collaborating in the Gynaecological Cancer Intergroup. Eligible women had high-risk endometrial cancer with FIGO 2009 stage I, endometrioid-type grade 3 with deep myometrial invasion or lymphovascular space invasion (or both), endometrioid-type stage II or III, or stage I to III with serous or clear cell histology. Women were randomly assigned (1:1) to receive radiotherapy alone (48.6 Gy in 1.8 Gy fractions given on five days per week) or radiotherapy and chemotherapy (consisting of two cycles of cisplatin 50 mg/m² given during radiotherapy, followed by four cycles of carboplatin AUC5 and paclitaxel 175 mg/m²) using a biased-coin minimisation procedure with stratification for participating centre, lymphadenectomy, stage of cancer, and histological type. The co-primary endpoints were overall survival and failure-free survival. We

used the Kaplan-Meier method, log-rank test, and Cox regression analysis for final analysis by intention to treat and adjusted for stratification factors. The study was closed on 20 December 2013, after achieving complete accrual; follow-up is ongoing. PORTEC-3 is registered with ISRCTN, number ISRCTN14387080, and ClinicalTrials.gov, number NCT00411138.

Results

In total, 686 women were enrolled between 23 November 2006 and 20 December 2013. Of these, 660 eligible patients were included in the final analysis, of whom 330 were assigned to chemoradiotherapy and 330 were assigned to radiotherapy. Median follow-up was 60.2 months (IQR 48.1-73.1). Five-year overall survival was 81.8% (95% CI 77.5-86.2) with chemoradiotherapy versus 76.7% (72.1-81.6) with radiotherapy (adjusted hazard ratio [HR] 0.76, 95% CI 0.54-1.06; p=0.11); five-year failure-free survival was 75.5% (95% CI 70.3-79.9) versus 68.6% (63.1-73.4; HR 0.71, 95% CI 0.53-0.95; p=0.022). Grade 3 or worse adverse events during treatment occurred in 198 (60%) of 330 patients who received chemoradiotherapy versus 41 (12%) of 330 patients who received radiotherapy (p<0.0001). Neuropathy (grade 2 or worse) persisted significantly more often after chemoradiotherapy than after radiotherapy (20 [8%] women versus one [1%] at three years; p<0.0001). Most deaths were due to endometrial cancer; in four patients (two in each group), ▼

the cause of death was uncertain. One death in the radiotherapy group was due to either disease progression or late treatment complications; three deaths (two in the chemoradiotherapy group and one in the radiotherapy group) were due to either intercurrent disease or late treatment-related toxicity.

Interpretation

Adjuvant chemotherapy given during and after radiotherapy for high-risk endometrial cancer did not improve five-year overall survival, although it did increase failure-free survival. Women with high-risk endometrial cancer should be individually counselled about this combined treatment. Continued follow-up is needed to evaluate long-term survival.





READ IT BEFORE
YOUR PATIENTS

CERVICAL

Neoadjuvant chemotherapy followed by radical surgery versus concomitant chemotherapy and radiotherapy in patients with stage IB2, IIA, or IIB squamous cervical cancer: a randomised controlled trial

Gupta S, Maheshwari A, Parab P, Mahantshetty U, Hawaldar R, Sastri Chopra S, Kerkar R, Engineer R, Tongaonkar H, Ghosh J, Gulia S, Kumar N, Shylasree TS, Gawade R, Kembhavi Y, Gaikar M, Menon S, Thakur M, Shrivastava S, Badwe R.

J Clin Oncol. 2018, Epub ahead of print.

Purpose

We compared the efficacy and toxicity of neoadjuvant chemotherapy followed by radical surgery versus standard cisplatin-based chemoradiation in patients with locally advanced squamous cervical cancer.

Patients and methods

This was a single-centre, phase III, randomised controlled trial (ClinicalTrials.gov identifier: NCT00193739). Eligible patients were between 18 and 65 years old and had stage IB2, IIA, or IIB squamous cervical cancer. They were randomly assigned, after stratification by stage, to receive either three cycles of neoadjuvant chemotherapy using paclitaxel and carboplatin once every three weeks followed by radical hysterectomy or standard radiotherapy with concomitant cisplatin once every week for five weeks. Patients in the neoadjuvant group received postoperative adjuvant radiation or concomitant chemotherapy and radiotherapy, if indicated. The primary end point was disease-free survival (DFS), defined as survival without relapse or death related to cancer, and secondary end points included overall survival and toxicity.

Results

Between September 2003 and February 2015, 635 patients were randomly assigned, of whom 633 (316 patients in the neoadjuvant chemotherapy plus surgery group and 317 patients in the concomitant chemoradiation group) were

included in the final analysis, with a median follow-up time of 58.5 months. The five-year DFS in the neoadjuvant chemotherapy plus surgery group was 69.3% compared with 76.7% in the concomitant chemoradiation group (hazard ratio, 1.38; 95% CI, 1.02 to 1.87; $P = .038$), whereas the corresponding five-year OS rates were 75.4% and 74.7%, respectively (hazard ratio, 1.025; 95% CI, 0.752 to 1.398; $P = .87$). The delayed toxicities at 24 months or later after treatment completion in the neoadjuvant chemotherapy plus surgery group versus the concomitant chemoradiation group were rectal (2.2% vs 3.5%, respectively), bladder (1.6% vs 3.5%, respectively), and vaginal (12.0% vs 25.6%, respectively).

Conclusion

Cisplatin-based concomitant chemoradiation resulted in superior DFS compared with neoadjuvant chemotherapy followed by radical surgery in locally advanced cervical cancer.



READ IT BEFORE
YOUR PATIENTS

VULVAR

Vulvar field resection based on ontogenetic cancer field theory for surgical treatment of vulvar carcinoma: a single-centre, single-group, prospective trial

Höckel M, Trott S, Dornhöfer N, Horn LC, Hentschel B, Wolf B.

Lancet Oncol. 2018 Apr;19(4):537-548. doi: 10.1016/S1470-2045(18)30109-8. Epub 2018 Mar 9.

Background

The incidence of vulvar cancer is increasing, but surgical treatment – the current standard of care – often leads to unsatisfactory outcomes, especially in patients with node-positive disease. Preliminary results at our centre showed that locoregional spread of vulvar carcinoma occurs within tissue domains defined by stepwise embryonic and foetal development (ontogenetic cancer fields and associated lymph node regions). We propose that clinical translation of these insights into practice could improve outcomes of surgical treatment of vulvar cancer.

Methods

We did a single-centre prospective trial at the University of Leipzig's (Germany) Cancer Centre. Eligible patients were aged 18 years or older, had ontogenetic stage 1-3b histologically proven primary carcinoma of the vulva, and had not undergone previous surgical or radiotherapy treatment for vulvar cancer or any other major perineal or pelvic disease. In view of staged morphogenesis of the vulva from the cloacal membrane endoderm at Carnegie stage 11 to adulthood, we defined the tissue domains of tumour spread according to the theory of ontogenetic cancer fields. On the basis of ontogenetic staging, patients were treated locally with partial, total, or extended vulvar field resection; regionally with therapeutic inguinopelvic lymph node dissection; and anatomical reconstruction without adjuvant radiotherapy. The primary endpoints were

recurrence-free survival, disease-specific survival, and early postoperative complications. Analysis of tumour spread and early postoperative surgical complications was done by intention to treat (i.e. all patients were included), whereas outcome analyses were done per protocol. This ongoing trial is registered with the German Clinical Trials Register, number DRKS00013358.

Findings

Between 1 March 2009 and 8 June 2017, 97 consecutive patients were included in the study, of whom 94 were treated per protocol with vulvar field resection, therapeutic inguinopelvic lymph node dissection, and anatomical reconstruction without adjuvant radiotherapy. In total, 46 patients had moderate or severe postoperative complications, especially infectious perineal and inguinal wound dehiscence. Three-year recurrence-free survival in all patients was 85.1% (95% CI 76.9-93.3), and three-year disease-specific survival was 86.0% (78.2-93.8).

Interpretation

Our results support the theory of ontogenetic cancer fields for vulvar carcinoma, accord with our previous findings in cervical cancer, and suggest the general applicability of the theory. Application of the concept of cancer field resection could improve outcomes in patients with vulvar carcinoma, but needs to be investigated further in multicentre randomised controlled trials.



READ IT BEFORE
YOUR PATIENTS

PROSTATE

Comparative toxicities and cost of intensity-modulated radiotherapy, proton radiation, and stereotactic body radiotherapy among younger men with prostate cancer

Pan HY, Jiang J, Hoffman KE, Tang C, Choi SL, Nguyen QN, Frank SJ, Anscher MS, Shih YT, Smith BD.

J Clin Oncol. 2018, Epub ahead of print.

Purpose

To compare the toxicities and cost of proton radiation and stereotactic body radiotherapy (SBRT) with intensity-modulated radiotherapy (IMRT) for prostate cancer among men younger than 65 years of age with private insurance.

Methods

Using the MarketScan Commercial Claims and Encounters database, we identified men who received radiation for prostate cancer between 2008 and 2015. Patients undergoing proton therapy and SBRT were propensity score-matched to IMRT patients on the basis of clinical and sociodemographic factors. Proportional hazards models compared the cumulative incidence of urinary, bowel, and erectile dysfunction toxicities by treatment. Cost from a payer's perspective was calculated from claims and adjusted to the value of US\$2015.

Results

A total of 693 proton therapy patients were matched to 3,465 IMRT patients. Proton therapy patients had a lower risk of composite urinary toxicity (33% vs 42% at two years; $P < .001$) and erectile dysfunction (21% vs 28% at two years; $P < .001$), but a higher risk of bowel toxicity (20% vs 15% at two years; $P = .02$). Mean radiation cost was \$115,501 for proton therapy patients and \$59,012 for IMRT patients ($P < .001$). A total of 310 SBRT patients were matched to 3,100 IMRT patients. There were no significant differences in composite urinary, bowel, or erectile dysfunction

toxicities between SBRT and IMRT patients ($P > .05$), although a higher risk of urinary fistula was noted with SBRT (1% vs 0.1% at two years; $P = .009$). Mean radiation cost for SBRT was \$49,504 and \$57,244 for IMRT ($P < .001$).

Conclusion

Among younger men with prostate cancer, proton radiation was associated with significant reductions in urinary toxicity but increased bowel toxicity at nearly twice the cost of IMRT. SBRT and IMRT were associated with similar toxicity profiles; SBRT was modestly less expensive than IMRT.



READ IT BEFORE
YOUR PATIENTS

PROSTATE

Standard whole prostate gland radiotherapy with and without lesion boost in prostate cancer: toxicity in the FLAME randomised controlled trial

Monninkhof EM, van Loon JW, van Vulpen M, Kerkmeijer LGW, Pos FJ, Haustermans K, van den Bergh L, Isebaert S, McColl GM, Jan Smeenk R, Noteboom J, Walraven I, Peeters PHM, van der Heide UA.

Radiother Oncol. 2018, Epub ahead of print.

Purpose

To compare toxicity rates in patients with localised prostate cancer treated with standard fractionated external beam radiotherapy (EBRT) with or without an additional integrated boost to the macroscopically visible tumour.

Material and methods

FLAME is a phase 3 multicentre RCT (NCT01168479) of patients with pathologically confirmed localised intermediate or high-risk prostate cancer. The standard treatment arm (n = 287) received a dose to the entire prostate of 77 Gy in 35 fractions. The dose-escalated treatment arm (n = 284) received 77 Gy in 35 fractions to the entire prostate, with an integrated boost up to 95 Gy to the multi-parametric MRI-defined (macroscopic) tumour within the prostate. Treatment related toxicity was measured using the CTCAE version 3.0. Grade 2 or worse GU or GI events up to two years were compared between groups by presenting proportions and by Generalised Estimating Equations (GEE) analyses for repeated measures.

Results

Ninety per cent of the 571 men randomly assigned between September 2009 and January 2015 had high-risk disease (Ash 2000), of whom nearly 66% were prescribed hormonal therapy up to three years. Median follow-up was 55 months at the time of this analysis. Toxicity prevalence rates for both GI and GU increased until the

end of treatment and regressed thereafter, with no obvious differences across treatment groups. Late cumulative GI toxicity rates were 11.1% and 10.2% for the standard and dose-escalated group, respectively. These rates were 22.6% and 27.1% for GU toxicity. GEE analyses showed that both GU toxicity and GI toxicity (\geq grade 2) up to two years after treatment were similar between arms (OR 1.02 95%CI 0.78-1.33 $p = 0.81$ and (OR 1.19 95%CI 0.82-1.73 $p = 0.38$), respectively.

Conclusions

In intermediate- and high-risk prostate cancer patients, focal dose escalation integrated with standard EBRT did not result in an increase in GU and GI toxicity when compared to the standard treatment up to two years after treatment. This suggests that the described focal dose escalation technique is safe and feasible.

EMUC18



10th European Multidisciplinary Congress
on Urological Cancers

8-11 November 2018 | Amsterdam, The Netherlands

[Read the interview with the two ESTRO representatives, Anne Kiltie and Bernardino de Bari, in the Clinical Corner on page 35 >](#)



READ IT BEFORE
YOUR PATIENTS

HEAD AND NECK

Postoperative concurrent chemoradiotherapy versus postoperative radiotherapy in high-risk cutaneous squamous cell carcinoma of the head and neck: the randomised phase III TROG 05.01 trial

Porceddu SV, Bressel M, Poulsen MG, Stoneley A, Veness MJ, Kenny LM, Wratten C, Corry J, Cooper S, Fogarty GB, Collins M, Collins MK, Macann AMJ, Milross CG, Penniment MG, Liu HY, King MT, Panizza BJ, Rischin D.

J Clin Oncol. 2018, Epub ahead of print.

Purpose

To report the results of the Trans Tasman Radiation Oncology Group (TROG) randomised phase III trial designed to determine whether the addition of concurrent chemotherapy to postoperative radiotherapy (CRT) improved locoregional control in patients with high-risk cutaneous squamous cell carcinoma of the head and neck.

Patients and methods

The primary objective was to determine whether there was a difference in freedom from locoregional relapse (FFLRR) between 60 or 66 Gy (6 to 6.5 weeks) with or without weekly carboplatin (area under the curve 2) after resection of gross disease. Secondary efficacy objectives were to compare disease-free survival and overall survival.

Results

Three hundred and twenty-one patients were randomly assigned, with 310 patients commencing allocated treatment (radiotherapy [RT] alone, n = 157; CRT, n = 153). Two hundred and thirty-eight patients (77%) had high-risk nodal disease, 59 (19%) had high-risk primary or in-transit disease, and 13 (4%) had both. Median follow-up was 60 months. Median RT dose was 60 Gy, with 84% of patients randomly assigned to CRT completing six cycles of carboplatin. The two- and five-year FFLRR rates were 88% (95% CI, 83% to 93%) and 83% (95% CI, 77% to 90%), respectively, for RT and 89% (95% CI, 84% to 94%) and 87% (95% CI, 81% to 93%; hazard ratio, 0.84; 95%

CI, 0.46 to 1.55; P = .58), respectively, for CRT. There were no significant differences in disease-free or overall survival. Locoregional failure was the most common site of first treatment failure, with isolated distant metastases as the first site of failure seen in 7% of both arms. Treatment was well tolerated in both arms, with no observed enhancement of RT toxicity with carboplatin. Grade 3 or 4 late toxicities were infrequent.

Conclusion

Although surgery and postoperative RT provided excellent FFLRR, there was no observed benefit with the addition of weekly carboplatin.




2018
ESTRO School

Multidisciplinary management of head and neck oncology

30 September - 3 October 2018
Lisbon, Portugal

Early registration deadline: 3 July 2018

[www.estro.org/school >](http://www.estro.org/school)



READ IT BEFORE
YOUR PATIENTS

HEAD AND NECK

DAHANCA 10 - Effect of darbepoetin alfa and radiotherapy in the treatment of squamous cell carcinoma of the head and neck. A multicentre, open-label, randomised, phase 3 trial by the Danish head and neck cancer group

Overgaard J, Hoff CM, Hansen HS, Specht L, Overgaard M, Lassen P, Andersen E, Johansen J, Andersen LJ, Evensen JF, Alsner J, Grau C.

Radiother Oncol. 2018 Epub ahead of print.

Purpose

To evaluate if correction of low haemoglobin (Hb) levels by means of darbepoetin alfa improves the outcomes of radiotherapy in patients with squamous cell carcinoma of the head and neck (HNSCC).

Patients and methods

Patients eligible for primary radiotherapy and who had Hb values below 14.0 g/dl were randomised to receive accelerated fractionated radiotherapy with or without darbepoetin alfa. Patients also received the hypoxic radiosensitiser nimorazole. Darbepoetin alfa was given weekly during radiotherapy or until the Hb value exceeded 15.5 g/dl.

Results

Following a planned interim analysis which showed inferiority of the experimental treatment the trial was stopped after the inclusion of 522 patients (of a planned intake of 600). Of these, 513 were eligible for analysis (254 patients treated with darbepoetin alfa and 259 patients in the control group). Overall, the patients were distributed according to the stratification parameters (gender, T and N staging, tumour site). Treatment with darbepoetin alfa increased the Hb level to the planned value in 81% of the patients. The compliance was good without excess serious adverse events. The results showed a poorer outcome with a five-year cumulative

loco-regional failure rate of 47% versus 34%, Hazard Ratio (HR): 1.53 [1.16-2.02], for the darbepoetin alfa versus control arm, respectively. This was also seen for the endpoints of event-free survival (HR: 1.36 [1.09-1.69]), disease-specific death (HR: 1.43 [1.08-1.90]), and overall survival (HR: 1.30 [1.02-1.64]). There was no enhanced risk of cardiovascular events observed in the experimental arm or any significant differences in acute or late radiation related morbidity. All univariate analyses were confirmed in a multivariate setting.

Conclusion

Correction of the Hb level with darbepoetin alfa during radiotherapy of patients with HNSCC resulted in a significantly poorer tumour control and survival.

7TH ICHNO

International Congress on
innovative approaches in

HEAD & NECK ONCOLOGY

14-16 March 2019

Barcelona, Spain

DEADLINES

Abstract submission:
15 October 2018

Early registration:
6 November 2018

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READ IT BEFORE
YOUR PATIENTS

NASOPHARYNGEAL

Concurrent chemoradiotherapy with nedaplatin versus cisplatin in stage II-IVB nasopharyngeal carcinoma: an open-label, non-inferiority, randomised phase 3 trial

Tang LQ, Chen DP, Guo L, Mo HY, Huang Y, Guo SS, Qi B, Tang QN, Wang P, Li XY, Li JB, Liu Q, Gao YH, Xie FY, Liu LT, Li Y, Liu SL, Xie HJ, Liang YJ, Sun XS, Yan JJ, Wu YS, Luo DH, Huang PY, Xiang YQ, Sun R, Chen MY, Lv X, Wang L, Xia WX, Zhao C, Cao KJ, Qian CN, Guo X, Hong MH, Nie ZQ, Chen QY, Mai HQ.

Lancet Oncol. 2018 Apr;19(4):461-473. doi: 10.1016/S1470-2045(18)30104-9. Epub 2018 Feb 28.

Background

Cisplatin-based concurrent chemoradiotherapy is currently considered to be the standard treatment regimen for patients with advanced nasopharyngeal carcinoma, but has well-known side-effects such as gastrointestinal reactions, nephrotoxicity, and ototoxicity. Nedaplatin was developed to decrease the toxic effects induced by cisplatin, and in this trial we assessed whether a nedaplatin-based concurrent chemoradiotherapy regimen was non-inferior to a cisplatin-based regimen in patients with locoregional, stage II-IVB nasopharyngeal carcinoma.

Methods

We did an open-label, non-inferiority, phase 3, randomised, controlled trial at two centres in China. Patients aged 18-65 years with non-keratinising stage II-IVB (T1-4N1-3 or T3-4N0) nasopharyngeal carcinoma, a Karnofsky score of at least 70, and adequate haematological, renal, and hepatic function were randomly assigned (1:1) to receive intravenously either nedaplatin 100 mg/m² or cisplatin 100 mg/m² on days 1, 22, and 43 for three cycles concurrently with intensity-modulated radiotherapy. Randomisation was done manually using a computer-generated random number code and patients were stratified by treatment centre and clinical stage. Patients and clinicians were not masked to treatment allocation. The primary endpoint was progression-free survival at two

years; non-inferiority was shown if the upper limit of the 95% CI for the difference in two-year progression-free survival between the two groups did not exceed 10%. Analyses were by both intention to treat and per protocol, including all patients who received at least one complete cycle of chemotherapy. This trial is registered with ClinicalTrials.gov, number NCT01540136, and is currently in follow-up.

Findings

Between 16 January 2012 and 16 July 2014, we randomly assigned 402 patients to nedaplatin-based (n=201) or cisplatin-based (n=201) concurrent chemoradiotherapy. In the intention-to-treat population, two-year progression-free survival was 89.9% (95% CI 85.8-94.0) in the cisplatin group and 88.0% (83.5-94.5) in the nedaplatin group, with a difference of 1.9% (95% CI -4.2 to 8.0; p_{non-inferiority}=0.0048). In the per-protocol analysis (cisplatin group, n=197; nedaplatin group, n=196), two-year progression-free survival was 89.7% (95% CI 85.4-94.0) in the cisplatin group and 88.7% (84.2-94.5) in the nedaplatin group, with a difference of 1.0% (95% CI -5.2 to 7.0; p_{non-inferiority}=0.0020). A significantly higher frequency of grade 3 or 4 vomiting (35 [18%] of 198 in the cisplatin group vs 12 [6%] of 200 in the nedaplatin group, p<0.0001), nausea (18 [9%] vs four [2%], p=0.0021), and anorexia (53 [27%] vs 26 [13%], p=0.00070) was observed in the cisplatin group ▼

compared with the nedaplatin group. In total, 11 (6%) patients in the nedaplatin group had grade 3 or 4 thrombocytopenia compared with four (2%) in the cisplatin group ($p=0.065$). Patients in the cisplatin group had a higher frequency of any grade or grade 3 or 4 late auditory or hearing toxicities than did patients in the nedaplatin group (grade 3 or 4: three [2%] in the nedaplatin group vs 11 [6%] in the cisplatin group, $p=0.030$). No patients died from treatment-related causes.

Interpretation

Our findings show that nedaplatin-based concurrent chemoradiotherapy represents an alternative doublet treatment strategy to cisplatin-based concurrent chemoradiotherapy for patients with locoregional, advanced nasopharyngeal carcinoma. Further investigations are needed to explore the potential use of this treatment as induction or adjuvant chemotherapy or in combination with other agents.



2018
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Research course in translational radiation biology and oncology

Special focus in 2018: Radio-immunotherapy

4-6 October 2018 | Brussels, Belgium

Early registration deadline: 9 July 2018

[Read the interview with the chairs, Martin Pruschy and Philippe Lambin, in the School Corner on page 116 >](#)



READ IT BEFORE
YOUR PATIENTS

RECTAL

Organ preservation for rectal cancer (GRECCAR 2): a prospective, randomised, open-label, multicentre, phase 3 trial

Rullier E, Rouanet P, Tuech JJ, Valverde A, Lelong B, Rivoire M, Faucheron JL, Jafari M, Portier G, Meunier B, Sileznief I, Prudhomme M, Marchal F, Pocard M, Pezet D, Rullier A, Vendrely V, Denost Q, Asselineau J, Doussau A.

Lancet. 2017 Jul 29;390(10093):469-479. doi: 10.1016/S0140-6736(17)31056-5. Epub 2017 Jun 7.

Background

Organ preservation is a concept proposed for patients with rectal cancer after a good clinical response to neoadjuvant chemotherapy, to potentially avoid morbidity and side-effects of rectal excision. The objective of this study was to compare local excision and total mesorectal excision in patients with a good response after chemoradiotherapy for lower rectal cancer.

Methods

We did a prospective, randomised, open-label, multicentre, phase 3 trial at 15 tertiary centres in France that were experts in the treatment of rectal cancer. Patients aged 18 years and older with stage T2T3 lower rectal carcinoma, of maximum size 4cm, who had a good clinical response to neoadjuvant chemoradiotherapy (residual tumour ≤ 2 cm) were centrally randomly assigned by the surgeon before surgery to either local excision or total mesorectal excision surgery. Randomisation, which was done via the internet, was not stratified and used permuted blocks of size eight. In the local excision group, a completion total mesorectal excision was required if tumour stage was ypT2-3. The primary endpoint was a composite outcome of death, recurrence, morbidity, and side-effects at two years after surgery, to show superiority of local excision over total mesorectal excision in the modified intention-to-treat (ITT) population (expected proportions of patients having at least one event were 25% vs 60% for superiority). This trial was registered with ClinicalTrials.gov, number NCT00427375.

Findings

From 1 March 2007 to 24 September 2012, 186 patients received chemoradiotherapy and were enrolled in the study. Of these, 148 good clinical responders were randomly assigned to treatment, three were excluded (because they had metastatic disease, tumour >8 cm from anal verge, and withdrew consent), and 145 were analysed: 74 in the local excision group and 71 in the total mesorectal excision group. In the local excision group, 26 patients had a completion total mesorectal excision. At two years in the modified ITT population, one or more events from the composite primary outcome occurred in 41 (56%) of 73 patients in the local excision group and 33 (48%) of 69 in the total mesorectal excision group (odds ratio 1.33, 95% CI 0.62-2.86; $p=0.43$). In the modified ITT analysis, there was no difference between the groups in all components of the composite outcome, and superiority was not shown for local excision over total mesorectal excision.

Interpretation

We failed to show superiority of local excision over total mesorectal excision, because many patients in the local excision group received a completion total mesorectal excision that probably increased morbidity and side effects, and compromised the potential advantages of local excision. Better patient selection to avoid unnecessary completion total mesorectal excision could improve the strategy.



READ IT BEFORE
YOUR PATIENTS

COLORECTAL

Sildenafil suppresses inflammation-driven colorectal cancer in mice

Islam BN, Sharman SK, Hou Y, Bridges AE, Singh N, Kim S, Kolhe R, Trillo-Tinoco J, Rodriguez PC, Berger FG, Sridhar S, Browning DD.

Cancer Prev Res (Phila). 2017 Jul;10(7):377-388. doi:
10.1158/1940-6207.CAPR-17-0015. Epub 2017 May 3.

Intestinal cyclic guanosine monophosphate (cGMP) signalling regulates epithelial homeostasis and has been implicated in the suppression of colitis and colon cancer. In this study, we investigated the cGMP-elevating ability of the phosphodiesterase-5 (PDE5) inhibitor sildenafil to prevent disease in the azoxymethane / dextran sulfate sodium (AOM/DSS) inflammation-driven colorectal cancer model.

Treatment of mice with sildenafil activated cGMP signalling in the colon mucosa and protected against dextran-sulfate sodium (DSS)-induced barrier dysfunction. In mice treated with AOM/DSS, oral administration of sildenafil throughout the disease course reduced polyp multiplicity by 50% compared with untreated controls. Polyps that did form in sildenafil-treated mice were less proliferative and more differentiated compared with polyps from untreated mice, but apoptosis was unaffected. Polyps in sildenafil-treated mice were also less inflamed; they exhibited reduced myeloid-cell infiltration and reduced expression of iNOS, IFN γ , and IL6 compared with untreated controls. Most of the protection conferred by sildenafil was during the initiation stage of carcinogenesis (38% reduction in multiplicity). Administration of sildenafil during the later promotion stages did not affect multiplicity but had a similar effect on the polyp phenotype, including increased mucus production, and reduced proliferation and inflammation.

In summary, the results demonstrate that oral administration of sildenafil suppresses polyp formation and inflammation in mice treated with AOM/DSS. This validation of PDE5 as a target highlights the potential therapeutic value of PDE5 inhibitors for the prevention of colitis-driven colon cancer in humans.



READ IT BEFORE
YOUR PATIENTS

GASTRIC

Chemotherapy versus chemoradiotherapy after surgery and preoperative chemotherapy for resectable gastric cancer (CRITICS): an international, open-label, randomised phase 3 trial

Cats A, Jansen EPM, van Grieken NCT, Sikorska K, Lind P, Nordmark M, Meershoek-Klein Kranenbarg E, Boot H, Trip AK, Swellengrebel HAM, van Laarhoven HWM, Putter H, van Sandick JW, van Berge Henegouwen MI, Hartgrink HH, van Tinteren H, van de Velde CJH, Verheij M; CRITICS investigators.

Lancet Oncol. 2018 May;19(5):616-628. Doi: 10.1016/S1470-2045(18)30132-3. Epub 2018 Apr 9.

Background

Both perioperative chemotherapy and postoperative chemoradiotherapy improve survival in patients with resectable gastric cancer from Europe and North America. To our knowledge, these treatment strategies have not been investigated in a head to head comparison. We aimed to compare perioperative chemotherapy with preoperative chemotherapy and postoperative chemoradiotherapy in patients with resectable gastric adenocarcinoma.

Methods

In this investigator-initiated, open-label, randomised phase 3 trial, we enrolled patients aged 18 years or older who had stage IB-IVA resectable gastric or gastro-oesophageal adenocarcinoma (as defined by the American Joint Committee on Cancer, sixth edition), with a World Health Organization (WHO) performance status of 0 or 1, and adequate cardiac, bone marrow, liver, and kidney function. Patients were enrolled from 56 hospitals in The Netherlands, Sweden, and Denmark, and were randomly assigned (1:1) with a computerised minimisation programme with a random element to either perioperative chemotherapy (chemotherapy group) or preoperative chemotherapy with postoperative chemoradiotherapy (chemoradiotherapy group). Randomisation was done before patients were given any preoperative chemotherapy treatment and was stratified

by histological subtype, tumour localisation, and hospital. Patients and investigators were not masked to treatment allocation. Surgery consisted of a radical resection of the primary tumour and at least a D1+ lymph node dissection. Postoperative treatment started within 4-12 weeks after surgery. Chemotherapy consisted of three preoperative 21-day cycles and three postoperative cycles of intravenous epirubicin (50 mg/m² on day 1), cisplatin (60 mg/m² on day 1) or oxaliplatin (130 mg/m² on day 1), and capecitabine (1000 mg/m² orally as tablets twice daily for 14 days in combination with epirubicin and cisplatin, or 625 mg/m² orally as tablets twice daily for 21 days in combination with epirubicin and oxaliplatin), received once every three weeks. Chemoradiotherapy consisted of 45 Gy in 25 fractions of 1.8 Gy, for five weeks, five daily fractions per week, combined with capecitabine (575 mg/m² orally twice daily on radiotherapy days) and cisplatin (20 mg/m² intravenously on day 1 of each five weeks of radiation treatment). The primary endpoint was overall survival, analysed by intention-to-treat. The CRITICS trial is registered at ClinicalTrials.gov, number NCT00407186; EudraCT, number 2006-004130-32; and CKTO, 2006-02.

Findings

Between 11 January 2007 and 17 April 2015, 788 patients were enrolled and randomly assigned to chemotherapy (n=393) or chemoradiotherapy ▼

(n=395). After preoperative chemotherapy, 372 (95%) of 393 patients in the chemotherapy group and 369 (93%) of 395 patients in the chemoradiotherapy group proceeded to surgery, with a potentially curative resection done in 310 (79%) of 393 patients in the chemotherapy group and 326 (83%) of 395 in the chemoradiotherapy group. Postoperatively, 233 (59%) of 393 patients started chemotherapy and 245 (62%) of 395 started chemoradiotherapy. At a median follow-up of 61.4 months (IQR 43.3-82.8), median overall survival was 43 months (95% CI 31-57) in the chemotherapy group and 37 months (30-48) in the chemoradiotherapy group (hazard ratio from stratified analysis 1.01 (95% CI 0.84-1.22; p=0.90). After preoperative chemotherapy, in the total safety population of 781 patients (assessed together), there were 368 (47%) grade 3 adverse events; 130 (17%) grade 4 adverse events, and 13 (2%) deaths. Causes of death during preoperative treatment were diarrhoea (n=2), dihydropyrimidine deficiency (n=1), sudden death (n=1), cardiovascular events (n=8), and functional bowel obstruction (n=1). During postoperative treatment, grade 3 and 4 adverse events occurred in 113 (48%) and 22 (9%) of 233 patients in the chemotherapy group, respectively, and in 101 (41%) and ten (4%) of 245 patients in the chemoradiotherapy group, respectively. Non-febrile neutropenia occurred more frequently during postoperative chemotherapy (79 [34%] of 233) than during postoperative chemoradiotherapy (11 [4%] of 245). No deaths were observed during postoperative treatment.

Interpretation

Postoperative chemoradiotherapy did not improve overall survival compared with postoperative chemotherapy in patients with resectable gastric cancer treated with adequate preoperative chemotherapy and surgery. In view of the poor postoperative patient compliance in both treatment groups, future studies should focus on optimising preoperative treatment strategies.



READ IT BEFORE
YOUR PATIENTS

CARDIOVASCULAR

Association of “weekend warrior” and other leisure time physical activity patterns with risks for all-cause, cardiovascular disease, and cancer mortality

O'Donovan G, Lee IM, Hamer M, Stamatakis E.

JAMA Intern Med. 2017 Mar 1;177(3):335-342. doi: 10.1001/jamainternmed.2016.8014.

Importance

More research is required to clarify the association between physical activity and health in ‘weekend warriors’ who perform all their exercise in one or two sessions per week.

Objective

To investigate associations between the weekend warrior and other physical activity patterns and the risks for all-cause, cardiovascular disease (CVD), and cancer mortality.

Design, setting, and participants

This pooled analysis of household-based surveillance studies included 11 cohorts of respondents to the Health Survey for England and Scottish Health Survey with prospective linkage to mortality records. Respondents 40 years or older were included in the analysis. Data were collected from 1994 to 2012 and analysed in 2016.

Exposures

Self-reported leisure time physical activity, with activity patterns defined as inactive (reporting no moderate- or vigorous-intensity activities), insufficiently active (reporting <150 min/wk in moderate-intensity and <75 min/wk in vigorous-intensity activities), weekend warrior (reporting ≥150 min/wk in moderate-intensity or ≥75 min/

wk in vigorous-intensity activities from one or two sessions), and regularly active (reporting ≥150 min/wk in moderate-intensity or ≥75 min/wk in vigorous-intensity activities from ≥3 sessions). The insufficiently active participants were also characterised by physical activity frequency.

Main outcomes and measures

All-cause, CVD, and cancer mortality ascertained from death certificates.

Results

Among the 63,591 adult respondents (45.9% male; 44.1% female; mean [SD] age, 58.6 [11.9] years), 8,802 deaths from all causes, 2,780 deaths from CVD, and 2,526 from cancer occurred during 561,159 person-years of follow-up. Compared with the inactive participants, the hazard ratio (HR) for all-cause mortality was 0.66 (95% CI, 0.62-0.72) in insufficiently active participants who reported one to two sessions per week, 0.70 (95% CI, 0.60-0.82) in weekend warrior participants, and 0.65 (95% CI, 0.58-0.73) in regularly active participants. Compared with the inactive participants, the HR for CVD mortality was 0.60 (95% CI, 0.52-0.69) in insufficiently active participants who reported one or two sessions per week, 0.60 (95% CI, 0.45-0.82) in weekend warrior participants, and 0.59 (95% CI, 0.48-0.73) in regularly active participants. Compared with the inactive participants, the

HR for cancer mortality was 0.83 (95% CI, 0.73-0.94) in insufficiently active participants who reported one or two sessions per week, 0.82 (95% CI, 0.63-1.06) in weekend warrior participants, and 0.79 (95% CI, 0.66-0.94) in regularly active participants.

Conclusions and relevance

Weekend warrior and other leisure time physical activity patterns characterised by one or two sessions per week may be sufficient to reduce all-cause, CVD, and cancer mortality risks regardless of adherence to prevailing physical activity guidelines.



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Haematological malignancies

In collaboration with ILROG (International Lymphoma Radiation Oncology Group)
5-8 September 2018 | Utrecht, The Netherlands

The course teaches you to design treatment strategies and apply modern principles of target volume definition, fractionation and treatment techniques for radiation therapy in the multimodality treatment of haematological malignancies.

COURSE AIM
The aim of this course is to:

- Enable radiation oncologists to participate in the multidisciplinary management of haematological malignancies
- Administer radiotherapy to these diseases according to modern principles, using up-to-date technology to achieve maximum cure rates while at the same time minimising the risk of long-term complications.

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CLINICAL



REPORTS FROM THE CLINICAL TRACK AT ESTRO 37



From immunotherapy to clinical trials ▶▶

“This house believes that stereotactic radiosurgery will replace whole brain radiotherapy in patients with ten brain metastases” - Report on the debate ▶▶



From immunotherapy to clinical trials



Philip Lambin



JOANNA KAZMIERSKA

The 37th ESTRO congress attracted the attention of more radiotherapy professionals than ever before. The main reason behind this success was the programme – a very interesting blend of state-of-the-art lectures and presentations of new experimental approaches to cancer treatment. As well as the clinical sessions, multidisciplinary sessions also proved to be popular with many clinicians.

One of the most popular sessions was on radio-immunotherapy. The ‘Immunotherapy meets radiotherapy’ session provided an excellent overview of the immune-response mechanisms induced by radiotherapy in head and neck cancers. The topic was introduced by biologist Martin Prushy, followed by radiation oncologist Vincent Gregoire, who presented methods of dose optimisation and timing. The final ▼



Corrie Marijnen



Nancy Lee

presentation by medical oncologist Lisa Licitra summarised the toxicities of new immunomodulating therapies, pointing out the need for careful observation of these new and sometimes unexpected side effects.

Philip Lambin presented an interesting view on an immunotherapy approach utilising the concept of ‘releasing the immune break’ with check-point inhibitors and, at the same time,

‘pushing the accelerator’ using immunocytokines. When combined with radiotherapy these agents may lead not only to tumour response, but also induce a phenomenon of immune-memory, a form of ‘vaccination’, against potential metastases in the future.

Clinical sessions on head and neck cancer treatment addressed the methods of precise and tailored radiotherapy. For example, Chris Nutting

presented on minimising the dose delivered to the dysphagia aspiration-related structures (DARS). Nancy Lee focused on nasopharyngeal cancer and the role of circulating post-treatment Epstein-Barr virus (EBV) DNA as a predictor of worse prognosis and its role in decision-making about adjuvant chemotherapy. She also discussed a similar concept for HPV positive oropharyngeal squamous cell carcinoma, where cfDNA of virus circulating in blood could be a marker ▼



of persistent disease and indicate the need for further adjuvant treatment. We look forward to the results of this study.

Selected clinical trials were presented at a plenary session. Jens Overgaard gave an update on the DAHANCA 19 trial, concluding that zalutumumab did not influence compliance to radiation therapy. Although zalutumumab is well tolerated, when it is added to accelerated radiotherapy or chemo-radiation in head and neck squamous cell carcinoma it did not alter any endpoint of the study, including overall survival at five years. Moreover, response to zalutumumab was unrelated either to HPV/p16 status or to concomitant cisplatin.

Lastly, a very interesting session dedicated to patient-reported outcome measures (PROMS) attracted many clinicians. Corrie Marijnen delivered a very interesting and personal presentation on the opportunities and challenges in shared decision-making. This reminded us of the importance of respectful communication with patients to address their individual needs.

Joanna Kazmierska
Greater Poland Cancer Center
Poznan, Poland





“This house believes that stereotactic radiosurgery will replace whole brain radiotherapy in patients with ten brain metastases”

DEBATE

Chairs: Neil Burnet (UK), Gerben Borst (The Netherlands)



Surprisingly, there was strong agreement amongst the speakers at the end of the debate. How can that be?



GERBEN BORST



NEIL BURNET

In this well-attended session all the speakers – Brigitta Baumert, Jean-François Daisne, Masaaki Yamamoto and Jaap Zinder – managed successfully to put forward their case in favour or against the motion. Surprisingly, there was strong agreement amongst the speakers at the end of the debate. How can that be?

Whole brain radiotherapy (WBRT) is increasingly becoming a questionable treatment for many patients. WBRT stands for cognitive toxicity, hair loss and a low tumour dose. This is not what any of the speakers, the audience or our Society wants for their patients. But with an increasing number of patients with brain ▼



Jaap Zindler, against the motion



Brigitta Baumer, for the motion



Gerben Borst and Neil Burnet, chairs of the debate

metastasis (BM), and with many of these patients living longer, what are we to do?

It was pointed out that we are seeing an increasing variety of patients in our clinical practice. Three examples given by Jaap Zindler in his presentation were:

- Female, 10 BM, age 42, KPS=100, Her-2-neu, T2N1M1 breast cancer
- Male, 10 BM, age 80, KPS=60, T4N3M1b NSCLC (non-small cell lung cancer)
- Male, 10 BM, age 42, KPS=100, T1N0M1b, ALK+ non-small cell lung cancer

In these three examples best supportive care (BSC), WBRT and stereotactic radiosurgery (SRS) can be advocated for the different patients. We can easily add dozens of other examples that we see in our daily clinics in which BSC, WBRT and SRS could be the best option for patients. But we often forget one other treatment option. Which one? The answer lies in the reason as to why we see so many more of these patients: targeted agents.

The issue with targeted agents is that 1) brain metastases do not usually respond to these

agents, even if they manage to penetrate into the brain, 2) tumours (and brain metastases) become, at some point, resistant to targeted agents, and 3) what to say about immunotherapy?

With the increase in knowledge of how tumours can be targeted and the availability of targeted agents, our patient population will gradually become a population in which the statement “This house believes that stereotactic radiosurgery will replace whole brain radiotherapy in patients with ten brain metastases” becomes an obsolete one. ▼



EUROPEAN MULTIDISCIPLINARY MEETING ON UROLOGICAL CANCERS (EMUC)

8-11 November 2018, Amsterdam, The Netherlands - 10th European Multidisciplinary Congress on Urological Cancers

EMUC18
Implementing multidisciplinary
strategies in genito-urinary cancers

Early fee registration deadline:
13 August 2018

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Working with the European Association of Urology (EAU) and the European Society for Medical Oncology (ESMO), ESTRO is co-organiser of the next European Multidisciplinary Meeting on Urological Cancers (EMUC). In this interview the two ESTRO representatives of the scientific programme committee, Bernardino de Bari (Switzerland) and Anne Kiltie (UK), outline where we stand in the treatment of urological cancers, especially with regard to prostate cancer.



European Multidisciplinary Meeting on Urological Cancers (EMUC)

8-11 November 2018
Amsterdam, The Netherlands

Interview with the ESTRO
representatives



BERARDINO DE BARI



ANNE KILTIE

The scientific programme will focus on prostate cancer. What do you see as the most important recent developments in the multidisciplinary treatment of prostate cancer?

The paradigm of treatment of this disease is changing. The implementation in daily clinical practice of new predictive tools, and of new imaging modalities is changing the type of patients that we treat. The role of local treatments in metastatic patients, the choice of the best treatment strategy in oligometastatic patients and the challenge of combining new hormonal and immunologic approaches are becoming part of our daily decision-making. Therefore, it is vital that we obtain high-level evidence and share best practice to help us make our choices.

What are the latest advances in radiation oncology for this specific cancer?

The role of extreme hypofractionation – for example, stereotactic body radiation therapy (SBRT) – is an object for debate in our community; a lot of patients are treated with SBRT nowadays, but long-term results are still lacking globally. Another controversial aspect is the role of primary radiotherapy to the prostate in the context of metastatic disease.

What about the biological aspects of this type of cancer?

In the near future, we need to face the challenge of the growing use of immunotherapy in cancer treatment, and its role in the context of localised disease. Recent evidence suggests that prostate cancer could be an interesting model in which to study the immune-modulatory effects of radiotherapy.

Will these topics be addressed at the conference?

Absolutely, yes. We have planned several sessions, some of them based on standard presentations and some of them in the format of multidisciplinary tumour boards. We will also be holding a session to present the results (sometimes preliminary) of the most important ongoing randomised trials.

On what other organs will the scientific programme focus?

Several important sessions will be devoted to bladder and kidney cancer. We are strongly supporting the multidisciplinary nature of this meeting in all these sessions. Some important sessions devoted to statistics have been ▼

included, to give participants the best tools to understand the results of the studies presented.

It is a multidisciplinary conference. Why should radiation oncologists attend?

Because, historically, radiation therapy has been, along with surgery and androgen deprivation therapy, one of the three standard therapeutic approaches to prostate cancer. Recent results have confirmed the important curative role of radiotherapy. However, the landscape is changing, and it is important that we are ready to face new challenges and to be part of it. The future of our discipline lies in multidisciplinary oncology, and we must step up to this challenge.

*Berardino de Bari
Radiation Oncology Department
Centre Hospitalier Universitaire Vaudois (CHUV)
Lausanne, Switzerland*

*Anne Kiltie
CRUK / MRC Oxford Institute for Radiation
Oncology
Oxford, UK*

8-11 November 2018, Amsterdam, The Netherlands

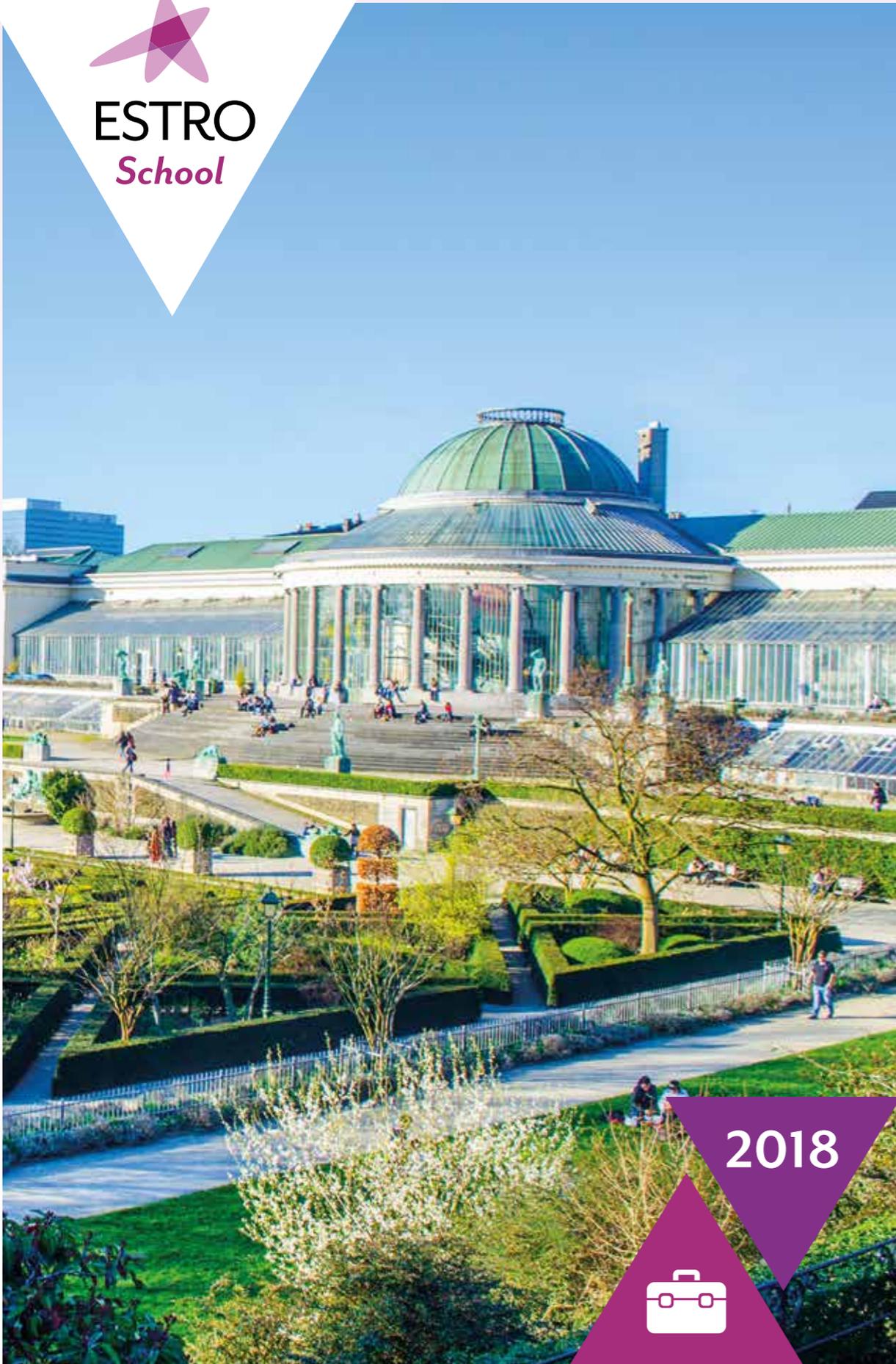
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10th European Multidisciplinary Congress on Urological Cancers

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- 7th Meeting of the EAU Section of Urological Imaging (ESUI)
- EAU Prostate Cancer Consensus meeting on Active Surveillance (EPCCAS)
- EAU-ESMO Bladder Cancer Consensus meeting
- EMUC Symposium on Genitourinary Pathology and Molecular Diagnostics (ESUP)
- European School of Urology (ESU)
- EAU Young Academic Urologists Meeting (YAU)

   www.emuc18.org



Multidisciplinary management of non-melanoma skin cancer

NEW

4-6 October 2018 | Brussels, Belgium

Early registration deadline: 9 July 2018

Benefit from increased understanding of multimodality management of non-melanoma skin cancer (NMSC). Your clinical daily work will improve due to more awareness of best practices with the patients benefiting from the best possible treatment.

LEARNING OUTCOMES

By the end of this course participants should be able to:

- Understand prophylaxis, epidemiology and pathology of NMSC with special focus on basal, squamous and Merkel cell carcinoma. Rare skin cancers will also be included.
- Discuss advantages and limitations of imaging modalities used for diagnosis and treatment of NMSC
- Understand indications and limitations of surgical and non-surgical treatment modalities in NMSC
- Design a radical and palliative radiotherapy plan for NMSC
- Develop a deep understanding of best practices in NMSC and provide patients with the best possible treatment, skin care advice and follow-up care
- Understand challenges of palliative and supportive care in NMSC patients
- Have a general understanding of principles in geriatric oncology and integrate geriatric oncology assessment into clinical practice involving NMSC patients
- Summarise the latest technical developments and gain knowledge of future directions in research and clinical trials in the management of NMSC

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BRACHYTHERAPY





The theme of this year's workshop is 'Performing optimal brachytherapy'

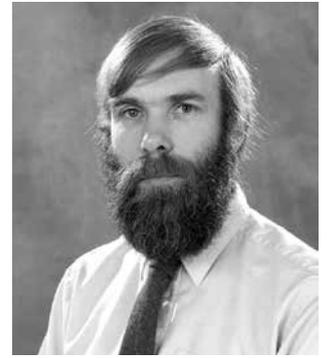
Welcome to the Brachytherapy Corner.

At the end of November this year, the annual Groupe Européen de Curiethérapie (GEC)-ESTRO workshop will be held in Brussels, Belgium. The theme of this year's workshop is 'Performing optimal brachytherapy'. In this Corner, you can read an interview with Bradley Pieters, chair of the workshop, reflecting on the success of the workshop series and the content of this year's event.

As well as looking forward to the GEC-ESTRO workshop, in this Corner we also look back at this year's very successful ESTRO 37 meeting in Barcelona, Spain. You will find summaries of several presentations on brachytherapy given at ESTRO 37, covering areas such as prostate, breast, gynaecology, physics and quality assurance.

Finally, in this issue we announce with great sadness the death of Professor Peter Levendag. He was very much involved in the field of head and neck cancer and brachytherapy and a great contributor to developments of radiation oncology. You can read more about Peter in his obituary.

Bradley Pieters, Peter Hoskin, Åsa Tedgren



PETER HOSKIN



BRADLEY PIETERS



ÅSA CARLSSON
TEDGREN



Interview with Bradley Pieters

Chair of the 6th GEC-ESTRO
workshop,
November 2018, Brussels, Belgium



Bradley Pieters at ESTRO 37, Barcelona, April 2018



BRADLEY PIETERS

The GEC-ESTRO workshop in November will be the sixth time it has been held. How does that feel?

Very satisfying. The GEC-ESTRO workshop is very different from the large ESTRO annual event: we discuss practical issues, exchange ideas and views, start new collaborations, network... and of course the GEC-ESTRO workshop focuses on brachytherapy. It's great that this meeting is the sixth in a series. This is testament to the success of the previous five.

Have there been any tangible outcomes from the workshops so far?

What is clear from the last meeting's evaluation is that people are interested in becoming members within the working groups to develop brachytherapy-related projects. This meeting is a unique opportunity to show participants what the ongoing projects are, as well as a way to share new ideas. Our aim ultimately is to advance the brachytherapy discipline further. ▼

How do you arrive at the workshop's theme each year? What is the theme this year?

Performing optimal brachytherapy. This theme was decided within the GEC-ESTRO committee. We closely collaborate with the seven working groups to decide on a different main topic every year.

How is the programme for the workshop developed?

It is developed within distinct working groups. The topics and issues are discussed within the teams and each team leader is tasked to come up with a programme. Once the draft programme is ready, the GEC-ESTRO committee choose which sessions will be at the workshop and, therefore, which programme to follow. It may happen that multiple groups have to collaborate on a mutual topic.

Who is the target audience? Is industry involved?

Anyone interested in brachytherapy: radiation oncologists, radiation therapists (RTTs), physicists, and industry too. They present their products at the exhibition and can sponsor a part of the workshop.

Are there participants that attend every year and, if so, why?

Indeed. At the last workshop, 90% of the participants stated that they intended to attend the workshop in November. What we have seen throughout the years is that the number of attendees is slowly increasing. This is because participants see the GEC-ESTRO workshop as a unique opportunity to network, share opinions and learn more about brachytherapy. This is a sign of success.

How would you encourage someone who has not been before to join the workshop in Brussels?

Come, listen to the discussion, share your ideas and learn more about the great discipline of brachytherapy. This is a remarkable opportunity to get involved in practical projects involving brachytherapy.

Any final thoughts?

I hope to see lots of new faces, as well as more familiar faces, at this year's workshop. I really want everyone to feel that they are fully contributing to the advancement of brachytherapy. Let's make this sixth GEC-ESTRO workshop another success.



6TH GEC-ESTRO WORKSHOP

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REPORTS FROM THE BRACHYTHERAPY TRACK AT ESTRO 37



Alfonso Gomez-Iturriaga - Prostate brachytherapy ▶▶

Jacob G Johansen - Brachytherapy physics ▶▶

Cristina Gutiérrez - Breast brachytherapy ▶▶

Barbara Šegedin - Gynaecological brachytherapy ▶▶



Prostate brachytherapy

Several important topics were addressed regarding prostate brachytherapy during ESTRO 37 and the meeting was a great opportunity to learn about some of the ongoing research activities.

The always-controversial topic of different treatment comparison was addressed in three abstracts (PV-0254, PV-0629 and OC-0287). Mauricio Cambeiro *et al* (PV-0254) from Clinica Universidad de Navarra (Spain) presented a matched-paired analysis of radical radiotherapy (combination of high dose rate [HDR] and external beam radiation therapy [EBRT]; BED 89-110 Gy) versus radical prostatectomy (RP) in high-risk prostate cancer patients. They found in 123 patients that HDR+EBRT achieved higher biochemical control rates than RP ($p < 0.001$), and no differences in terms of distant metastases and overall survival (OS). Also, Sebastian *et al* (PV-0629) from The Ohio State University (USA) presented a population-based study using the National Cancer Database and compared overall survival rates of patients treated with RP, EBRT alone and EBRT-brachytherapy (BT) boost. They identified 49,986 patients with high-risk characteristics, and did not find any significant difference in overall survival between RP and EBRT-BT. However, there was a

survival advantage with the use of either of these modalities compared to treatment with EBRT alone, suggesting equivalence between RP and EBRT-BT and inferiority with EBRT alone in the treatment of high-risk prostate cancer.

The comparison between treatment modalities was also present in the proffered papers session. Benjamin Guix *et al* (OC-0287) from Fundacion IMOR in Barcelona (Spain) presented a study comparing EBRT versus EBRT-BT boost in intermediate and high-risk patients. They found in 1,452 patients with a median follow-up of 102 months, better failure-free survival (98.3% vs 90.7%; $p < 0.002$) and metastases-free survival rates (97.8% vs 95.9%; $p < 0.006$) in patients treated with combination of EBRT and BT versus patients treated with EBRT alone. In this study the adverse events were higher in the EBRT alone arm.

The second topic addressed was the role of prostate brachytherapy in the salvage setting after local relapse. Manuel Galdeano-Rubio *et al* (PV-0255) from Instituto Catalan de Oncologia in Barcelona (Spain) reported efficacy and safety results of salvage HDR-BT in a series of 96 patients treated between 2004 and 2016. The dose administered was 38 Gy, in four fractions of ▼



ALFONSO
GOMEZ-ITURRIAGA

9.5 Gy with two implants spaced two weeks apart. In this retrospective analysis, after a median follow-up of 44 months, the three- and five-year biochemical relapse free rates were 61% and 31% respectively. The five-year local and regional relapse rates were 21% and 16% respectively. The five-year systemic relapse rate was 18%. The five-year disease free survival was 54% and the five-year cancer specific survival rate was 94%. Late genitourinary toxicity rates Grade 3 and 4 were 12% and 2% respectively, including eight cases of prostate necrosis. They concluded that although salvage prostate HDR-BT is an effective modality for local relapse after EBRT, its toxicity is not negligible and proposed a lower total radiation doses and better patient selection based on MRI and PET to avoid over-treatment in metastatic patients.

Another study presented in the proffered papers session reported outcomes after salvage brachytherapy. In this study, Van Son *et al* (OC-0288) from UMC Utrecht (The Netherlands) reported outcomes after MRI-guided focal salvage HDR brachytherapy for recurrent prostate cancer. Sixty-eight patients were included between 2013 and 2017; staging studies included MRI and prostate-specific membrane antigen (PSMA) or Choline PET/

CT. A single dose of 19 Gy was administered after contour adaptation on 1.5T intraoperative MR images with brachytherapy catheters in situ. The median follow-up was 9.5 months. No acute genitourinary (GU) or gastrointestinal (GI) grade 3 toxicity was found. One patient (1.5%) presented with late grade 3 GU toxicity (urethral stricture) at 24 months. Erectile dysfunction remained relatively stable throughout follow-up. There were no significant differences in quality of life (QoL), except for a significant increase in urinary complaints in the first month. Biochemical recurrence occurred in eight patients, and six of the eight patients had metastatic disease on diagnostic images, suggesting that preliminary results in terms of biochemical control are promising, but longer follow-up is warranted.

Also, Noelia Sanmamed *et al.* (PV-0258) from Princess Margaret Cancer Centre, Toronto (Canada) presented an interesting abstract looking at the relationship between doses to the bladder neck (BN) and urinary toxicity. In this study 51 patients were treated with MRI guided HDR prostate brachytherapy followed by EBRT as part of prospective phase II clinical trial. The BN was delineated in retrospect on T2-weighted images by the same radiation oncologist and

reviewed by an independent physician. Acute (≤ 3 months) toxicity and health-related quality of life (HRQoL) data were collected prospectively using CTCAE v.4 and the Expanded Prostate Index Composite (EPIC) respectively. Acute grade 2+ urinary toxicity was observed in 30% of patients. Among those, two patients had acute urinary retention. Although none of the dosimetric parameters was associated with acute grade 2+ urinary toxicity or deterioration of HRQoL, the two patients with urinary retention had a BNDmax in the highest quartile; 28.3 and 26.4 Gy ($>175\%$ of prescription dose). The authors concluded that with the increased use of MRI in brachytherapy treatment planning, it may be worthwhile delineating the BN and paying appropriate attention to doses delivered to this anatomical structure. However, the predictive value of this parameter needs to be validated in larger cohorts of patients.

The Mount Vernon Cancer Centre, London (UK), presented one of the most provocative abstracts. In this abstract, Hannah Tharmalingam *et al.* (OC-0285) evaluated the benefit of pelvic irradiation in patients with intermediate and high-risk prostate cancer. Data from a national UK database of patients treated with EBRT and HDR brachytherapy were reviewed. ▼

From 2009 to 2013, 755 patients with intermediate- and high-risk prostate cancer (clinical stage \geq T2b or Gleason score \geq 7 or presenting prostate-specific antigen (pPSA) \geq 10) were treated in a UK national protocol with EBRT and HDR brachytherapy. Whole pelvis EBRT, including the pelvic nodes to the level of the common iliac chain, was given to 370 patients to a dose of 46 Gy in 23 fractions and radiotherapy to the prostate only (PORT) was given to 385 patients to a dose of 37.5 Gy in 15 fractions. HDR brachytherapy 15 Gy single dose was given to all cases. Ninety-six per cent of patients received androgen deprivation therapy (ADT) with a median duration of 24 months. After a median follow-up of 4.5 years, the five-year biochemical progression-free survival rates for the whole pelvic radiotherapy (WPRT) versus the PORT arms were 88% versus 80% ($p < 0.05$) for all patients and 89% versus 76% ($p < 0.05$) for high-risk patients. Differences in biochemical progression-free survival (bPFS) remained significant ($p < 0.05$) after accounting for Gleason score, presenting prostate-specific antigen (PSA), T stage and ADT duration as covariates. There was no difference in overall survival. WPRT resulted in increased acute GU toxicity ($p = 0.03$) but not acute GI toxicity ($p = 0.06$). No difference in late radiation toxicity was observed. The

PIVOTAL boost trial in the UK will assess this further in a prospective randomised study.

Another interesting theme covered in the ESTRO 37 meeting was the single fraction HDR monotherapy topic. The group from the Cruces University Hospital, Bilbao (Spain) presented the clinical outcomes of their prospective phase II trial of single fraction HDR brachytherapy monotherapy. In this study Alfonso Gomez-Iturriaga *et al* (OC-0286) reported prospective data from 44 patients with low- and intermediate-risk prostate cancer. All patients were treated with a real-time MRI-TRUS fusion BRT-HDR technique. Treatment was delivered using ^{192}Ir to a dose of 19 Gy prescribed to the prostate, no margins were applied. The median follow-up was 27 months. The PSA nadir was reached at 12 months follow-up, with a median value of 1.22 ng/mL. Twenty-one out of the 32 patients (65.6%) with at least 24 months of follow-up, presented a rising PSA at last follow-up. To date, 11 patients (25%) have experienced biochemical failure. Restaging mpMRI showed local relapse/persistence in 20.5% of patients. MRI-TRUS fusion biopsy showed histologically confirmed local relapse in the same location of the dominant lesion in 13.6% of patients. The authors concluded that PSA nadir values,

PSA kinetics after treatment and the number of patients experiencing biochemical and local failure, demonstrate that single fraction 19 Gy real-time TRUS-guided HDR-brachytherapy is not as effective as other established therapeutic options for low and intermediate-risk prostate cancer such as LDR brachytherapy or multi-fraction BRT-HDR monotherapy.

Furthermore, the topic of single fraction for prostate cancer was also commented on the symposium 'What is the limit of hypofractionation?'. In this event, Pierre Blanchard from Institute Gustave Roussy, Villejuif (France) discussed the evidence for hypofractionation (moderate hypofractionation with EBRT and extreme hypofractionation with SBRT). He also discussed the disparate results of the single fraction HDR monotherapy, with data from Morton, Prada and Gomez-iturriaga showing high rates of biochemical failure versus the results from Hoskin showing excellent rates of biochemical control with the same fractionation. In this regard, one group is investigating the single fraction with SBRT 24 Gy (Greco *et al.* PV-0621).

A very interesting symposium, 'Prostate brachytherapy: LDR seeds versus HDR ▼



monotherapy, debated differences in dosimetry, planning and equieffective dose (Annette Haworth, University of Sidney, Australia), long-term data of LDR brachytherapy (Stefan Machtens, Gladbach, Germany), and long-term evidence of multi-fraction HDR monotherapy (Yasuo Yoshioka, Cancer Institute Hospital of JFCR, Tokyo, Japan). Finally, an ongoing randomised control trial comparing HDR single fraction 19 Gy versus LDR prostate brachytherapy was presented by Peter Agoston from the National Institute of Oncology, Budapest (Hungary).

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Brachytherapy physics

The main topic within the brachytherapy physics strand at ESTRO 37 was quality assurance of treatment. The strand opened with a symposium session dedicated to this topic. The session began with Una Findlay from Public Health England (PHE), UK, who gave a talk on the importance of reporting incidents and near misses as a tool for learning and improving treatment. The presentation was based on the experience in the UK, where a national reporting and learning system for radiotherapy was initiated in 2003. Una presented results from the past nine years. Over this time PHE has received 276 incident reports in brachytherapy (and more than 40,000 in total), with most reports relating to initial positioning of applicators or sources.

The second talk featured an overview of the latest developments within *in vivo* dosimetry for brachytherapy from Jacob Johansen from Aarhus University, Denmark. Jacob began by presenting results from a number of clinical studies, showing the current limitations with *in vivo* dosimetry based on total point dose measurements. After this, he presented the latest developments on active dosimeters for *in vivo* dosimetry. It is clear that active dosimeters, besides providing real-time dose information, can be used to track the source directly with high precision. This enables

potential incidents relating to positioning of the applicators or sources to be identified.

The session closed with a talk by Frank-André Siebert from University Hospital Kiel, Germany, who focused on what he termed the first part of the chain, pre-treatment quality assurance. The talk highlighted three of the current areas of focus within the Groupe Européen de Curiethérapie (GEC)-ESTRO (GEC-ESTRO) working group, BRAPHYQS. The first area of focus is the work on establishing guidelines for calibration of low dose rate (LDR) seeds in clinics, including a 5% threshold for acceptance in deviation between measured and reported dose rate. The second part of the presentation concerned the quality of treatment planning. A newly established BRAPHYQS working group will look at deviations between the established treatment planning systems, which are based on the TG43 formalism, and systems using a model-based dose calculation algorithm (MBDCA). The talk ended with a discussion of the importance of continuous quality assurance of ultrasound systems.

The second session on brachytherapy physics was a proffered papers session. The first part of this session also focused on quality assurance, ▼



JACOB G JOHANSEN

with four talks presenting different ways of ensuring a proper treatment. The first talk was from Ellis Beld from University Medical Centre Utrecht, The Netherlands, who presented results from initial phantom studies for MR-guided high dose rate (HDR) brachytherapy. Ellis showed how they were able to correct for the artefacts stemming from the metal composition of the source, leading to a positional accuracy of 0.4-0.6mm with a temporal resolution of around one second.

This talk was followed by a presentation on a clinical study with flat panel detectors for source tracking given by Maximilian Hanlon from RMIT University, Melbourne, Australia. Maximilian gave a detailed illustration of one way of using *in vivo* dosimetry for source tracking as discussed during the symposium by Jacob Johansen. This included a discussion of the necessity of using imaging to link the anatomy of the patient to the detector and reconstructed source positions.

Source tracking was also the topic of the third presentation, which was given by Karoline Kallis from University Hospital Erlangen, Germany. She presented results from a study where electromagnetic tracking (EMT) was used to check the position of the catheters in the treatment of breast

cancer. Results from phantom measurements and post-treatment studies were presented showing a high positional resolution, low additional workload and even identification of incidents in the post-treatment study. The last talk on quality assurance was given by Gustavo Kertzsch from MD Anderson Cancer Center, Houston, USA, who presented the benefits of using inorganic scintillators for *in vivo* dosimetry. A comparison between different types of scintillators was presented showing up to a factor of 1,000 improved signal for some inorganic scintillators (ZnSe:O and CsI:Ti) as compared to plastic scintillators. The improved signal reduces stem effect to a negligible level and enables a signal-to-noise ratio of less than 0.2% without sophisticated read-out equipment.

The last part of the session focused on ways to improve the quality of treatment. Gabriel Famulari from McGill University, Montreal, Canada, presented a novel concept of treatment delivery with intensity modulated brachytherapy (IMBT). The system was designed to work with the currently available afterloaders combined with a dynamic source shield. The assembly consisted of a small platinum shield on one side, which can reduce the radiation from a Yb source by 75%, while still fitting in a treatment

needle. The direction of the shield was controlled by a rotating mechanism mounted at the needle connection. Examples were presented of treatments where dose to urethra or rectum was reduced without a reduction to the prostate.

The next presentation was given by Laura van Heerden from Academic Medical Centre Amsterdam, The Netherlands. Laura presented a study on deformable image registration for cervical cancer patients treated with combined external beam radiation therapy (EBRT) + brachytherapy (BT). They tested whether deformable registration is necessary or if assuming a uniform distribution from EBRT is sufficient for assessment of the total EBRT+BT dose. For EBRT dose calculation the delivered dose was used from daily cone beam (CT) data. The study involved ten patients, and no significant deviations between the methods were seen with a maximum deviation of 3.7% for D2cm3 of both the bladder and rectum.

Professor Annette Haworth from The University of Sydney, Australia, concluded the brachytherapy physics strand of ESTRO 37 with a talk on the BiRT project. The aim of the project is to improve the localisation of the tumour and target volumes for prostate cancer by using radiomics based ▼



on parametric and pharmacokinetic maps from dynamic contrast-enhanced (DCE) MRI. The method was tested and showed an accuracy of up to 87.1%. Furthermore, the method was able to distinguish between different low and high-grade tumours.

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[Read the interview with Dimos Baltas, course director, in the School Corner on page 114 >](#)

A graphic for the ESTRO School 2018 event. It features a purple and white geometric design with the year '2018' and the text 'ESTRO School'. Below this is a photograph of the Valencia Cathedral. The event title 'Advanced brachytherapy physics' and dates '7-10 October 2018 | Valencia, Spain' are displayed in white text on a purple background. A dark purple box highlights the 'Early registration deadline: 9 July 2018'. At the bottom, a link to an interview with Dimos Baltas is provided.

Breast brachytherapy

There were several interesting presentations about breast brachytherapy at ESTRO 37. One of the most important was a paper selected in the highlights of proffered papers, about quality of life in patients that participated in the European randomised study on partial breast irradiation (APBI), given by Rebekka Schäfer on behalf of the breast group at Groupe Européen de Curiethérapie (GEC)-ESTRO. Published in *Lancet Oncology*, the results show that APBI with multicatheter brachytherapy was not associated with worse quality of life compared to whole-breast irradiation. These findings support APBI as an alternative treatment option after breast-conserving surgery for patients with early breast cancer.

The abstracts selected for oral presentations were almost all about APBI. Results from Gliwice, Poland, presented by Sylwia Kellas-Slecza, with a median follow-up of 87 months, showed no late serious complications and a failure rate of 1.83% (three local recurrences and one case of distant metastases). Interestingly an abstract from Nice, France, presented by Rémy Kinj about APBI with a single fraction of 16 Gy high dose rate (HDR) brachytherapy in the elderly, showed excellent results: with a median follow-up of 40 months, the rate of local relapse was 3.8%, no \geq G3 late toxicity was observed and the rate of excellent

cosmetic outcome was 75.4%. In addition, results from ICO Barcelona, Spain, presented by Maria Laplana, with a follow-up of 62 months, showed local control at five years was 98.8%. She also presented their results on second conservative treatment with APBI as part of the rescue.

The other two oral presentations were also about secondary conservative treatments with APBI: one from Turin, Italy, presented by Ciara Cavallin, won the GEC-ESTRO Best Junior Presentation award, sponsored by Elekta. The other, presented by Lucile Montagné, from Nice, analysed the impact of the GEC-ESTRO APBI classification for this secondary radiotherapy. Both concluded that a second conservative strategy, using lumpectomy followed by interstitial brachytherapy HDR is a feasible treatment and may represent a valid alternative to salvage mastectomy, offering very low complication rates and good cosmetic results, provided strict selection criteria are used for patient selection.

The GEC-ESTRO APBI criteria is a very helpful decision tool to discuss conservative or radical treatment options. Only one oral presentation dealt with administering the boost with brachytherapy: Jose Luis Guinot from Valencia, Spain, explained their experience with HDR ▼



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brachytherapy boost for ductal carcinoma *in situ* (DCIS) of the breast with close or positive margins, and concluded that although the treatment of patients with DCIS with positive surgical margins is usually re-excision, when this option is rejected, there is an alternative treatment, involving whole-breast irradiation (WBI) plus HDR-BT boost to the tumour bed. In cases of DCIS with close margins, his approach achieved a 100% local control rate at ten years.

The rest of the presentations were posters, most about APBI. One poster presented by Tabassum Wadasadawala from Mumbai, India, concerned cosmetic results after APBI, involving a comparison of subjective and objective assessment of cosmetic outcomes following breast brachytherapy. The results showed a 68.3% agreement in the physician-rated subjective and objective methods of assessment of overall cosmesis.

Quality of life was another important issue in APBI: Marina Arangüena Peñacoba from Santander, Spain, presented their results using Breast Q questionnaires. The results showed that patients treated with APBI had higher levels of satisfaction with the treated breast, better psychosocial, sexual and physical wellbeing and a lower ratio of adverse effects of radiation than

those who received external beam radiation therapy (EBRT).

Lurdes Trigo from Porto, Portugal, reported the long-term experience, treating some patients for up to 13 years. With a median follow-up of 59 months, no loco-regional relapses were documented. In another poster, Johann Tang from Singapore showed how to use a decision board to evaluate a patient's choice when choosing multicatheter APBI. In the physics field only the poster from Kazunori Miyaura, from Showa University, Tokyo, was presented. They investigated dose volume histogram (DVH) parameters for accelerated partial breast irradiation using SAVITM (strut-adjusted volume implant) and concluded that although deviations in dose constraints were observed in several cases, achievement of dose constraint in SAVI devices was good in most cases.

There was only one poster about using HDR boost, titled 'Adjuvant hypofractionated breast IMRT plus brachytherapy boost for ductal carcinoma in situ'. It was presented by Ana Aurora Diaz Gavela from Hospital Quiron Madrid, Spain, and the results seem to be safe and effective, with low rates of local relapses and side effects.

On the non-clinical side of things, there was a poster concerning the use of a subcutaneous spacer for skin protection during breast brachytherapy, a pilot study on mastectomy specimen, presented by Gerson M. Struik, from Erasmus MC Cancer Institute, Rotterdam, The Netherlands. It was a study on the feasibility of an ultrasound-guided spacer injection, performed on fresh mastectomy specimens. Two products were tested: hyaluronic acid gel and iodined polyethylene glycol (PEG). The results confirm that a spacer of at least 5mm reduces skin dose dramatically and this may reduce the long-term skin toxicity for breast brachytherapy patients.

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Do not miss the GEC-ESTRO breast working group: five-year results of a randomised, phase 3 trial, in the Read it Before Your Patients Corner on page 9 >



Gynaecological brachytherapy

At ESTRO 37, seven papers on different aspects of image-guided adaptive brachytherapy (IGABT) for gynaecological malignancies were presented during the proffered papers session.

Henrike Westerveld from Amsterdam, The Netherlands, presented the results of a multicentre international retrospective study on IGABT for vaginal cancer on behalf of the Groupe Européen de Curiethérapie (GEC)-ESTRO gynae working group. This is, to date, the largest published series, reporting on 148 patients treated with CT or MRI-based IGABT with or without concurrent chemotherapy. The majority of patients were treated with pulsed dose rate (PDR) (78%) and a combined intracavitary / interstitial approach (55%). The results were favourable, compared to the conventional brachytherapy results, with three- and five-year local control, disease-free survival and overall survival of 84% and 82%, 69% and 65%, and 75% and 68%, respectively. With the median doses of 64 Gy, 63.5 Gy, 48.6 Gy and 48.9 Gy to the 2cm³ of the bladder, rectum, sigmoid and bowel, respectively, the combined crude grade 3-4 bladder and bowel morbidity was 10.8%, while grade 3-4 vaginal morbidity was 9.5%. Local control was significantly better in patients with

T2-4 tumours, who received more than 80 Gy to the clinical target volume (CTV). A common target volume concept is needed to further improve our understanding of the dose-volume relationships and the outcomes of these patients.

The objective of the second paper, presented by Lars Fokdal from Aarhus, Denmark, was a descriptive analysis of grade 3-4 ureteral strictures following IGABT of locally advanced cervical cancer (LACC) within the RetroEMBRACE and EMBRACE studies and to investigate the risk factors for ureteral stricture. The outcomes of 1,860 patients were analysed. With six patients being censored due to baseline (BL) stricture, persistent or recurrent disease and downgrading of the morbidity, there were 32 patients with grade 3-4 ureteral strictures and a median follow-up of 34 months left for analysis. In most patients the stricture was treated with a nephrostomy (50%) or ureteral stenting (25%). In total, 16% had a nephrectomy due to a non-functioning kidney; ureteral re-implantation, major pelvic surgery or a Bricker conduit were each performed in 3% of patients. In multivariate analysis, T-stage 3-4 with BL hydronephrosis was the only significant risk factor, with an 11.5% risk for ureteral stricture at five years. In general, ▼



BARBARA ŠEGEDIN

the risk of severe or life threatening ureteral stricture after IGABT for LACC is low.

Monica Serban from Aarhus presented a paper which showed that the use of IGABT together with a combined intracavitary / interstitial (IC/IS) approach for LACC leads to improved dose conformity and reduction of the isodose surface volumes (ISVs), compared to standard applicator loading. In total, 1,201 patients accrued in the EMBRACE study were analysed, and their treatment plans were compared to the 85, 75 and 65 Gy EQD2 point-A prescribed plans, created for the purpose of the analysis. Median EQD2₁₀ V85 Gy, V75 Gy and V60 Gy were strongly dependent on CTV_{HR} size, showing individual dose adaptation according to tumour size. Median V85 Gy was 24% smaller in the actual treatment plan, compared to the standard 85 Gy point-A prescription. Thirty-seven per cent of patients were treated with ISVs similar to the standard applicator loading; in 42% the treated V85 Gy was smaller and in 21% the treated V85 Gy was larger, to ensure adequate coverage of the target volume. The conformity was better in the tandem and ring (T&R) applicators, compared to the tandem and ovoids (T&O), with the conformity index 23% and 16% smaller in the T&R in the IC/IS and IC groups, respectively. As

expected, the conformity was better in the IC/IS compared to the IC group regardless of the applicator type.

Sophie Bockel from Paris, France, presented a single centre study that aimed to examine the correlation between late bowel toxicity, including diarrhoea, flatulence, abdominal pain, obstruction, stenosis and bowel fistula, and total reference air kerma (TRAK) in patients treated with PDR IGABT for LACC. The data from 260 patients were analysed. These patients were treated with at least 60 Gy D90 to CTV_{IR}, with D2cm³ below 70-75 Gy for the sigmoid, and no dose constraint applied to the small bowel loops. Late bowel toxicity grade ≥ 2 occurred in 21.5% of the patients after a median follow-up of five years. The mean TRAK was 1.7c Gy at 1m. In multivariate analysis, smoking and TRAK > 1.8c Gy at 1m were significantly associated with higher probability of bowel toxicity grade ≥ 2 , with a HR=6.45 (95% confidence interval:1.22-34.19). The authors concluded TRAK was predictive of late bowel toxicity grade ≥ 2 , so integral dose should be considered in addition to D2cm³ dose constraints even in the IGABT era.

In the next talk, Sylvain Reuzé from Paris presented a retrospective study that aimed to

identify a radiomic signature of LACC recurrence based on fast-spin echo T2 (FSE T2) MRI at the time of brachytherapy with a vaginal mould in situ. FS T2 MRIs of 100 patients with LACC were analysed in two groups, 60 for training and 40 for validation. Eleven groups of highly correlated features were identified using LIFEex freeware and four features were shown to highly correlate with CTV_{HR} size. Therefore, the clinical analysis was carried out on 24 robust features in nine groups and identified a five-features signature, significantly related to relapse of LACC. With this study a methodology for prediction of LACC recurrence was proposed, but the method needs to be validated in an external cohort before clinical use for treatment personalisation is considered.

In the last talk of the session, Michael Milosevic from Toronto, Canada, presented a study that evaluated the cost versus utility of best practice MR-guided compared to CT-guided IGABT for LACC in Ontario, Canada. A four-state Markov model was used with a five-year time horizon. Treatment effectiveness was expressed as quality adjusted life years (QUALY), while the costs were expressed in Canadian dollars. ▼

The effectiveness ratios of MR IGABT were 0.36 and 0.44 QALY per patient in the entire population and the high-risk group, respectively. At the same time, the incremental cost savings were \$1,373 and \$2,080 per patient for the same groups of patients, respectively. For the low-risk sub-group MR IGABT was more effective, but also more expensive than CT IGABT. The results of this study provide sufficient evidence that MR IGABT is cost-effective in high-risk patients, and is also justified in all LACC patients. The authors conclude that for widespread implementation of MR IGABT, an allocation of the resources will be needed from treatment of recurrences to primary treatment. Therefore, the results of this study can be drawn on by policy makers as guidance for the required investment in human resources and infrastructure to secure the availability of this treatment for all patients with LACC in the region.

Together, the papers presented during this session provide further evidence for the safety, efficacy and cost-effectiveness of IGABT for LACC. With a greater chance of identifying patients with higher risk of recurrence, further individualisation of treatment is on the horizon. One possibility in the future is to introduce target volume concepts for other gynaecological

malignancies and we look forward to the presentation of a common target volume concept for vaginal cancer at ESTRO 38 in Turin.

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In memory of Peter Levendag 1949-2018



Peter Levendag died in his beloved Caribbean on Friday 8 June 2018. Despite the fact that he had been ill for some time, his death, and the sense of loss that goes with it, still comes as a shock.

Peter leaves behind a saddened family and a large group of former colleagues and friends who will remember him as an exceptionally gifted doctor, but above all, as a very good friend, who was generous, kind, full of humour and always willing to offer help and advice.

Peter Levendag was born on 1 June 1949 in Bandung, Indonesia. He spent most of his childhood on the Dutch island of St Maarten in the Caribbean.

After finishing medical school in 1975, he specialised to become an ear, nose and throat (ENT) surgeon. He finished this training in 1980. After this, Peter became a resident in radiotherapy, completing training in this field in 1985.

That year, after a fellowship at Memorial Sloan Kettering Cancer Center in New York, USA, he started working as a radiation oncologist at the Department of Radiotherapy in the former Daniel den Hoed Cancer Centre of Erasmus MC, Rotterdam, The Netherlands. In 1990 he became chair of the department.

Peter was especially devoted to head and neck oncology and was a leading physician in ENT brachytherapy internationally. He was an eminent scholar and authored numerous articles and

books that have become standard texts in the profession. Peter was also dedicated to image-guided, 4D radiotherapy and was the first to use the Cyberknife® in the European academic world.

Peter was the driving force behind the establishment of the Radiotherapy Institute Suriname (RTCS) in 2010, which is still the most modern irradiation facility in the Caribbean.

He was knighted in The Netherlands and has received the highest Suriname civilian award.

Peter was a leading member of ESTRO, the American Society for Radiation Oncology (ASTRO), Groupe Européen de Curiethérapie (GEC)-ESTRO and Dutch Society of Radiotherapy and Oncology (NVRO). In 2015 he received the GEC-ESTRO Iridium award for his lifetime's achievements.

Partly due to his debilitating health, Peter retired in 2013 as head of the radiotherapy department at the Erasmus MC and left for St Maarten, the island of his youth.

It was an honour and a privilege to have known Peter and to have worked with such an inspiring and great man.

A memorial ceremony will be held on St Maarten. Our thoughts are with Peter's family and close friends.

*Manouk Olofsen, Luca Incrocci and John Praag
Former colleagues and collaborators at the Erasmus MC*



“It is with deep sadness that we heard of the death of Professor Peter Levendag. Peter, an ear, nose and throat (ENT) surgeon and radiation oncologist, was a prominent proponent of brachytherapy. His career was spent mainly at the Erasmus Medical Centre, Rotterdam, The Netherlands, and he was internationally known in the field of head and neck cancer.

His work in brachytherapy resulted in developments that are still visible today. Examples include the development of the Rotterdam nasopharyngeal applicator and the introduction of pulsed-dose rate brachytherapy in head and neck cancer. For his dedicated commitment to brachytherapy and the Society he was awarded the Groupe Européen de Curiethérapie (GEC)-ESTRO Iridium award by ESTRO in 2015. He was also decorated as Officer in the Order of Oranje-Nassau by the King of The Netherlands in 2014.

With Peter’s death the brachytherapy community has lost a visionary man whose ideas and contributions to the field will survive him for many years to come.

Our thoughts and sympathies are with Peter’s family and friends.”

*Bradley Pieters, Christian Kirisits, Ina Jurgenliemk-Schulz and Taran Paulsen-Hellebust
On behalf of the GEC-ESTRO Committee*

“We have lost a good friend and brilliant physician devoted to patients and science”

*Eduardo Rosenblatt, radiation oncologist,
Monserrat, Valencian community, Spain*

“I am very sorry to hear of Peter’s death. His work was very helpful in my understanding of head and neck cancer radiotherapy. He was a kind, pleasant gentleman and I enjoyed meeting him at the ASTRO annual meetings”

Matthew Katz Lowell, MA, USA

“Peter was instrumental to the progress we made in Rotterdam. We will miss his visionary views and direct approach to translational research”

Maarten Paulides, Associate Professor at Erasmus MC (Radiotherapy Rotterdam, The Netherlands

“Peter was a friend and distinguished colleague. He will be missed”

Ismail Kazem

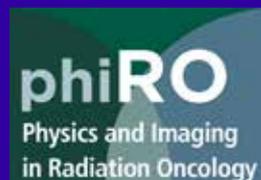
“Peter was a great teacher with a great sense of humour”

*Adela Poitevin Medica sur, SOMERA,
Mexico City, Mexico*



PHYSICS

“Is this still science fiction or is it now entering clinical practice?”



Call for submissions of papers to *phiRO* on: **Imaging for radiotherapy of prostate cancer.**

Deadline: 1 September 2018

www.phiro.science >

Dear colleagues,

Welcome to the latest edition of the Physics Corner. We start with an interview with Núria Jornet, the chair of the physics committee. She outlines plans for the second ESTRO physics workshop: ‘science in development’, which is very focused on discussions and interaction. It is not actually a single workshop, but five running in parallel, with different topics. Curious? Read the interview to see if there is something for you. We hope to see you in Malaga, Spain, this October.

We also have something new in this edition. For our review of ESTRO 37 in Barcelona, we have asked two ESTRO members to provide their impressions of this year’s conference. Marta Gizynska, a PhD student and resident from Poland, and Tobias Gauer, a medical physics research director from Germany, share their perspectives with us. What did they think? Do you agree? Find out what they would change if they were the chair of the physics track. And if you are interested in sharing your views next year, let us know, and you could become one of next year’s ESTRO conference reporters.

That’s not all. Daniela Thorwarth and Wouter van Elmpt provide a report on the ESTRO 37 physics symposium ‘Multi-parametric functional imaging for patient classification, radiotherapy personalisation and response monitoring’. Is this still science fiction or is it now entering clinical practice?

We wish you a wonderful summer.

Mischa Hoogeman (m.hoogeman@erasmusmc.nl),
Brendan McClean (Brendan.McClean@slh.ie)
Christian Richter (christian.richter@oncoray.de)



MISCHA HOOGEMAN



BRENDAN MCLEAN



CHRISTIAN RIC R

Interview with Núria Jornet

Chair of the 2nd Physics Workshop

26-27 October 2018
Malaga, Spain



NÚRIA JORNET

The ESTRO physics workshop, ‘Science in development’, was launched last year in Glasgow, Scotland, UK. Were the objectives met and are they likely to change over time?

The physics workshop aimed to create a platform to facilitate networking among ESTRO members in order to present and receive feedback on new projects, and to discuss clinical practice and reach consensus. We also wanted to engage with industry in a different way to the large commercial exhibitions, involving them in scientific discussions, which could help to better align their developments to the needs of the radiation oncology community. The feedback from participants suggests the main objectives were fully met. The physics committee also feels that it was a real success and wishes to continue this new meeting format with a second physics workshop on ‘science in development’.

The physics committee believes that the format and objectives should remain the same. The aim is to have specialised, small forums, with a maximum of 50 people each, where projects at an initial stage or clinical practice can be discussed, and where collaboration among institutions and professionals at an international level can be initiated.

At the next workshop I would like to see good discussions and new networks being formed. After the workshop and for others in the future, I would like to have suggestions from the ESTRO’s physics community for possible future topics, and also new topic leaders. This is crucial

to maintaining the momentum that we have achieved up to now.

Were there any tangible outcomes from the first workshop?

Of course. A few examples include: the establishment of a working group currently working on a white paper ‘*In vivo* dosimetry in external beam photon and brachytherapy requirements and future directions for research’; the development of clinical practice; a special issue in *PhiRO* on audit methodologies; launching new educational activities, including a pre-meeting course at ESTRO 38 on deep learning for automation in radio-oncology; and the creation of discussion forums on the ESTRO Moodle platform.

You are getting ready for the second workshop in Malaga, Spain. Has anything changed?

The main format will remain the same as Glasgow. However, there will be some improvements for the wrap-up session and for the participation of industry, which will be more in line with the workshop topic and also, we hope, more integrated in the discussions.

How were the topics for this second workshop selected?

We had a round of suggestions from ESTRO medical physicists. After collating the proposed ▼

topics, we sent a survey to all medical physicist ESTRO members to assess their preferences and to ask whether they were willing to contribute to the selected theme or if they knew any active group in their country working on any of the themes. We were also determined to achieve a real diversity in our final selection of topics.

Who is the target audience?

All medical physicists and scientists, as well as industry developers interested in the topics.

What should first-time participants expect from the workshop in Malaga? What about those attending their second workshop?

For first timers, a lot of networking opportunities and an excellent forum for exchange of opinions. For the workshop to be a success we need participants to share their opinions, and to engage actively with each other and the discussions.

To those coming back for the second time, they already know what to expect. We hope that they will contribute to the meeting, being key actors in making the workshop a success.

*Núria Jornet
Chair of the ESTRO physics committee
and of the 2nd Physics Workshop*



Science in development

**26-27 October 2018
Malaga, Spain**

REGISTRATION IS OPEN

**DEADLINES
Early registration:
21 August 2018**

No onsite registration.

Please note that as the month of October is still 'high season' in Malaga, hotels may book up very quickly.

www.estro.org

REPORTS FROM THE PHYSICS TRACK AT ESTRO 37



Multi-parametric functional imaging for patient classification, radiation therapy personalisation and response monitoring ▶▶

Feedback from members:

- Tobias Gauer ▶▶

- Marta Gizyńska ▶▶

Multi-parametric functional imaging for patient classification, radiation therapy personalisation and response monitoring

SYMPOSIUM

Chairs: Daniela Thorwarth (Germany), Wouter Van Elmpt (The Netherlands)



DANIELA THORWARTH



WOUTER VAN ELMPT

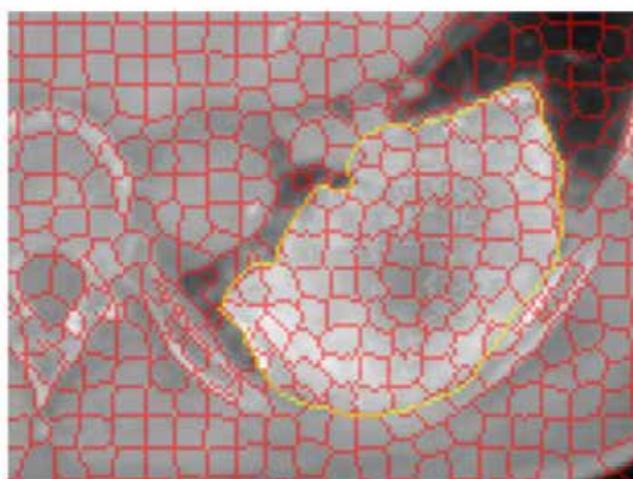
At this year's ESTRO 37 a physics symposium offered insights into 'Multi-parametric functional imaging for patient classification, radiation therapy personalisation and response monitoring'. In a well-attended symposium, the three speakers gave presentations focused on different aspects of this complex topic.

First, Dr Wouter van Elmpt (Maastricht, The Netherlands) discussed different methods for analysing multi-parametric (mp) imaging data from various sources, such as computed tomography (CT), magnetic resonance imaging (MRI) and positron emission tomography (PET). He pointed out that depending on the aim of the study, mp analysis could be carried out at a population level, as a volume analysis or even on a voxel level, with advantages and disadvantages associated with each approach. He also discussed results from his own group, where mp imaging data from dynamic contrast enhanced (DCE) CT in addition to fluorodeoxyglucose (FDG) and HX4 PET were used for a clustering approach using 'supervoxels' (see figure) to stratify patients into different risk groups (Even AJG, *et al. Radiother Oncol* 2017). He presented a study where mp imaging was used to predict hypoxia information on a voxel level (Even AJG, *et al. Acta Oncol* 2017).

The second talk, given by Dr Ghazaleh Ghobadi (Amsterdam, The Netherlands), focused on strategies to individualise radiotherapy treatment plans based on mp imaging information. Dr Ghobadi presented data from the FLAME trial, which showed that mp MRI can be used to safely apply personalised radiotherapy using dose painting (Dinh CV, *et al. Phys Med Biol* 2016). However, even though imaging information may be very similar, the underlying microarchitecture and structure can be very different, leading to different levels of radiation sensitivity. Dr Ghobadi discussed results of a study performed in her group where pathology samples were used to calibrate a model that predicts Gleason scores in prostate cancer based in mp MRI data (Ghobadi G, *et al. Radiother Oncol* 2017). The resulting Gleason maps can then be used to guide dose modulation for radiotherapy dose painting treatment planning.

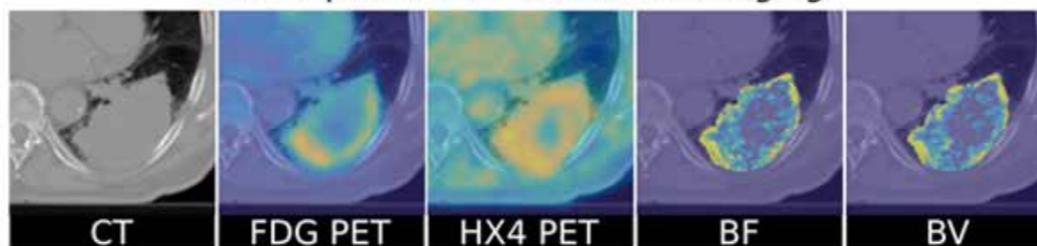
The third presentation was given by Professor Eirik Malinen (Oslo, Norway), who discussed the use of mp imaging for outcome assessment and response monitoring. He gave a comprehensive overview of different research studies where mp imaging had been used for outcome assessment after radiotherapy in various different tumour entities. Prof Malinen also presented results ▼

Supervoxels: clusters of voxels



- Oversegmentation of the tumour
 - Homogeneous patches
 - Clustering based on k-means (SLIC)
- Achanta, IEEE Trans Pattern Anal Mach Intell. 2012

Multi-parametric functional imaging



from studies at Oslo University where mp DCE MRI was used to stratify patients according to treatment outcome. Kinetic analysis of the dynamic MRI data was used to generate mp data, which in a second step were used to distinguish three clusters in the tumours according to different DCE MRI parameters, where one cluster was shown to be associated with outcome (Halle C, *et al. Cancer Res* 2012). An alternative strategy was discussed where DCE raw data were directly used to cluster tumour voxels (Thorheim T, *et al. Acta Oncol* 2016).

Overall, this symposium provided a useful summary of the different methods that can be used to analyse and process mp imaging data in radiotherapy. It also featured a comprehensive overview of the potential of using mp imaging for radiotherapy outcome prediction, treatment personalisation and response assessment. The imaging and analysis techniques are now becoming mature enough to take the studies to the next level of clinical investigation by linking the various modalities to treatment outcome predictions. This is a long-awaited step in which we can use non-invasive biological imaging information to support the personalisation of treatment. Academic centres are now ▼

Figure 1: Example of the supervoxel concept presented during the symposium for a new way of analysing sub-structures inside tumours for multi-parametric imaging. More information in Even AJG, *et al. Radiother Oncol* 2017.

presenting the results of the first clinical trials where mp imaging is the basis of treatment adaptation. Examples include the FLAME trial for prostate cancer, but also hypoxia imaging in lung, head and neck and cervical cancer is expected to provide promising avenues to explore further.

Thank you to all three speakers.

*Daniela Thorwarth
Eberhard Karls University
Tübingen, Germany*

*Wouter van Elmpt
Maastricht University Medical Centre
Maastricht, The Netherlands*



Physics for modern radiotherapy

A joint course for clinicians and physicists

9-13 September 2018 | Budapest, Hungary

This course will provide medical physicists and clinicians with the tools and techniques for safe and effective radiation treatments. All major physics topics are covered through lectures and case discussions.

LEARNING OUTCOMES

By the end of this course participants should be able to:

- Apply, together with the treatment team from their department, modern physics principles and techniques in clinical practice
- Discuss and select modern treatment techniques based on their pros and cons
- Select physics and technical measures that enhance accurate and safe application of radiation therapy.

www.estro.org/school >

Feedback from members on ESTRO 37

Tobias Gauer, medical physicist



TOBIAS GAUER

Please tell us about your professional background

I studied physics with subsidiary courses in radiation physics, radiation biology and economics at the University of Hamburg, Germany. Following my PhD, I worked for the International Atomic Energy Agency's (IAEA) Programme of Action for Cancer Therapy (PACT) in Vienna, Austria. Since 2012, I have been the head of research in medical physics at the radiotherapy department at the University Medical Centre Hamburg-Eppendorf.

What was your motivation for taking part in ESTRO 37?

I've been going to ESTRO conferences for ten years now. They provide a unique opportunity to contribute to the scientific programme and keep up to date with the latest developments in research and clinical affairs, as well as maintaining long-standing relations with colleagues from across Europe.

Were your expectations met?

I prefer to think in terms of appreciation, rather than expectations. It was a wonderful and valuable ESTRO conference from a number of points of view.

Which sessions were highlights for you? What will you tell your colleagues at home about them?

The sessions on clinical research using medical-imaging intelligence, deep learning and radiomics approaches were definitely among my highlights. The rapid increase and range of potential applications of such methods and the optimisation tools now available in this field is impressive. I will tell my colleagues at home that radiotherapy remains innovative, dynamic and technology-driven.

What are the strengths of the ESTRO conference?

As the annual ESTRO conference is constantly evolving, its strengths are changing too. It is a big event with over 6,000 participants and seven sessions running in parallel. Scientific dissemination is increasingly accomplished after the conference, with oral presentations being made available online. At the same time, ESTRO 37 offered an unparalleled opportunity to host project- or topic-specific side events that took advantage of such a large gathering of radiotherapy and oncology professionals. ▼



What could be improved?

According to ESTRO's 'Vision', every cancer patient should have access to state-of-the-art radiation therapy. During ESTRO 37, I was not sure if the exchange of scientific knowledge in standard of care, education and research was sufficiently well-balanced across Europe to achieve ESTRO's vision.

If you were chair of the physics track at ESTRO 38 what would you change?

I would organise joint sessions with physicians and/or radiobiologists on topics of mutual research interest. And I would put more emphasis on lively discussions between speakers and the audience.

How would you rate the importance of these three activities at ESTRO out of a total of 100%:

- a. Scientific presentations?
- b. Networking with colleagues?
- c. Industrial exhibition/talking to vendors?

Scientific presentations: 30%

Networking with colleagues: 50%

Industrial exhibition/talking to vendors: 20%

What would you say to a colleague attending the ESTRO conference for the first time next year?

Get prepared for an exciting event in Milan, Italy.

Tobias Gauer

*Department of Radiotherapy and Radio-oncology,
University Medical Centre Hamburg-Eppendorf,
Hamburg, Germany*



2018
ESTRO School

Advanced brachytherapy physics
7-10 October 2018 | Valencia, Spain

Early registration deadline: 9 July 2018

[Read the interview with Dimos Baltas, course director, in the School Corner on page 114 >](#)

Feedback from members on ESTRO 37

Marta Giżyńska, medical physicist



MARTA GIŻYŃSKA

Please tell us about your professional background

I am a medical physicist working in a hospital in Warsaw, Poland, and have more than 10 years' experience in practice. I am currently finishing my PhD studies at the University of Warsaw.

What was your motivation for taking part in ESTRO 37?

I have attended the ESTRO conference for the past few years. I always find it a good place to share new ideas and feel the enthusiasm of researchers encouraging me to do more than just the routine.

Where your expectations met?

I sometimes find it difficult to introduce new ideas picked up from the conference into my clinical practice. In this respect, I think more could be done at the ESTRO conference to explain how new ideas and research results can be applied in clinical practice.

Which sessions were highlights for you? What will you tell your colleagues at home about them?

I really enjoy and value the conference debates. This year there was a debate focused on the necessity of patient pre-treatment quality assurance. The discussion was very good and necessary. This topic, alongside prospective risk analysis (which was a subject of one of the teaching lectures) is something I'd like to discuss with colleagues at my hospital.

What are the strengths of the ESTRO conference?

Radiotherapy is a process that depends on many different groups of people including physicians, physicists, radiologists, dosimetrists and radiation therapists (RTTs). I think one of the most valuable aspects of the ESTRO conference is that it provides a place to discuss things from an interdisciplinary perspective, bringing us together in our efforts to treat cancer. There is always a question of balance between research and practical topics at the ESTRO conference. At this conference I found that the practical side was covered mostly by teaching lectures and a few symposiums. Meanwhile, research was widely ▼



discussed during symposia and the sessions with proffered papers.

What could be improved?

As the conference attracts not only researchers but also practitioners, I think it might be beneficial to have more balance between practical and scientific topics. This would make it easier to go back home and apply new findings into everyday practice. During the conference there are normally two or three physicists' sessions taking place at the same time. My suggestion for next year would be to have a survey ahead of the conference assessing interest in the different topics to lower the probability of having to choose between two interesting things happening concurrently.

How would you rate the importance of these three activities at ESTRO:

- a. Scientific presentations?
- b. Networking with colleagues?
- c. Industrial exhibition/talking to vendors?

How you divide your time at an ESTRO conference depends on the presented topics and your personal and professional needs. This year I concentrated on scientific presentations.

I also spent quite a bit of time networking with colleagues. I spent the rest of my time at the industrial exhibition talking with vendors.

Was there a topic that you missed or found underrepresented?

This year I felt that practical dosimetry, with research concentrated on routine work, was a little under-represented although it might be useful for medical physicists.

Was there a topic that you found overrepresented?

It seems to me that radiomics is a hot topic right now, but still a long way from clinical usage. As such, I found it rather over-represented.

What would you say to a colleague attending the ESTRO conference for the first time next year?

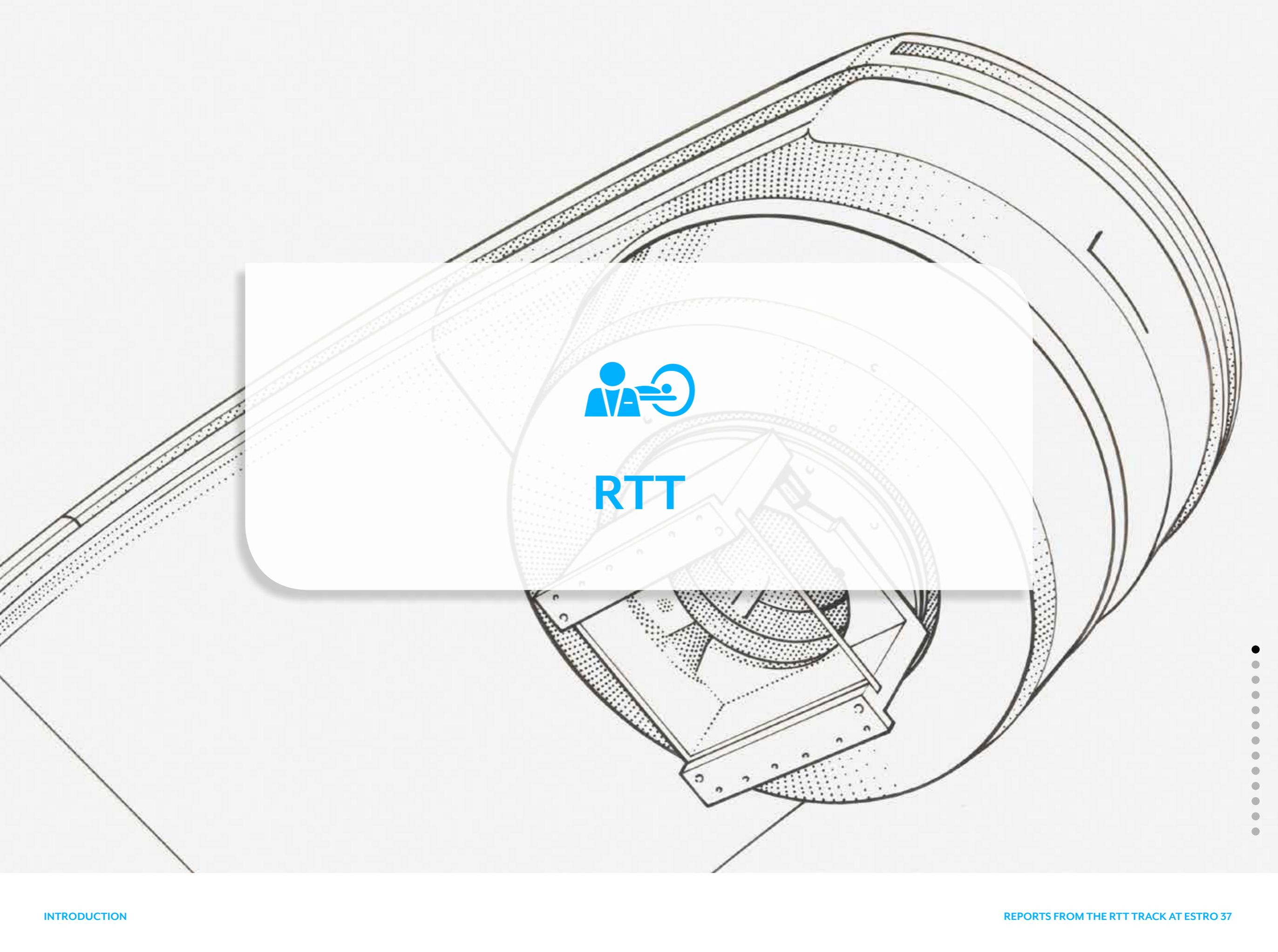
Attending the conference for the first time you have to think about your main interests (research, collaboration, clinical practise, new equipment and solutions). You would not have time for everything (even if you skip sightseeing). To get

the most of out of the conference you have to think carefully about what subjects matter to you.

Marta Giżyńska
Maria Skłodowska-Curie Memorial Cancer Centre and Institute of Oncology
Department of Medical Physics
Warsaw, Poland
 &
University of Warsaw
Faculty of Physics
Department of Biomedical Physics
Warsaw, Poland

2018
ESTRO School

Imaging for physicists
 23-27 September 2018 | Vienna, Austria
www.estro.org/school >



RTT



For those of you who could not attend ESTRO 37, this edition of the RTT Corner summarises some of the interesting oral presentations delivered within the RTT track and pre-meeting course. It's always helpful to revisit discussions that take place during the meeting and reflect on practice within our own institutes.

This year there was a record number of participants, and more than 11% of these were RTTs. This percentage is similar to last year, demonstrating that not only is the overall number of participants increasing, but also the number of RTTs. I have certainly seen an increase in the number of colleagues who are submitting abstracts and also attending the annual conference. This generates discussion within multidisciplinary teams and helps us to improve the research culture across all disciplines.

The session I chaired was the stereotactic radiotherapy and radiosurgery symposium, which included three speakers, presenting three different topics. Yatman Tsang from the UK discussed the rationale and evidence for stereotactic body radiation therapy (SBRT) in the treatment of oligo-metastatic disease. Yatman gave an overview of the recruiting trials and generated discussion around the common difficulties experienced in recruiting patients to such clinical trials.

Mischa Hoogeman from The Netherlands went on to discuss important aspects required in implementing the optimal stereotactic radiosurgery (SRS) service, including margins required to ensure target coverage, the importance of interpreting the ways a dose is described in the literature, and small field dosimetry. The session finished with Sarah Barrett from Ireland who described the evidence base for using SRS in benign intracranial lesions. Sarah gave us an insight into some of the indications suitable for this highly conformal technique and described the RTT role within this specialised patient group.

One of the highlights for me was the RTT 'meet and greet', which was successfully led by Michelle Leech and took the form of a 'speed dating' format. The room was full to capacity with RTTs from across the world who welcomed the opportunity to network with other RTTs. I hope that through the newsletter, we can continue to build this network and raise the profile of the diverse RTT roles across Europe. RTTs are a key component of the multidisciplinary team who contribute to the management of oncology patients, and we would welcome hearing more about what you do.

Please get in touch and let us know if you would like to share your experience with us.

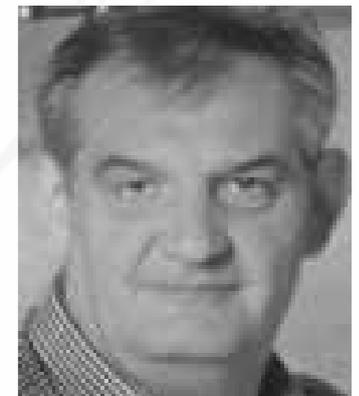
Aileen Duffton, member of the RTT committee



AILEEN DUFFTON



ISABEL LOBATO



ILIJ ČURIĆ

—

“This year there was a record number of participants, and more than 11% of these were RTTs”

—

REPORTS FROM THE RTT TRACK AT ESTRO 37



Clinical implementation and use of MR imaging in external beam radiation therapy ▶▶

Image-guided radiation therapy (IGRT), image-guided adaptive radiation therapy (IGART) and surface-guided radiation therapy (SGRT) ▶▶

Patient involvement and shared decision-making ▶▶

Patient-centred care and monitoring side effects: review clinics and follow ups ▶▶

Treatment planning and quality assurance ▶▶

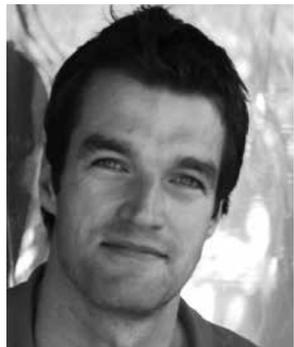
Brachytherapy – RTT advanced roles ▶▶



Clinical implementation and use of MR imaging in external beam radiation therapy

PREMEETING COURSE

Course directors: Martijn Kamphuis and Jeroen Smienk (The Netherlands)



MARTIJN KAMPHUIS

Together with Jeroen Smienk (UMC Utrecht, The Netherlands), I had the privilege of being course director of the RTT pre-meeting course at ESTRO 37 in Barcelona. The aim of the course was to provide an overview of the current and future role of MR imaging in radiotherapy. Furthermore, we wanted to explore how to implement MR imaging into external beam radiation therapy in the clinic.

The topic was chosen because there are a lot of departments who are currently converting (CB) CT-based treatment into MR-guided treatment preparation and even delivery. This topic was also addressed in the physics track. Our pre-meeting course was well attended, and we were happy to see 60-70 participants throughout the course.

The course started with the clinical rationale behind the increased use of MR in radiation therapy. A very interesting lecture was given by Professor Dr Karin Haustermans from Leuven University, Belgium. After this, site-specific benefits for pelvic, brain, and head and neck cancer treatment were clearly explained by Professors Uulke van der Heide and Esther Troost.

The programme then carried on with an overview of different state-of-the-art MR-guided treatment delivery techniques. It was very interesting to see how quickly this area is evolving, and what possibilities are already available in online adaptive MR-guided treatment delivery. Of course, for such a major change in practice, quality assurance, education and training are necessary. These topics, together with a lecture on MR safety, were also discussed.

In the afternoon, the programme became more interactive, maintaining the excellent energy levels of the morning. First a workshop was given on how to implement MR imaging into the radiotherapy department. This workshop was given by the RTTs from the department of radiotherapy in UMC Utrecht, The Netherlands, and focused on the design of imaging protocols. The afternoon ended with a very interesting and sometimes very funny debate on the role of MR in radiotherapy. An online voting tool was used, giving the audience the opportunity to take part.

I would like to end by thanking all the speakers and participants for their input in this pre-meeting course. A special thanks to the department of radiotherapy in Utrecht for ▼



their major contribution to the course. I would also like to thank the ESTRO office for their efforts in making this course happen. I hope everyone enjoyed the course as much as I did.

*Martijn Kamphuis
Research Radiation Therapist
Department of Radiotherapy, Academic Medical
Center (AMC)
Amsterdam, The Netherlands*



Image-guided radiation therapy (IGRT), image-guided adaptive radiation therapy (IGART) and surface-guided radiation therapy (SGRT)

SYMPOSIUM

Chair: Louise Turtle (UK)

Co-chair: Laura Mullaney (Ireland)



LAURA MULLANEY

This symposium started with a reflective presentation from Maddalena Rossi (Netherlands Cancer Institute, Amsterdam, The Netherlands) looking back on the origins of treatment image verification, and how it has developed over the past 60 years.

The presentation began by describing the first use of kV imaging on cobalt units. It then moved to current practice, including 4D, adaptive radiation therapy (ART) and MR-based imaging. Maddalena used the analogy of an Airbus 380 to depict this journey across the history of imaging. In the beginning, Maddalena demonstrated plain film x-ray similar to visualising the Airbus externally from the front and the rear. This progressed to show the ability to visualise every aspect of the airplane internally and externally and in all dimensions, akin to MR-imaging. The presentation finished with the vast benefits that our current level of imaging affords us: tremendous improvements in accuracy and precision, facilitating margin reduction-reduced toxicity and the possibility for dose escalation.

This was followed by a presentation on the advances in surface guided radiation therapy (SGRT) by Philipp Freislederer (University Hospital, LMU Munich, Germany). Philipp

delivered a very informative discussion on the use of SGRT in areas such as deep inspiration breath-hold (DIBH), open mask whole brain radiation therapy (WBRT) and stereotactic radiosurgery (SRS). Some of the advantages of SGRT include the ability to monitor and verify intra-fraction motion; verification of DIBH over the whole treatment surface area, rather than one or two specific points; the ability to verify positional accuracy in open-mask cranial treatments for claustrophobic patients and the ability to facilitate surface scanning of the patient's entire chest for robust and time efficient 4D-CT scanning. Philipp closed the presentation with a reminder of the limitations of SGRT, which include: surface motion may not always correlate with tumour motion in lung SBRT; there can be minor time delays with position calculations of the software, and there is a decrease in positioning precision for the pelvic region as registration algorithms are not effective for tube-like shaped anatomy.

The symposium finished with a practical case-based ART presentation by Rianne De Jong (AMC, Amsterdam, The Netherlands). Rianne considered the practical challenges of using ART, offering some solutions and translated this into clinical examples. A range of topics were covered including: image quality; registration algorithms; treatment ▼

planning in the ART environment; software management systems; staff training; and future opportunities for ART in lung and oesophagus cancer treatment. Some of the examples discussed included bladder and rectal volume changes for pelvic cancer patients, tumour regression and uterine flexion. The challenges of implementing ART were laid bare: the plan library may not represent the full motion throughout a course of treatment; appropriate plan selection requires in-depth knowledge of the target volumes and relies heavily on image quality; and deformations and displacement can be unpredictable. Some of the solutions Rianne offered included the provision of training and protocolled plan selection workflows and the development of *ad hoc* plan selection of specific patients.

Overall, the symposium provided a great insight into where imaging has come from, where we are currently with IGRT, ART and SGRT, and what the future might hold for these technologies.

Laura Mullaney
Assistant Professor
Discipline of Radiation Therapy
School of Medicine
Trinity College Dublin, Ireland



Laura Mullaney is course director of the new ESTRO course on ‘Positioning and immobilisation, specially targeted for radiation therapists’.

In case you missed it, you can find her interview in the March-April issue of the newsletter [newsletter.estro.be/2018/2018MarchApril](http://www.estro.be/2018/2018MarchApril)

Positioning and immobilisation for radiotherapy

NEW

Online sessions: 4 October – 22 November 2018

Practical weekend in Vienna, Austria:
3-4 November 2018

Early registration deadline: 9 July 2018

COURSE AIM

The course aims to provide:

- Knowledge of the impact patient immobilisation and positioning has on the radiotherapy process and treatment outcomes
- Practical experience of constructing and using immobilisation devices for a range of disease site and treatment techniques
- A forum for participants to gain and exchange knowledge on patient immobilisation and positioning.

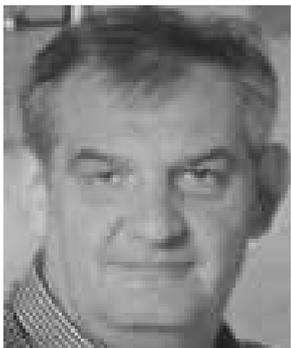
www.estro.org/school

Patient involvement and shared decision-making

TEACHING LECTURE

Chair: Ilija Čurić (Serbia)

Speaker: Chantal Van Audenhove (Belgium)



ILIJA ČURIĆ

Patient involvement in decision-making is becoming an increasingly important aspect of radiotherapy treatment. However, in many cases patients are still not being properly involved in decisions about their treatment.

Shared decision-making (SDM), in which health care professionals elicit the patient's needs and preferences, and then deliberate with the patient to make a joint decision about managing treatment, is the approach that most patients want. SDM is important in 'preference sensitive decisions' where trade-offs exist between options that depend on patient preferences. The main objective is that the patient undergoes the treatment that best suits their preferences and values. Often the decisional conflict scale is used to measure SDM. One of the most frequently cited barriers to SDM is that many clinicians think that patients are not able to make these difficult decisions, or do not want to be involved.

For effective implementation, SDM clinicians must be skilled in applying SDM through four steps:

1. making patients aware that a choice has to be made
2. explaining the options that are available
3. eliciting patient preferences and values

4. integrating patient and clinician preferences into a shared decision.

Unfortunately, even clinicians who are aware of SDM, usually only apply the first two steps, omitting steps iii) and iv), leaving the patient alone with a difficult choice.

As well as improving the education and training of clinicians, tools such as patient decision aids (PtDA) can be very helpful, ensuring that each patient receives the same objective information. To build a good PtDA, it is recommended to follow the IPDAS roadmap (www.ipdas.ohri.ca, Elwyn *et al*, 2009). One of the most important aspects in this roadmap is to involve patients at each step, if possible. Most PtDAs in radiotherapy will contain information on both side effects and effects on local control and survival. Until now, PtDAs have been fairly generic, and do not contain individualised information. SDM improves quality of care, but implementation is still quite rare, and several strategies to address this are currently being developed.

Ilija Čurić
Serbian Society of Radiotherapy Technicians
Belgrade, Serbia

Patient-centred care and monitoring side effects: review clinics and follow ups

SYMPOSIUM

Chair: Claire Poole (Ireland)

Co-chair: Bak Bartosz (Poland)



Gillian Thompson

It was my pleasure to chair this interesting session. The first speaker was Ludwig Van den Berghe from University Hospital Ghent, Belgium, who outlined his role as a specialist nurse in radiation oncology. His talk emphasised the need for both radiation therapists (RTTs) and nurses

working in the radiation oncology field to be experts in radiation therapy.

The second speaker was Suzanne Petri, a clinical nurse specialist and RTT at Copenhagen University Hospital, Denmark. She told the ▼



CLAIRE POOLE

story of Mr Brown who was reviewed by his clinician. The clinician noted his obvious physical symptoms, but not his psychological stress, as the patient did not directly report it. Suzanne discussed recent research that suggests that this is a common occurrence, with many patients under-reporting their side effects. Studies have demonstrated that when patients self-assess their symptoms, they are more likely to report their actual symptoms, which results in improved symptom control. She then presented current and future examples of patient-reported outcome measures (PROM) data in toxicity scoring and management during radiotherapy.

The final speaker was Gillian Thompson from the University of Sheffield, UK. Gillian provided us with an insight into patient treatment by explaining her experience as both a health professional and patient. She described the difficulties of treatment from a patient perspective. Before her own experience, she felt that she 'knew' what patients were going through however realised that this hadn't been the case. She emphasised the need to involve patients in the treatment process, highlighting the need to organise a dedicated clinic to manage late side effects. She discussed the possible benefits of introducing continuous long-term

monitoring after treatment to help patients to return to their normal life. She explained how patient experiences are a valuable resource and illustrated how they can be used in a positive manner. She reported peer support as being a great resource and proposes that a buddy system be set up - newly diagnosed patients buddying with patients who are a few years post-treatment. Patients can also teach students about their experiences and she recommended their integration into the curriculum to enhance learning.

For me, the take-home message from this session is that those delivering radiation therapy should be experts in patient care and not just the technological aspects of it. Only then will we be able to provide patients with optimal care.

Claire Poole
Trinity College, Dublin, Ireland



Treatment planning and quality assurance

PROFFERED PAPER SESSION

Chairs: Maureen Thomson, UK and Ingrid Kristensen, Sweden



Miranda Ashton presenting on dose constraints for hypofractionated, dose-escalated radiotherapy of mesothelioma



INGRID KRISTENSEN

There were six very interesting talks in this session, the first two using MR-linacs. Mark Warren from the UK discussed three methods for re-optimising a treatment plan for daily adaptation. The three methods differed in accuracy for larger shifts as well as in the time needed. Further work will be done to define which method should be used depending on the daily variation.

Dennis Winkel from The Netherlands presented a method to plan and treat patients with multiple oligometastases in the pelvic area with the MR-linac. The method presented lends support to the idea that stereotactic body radiation therapy (SBRT) with the MR-linac in this area is feasible and promising. ▼

Madalyne Chamberlain from Switzerland presented a novel method for volumetric modulated arc therapy (VMAT) planning of craniospinal treatment. A base plan is created for the cranial and lower back, which is then used as a base plan in the treatment planning system (Eclipse). The method creates smooth and robust junctions between the arcs and is less prone to set-up errors and patient motion.

François Lucia from France presented a comparison between homogeneous and inhomogeneous dose for stereotactic treatment of brain metastases. He analysed the data with respect to local control and overall survival. The inhomogeneous dose distribution resulted in better local control, but there was no significant difference in freedom from distant brain metastases, overall survival or radionecrosis.

Severine Cucchiaro from Belgium presented a treatment planning study for robust optimisation for head and neck cancer patients. The aim was to include set-up uncertainties in the optimisation and to evaluate and compare dose to organs at risk and the risk of reduced clinical target volume coverage. The results show that this is a feasible way of treatment planning, with doses to organ at

risks remaining the same or lower and the target coverage maintained using common verification strategies.

The last speaker, Miranda Ashton from the UK, presented dose constraints for hypofractionated, dose-escalated radiotherapy of mesothelioma. She recalculated dose constraints for the hypofractionated regime and re-planned five patients with targets close to critical organs at risk. The new dose constraints are now used within the SYSTEMS-2 study that is recruiting patients across the UK.

The session was very interesting with new techniques presented, as well as patient-related data with important implications for treatment planning.

Ingrid Kirstensen
Radiation Physics
Dept of Haematology, Oncology and
Radiation Physics
Skåne University Hospital, Lund, Sweden

Brachytherapy – RTT advanced roles

SYMPOSIUM

Chair: Isabel Lobato (Portugal)

Co-chair: Maeve McGarry (Qatar)



Maeve McGarry (left) and Isabel Lobato (right), chairs of the symposium

This symposium involved sharing ideas and experiences about radiation therapists' (RTTs) advanced roles in brachytherapy, in three different countries across Europe.

Brachytherapy is a radiation oncology specialty in which RTTs have a very important role, not only in planning, but also in treatment administration as part of a multidisciplinary team.

According to our colleague Rogier Schokker, from UMC Utrecht, The Netherlands, it is essential that modern imaging, such as MRI and ultrasound, is used for pre-planning and planning in different pathologies, like prostate and uterus, thereby enhancing the RTT's role.

Ana Luisa Soares, an RTT from IPO do Porto, Portugal, shared her department's experience of treatment planning based on ICRU 38 and

ICRU 58. She explained that it has become a standard for treatment planning, using the Manchester and Paris Systems, which provide the most up-to-date information and recommendations in brachytherapy planning.

For Bernd Wisgrill, from Austria, working in the General Hospital Vienna and the University for Radiotherapy and Radiobiology, the workflow relating to cervix brachytherapy in his department has been an achievement for RTTs. It reflects trends towards an enhanced role for the RTT, in which the professional is involved in document management, imaging treatment planning and treatment delivery. This goes much beyond the basic role of the RTT.

These different experiences and perspectives highlighted the need for more specialised education, in which the RTT may acquire and consequently provide new and current approaches to brachytherapy in its multidimensional disciplines, sustaining and validating their advanced role in a department.

Isabel Pereira Lobato
chief RTT in Hospital do Espírito Santo,
Évora. Lenicare, Lda.
Assistant Lecturer for Radiation Therapy
in ESTeSL (Escola Superior de Tecnologia da Saúde
de Lisboa), Lisbon, Portugal



ISABEL PEREIRA
LOBATO

A FAMILY OF RADIATION ONCOLOGY JOURNALS FROM ESTRO

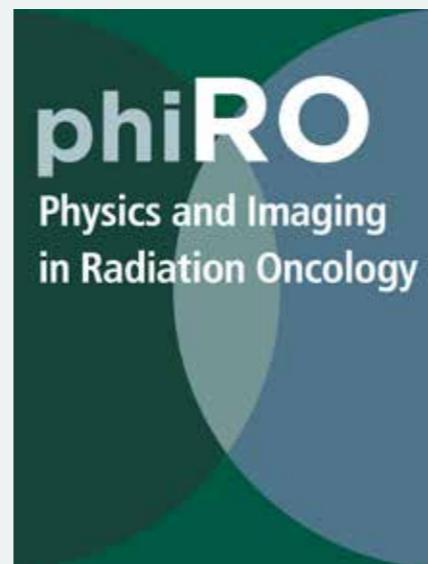
ESTRO's open access journals are published alongside *Radiotherapy & Oncology*, the premier journal in radiation oncology. ESTRO's family of journals further the Society's mission to foster the role of radiation oncology to improve the care of patients with cancer.



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RADIOBIOLOGY



"In this Radiobiology Corner, members of the radiobiology committee have summarised many of the relevant sessions"

There were lots of presentations to interest radiobiologists at ESTRO 37, much of which were also of interest to clinicians, physicists and radiation therapists (RTTs). In this Radiobiology Corner, members of the radiobiology committee have summarised many of the relevant sessions.

Our pre-meeting course was on the important topic of particle therapy, not only its radiobiological basis, but also issues regarding its clinical application. In the main meeting, we heard about the wide variety of ways in which mouse models can be applied to radiotherapy questions and, in an interdisciplinary track, the important topic of minimising the pelvic toxicity of radiotherapy.

In the proffered paper session on the topic of imaging hypoxia, six young scientists presented their recent work. Radiogenomics were also well represented at the meeting in a dedicated session on genome-wide association studies (GWAS) and how they can assist in the stratification of radiotherapy patients.

For those who survived the ESTRO party, the final morning of the meeting rewarded them with excellent sessions on stem cells and their radiation response and advances in normal tissue radiobiology, including the importance of senescence in post-radiation toxicity. In summary, we heard about a very wide range of interesting topics, which you can read about in more detail in the next pages.

Anne Kiltie, member of the Radiobiology committee



ANNE KILTIE



REPORTS FROM THE RADIOBIOLOGY TRACK AT ESTRO 37



Radiobiological basis of clinical particle therapy ▶▶

How to minimise toxicity in pelvic malignancies in the era of precision ▶▶

Mouse cancer clinic: models and modalities for precision imaging and radiotherapy in small animal models ▶▶

Imaging hypoxia – biology in the clinic ▶▶

Genome-wide association studies (GWAS) in radiation oncology: watch this space... ▶▶

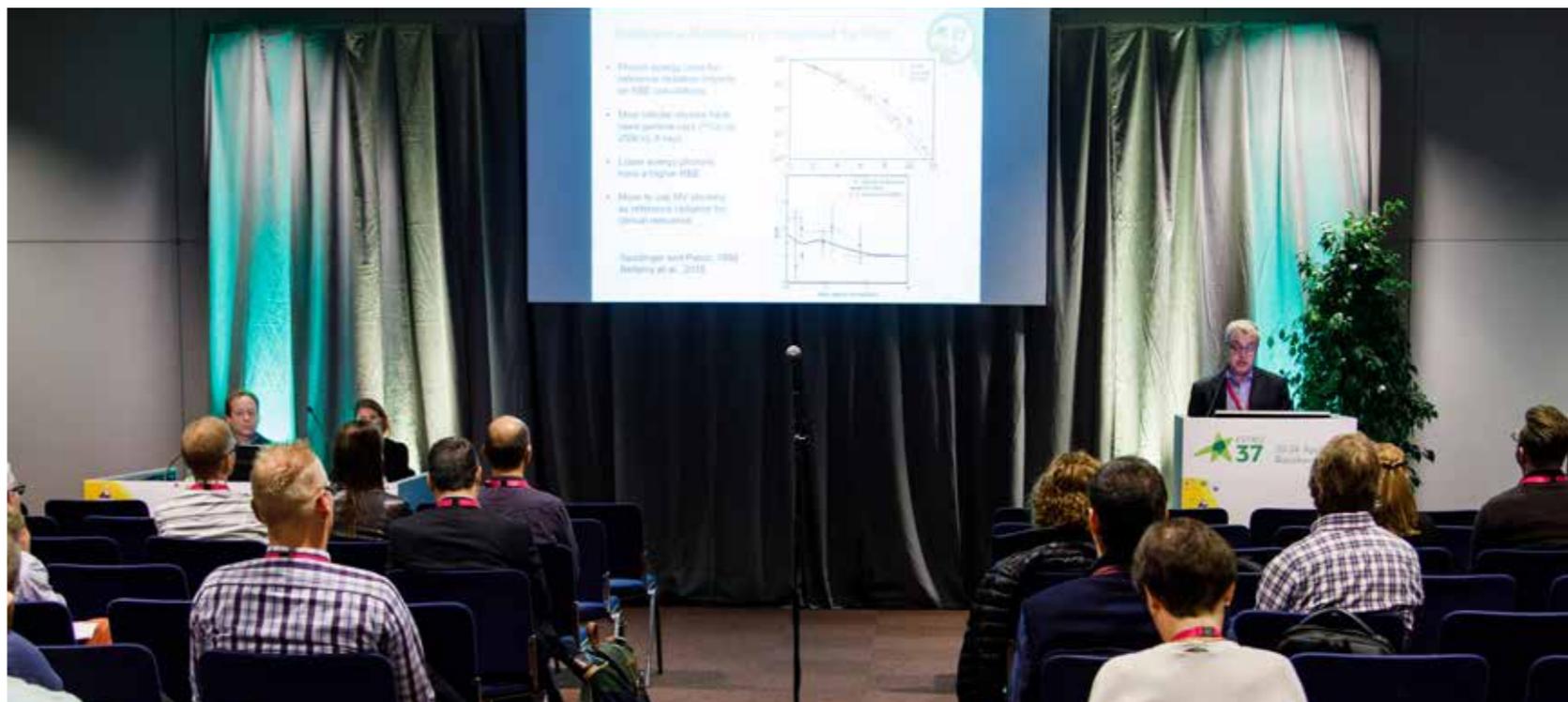
Normal tissue, stem cells and radiation response ▶▶



Radiobiological basis of clinical particle therapy

PRE-MEETING COURSE

Course directors: Brita Singers Sørensen (Denmark) and Peter van Luijk (The Netherlands)



PETER VAN LUIJK

This pre-meeting course chaired by Brita Sørensen and myself aimed to enable participants to understand the benefits and challenges of using particles in radiation therapy, a rapidly developing area of practice. The course was well attended, attracting more than 50 attendees.

After Brita Sørensen opened the meeting, Cai Grau introduced the rationale for clinical use of particle therapy to improve the therapeutic window in radiation oncology and highlighted

the need for evidence supporting the added value of proton therapy. Martin Pruschy, Christian Karcher and Oliver Jäkel then provided an overview of the basics of the radiobiology of particle therapy. Besides describing the classical framework of quantitative differences in the effect of dose, they provided insight into evidence for differences in mechanisms induced by particles in comparison with photons. At present, these qualitative differences have been observed, but interestingly their origin as well as ▼

consequences have not been well understood. These differences may have implications both directly in terms of optimisation of particle treatment and in the context of combination treatments.

Around lunch the programme made a transition from the radiobiological basis of particle therapy towards more clinically-orientated issues on the use of particles that benefit from radiobiological insights. This part of the course started with Oliver Jäkel, who described different approaches to estimate quantitative differences in responses between photon and particle therapy and how they were used for the clinical introduction of carbon ion therapy. Subsequently, Tony Lomax discussed different scenarios in which particles may, or may not offer a benefit.

This connected nicely to the contribution by Hans Langendijk who provided an overview of the model-based selection of patients, which is used to select patients in whom the gains described by Tony are expected to result in a beneficial outcome, and also for the validation of this expectation. Understanding the model-based approach requires knowledge of normal tissue complication probability (NTCP) modelling, which was provided by a contribution from Joe Deasy.

Finally, the undersigned presented a discussion on the extent to which photon-based models will lead to optimal use of the unique features of particles, based on the observation that the photon data these models are based on fundamentally don't contain information on the response of patients to use of these unique features.

Taken together, the course offered participants a basic grounding in a broad range of topics in clinical particle therapy and its radiobiological basis.

*Peter van Luijk, PhD
Assistant Professor Radiobiology / University
Medical Center
Groningen, Groningen, The Netherlands*

How to minimise toxicity in pelvic malignancies in the era of precision

INTERDISCIPLINARY TRACK

Chair: Stefano Magrini (Italy)

Co-Chair: Tomas Janssen (The Netherlands)

Spteakers: Pierfrancesco Franco,

Hans de Boer, Bradley Pieters and Renaud de Crevoisier



ANNE KILTIE

Minimising toxicity in the treatment of pelvic malignancies is an important radiobiological consideration. In this session, this topic was considered in the era of precision radiotherapy for cancers of the cervix, prostate, bladder, rectum and anus.

When chemotherapy is added to radiotherapy this affects haematological toxicity (Pierfrancesco Franco). Methods to ameliorate this include substituting less toxic chemotherapy, giving single rather than multiple drugs, reducing the number of cycles and reducing the volumes of pelvic radiotherapy given. Forty per cent of the bone marrow is located in the pelvis, which can be imaged functionally by ¹⁸F-FLT-PET. A phase II single arm study is looking at bone marrow-sparing intensity-modulated radiation therapy (IMRT) in locally advanced cervix cancer. The bone marrow should be considered an organ-at-risk in the treatment of pelvic malignancies and ongoing research is needed.

Stereotactic radiotherapy is an extreme form of hypofractionation, often given as five fractions of 5-7.5 Gy (Hans de Boer). This achieves very good biochemical control in prostate cancer with grade II toxicity rates very similar to 2 Gy

per fraction and, in a recent study, 0% grade III toxicity. It is necessary to minimise margins and spare the urethra, but one also needs to control intra-fraction motion and rotation to ensure safe delivery. This may be achieved by using an MRI-linac.

Brachytherapy is being used in The Netherlands to preserve bladder function in muscle-invasive bladder cancer, for small solitary tumours <5 cm, with good local relapse-free survival and approximately 90% bladder preservation rates (Bradley Pieters). Unfortunately, there are very limited data on late effects and bladder function, although in one centre there was no change in bladder capacity post-treatment (approximately 375 ml).

Finally, determinants of toxicity following pelvic radiotherapy were discussed (Renaud de Crevoisier). Dose-volume histograms predict severe rectal bleeding consistently across centres, the rectum being a ‘serial’ organ for toxicity, and dose surface maps can identify a highly predictive rectal sub-region that needs constraints applied to reduce toxicity. Furthermore, non-dose-related risk factors have also been identified for rectal, anal and urinary tract toxicities. ▼



At the end of the session, it was concluded that both physics and biology are needed to generate highly predictive models of pelvic toxicity.

*Anne Kiltie
Clinical Group Leader
CRUK/MRC Oxford Institute for Radiation
Oncology
University of Oxford, Oxford, UK*



2018
ESTRO
School

Research course in Translational Radiation Biology and Oncology
Special Focus in 2018: Radio-immunotherapy
4-6 October 2018 | Brussels, Belgium

Early registration deadline: 9 July 2018

[Read the interview with the chairs, Martin Pruschy and Philippe Lambin, in the School corner page 116 >](#)

The graphic features a purple background with a photograph of a large Gothic cathedral. Overlaid on the image are two purple triangles: one pointing down with the year '2018' and another pointing up with a white medical bag icon. The text 'ESTRO School' is positioned to the right of the triangles.

Mouse cancer clinic: models and modalities for precision imaging and radiotherapy in small animal models

SYMPOSIUM

Chair: M. Vooijs (The Netherlands)

Co-chair: Rebecca Bütof (Germany)

Speakers: Frank Verhaegen, Annette Byrne and Peter van Luijk



ANNE KILTIE

Radiotherapy is currently very technology driven, with limited insight provided by radiobiology (Frank Verhaegen). However, this may change with the recent development of novel animal models and mouse image-guided radiotherapy platforms. Currently, two such systems are available that are capable of treating using 1-5mm beams. The process involves micro-cone beam computed tomography (CBCT) of the mouse followed by treatment planning and plan delivery, all in one session. We do not yet know the size of the margins needed to treat mice, but innovations to address motion effects include the use of breathing ‘MOBY’ phantoms and shutter gating systems.

Patient-derived xenograft models (PDXs) can be used to interrogate open issues in cancer precision medicine (Annette Byrne). The EuroPDX consortium now has more than 1,500 models, including subcutaneous and orthotopic, primary- or metastasis-derived. PDXs are able to capture intra- and inter-tumour heterogeneity, and now include models of treatment-resistant disease. A new development is clinical trial-associated xenografts (CTAX) where image-guided biopsies are taken at different time points. With the advent of immunotherapy, humanised PDX models are being developed. It is hoped that

PDXs can be used for clinical decision-making, in ‘xeno patient’ trials, PDX co-clinical avatar trials and PDX biofacsimile / proxy trials. High throughput screening can also be performed with PDXs to predict clinical trial drug responses.

It is important to study the impact of chemotherapy or immunotherapy on the radiotherapy response (Peter van Luijk), but clinical data are not always the best way to test hypotheses, so there is a need for well-controlled pre-clinical studies to test hypotheses and new conditions beyond current clinical practice. The price of leaving the clinical arena is that further translational steps are needed. Pre-clinical results are not always consistent between research groups, e.g. upper and lower lung toxicities, but such difference may be due to the use of different species, e.g. mouse versus rat, and strain differences, e.g. C3H versus B6. Therefore, the choice of model is very important and animal studies should be considered hypothesis-generating.

*Anne Kiltie
Clinical Group Leader
CRUK/MRC Oxford Institute for Radiation
Oncology
University of Oxford, Oxford, UK*

Imaging hypoxia – biology in the clinic

PROFFERED PAPERS SESSION
Chairs: Jan Bussink and Ghazaleh Ghobadi (The Netherlands)



JAN BUSSINK

In the session ‘Imaging hypoxia – biology in the clinic’ six young scientists reported on their studies all dealing with the latest developments in imaging modalities for hypoxia assessment, which have made or almost made their way into the clinic. I had the honour of chairing the session together with Ghazaleh Ghobadi from the NKI in Amsterdam, The Netherlands.

The first presentation was from I. Grgic from Switzerland. He discussed a study that used a new ‘anti-hypoxia’ drug: ITTP. Interestingly, this drug not only affected hypoxia through vascular remodelling but also impacted on the immune system. Second came F. Huizing from Nijmegen, The Netherlands. His experiments showed that carbonic anhydrase IX (CAIX) imaging not only visualised the hypoxic cells, but also the hypoxic cells that adapted to hypoxia.

Next was A. Salem from Manchester, UK. While imaging of hypoxia with 18F-fluoroazomycin arabinoside FAZA has great potential in non-small cell lung cancer (NSCLC), the results are pathology-specific, with better correlating in squamous but less in adenocarcinomas.

Then we listened to the presentation from M. Saksø, Aarhus, Denmark. FAZA was used

in the Danish Head and Neck Cancer Group (DAHANA) 24 study to detect hypoxia. The group clearly showed that hypoxic tumours did worse, despite concurrent nimorazol treatment. Interestingly, failures were also outside the hypoxic area of the tumour, which makes dose painting based on these scans doubtful.

The penultimate presentation was from S. Löck from Dresden, Germany. The best way to separate patients with hypoxic versus non-hypoxic tumours, that is separating good versus poor locoregional control, came from combining the hypoxic gene signature and fluoromisonidazole (FMISO) scanning.

The final presentation came from T. Hompland from Oslo, Norway. Functional imaging with MRI has great potential. With MR-linacs being introduced in the clinic, this methodology has great potential. Daily or weekly imaging with adaptation based on functional imaging could be a major step towards online adaptation of targeting resistance based on tumour hypoxia.

Jan Bussink
Professor of Experimental Radiotherapy
Radboud University Medical Centre
Nijmegen, The Netherlands

—

Genome-wide association studies (GWAS) in radiation oncology: watch this space...

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The well-attended radiogenomics session on Monday afternoon opened a discussion on the uncontested potential of genome-wide association studies (GWAS) to study genetic variations associated with response to radiation therapy and their outstanding challenges. All the speakers provided strong evidence that GWAS in radiation oncology can assist the stratification of patients. Professor Gillian Barnett, Cambridge University Hospitals, UK, reported that the first meta-analysis of GWAS studies has identified three novel risk *loci* for late toxicity.

However, Professor Camilla Andreassen, Arhus University Hospital, Denmark, warned that the number of compelling associations remains very limited, are associated with genes not typically related to radiobiology and appear specific to each type of toxicity. But they highlighted that the falling costs of DNA sequencing and our increasing understanding of the processes underlying the development of radiation-induced toxicity will enable a more focused search for key genetic variants. All the speakers agreed that the strength of these studies is dependent on large patient cohorts and powerful statistical analysis methods.

Professor Christopher Talbot, University of Leicester, UK, presented highlights of the REQUITE consortium which has recruited over 4,400 patients across multiple centres and remains open to new collaborations (www.requite.eu). The GAME-ON OncoArray consortium and ongoing RAPPER study are also pushing the limits of GWAS. Professor Joseph Deasy, Memorial Sloan Kettering Cancer Center, New York, USA, proposed the application of multi-step machine learning approaches for the development of novel and promising predictive models based on GWAS data. We all look forward to hearing about the outcomes of these exciting strategies at forthcoming ESTRO meetings.

Laure Marignol
Associate Professor in Radiobiology
Trinity College Dublin, Ireland



LAURE MARIGNOL



Normal tissue, stem cells and radiation response

Focus on the sessions of the last day

The last morning started early at 8.30am with a teaching lecture on normal tissue and cancer stem cells delivered by myself (Rob Coppes). Even though it was the morning after the ESTRO 37 party, the presentation on the characteristics of stem cells and their radiation response still attracted a good audience and was well received. I discussed the possibilities of using patient derived normal tissue and tumour organoids for personalised medicine with radiotherapy and presented a number of examples.

The next session was on advances in normal tissue radiobiology. John Yarnold discussed the use of hyperbaric oxygen (HBO) for the treatment of late effects. He showed both negative and positive studies, with the varying outcomes most likely dependent on how HBO treatment was performed. He ended with a hopeful discussion on the potential use of hyperbaric oxygen treatment.

After this, Roberto Pacelli discussed tissue complication probability (TCP) and normal TCP (NTCP) modelling related to the Quantec initiative. The use of novel biotechnological and computational tools, challenges and opportunities were discussed. Last but not

least, Marc Benderitter discussed the clinical potential of human-induced pluripotent stem cells (hiPS) in the management of normal tissue damage. He reviewed some of his work done with mesenchymal stem cells (MSCs), to show that MSCs derived from hiPS could also do this, but could be expanded to much greater numbers. In addition, he showed data on the use of hiPS-derived haematopoietic stem cells to reconstitute human haematopoiesis in a radiation-induced aplastic anaemia preclinical model. His studies showed the potential that the use of hiPS may have in the future treatment of radiation-induced normal tissue damage.

The last session of the day was on radiation-induced senescence. The first presentation by Marco Demaria showed what senescence is, how it is related to ageing and why it is necessary, but also dangerous. He discussed the senescence-associated secretory phenotype (SASP) that included secretion of cytokines, chemokines, growth factors and proteases. SASP can result from irradiation and may facilitate inflammation and fibrosis, but may also induce motility of cancer cells. Senescence is related to ageing and the specific deletion of senescence cells upon ageing or radiation may benefit longevity.



ROB COPPES



After this, Jonathan Axelrod discussed the role of senescence in the salivary gland after irradiation and the relation with SASP IL6. He also suggested that prevention or removal of senescence cells in the salivary gland may improve post-irradiation function.

The last speaker was Konstantinos Evangelou, who went into further depth on stress- and radiation-induced senescence. He discussed stress-induced premature senescence (SISP). To be able to properly detect senescence cells he showed a novel assay that is based on a biotinylated Sudan Black-B analogue hybrid immune-histochemistry. Since the markers of senescence are under discussion, such a method may become very important in the detection of senescence cells. All in all, this was a very good session with excellent speakers discussing this developing field, which may lead to a novel way to modulate radiation responses.

Rob Coppes
ESTRO radiobiology committee chair
Professor, Departments of Radiotherapy
and Cell Biology
University Medical Center Groningen
The Netherlands





ESTRO SCHOOL





“The five pre-meeting courses attracted 562 participants and covered innovative clinical and inter-disciplinary topics”

The ESTRO School organised various educational activities during ESTRO 37. The six pre-meeting courses attracted 562 participants and covered innovative clinical and inter-disciplinary topics dedicated to: radiation for lymphoma; combined stereotactic body radiation therapy and targeted immune therapies; MRI physics for applications in radiation oncology; clinical implementation and use of MR-imaging; foundations of leadership in radiation oncology and the radiobiological basis of clinical particle therapy. Attendees could choose from a large selection of teaching lectures every morning, and the workshops and multidisciplinary tumour board sessions attracted many enthusiastic participants.

Before heading to the beach for your holidays, don't forget to decide which courses you want to get involved in from September onwards. Amongst many others, two new courses dedicated to 'Multidisciplinary management of non-melanoma skin cancer' and 'Positioning and immobilisation for radiation therapy are still ahead' are available, as well as the 'Research-orientated course in translational radiation biology and oncology'.

We wish you a happy summer.

Jesper Eriksen, Marie-Catherine Vozenin and Christine Verfaillie



JESPER ERIKSEN
Member and chair of the education council



MARIE-CATHERINE VOZENIN
Member of the education council



CHRISTINE VERFAILLIE
ESTRO Managing director education and science



FALCON contouring opportunities at ESTRO 37

FALCON MEETS YOU At the ESTRO booth

Participants at ESTRO 37 had the opportunity to receive one-on-one information on all that FALCON has to offer. Take a look at this unique "tête à tête"



The tutors preparing the stand ahead of the 'FALCON MEETS YOU' session



A group getting to know FALCON



The head and neck case served as a nice example of how FALCON-Educase can be used on a practical basis



ELEONOR RIVIN



CHIARA VALENTINI





FALCON contouring opportunities at ESTRO 37

FALCON onsite workshops

Once again, the FALCON onsite workshops were a hit. Here's a glimpse of how they turned out



Workshop participants focusing on a presentation on the spinal cord

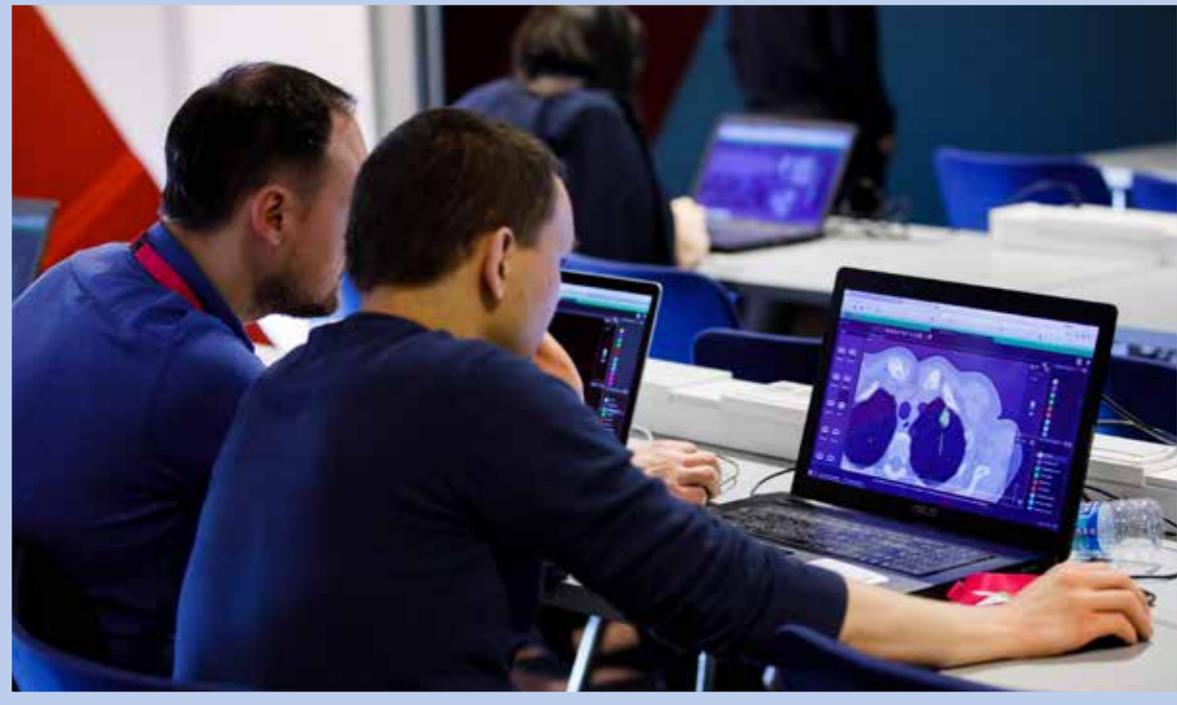


The bronchial tree in focus



A participant busy taking notes, with the contouring case in the background

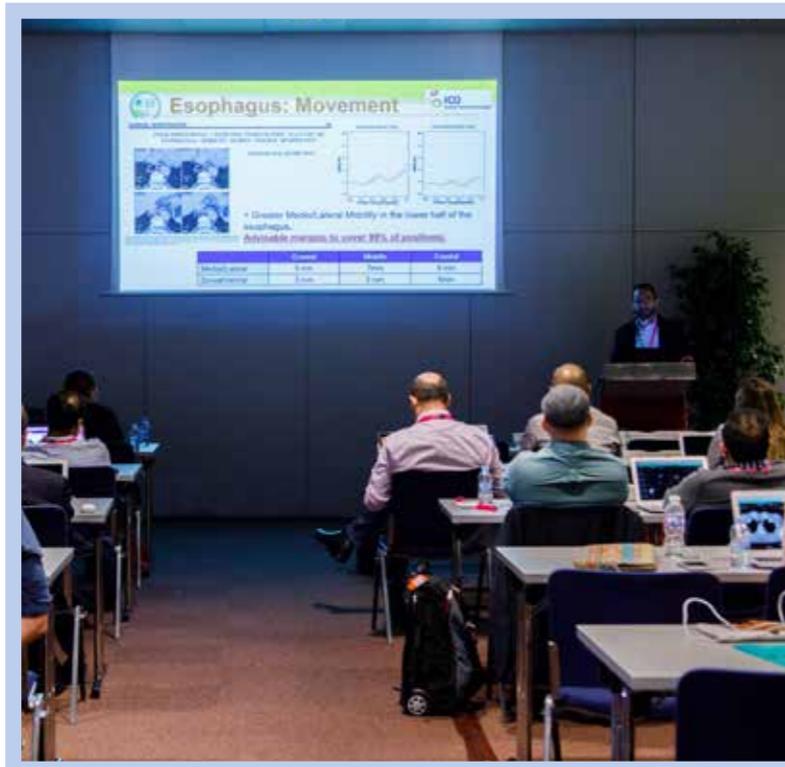




Sometimes two heads can think better than one, as has already been published in the literature, "When there is no expert, ask your colleague". Doll *et al*, *Strahlenther Onkol* 2014. With the added luxury of having the expert in the room for posterior verification



When in need, there is always a tutor there to help!



Something to keep in mind, the oesophagus doesn't stay put.



With, as always, essential support from the developer



MARK YOUR CALENDAR

ESTRO members can benefit from a discount on the registration fee to attend an online workshop.

NEXT ONLINE CONTOURING WORKSHOPS

Each online workshop includes two sessions

Rectal cancer (Australian Time)	4 September 2018	11 September 2018
Lung cancer	18 September 2018	25 September 2018
Organs at risk - Abdomen	9 October 2018	16 October 2018
Prostate cancer	24 October 2018	31 October 2018
Anal cancer	6 November 2018	13 November 2018
Gynaecological cancer EBRT (Australian Time)	14 November 2018	21 November 2018



FOUNDATIONS OF LEADERSHIP IN RADIATION ONCOLOGY PRE-MEETING COURSE AT ESTRO 37

Perspective from a clinical oncologist
Anthea Cree, UK ▶▶

Perspective from a medical physicist
Camelia Constantinescu, Saudi Arabia ▶▶

Perspective from a radiation therapist (RTT)
Aidan Leong, New Zealand ▶▶



Foundations of leadership in radiation oncology

20 April 2018
Barcelona, Spain

COURSE DIRECTORS:

Kim Benstead, radiation oncologist,
Gloucestershire Hospitals NHS Foundation Trust,
Cheltenham (UK)

Meredith Giuliani, radiation oncologist,
Princess Margaret Cancer Centre, Toronto (Canada)

Sandra Turner, radiation oncologist,
Westmead Hospital, Sydney (Australia)



Perspective from a clinical oncologist from UK, Anthea Cree

I have never really considered myself to be a leader as I do not fit the stereotypical picture of a strong and charismatic extrovert. However, this course has highlighted that there are many different sorts of leaders, all with their own strengths and weaknesses. The focus is on 'little L' leadership, the everyday roles, often without formal titles, that we perform all the time. It aimed to equip us with

some background theory as well as the practical skills to help lead and support change within our institutions.

The course mascot was an inflatable black swan. This is a metaphor for an unexpected and unpredictable event which alters your world view – it was assumed all swans were white, until black swans were discovered in Australia. This underlined some of the different ways of thinking about and managing change, and also that this course was going to be fun and interesting.

This was a blended course with a small amount of online homework, including a personality assessment and a pre-course webinar. This maximised the benefit of the live sessions at ESTRO 37 (a full day on Friday and two lunchtime sessions). The course leaders were excellent, comprising enthusiastic and inspiring clinicians and benefitting from a different perspective provided by Alessandro Cortese, the chief executive officer of ESTRO.

The face-to-face sessions were very interactive, with a variety of different themes. Practical sessions included discussing ideas for quality improvement (QI) projects and developing a strategy (including a logo) to 'sell' a new idea to different stakeholders. I'm not sure that either the idealistic concept of a mobile MR-linac or my drawing of a wheel transected by x-rays should ever be mentioned again.

One of the other benefits of the course was the opportunity to meet and learn from the other participants who were a mix of doctors, radiographers and medical physicists from across Europe and beyond. The richness of this mix led to many interesting discussions especially during the QI session.

I found the insights from the personality questionnaire particularly useful. My report was scarily accurate, but considering the perspective of those with different personalities was even more helpful. It also highlighted some of my traits, which can be used to develop successful leadership strategies.

I really enjoyed the course, although it was very intensive and by the end of the conference I was looking forward to some peace and quiet. As with other ESTRO courses I have attended, the organisation was excellent.

I would recommend this course to anyone who would like to develop the skills to achieve positive change within their workplace, especially those who don't see themselves as leaders.



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Perspective from a medical physicist from Saudi Arabia, Camelia Constantinescu

A culture of continuous patient-centred quality and safety improvement is a key feature of daily practice in radiation oncology. This is a very positive and exciting aspect of our work, but also represents a challenge, especially in a multidisciplinary team environment. As a medical physicist working in a large multi-national team, I saw this course as an opportunity for my personal development. The fact that it was organised by three professional organisations – ESTRO, the Canadian Association of Radiation Oncology (CARO) and the Royal Australian and New Zealand College of Radiologists (RANZCR) – each leading the discipline of radiation oncology in their respective regions of the globe, reinforced this view.

The course started online with introductory lectures on leadership, change and quality improvement, along with some homework that we had to do before the live sessions. The homework consisted of readings and e-learning lectures covering various aspects of the subject,



such as leadership basics, effective meetings, negotiation, conflict management, teamwork and quality improvement.

The live course in Barcelona was a blend of lectures and interactive sessions about leadership theories and styles, leading change, team building and engagement, and creating and communicating a vision.

In addition, ahead of the live course, we completed a questionnaire that assessed our interpersonal styles as health professionals. This generated a personal report, which was used in the subsequent interpersonal effectiveness session, in which emotional intelligence was discussed. This not only enriched our awareness of our own personal styles, but also increased our ability to communicate and work together in teams on the course. I have to mention the delicate and sensible way the notes from our personal reports were used during the interactive sessions, which left everybody feeling comfortable and excited to be involved. This personalised perspective on leadership skills really added value to the course.

In my capacity working for a leading healthcare organisation in Saudi Arabia, I have attended

various courses learning how to manage employees with different cross-cultural competency requirements or to address quality and safety issues. However, the majority of these courses were generic and not specifically related to my specialty. Therefore, I greatly appreciated this course, which offered a broad insight into general leadership concepts, along with particular applications to radiation oncology. I know how difficult it is to meet the needs of a wide target audience including physicians, medical physicists and radiation therapists, and I was happy to find that the course was designed for each and all radiation oncology professionals. Interactive topics such as identifying a local process for improvement, designing a quality improvement project or creating and communicating a vision gave everyone the chance to address them through the view of their personal specialty, while working within the framework of multidisciplinary teams.

Overall, this course was a wonderful experience, deeply motivational and inspiring. It offered a comprehensive analysis of leadership in radiation oncology and enabled me to acquire knowledge and skills for effective engagement and leadership. With colleagues from all over

the world attending, I am confident that this course will successfully address the global need of educating leaders in the field of radiation oncology.

Finally, I would like to thank the faculty for sharing their expertise, and to congratulate the course directors Kim Benstead, Meredith Giuliani and Sandra Turner for their excellent programme.



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Perspective from a radiation therapist (RTT) from New Zealand, Aidan Leong

Thirty hours on three planes travelling from (quite literally) the other side of the world probably isn't the ideal way to prepare for a leadership course. But that's how it was, escaping the early winter of New Zealand for a warmer welcome in Barcelona.

Several weeks earlier, I had met the other participants in an online session, where the course leaders introduced themselves and laid out the structure of the course. This was a great overview of what we were to expect. We also received a range of resources to review in our own time ahead of the face-to-face meeting in Barcelona. What was apparent from that first session was the diverse cross-section of participants, not just from various countries, but also in our professional roles (radiation therapists, medical physicists, radiation oncologists) and levels of experience and seniority. Rather than a challenge, this was a strength of the course, particularly as we engaged more with one another and came to appreciate the shared importance of leadership skills in all of our roles.

On arrival at the pre-conference meeting in Barcelona, course director Sandra Turner was quick to break the ice and set the tone for the sessions as informal and interactive. This was common across all the leaders of the course as they not only explored various dimensions of the principles and practice of leadership, but made every effort to engage with each participant and build rapport within the group.

Exercises ranged from the very first steps of discussing a change in practice, through to developing a vision for a whole new service. These exercises were placed throughout the sessions so that the planning and communication strategies we were being shown could immediately be put into use. We also had the opportunity to utilise examples from our own clinical practice, which was helpful to gain new perspectives on issues that many of us encounter.

Alongside this, there was a strong emphasis on developing self-awareness of your own leadership style and how we can best use our natural tendencies in situations that may often be challenging to lead within. For me, this was one of the most refreshing aspects of the course. In contrast to many preconceptions around one

idealised model of how leaders must behave, the teaching faculty consistently highlighted the importance of diverse leadership styles that are aligned with an individual's own values.

After just one day of the pre-conference meeting and two further lunchtime sessions, there was a real atmosphere of positivity within the room. We all left with a genuine enthusiasm for influencing change, and a list of new strategies to better engage in our own clinical environments. Both the teaching faculty as well as the organisational team behind the course were fantastic to deal with. For those wanting to develop their leadership skills, or (more importantly) those who don't yet know where to start, I would highly recommend it.



Aidan Leong
Clinical education supervisor
- radiation therapist
Wellington Blood & Cancer
Centre
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Advanced skills in modern radiotherapy ▶▶

6-10 May 2018 | Rome, Italy

Target volume delineation ▶▶

13-16 May 2018 | Prague, Czech Republic



Advanced skills in modern radiotherapy

6-10 May 2018
Rome, Italy

COURSE DIRECTOR

Rianne de Jong, radiation therapist,
 Academic Medical Centre,
 Amsterdam (The Netherlands)



WAI YIN FUNG

This year, the ‘Advanced skills in modern radiotherapy’ course was held in the ancient and beautiful city of Rome, Italy. I am a radiation therapy student and this was my first time on an ESTRO course. It was a fruitful, enjoyable and an invaluable learning experience.

Being a student in radiation therapy, I was worried that my limited clinical exposure would impede my understanding and learning. Fortunately, the course was well designed, setting

out basic concepts and theories as background, and then moving on to more complex and advanced skills. This enabled me to consolidate my existing knowledge, before exploring advances in current radiation therapy. Lectures covered a wide range of topics, including image guidance, organs at risk (OAR) delineation, image registration, margin calculation, as well as safety issues and risk management. The faculty, consisting of a team of experienced radiation therapists, radiation oncologists and ▼

medical physicists, delivered insightful and comprehensive lectures. They offered us different professional perspectives on a variety of clinical cases, leading to a complete and thorough understanding of the topics presented.

The course placed equal importance on both theory and practice. Each day, there were workshops to help us apply theories introduced in lectures into practice. This included the delineation of OARs (spinal cord, lung, heart and oesophagus), margin calculation, image registration on both Varian and Elekta systems, and prospective risk analysis. The workshops also encouraged participants to discuss their own experiences and points of view. It was eye-opening and interesting to learn about various radiotherapy practices in different countries and institutes. Following a workshop, an evaluation and discussion session was held in which the faculty gave recommendations based on our performance and results obtained in the workshop. I found this very helpful as I could assess my understanding of the theoretical concepts and performance in practice, and work out where I needed to improve my skills.

Another highlight of the course was the visit to the advanced radiation therapy (ART) centre

in the Gemelli Hospital, the host university's teaching hospital. Guided by radiation oncologists, we were given the chance to visit the state-of-the-art radiotherapy facilities, which included a MRIdian linac system. In addition to the site visit, a presentation on the MRIdian was given by the hospital to introduce the system and share their experience in the use of the machine. I was also deeply impressed by the patient-centred approach of their practice. All treatment rooms are beautifully decorated with paintings to put patients in a more comfortable and pleasant environment during radiotherapy. A dedicated therapeutic programme is also designed for paediatric patients to simulate their treatment experience as if they were driving a submarine. Both the physical and psychological aspects of being a radiotherapy patient are addressed in the department. The visit to the hospital was very informative and interesting.

During the course, not only did I attend great lectures, but I also had the opportunity to meet medical professionals working in radiation therapy from a range of different countries. Getting acquainted with professionals from different backgrounds and sharing experience on radiotherapy and other subjects was an

invaluable part of this course. It was a fascinating and unforgettable experience.

I would like to thank the teaching faculty for their well-prepared lectures and their willingness to answer all kinds of questions. The interactive learning environment they created fostered learning and the application of knowledge into practice. I would highly recommend this course to all radiation therapists.

Wai Yin Fung
Student radiation therapist
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Target volume delineation

13-16 May 2018

Prague, Czech Republic

COURSE DIRECTOR

Esther Troost, radiation oncologist,
TU Dresden, Dresden (Germany)



IAIN WARD

Spring in Prague. What a beautiful setting for around 80 radiation and clinical oncologists, residents, physicists and radiation therapists (RTTs) to gather to learn about how to improve target delineation for our patients. The venue was the Hotel NH Prague City, which was easy to get to by public transport and car, and close to the central city sights. Just how close, we learned on the first evening, when we met under the famous 600-year-old astronomical clock in the Old Town Square. We walked through the medieval

precinct and across the Vltava via the Charles Bridge to a restaurant on the slopes below Prague Castle for a sumptuous dinner. This provided an ideal chance to get to know each other, including our teachers, so that we weren't shy about asking questions over the following days.

Our coursework had started two weeks before. We were provided with six clinical vignettes and we used the online FALCON software to contour gross tumour volumes (GTVs) and clinical ▼

target volumes (CTVs) with the help of fused diagnostic CT, MRI and PET scans. On Sunday morning we had introductory sessions on the rationale behind volume delineation and the principles of imaging, including functional imaging and image registration. We then split into six groups and contoured our homework cases once more by consensus. One of the themes to emerge from the course was the marked reduction in inter-observer variation when contours are reviewed by colleagues and when guidelines were used.

There followed sessions focused on specific tumour sites: lung, brain, breast, prostate, oropharynx, stomach, anus and rectum. Each session started with a review of radiological anatomy and optimal imaging of the tumour and normal tissue. This was followed by a discussion of the relevant tumour biology, the patterns of local and lymphatic spread, and published guidelines. We then reviewed the contouring exercises and discussed points of uncertainty.

One of the ways in which ESTRO courses are different is their interactive nature. The talks were punctuated by frequent opinion polls, using our mobile phones. There was always plenty of time for questions and we were assured that there was

no such thing as a stupid question. The icebreaker dinner ensured that we were comfortable treating the teachers as experienced colleagues, rather than as professors to be regarded with awe.

I had two objectives for this course. As a mid-career radiation oncologist, I am interested in how others approach difficult delineation problems. The interactive nature of the teaching meant I was able to ask my fellow participants. My second objective was to update my target delineation skills for tumours that I had not treated for quite some years. My level of knowledge in this area was similar to that of a senior resident. Revision of modern imaging and current contouring guidelines has given me the confidence to treat these tumour sites once more (in consultation with my more experienced colleagues to reduce inter-observer variation).

Having experienced the course from two different perspectives, I would heartily recommend it to both radiation oncologists in training and to more senior colleagues. Thank you very much to Esther Troost, the course director, and the faculty for a rewarding four days.

Iain Ward
Radiation oncologist
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Christchurch, New Zealand



Advanced brachytherapy physics ▶▶

7-10 October 2018 | Valencia, Spain

Research course in translational radiation biology and oncology

Special focus in 2018: radio-immunotherapy ▶▶

11-14 November 2018 | Florence, Italy





Advanced brachytherapy physics

7-10 October 2018
Valencia, Spain

Interview with the course director

Dimos Baltas, physicist,
University of Freiburg, Germany



DIMOS BALTAS

What are the current challenges of brachytherapy for physicists?

Our era is characterised by a determination to personalise treatment and reduce related uncertainties. This is especially important in hypofractionation, a field pioneered by brachytherapy and later pursued by external beam methods, which remains a hot topic in radiation oncology as, for example, in localised prostate cancer treatment.

Within this context there is an increasing role for advanced 3D imaging, image guidance and navigation technologies for pre-planning and implantation, model-based treatment planning dosimetry and, finally, treatment verification. Combined, these techniques could facilitate adaptive (4D) treatment delivery.

A strong background and relevant expertise in brachytherapy is needed if medical physicists are to fulfil their central role in the development, validation and implementation of such advanced methods and techniques.

What are the main topics that will be tackled?

This three-and-a-half day course focuses on: (i) treatment delivery technology, (ii) 3D imaging technologies and localisation techniques, (iii) advanced 3D dose calculation algorithms and their implementation, (iv) inverse optimisation / planning methods and algorithms, (v) experimental dosimetry, in vivo dosimetry, and treatment verification, (vi) quality management, uncertainties and their clinical impact, and (vii) a look forward to expected technological advancements.

How will participants benefit with regard to their clinical practice?

By the end of this course participants should be able to: (i) define a quality assurance (QA) programme for 3D image-based brachytherapy treatment planning, (ii) identify and understand the benefits and limitations of advanced 3D dose calculation algorithms, (iii) identify and understand the resources available to commission advanced 3D dose calculation algorithms, (iv) identify the benefits and limitations of using inverse optimisation and inverse planning technology in specific disease sites, ▼

(v) identify the need for, and implement, a verification process for specific brachytherapy treatment techniques, and (vi) delineate the relative importance of different sources of uncertainty for specific brachytherapy applications.

Has the content of the ‘advanced brachytherapy for physics’ course evolved from the previous two courses?

Definitely. Besides the faculty effort to keep up with the developments in the field, the evaluation and feedback from participants on the Brussels (2014) and Vienna (2016) courses has been taken into account. This has led to improved scheduling and the inclusion of daily practical / hands-on sessions, made possible by the invaluable support of the three main brachytherapy technology vendors.

Who is the course aimed at?

The target group is medical physicists with an understanding of basic concepts and methods in image-based treatment planning and computational / experimental dosimetry in brachytherapy. Participation in the comprehensive and practical brachytherapy course is recommended but not mandatory. The course is also of value to PhD students and young researchers in the field.

Is there a particular message you will try to communicate during the course?

Brachytherapy remains an interesting field of clinical and research activity, especially suited to young researchers and medical physicists with a strong sense of multidisciplinary and interdisciplinarity. The faculty and our local organisers are prepared to demonstrate that ‘there is really something going on in the physics and technology of brachytherapy’.



Advanced brachytherapy physics

7-10 October 2018 | Valencia, Spain

Early registration deadline: 9 July 2018

Seeking to advance your expertise in brachytherapy physics? The advanced brachytherapy physics course provides a modern update on the clinical standard-of-care and an in depth look into the scientific foundation necessary to qualify as a brachytherapy physics expert in practice and research.

www.estro.org/school >



Research course in translational radiation biology and oncology

Special focus in 2018: radio-immunotherapy

11-14 November 2018

Florence, Italy

Interview with the course directors

Martin Pruschy, biologist, University Hospital Zürich, Switzerland, and

Philippe Lambin, radiation oncologist, MAASTRO Clinic,

Maastricht, The Netherlands

Why did you want to create a research course on translational radiation and oncology?

ESTRO is a scientific society and the ESTRO School wants to establish closer ties between education and research by offering courses that focus on different aspects of research, such as physics research, clinical research and translational radiation biology and oncology research.

These courses broaden the scope of ESTRO's educational offering, which has traditionally covered knowledge and skills for medical expertise, but has recently expanded to cover other competencies such as leadership, communication and scholarship. In the area of research education we currently offer a course on radiotherapy physics (organised since 2015); a masterclass on radiation oncology, which will become the clinical research course; a course on the biological basis of personalised radiotherapy in clinical practice. The ESTRO advanced radiobiology course will be adapted to cover not only the theoretical aspects of molecular and clinical aspects of radiobiology and radiation oncology, but also current research topics and research approaches.

In the long term, these courses aim to foster research in radiation oncology in all possible aspects, such as physics, clinical and translational research.

What areas of research will the course focus on?

We will present major current research topics in translational radiobiology and oncology and discuss them in the framework of classic radiobiology concepts and our clinical challenges. Each year, we will focus on a specific research topic. Due to the many new insights in the basic, translational and clinical levels in research at the interface of radiation oncology and immunology, we will focus on radio-immunotherapy this year. We hope to attract participants from different backgrounds and with different expertise. At the same time, we will not neglect other hot topics in current translational research, such as radiomics.

How will the course help participants in their research?

We will present topics based on the most recent published insights and discuss them in the broader radiobiology framework. ▼



MARTIN PRUSCHY



PHILIPPE LAMBIN

At the same time, we will present actual research projects and methodologies, discuss how teachers on the course perform translational research in radiation biology and oncology in their own research centres and what kind of challenges they encounter. We hope to increase theoretical knowledge, but also practical aspects of research.

What do you hope will be the afterlife of the course for participants?

We hope to stimulate collaborations between participants. We are also open to advising research groups and participants after the course.

Who is the course aimed at?

The target group are radiation oncologists in training and in practice, radiobiology students and post-doctoral fellows, as well as physicists and more advanced scientists, for example, heads of laboratories. We also want to encourage experts from other research areas to participate in 2018, for example, immunologists. In this way, we hope to stimulate interesting discussions and exchanges among participants and staff.



Research course in translational radiation biology and oncology

Special focus in 2018:
Radio-immunotherapy

11-14 November 2018 | Florence, Italy

Early registration deadline: 14 August 2018

The course will provide an understanding on current research trends and will outline research opportunities in radiation biology and translational radiation oncology to improve clinical practice and outcome.

LEARNING OUTCOMES

By the end of this course participants should be familiar with:

- Current research topics of translational research in the field of radiation oncology
- Relevant methodologies for translational research in the field of radiation oncology
- Relevant endpoints of translational research in the field of radiation oncology.

By the end of this course participants should feel motivated to improve:

- Their basic research projects with translational research aspects
- Their clinical research projects with translational research aspects.

www.estro.org/school >

ESTRO School of Radiotherapy and Oncology

WWW.ESTRO.ORG



POSTGRADUATE COURSES IN EUROPE

Image Guided Radiotherapy in Clinical Practice

11-15 February 2018 | Budapest, Hungary

Comprehensive and Practical Brachytherapy

4-8 March 2018 | Ljubljana, Slovenia

Particle Therapy

5-9 March 2018 | Vienna, Austria

Multidisciplinary Management of Lung Cancer

10-12 March 2018 | Brussels, Belgium

Foundation of Leadership in Radiation Oncology

20 April 2018 | Barcelona, Spain

Advanced Skills in Modern Radiotherapy

6-10 May 2018 | Rome, Italy

Target Volume Determination - From Imaging to Margins

13-16 May 2018 | Prague, Czech Republic

Evidence Based Radiation Oncology

27 May - 1 June 2018 | Athens, Greece

IMRT and Other Conformal Techniques in Practice

3-7 June 2018 | Tallinn, Estonia

Dose Modelling Verification for External Beam Radiotherapy

10-14 June 2018 | Dublin, Ireland

Brachytherapy for Prostate Cancer

14-16 June 2018 | Avignon, France

Basic Clinical Communication in Oncology

15-17 June 2018 | Brussels, Belgium

POSTPONED

Clinical Practice and Implementation of Image-Guided Stereotactic Body Radiotherapy

2-6 September 2018 | Porto, Portugal

Image-Guided Radiotherapy and Chemotherapy in Gynaecological Cancer: Focus on Adaptive Brachytherapy

2-6 September 2018 | Madrid, Spain

Haematological Malignancies

5-8 September 2018 | Utrecht, The Netherlands

Physics for Modern Radiotherapy (joint course for clinicians and physicists)

9-13 September 2018 | Budapest, Hungary

Basic Clinical Radiobiology

15-19 September 2018 | Dublin, Ireland

Target Volume Determination - From Imaging to Margins

23-26 September 2018 | Moscow, Russia

Imaging for Physicists

23-27 September 2018 | Vienna, Austria

Advanced Treatment Planning

23-27 September 2018 | Athens, Greece

Multidisciplinary Management of Head and Neck Oncology

30 September - 3 October 2018 | Lisbon, Portugal

Multidisciplinary Management of Non-Melanoma Skin Cancer

4-6 October 2018 | Brussels, Belgium

Advanced Brachytherapy Physics

7-10 October 2018 | Valencia, Spain

Best Practice in Radiation Oncology - Train the RTT (Radiation Therapists) Trainers - Part I

22-26 October 2018 | Vienna, Austria

Positioning and Immobilisation for Radiation Therapy

3-4 November 2018 | Vienna, Austria

Comprehensive Quality Management in Radiotherapy - Risk Management and Patient Safety

4-7 November 2018 | Athens, Greece

ESTRO/ESOR Multidisciplinary Approach of Cancer Imaging

5-6 November 2018 | Rome, Italy

Accelerated Partial Breast Irradiation

11-14 November 2018 | Brussels, Belgium

Research Course in Translational Radiation Biology and Oncology

11-14 November 2018 | Florence, Italy

POSTGRADUATE COURSES OUTSIDE EUROPE

3D Radiotherapy with a Special Emphasis on Implementation of MRI/CT Based Brachytherapy in Cervical Cancer

8-11 March 2018 | Lucknow, India

Basic Clinical Radiobiology

Endorsed by ESTRO

10-13 May 2018 | Melbourne, Australia

Multidisciplinary Management of Head and Neck Oncology

11-13 May 2018 | Osaka, Japan

Palliative Care and Radiotherapy

5-7 June 2018 | Mexico City, Mexico

Combined Drug Radiation Treatment: Biologic Basis, Current Applications and Perspectives

13-16 June 2018 | Chengdu, China

AROI Course in Collaboration with ESTRO on Advanced Technologies -

Endorsed by ESTRO

7-10 October 2018 | Rajamahendravaram, India

Advanced Technologies

28-31 October 2018 | Petaling Jaya, Malaysia

PRE-MEETING COURSES

Six Pre-Meeting Courses at ESTRO 37

20 April 2018 | Barcelona, Spain

UNDERGRADUATE COURSES

Medical Science Summer School in Oncology for Medical Students

2-11 July 2018 | Groningen, The Netherlands

ESO-ESSO-ESTRO Multidisciplinary Course in Oncology for Medical Students

August 2018 | Poznan, Poland

-  MULTIMODAL CANCER TREATMENT
-  RADIOTHERAPY TREATMENT PLANNING AND DELIVERY
-  BIOLOGY
-  IMAGING
-  RESEARCH
-  BEST PRACTICE



BCY4

4TH ESO-ESMO BREAST CANCER IN YOUNG WOMEN INTERNATIONAL CONFERENCE

6-8 October 2018
Lugano, Switzerland

Chair: O. Pagani, CH

Scientific committee: F. Cardoso, PT - N. Harbeck, DE
S. Paluch-Shimon, IL - F. Peccatori, IT - A. Partridge, US
E. Senkus, PL - Y. Wengström, SE

IMPORTANT DEADLINES

- Abstracts and travel grants: **6 May 2018**
- Early registration: **by 17 June 2018**
- Late registration: **by 23 September 2018**
- Onsite registration: **from 24 September 2018**

ORGANISING SECRETARIAT: European School of Oncology (ESO) | Via Turati, 29 | 20121 Milan | Italy | Francesca Marangoni | fmarangoni@eso.net | ph +39 02 85464 525

Further information available at www.eso.net | Follow us on   **#BCYlugano**



INSIDE TRACK CONFERENCE



YOUNG ESTRO



“This issue features an interview with the new chair of the yESTRO committee, Pierfrancesco Franco, who officially started his work at ESTRO 37”

Welcome to the Young Corner. We hope you had a great time in Barcelona at ESTRO 37. In this issue, we have several reports from the Young Track of the conference. We also have an interview with the winner of the Young Track quiz, who received a free registration to an ESTRO course.

This issue features an interview with the new chair of the yESTRO committee, Pierfrancesco Franco, who officially started his work at ESTRO 37. In the interview he tells us about himself, his experiences in ESTRO, and importantly, his ideas for the new tasks ahead in yESTRO.

And do not forget the next upcoming event for young members, at least if you are a medical physicist: the 2nd ESTRO physics workshop – ‘Science in development’ in Malaga, Spain, in October. Please follow the latest news about the workshop on the ESTRO website and young ESTRO Facebook page and don’t forget to register.

Kathrine Røe Redalen and Pierfrancesco Franco



KATHRINE RØE
REDALEN



PIERFRANCESCO
FRANCO



Interview with Pierfrancesco Franco MD, PhD, ESTRO Young committee chair



PIERFRANCESCO
FRANCO

What is your educational background and where do you work today?

I am a medical doctor and a radiation oncologist. I am associate professor of radiation oncology in the Department of Oncology at the University of Turin, Italy. This is also where I obtained my master's degree in medicine and attended the residency programme in radiation oncology. My fields of interest are head and neck and gastrointestinal malignancies and breast cancer and I am in (co)charge of the clinical research projects on these topics. I am particularly interested in the optimisation of radiotherapy treatment approaches for cancer patients in different settings. I spent a period at the University of Pennsylvania in Philadelphia, USA, working on high-precision radiation delivery in breast cancer. My PhD focused on developing strategies to minimise the haematologic toxicity profile in the combined modality treatment of patients affected with anal cancer.

Can you tell us a little about what you do outside work?

I like reading, watching movies and traveling to new places. I am particularly into (noisy) music (I guess some of you wouldn't even call it music). I like sports (especially US sports – basketball, American football and baseball). I adore modern and contemporary art. If I am not at work, there is a high chance you would find me inside a museum or art gallery.

What ESTRO activities were you involved in before you became the new yESTRO chair?

I started getting involved in ESTRO activities when I was appointed co-chair of the Young Corner for the ESTRO newsletter. I have now been running the Young Corner with my co-editor and friend Kathrine Røe Redalen for three years. It has been a rewarding experience so far. I also took part in the Agora Meeting, held in Mont Sant Benet, near Barcelona, in 2016. After that meeting, which was designed to bring together potential leaders in radiation oncology from all over Europe, I was selected (with Ludwig Dubois) to join the Young ESTRO committee as a member. This happened in late 2016. During a productive year within the young committee, I had the chance to contribute to the update of the core curriculum and to participate in the strategy meeting held in Mechelen, Belgium, in early 2018. I was also able to collaborate with Jean Emmanuel Bibault, helping him in the chairing duties. I took over as chair at ESTRO 37 in Barcelona, Spain.

Why did you want to become chair of yESTRO?

I considered becoming chair of yESTRO an honour. It is a privilege to be able to contribute to ESTRO's goals, vision and strategy in a practical way. It is a great opportunity to make my commitment to ESTRO concrete. Being in ▼

the young committee gives me the opportunity to meet young professionals in the field of radiation oncology from all over Europe and even outside the continent. This is enriching because it is a perfect networking context. I also want to increase my collaboration skills, taking advantage of the multidisciplinary nature of ESTRO. I would like to challenge myself in leading projects, being involved from the initial idea to the final execution.

What opportunities do you think you will get as chair of the committee?

There is a full range of opportunities in being chair of yESTRO. Being actively involved in the life of the Society; contributing with ideas, commitment and energy; collaborating with other committees, councils and the ESTRO Board; networking with young radiation oncology professionals in Europe; and increasing the visibility and the engagement of young members within the Society. yESTRO is a starting point for initiatives and projects, and new opportunities will always present themselves.

Will there be any challenges?

Of course there will be challenges. But first let me point out that the prior chairs and members of the young committee (and young task force previously) did a tremendous job in highlighting the role of young members within ESTRO. At present, young members are highly involved in the Society with respect to science, education and

executive duties and responsibilities. My task is to keep this momentum created by my predecessors going, trying to boost even more the role of yESTRO inside and outside the Society.

Have you already planned some new projects with yESTRO?

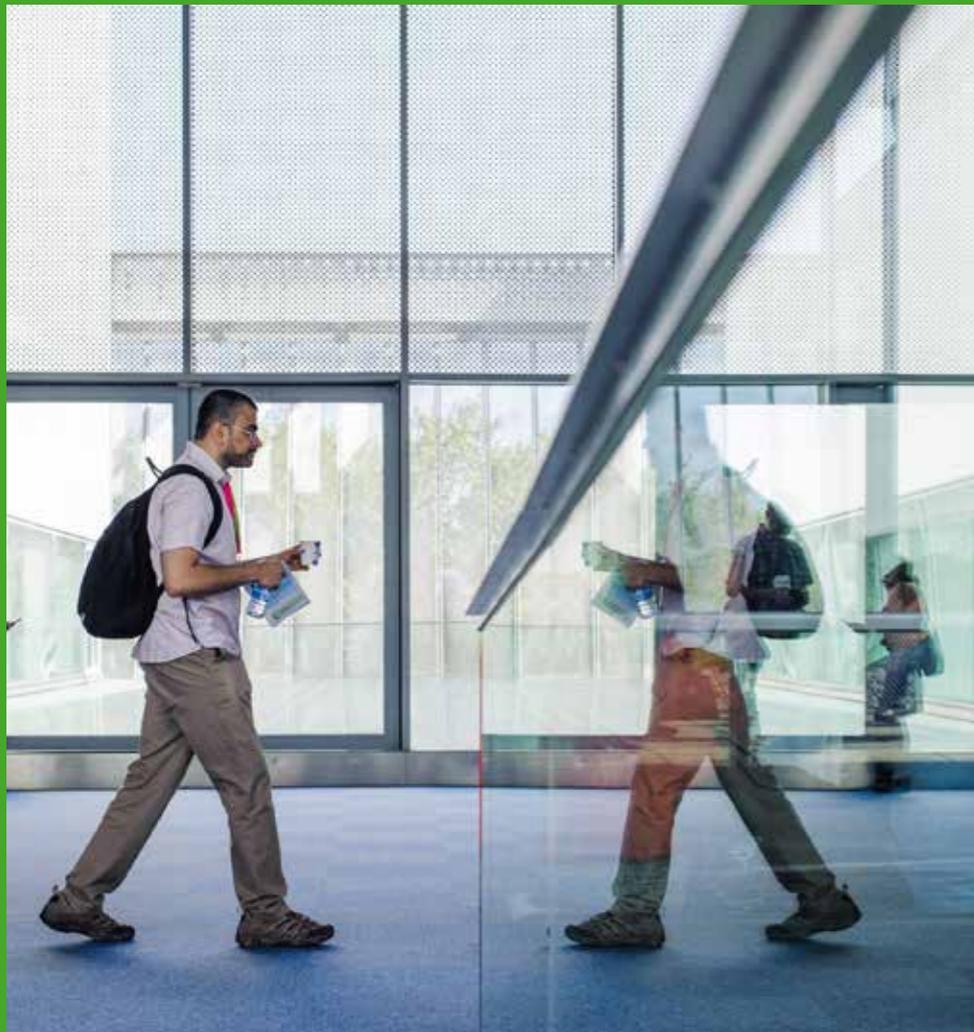
Actually we have. We are planning to act as facilitator for countries willing to set up a young national society, in close collaboration with the national society committee. I think this would be an ideal strategic plan to help young professionals on a national level and to strengthen the relationship between national societies and ESTRO. We are also working on a research project to investigate personality traits that may predispose some young radiation oncology professionals to burn out. You will hear about that soon.

Do you have any good advice for young ESTRO members?

Commit yourself and get involved in ESTRO and yESTRO. You will find the perfect environment to enhance your professionalism within an international setting and a friendly atmosphere. Please join us in our work.

*Pierfrancesco Franco MD, PhD
Department of Oncology, Radiation Oncology
University of Turin, Italy*

REPORTS FROM THE YOUNG TRACK AT ESTRO 37



Big data: how to handle, interpret and analyse? ▶▶

How to do good interdisciplinary science ▶▶

Medical writing and publishing ▶▶

Modern learning methods and 'speed dating' session ▶▶

Young Track quiz ▶▶

Young networking session ▶▶



Big data: how to handle, interpret and analyse?

TEACHING LECTURE

Chair: Wouter van Elmpt (The Netherlands)

Speaker: André Dekker (The Netherlands)



The Young Track opened with a lecture from Professor Andre Dekker

The Young Track at ESTRO 37 opened with a lecture from Professor Andre Dekker from the MAASTRO clinic, Maastricht, The Netherlands, on the use of big data. At 8 am the room was already filled with an enthusiastic mix of young radiation oncology professionals, as well as some more senior professionals who had found their way into the conference room. All the seats were occupied and a separate room with a live video feed was necessary so that everybody could get an introduction to big data.

The presentation started with a short introduction on the overwhelming amount of

data that is currently available for radiation oncology professionals to help them make their decisions. This put into perspective the cognitive capacities of human beings that can typically only take five or six variables into account simultaneously. Concepts such as the ‘sharp knife’ (no randomised evidence of sharp versus blunt knives, or the effectiveness of parachutes), and bias in current knowledge generated by clinical trials (with only the more ‘healthy’ part of the population included) set the scene for the lecture on why big data is becoming such an important part of radiation oncology, and medicine in general. ▼



WOUTER
VAN ELMPT



Overview of the big-data network currently in operation or planned around the globe focusing on radiation oncology. CAT is an abbreviation of computer-aided theragnostics

Big data has its backbone in the data themselves, and although terabytes of data are available, only a small proportion is actually accessible to researchers, because the data are kept behind the firewalls of hospitals. Prof Dekker discussed the perceived barriers that are typically put up as a reason for not sharing data: 1) administrative (we don't have the resources); 2) political (we don't want to share data because they might influence our practice); 3) ethical (we are not allowed to); and 4) technical (we want to but can't). All of these might be tackled, but a different solution is on the way. Prof Dekker said that instead

of bringing the data to the researcher for analysis (by sharing them), another option is to bring the researcher to the data to analyse them. Technology is currently being developed that allows for distributed sharing of data sources that are located in different places (see figure 1 on the CORAL network).

In the next part of the lecture, Prof Dekker talked about the amount and quality of the data that you need for modelling approaches and learning techniques. More data is often better, and he showed results that illustrated that a lack of data is often a problem in modelling techniques. The technical modelling approaches have been refined in the machine learning and data science community for years. It is the amount of patients in the research database that is the biggest factor influencing the outcome.

Various results using big data from the radiation oncology world were shown. One example came from proton therapy in The Netherlands, where a model-based approach is used in which a clinical benefit first needs to be proven in a photon versus proton plan comparison, before reimbursement is permitted. Another example comes from the domain of the automatic segmentation of organs at risk

(OARs). In this area, research and commercial software for contouring is becoming more powerful and barely distinguishable from human contours (see also the physics poster award-winning abstract by Gooding *et al*).

Although there are still challenges to be solved, the effective use of big data is going to be a key component of the methods and tools that we use to improve the outcomes of radiotherapy.

Wouter van Elmpt
Maastricht University Medical Centre
Maastricht, The Netherlands

How to do good interdisciplinary science

LUNCH SYMPOSIUM

Chair: Kathrine Røe Redalen (Norway)

Co-Chair: Jolien Heukelom (The Netherlands)



Dr Orit Kaidar-Person, about how to design a clinical trial with a translational focus



JOLIEN HEUKELOM

The subject of the Sunday lunch symposium was ‘How to do good interdisciplinary science’. It started with a presentation from Dr Orit Kaidar-Person, about how to design a clinical trial with a translational focus. She highlighted that the outline subject can be interpreted in many ways and covers a broad array of topics. For this reason, the presentation sought to offer

an effective overview, rather than an in-depth scientific outline for translational research.

Next up were the founders of the young German radiation oncology society (yDEGRO), who discussed how they had set up their network to improve communication and participation of young radiobiologists, physicists and radiation ▼



oncologists. Nadia Ebert explained how fruitful this has been already. A thought-provoking question was posed from the audience: “should we foster and set up young societies to increase engagement, or would it be better to involve the young more overtly in the regular society, thus increasing the communication between the established and the young?” Perhaps these options are not mutually exclusive.

After this, the first publication made possible by the collaboration within yDEGRO was presented, entitled ‘Predictive value of gross tumour volume (GTV) in radiotherapy of non-small cell lung carcinoma (NSCLC): early results of the NCT03055715 trial’. Although it was a great example of the success of yDEGRO, the in-depth scientific results felt a little out of place in this otherwise not-too-scientific session.

The session concluded with a section dedicated to ESTRO’s mobility grant scheme, in which we heard about the experiences of three young ESTRO members who had been abroad. One thing was apparent in all the presentations: going abroad is fun, extremely educational, and can be a great way to start long-lasting international collaborations. This is, of course, exactly the purpose of the grant, and with an acceptance rate

of 50%, the odds look good for young applicants. So, I encourage you all to apply, and perhaps we’ll hear your story next year?

*Jolien Heukelom
Radiotherapy Department Netherlands Cancer
Institute
Amsterdam, The Netherlands*



Medical writing and publishing

SYMPOSIUM

Chair: Gerben Borst (The Netherlands)

Co-Chair: Mateusz Spalek (Poland)



Pierre Blanchard, co-editor in chief of *Clinical and Translational Radiation Oncology* (ctRO) journal

You feel that results of your clinical trial are really important and practice changing. But how to write a good article? And how to make it publishable? For the majority of young researchers it is still a somewhat mysterious process, even a sophisticated art. Together with Dr Gerben Borst, I had the honour of co-chairing the session related to medical writing and publishing.

Our first guest was Phillip Leventhal, a scientific writer at 4Clinics in Lyon, and the editor-in-chief of the journal *Medical Writing*. His experience (more than 15 years as a scientific writer, writing and editing hundreds of peer-reviewed articles) spoke for itself. And he had a kind of magnetism – our meeting room was



Alison Waldron (Elsevier) gave the second presentation about *Physics and Imaging in Radiation Oncology* (phiRO)

full of people (we are sorry that we did not have enough seats). Phillip revealed many of the secrets of good medical writing. One of his tips was to make your manuscript understandable, interesting and convincing. Many researchers try to focus on too many things. In any article, the central message should be very clear. What about sophisticated language? A good article is not a poem – it should be understood by everyone who reads it. Keep it as simple as you can. And if you are not sure or you are not a native English speaker, you should always consider contacting professionals in medical writing. Phillip also spoke about grammatical techniques and conceptual methods that could improve the chance of a successful publication.



MATEUSZ SPALEK



Sara Faithfull about the third open access ESTRO journal - *Technical Innovations and Patient Support in Radiation Oncology* (tipsRO)

it's a rapidly developing 'ESTRO child' and its appearance on PubMed is just a matter of time.

Our last speaker, Sara Faithfull (Royal Marsden Hospital, UK), gave a very interesting presentation about the third 'young' ESTRO journal - *Technical Innovations and Patient Support in Radiation Oncology* (tipsRO). We know that the magical 'impact factor' matters. But what gives a journal real impact? What does this mean? Sara tried to resolve this question. Medical writing is a wish to communicate something new – and even to change practice. After Sara's presentation we understood that impact is not only a number, but a real benefit for health care.

The next speakers provided a first-year update for the three rapidly developing ESTRO journals. Dr Pierre Blanchard (Gustave Roussy Cancer Centre, France) presented data from the *Clinical and Translational Radiation Oncology* (ctRO) journal. The first issue was published in December 2016. Since then, a further six volumes have been published. But what about the speed of publication? This is one of the main goals of the new journals. The mean time

between submission and first editorial decision based on the reviewers' recommendations for research articles is currently close to three weeks. After receiving the revised version, the final decision is reached in less than two days. That's fast! ctRO is also now indexed on PubMed.

Alison Waldron (Elsevier) gave the second presentation about *Physics and Imaging in Radiation Oncology* (phiRO). She showed that

It was a really good symposium. Am I a better medical writer after these few presentations? I don't think so. But I am sure that I have understood how to become a better medical writer. I also hope that this short summary will be published in the ESTRO newsletter – it's a small start, isn't it?!

Mateusz Spalek
Maria Skłodowska-Curie Memorial Cancer Centre and Institute of Oncology in Warsaw, Poland

Modern learning methods and ‘speed dating’ session

SYMPOSIUM

Chairs: Ludvig Dubois (The Netherlands) and Pierfrancesco Franco (Italy)

The symposium ‘Modern learning methods’ was scheduled after the crowded lecture on big data. Christine Verfaillie, the 2018 ESTRO Emmanuel van der Schueren awardee and ESTRO managing director of education and science, guided us through the ESTRO School programme, offering advice on how to choose the right course. With around 35 ESTRO courses offered each year there are plenty to choose from.

Mateusz Spalek then took us through the history of education and into modern learning methods, concluding that blended learning has become the gold standard. The ESTRO Moodle platform is an excellent example of this blended learning method.

Next, we had the opportunity to hear about the personal experiences of three young scientists and their work in ESTRO, which resonated with the audience. Berardino De Bari explained that learning how to teach is a continual process and that feedback from peers is invaluable. Maria Luisa Belli described how the first ESTRO physics research masterclass had helped to structure her thinking so as to focus on a single research idea. Johanna Hundvin shared her experience from the basic

clinical radiobiology course, highlighting the importance of motivated teachers.

Overall, this was a very interesting symposium with lots of open questions, an ideal starting point for the ‘speed dating’ session that took place afterwards. This was a scientific networking session, in which young scientists and professionals at an early stage of their career had the chance to meet and exchange information and ideas. Participants had five minutes to introduce themselves to one another, state what topics they were interested and which research projects they were currently working on. When the time was up, they moved to the next colleague. It is a very informal way to share experiences, feedback and to potentially set up research collaborations on an international level. The session was joined by 30 young scientists and was very well received, with an enthusiastic and easy-going atmosphere.

*Ludwig Dubois and Pierfrancesco Franco
Chairs of the Young Track*



LUDWIG DUBOIS



PIERFRANCESCO
FRANCO

Young Track quiz

Interview with the 2018 winner: Ahmed Salem



Ahmed Salem, Young Track quiz winner (middle), Ludwig Dubois (left) and Pierfrancesco Franco (right)



AHMED SALEM

What is your background and where do you work?

I am a Jordanian radiation oncologist working in the UK as a senior clinical lecturer in lung cancer research at the University of Manchester, and honorary consultant in clinical oncology at Christie NHS Foundation Trust, Manchester. In my clinical work, I specialise in lung cancer radiotherapy, while

my research focuses on validating novel biomarkers of hypoxia in lung cancer patients.

Have you attended an ESTRO conference before?

Yes. In fact, this is my third. I have found coming to ESTRO conferences a very rewarding and effective exercise, which ▼

allows me to stay up to date with recent developments in the field, while establishing and maintaining professional and personal relationships with like-minded colleagues.

Have you been involved in any other ESTRO activities?

First and foremost, I am a proud ESTRO fellow. I am also a co-chair of the FALCON workshop operational group, assisting in the organisational aspects of the FALCON workshops.

The FALCON workshops aim to reduce inconsistencies in target and critical structure contouring among radiation oncologists and radiographers. I strongly encourage my colleagues to attend relevant workshops to inform and strengthen their daily practice.

What did you like most in the Young Track this year (other than winning the quiz)?

I was impressed that the sessions were delivered by young ESTRO members fostering an environment of peer-assisted learning. In general, the sessions were interesting and highly engaging. Apart from winning the award, the young networking session was a conference highlight.



It is very motivating to see what other young colleagues are up to. As a bonus, you often get along well with people you share a lot with.

Your prize is an ESTRO School course. Which will you choose?

This is a difficult one! There are two courses that I am considering:

- Clinical practice and implementation of image-guided stereotactic body radiotherapy (2-6 September 2018 - Porto, Portugal). This looks like a good choice, particularly as I

would like to improve my knowledge and skills in stereotactic body radiotherapy.

- Comprehensive quality management in radiotherapy: risk management and patient safety (4-7 November 2018 - Athens, Greece). One can never be too safe in radiation oncology.

Ahmed Salem

University of Manchester / The Christie NHS Foundation Trust, Manchester, UK

Young networking session



ANNE GASNIER

I was fortunate to attend the ESTRO congress for the first time this year. I was very much looking forward to this scientific meeting, which offers such a comprehensive range of talks by renowned speakers. However, organising my time during this four-day meeting was slightly daunting. How should I select the talks to attend while also making the most of

the impressive exhibition area and taking the opportunity to meet other European colleagues?

Luckily, a session dedicated to networking was organised on Sunday afternoon as part of the Young Track. Following a quiz, drinks and canapés were offered, which created a relaxed atmosphere to meet peers. I discussed the ▼



I took the opportunity to mingle and meet European peers from all four disciplines (radiation oncologists, radiation therapists, medical physicists and radiobiologists). We compared brachytherapy practices in various radiation oncology centres. This was particularly interesting to me, as I have recently moved from England to France, which has raised my awareness of practice differences in Europe.

I think the networking session is a great opportunity to meet people outside your circle of colleagues and to bring the European radiation oncology community closer together, hopefully creating future collaborations. I would definitely recommend any young ESTRO member to attend a similar networking event next year.

*Anne Gasnier
Medical Physicist,
Radiotherapy Department
Georges Pompidou European Hospital,
Paris, France*

remit of the young ESTRO committee (yESTRO) with Ludwig Dubois, one of the committee members, and Myriam Lybeer, membership manager. The committee is in charge of organising the Young Track at ESTRO, but also promoting tools like DOVE, an online library of peer-reviewed information

for radiation oncology professionals. It also organises European-wide surveys, such as the comparison of learning schemes for radiation oncology. In addition, members of the yESTRO committee join other standing committees as observers to represent the interests of young ESTRO members.



HEALTH ECONOMICS



What is driving innovation? Value for money or value for many?

Report on ESTRO 37 key theme: Innovation for value and access

This year’s conference theme – ‘Innovation for value and access’ – opened up passionate discussions about the global population’s access to adequate care and the importance of innovation in the field of treatment delivery.

ESTRO 37 started with a fresh viewpoint on value-based healthcare: Professor Rifat Atun’s opening presentation challenged the way we have been thinking about improving value. We need to focus on changing the system more than focusing on specific innovations.

The value of radiotherapy, and healthcare in general, means more than simply its financial value. Indeed, the challenge for modern healthcare is to tackle efficacy and effectiveness along with equity and responsiveness. Prof Atun defined value with the following pun: value for money, value for many. By doing so, he addressed the two-fold challenges of our European health welfare systems and population access to care constrained by the scarcity of public financing resources.

Monetary value of care

Let’s look at value for money. Traditional utilitarian methodologies, such as cost-effectiveness and cost-benefit evaluations, allow you to quantify the monetary cost of an intervention against its clinical outcome. Access

is here defined as covering financial interventions that have the highest clinical benefit to patients.

Two proffered papers presented such evidence. Adrian Paix produced evidence that stereotactic body radiation therapy (SBRT) treatment for early stage non-small cell lung carcinoma produces a gain of €2,714/quality-adjusted life years (QALY) against lobectomy. Michael Barton shared with us his findings on the inexpensive average cost of radiotherapy of in Australia of AU\$18,860 per life year gained.

Value of access to care

If we look at value for many, access has a wider definition. Three proffered papers tackled this issue: one looking at factors influencing the use of a treatment; another defining the establishment of a department in an isolated location, and the third, the shifting of tasks to overcome the lack of human resources.

Through a population-cohort study in Norway, Linn Asli showed that under universal coverage all patients needing palliative radiotherapy do not necessarily receive it. External factors such as being part of a high-income household and being diagnosed at a radiotherapy centre increase the likelihood of receiving the appropriate radiotherapy palliative care. ▼



NOEMIE DEFOURNY





standards on activities traditionally performed by other professions can be reached.

Innovation in daily treatment delivery practice

Christian Kirisits and Marco Van Vulpen debated that while all clinical ideas had to be economically viable to be developed by industry, innovation should be defined as the theoretical innovation that allowed for the implementation and daily utilisation of technologies, rather than the technology itself.

Indeed, concepts such as the planning target volume (PTV) conditioned the development and daily utilisation of advanced technologies. They both agreed that we need to move away from comparing technologies and collaborate on innovations that achieve real benefits for patients. At a departmental level, Calogero Casa presented a potential tool to identify innovation in treatment delivery such as improved management of patient processes and workflow. The ‘process mining’ tool, by extracting data from existing electronic health records (EHR), enables benchmarking of actual practice adherence to good clinical guidelines. ▼

Tackling access from a different angle, Michael Barton investigated the establishment of a department in a low and middle-income country (LMIC) in an isolated location. With the Global Task Force on Radiotherapy for Cancer Control (GTFRCC) investment plan, he built a case to establish an integrated cancer institute, to bring cancer treatment to a remote place, such as an island.

Task shifting was addressed by Nicole Harnett as a future solution for overcoming under-served regions. This idea was well supported by Justin Bekelman and Cai Grau, along with increased use of artificial intelligence (AI). The Advanced Practice Radiation Therapist (APRT) programme, presented by Nicole Harnett, with its competency framework, demonstrates that with adequate dedicated education and supervision, acceptable

How do we define value?

Prof Atun's definition of value was further discussed during the symposia on value-based radiotherapy and planning the future. Yolande Lievens presented a methodological review assessing value, started by the European Cancer Organisation (ECCO) Value-Based Healthcare Project. She stressed that we have to include value assessment in our research. Without it, we will not close the research gap between evidence-based medicine treatment developments that are considered for reimbursement policies and the implementation of innovation in daily practices, which lead to a broader type of evidence gathering than randomised control trials (RCTs). Vincenzo Valentini argued that value is being redefined in the modern system by including faster and wider diffusion. He argued that it is necessary to engage with more people through blended learning to widen the network of scientific content production. Building on the diffusion of value, for David Jaffray, the value of innovation relies on how we connect things altogether.

Reshuffling research priority

Finally, if you remember last year's newsletter, we reported at ESTRO 36 the limited correlation between current healthcare expenditures and treatment outcomes, suggesting a reshuffling of research priorities.

This year, Danielle Rodin advocated a way forward in shaping priorities by developing frugal design tailored to the need of each community. For David Jaffray, the priority was to engage in global discussion, outside the radiotherapy field to tackle this challenge in connection with all stakeholders, as part of a wider cancer plan programme. To conclude, David Jaffray takes an extra step by scaling up the research priority to engage in global discussion, outside the radiotherapy field to tackle this challenge in connection with all stakeholders, as part of a wider cancer plan programme.

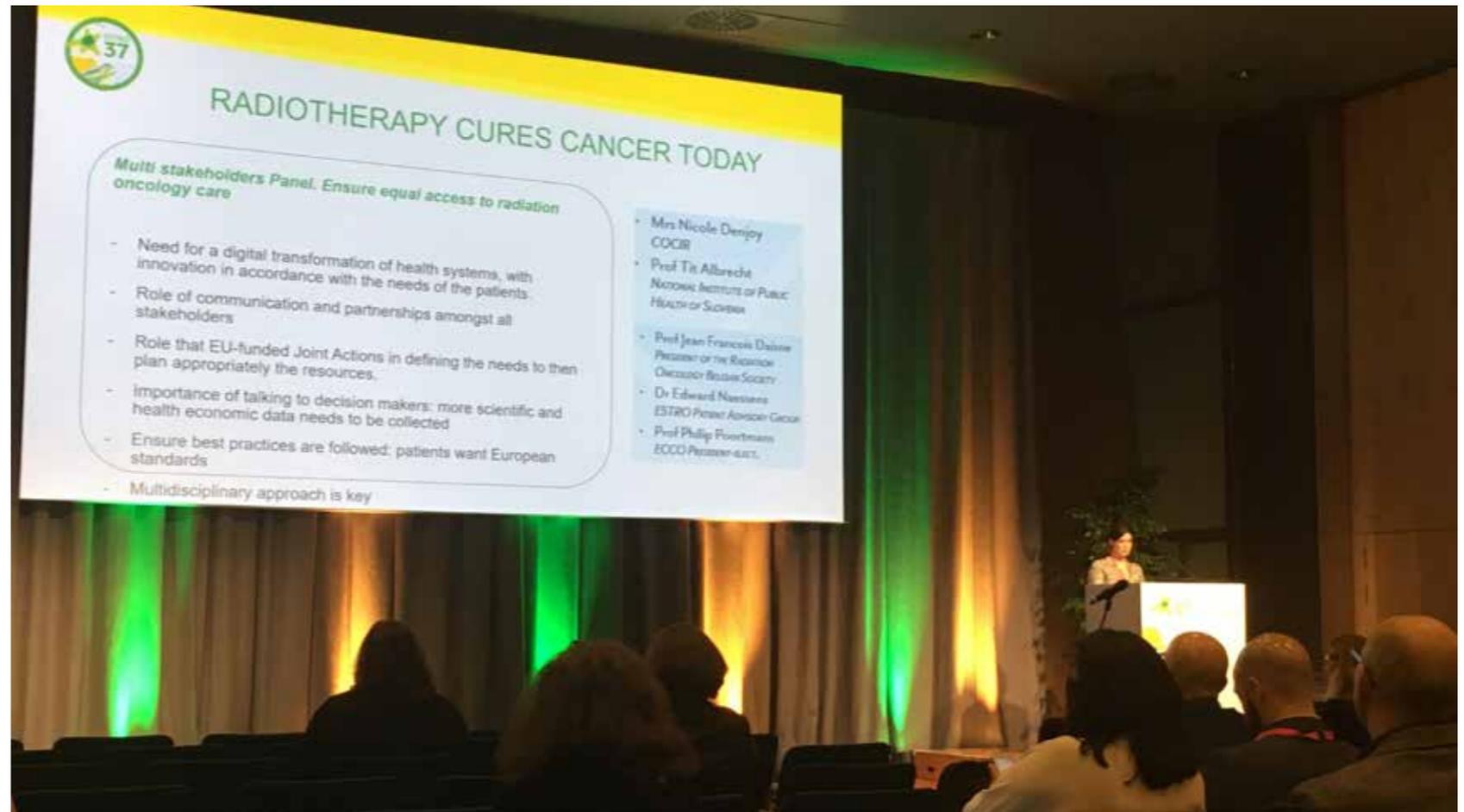
*Noémie Defourny
Health Economist
ESTRO office
Brussels, Belgium*



MAKE IT HAPPEN

National Societies Day 2018

Friday 20 April 2018
Barcelona, Spain



Chiara Gasparotto, ESTRO Director of Policy and Partnership reporting on the European Parliament symposium



GABRIELLA AXELSSON

The ESTRO National Societies meeting took place on Friday 20 April in parallel with the ESTRO 37 congress in Barcelona, Spain. It was attended by medical professionals from all over Europe, as well as some participants from Mexico and Kazakhstan. The attendance at the meeting has been steadily increasing every year, with an almost 10% rise since 2017, and with participants from 28 different countries. This increase in attendance suggests that there is a demand

for closer collaboration between societies and discussion during the day reinforced this view. National society representatives shared their enthusiasm, voicing a keen interest to learn from each other, and to continue the dialogue to foster collaborations between stakeholders to improve radiotherapy services for patients.

There were presentations and updates from a number of ESTRO projects, including the ▼





Health Economics in Radiation Oncology (HERO) project, the ESTRO-European Organisation for Research and Treatment of Cancer (EORTC) project E2radiate, the ESTRO School and the Radiation Oncology Safety and Information System (ROSEIS).

A dedicated slot was reserved for Professor Pedro Lara from the Spanish Society of Radiation Oncology (SEOR), who gave an overview of the current landscape in Spain, our national host for this year's congress. In the presentation, Prof Lara discussed educational courses provided locally, the success story of the Amancio Ortega Foundation providing €8 million funding to sustain radiotherapy technology, the application of the HERO tool, and the Spanish Society for Medical Physics (SEFM). In addition, SEOR has translated the ESTRO public affairs toolkit into Spanish, with the intention of supporting awareness-raising activities, education, research and innovation in Latin America. With the same goal, the Marie Curie campaign has been launched at national level in Spain.

This year's meeting paved the way for strengthening collaborations and inviting national societies to share their activities at the next National Societies Day in 2019.

We are eager to support societies with the implementation of European directives

at national level, in order to improve radiotherapy services for patients, and their family and friends. We look forward to next year's meeting in Milan, Italy.

Gabriella Axelsson
Public affairs project manager
ESTRO office
Brussels, Belgium





CONFERENCES



[ESTRO 37 scientific reports ▶▶](#)

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[Super Run ▶▶](#)

[Photo album ▶▶](#)



ESTRO 37 scientific reports



The congress report: a selection of the best studies explained by their authors



You can still access the various scientific materials from the congress, such as the abstract book and the programme book. More importantly, do not miss the congress report: the chairs of each track have selected some of the highest-scoring abstracts. We have asked their authors to share the outcome of their work with us. The report also includes summaries of the awarded lectures.

Access the congress report here: www.estro.org/binaries/content/assets/estro/conferences/estro37/180515-estro-37-congress-report.pdf >

The July-August newsletter: a tribute to the congress in all the Corners



In this July-August issue, the editors of the Corners and their teams have prepared some articles reporting on the congress. So jump from one Corner to another and, whether you were a participant or not, find out about the main moments of the congress in most of the Corners: clinical, brachytherapy, RTT, physics, radiobiology, ESTRO School, young, health economics, Make it happen, and, of course, the Conference Corner.



AWARDS

Lifetime achievement awards

Rob Glynne-Jones >

Michael Joiner >

Richard Pötter >

David Thwaites >

Erik Van Limbergen >

ESTRO award lectures

Emmanuel van der Schueren award

Christine Verfaillie >

Donal Hollywood award

Corinne Johnson >

Iridium award

Jean-Jacques Mazeron >

Klaas Breur award

Gillies McKenna >

Jens Overgaard Legacy award

Vincent Grégoire >

Honorary members

Regina Beets-Tan >

Soehartati Gondhowiardjo >

Joachim Yahalom >

Academic award

Jack Fowler University of Wisconsin award

Jenny Bertholet >

Company awards

ESTRO-Accuray award

Ahmed Salem >

ESTRO-Varian award

Alejandro Berlin >

ESTRO- Elekta Brachytherapy award

Luca Tagliaferri >

GEC-ESTRO best junior presentation Elekta
sponsored by Brachytherapy

Chiara Cavallin >

Young investigator awards

sponsored by Elsevier

ctRO award

Simon Duke >

phiRO award

Matthew La Fontaine

tipsRO award

Emina Ajanovic

ESTRO poster awards >

Best clinical poster award

Michiel Minten >

Best physics poster award

Mark Gooding >

Best RTT poster award

Eline de Groot – van Breugel >



Lifetime achievement award

Rob Glynne-Jones

Mount Vernon Centre for Cancer Treatment,
Northwood, UK



Rob Glynne Jones (left) and Umberto Ricardi (right), ESTRO President

What is your next challenge?

I find the human condition endlessly diverting. I am writing a play about Darwin. I am fascinated by his motives for keeping his preliminary thesis in a drawer for 15 years until 1859 when the 'Origin of species' was published. He instructed his wife to publish it on his death. There are many theories to account for "Darwin's delay". We know that he also delayed publication of his book on orchids and his book on earthworms for 30-40 years! This sounds extraordinary to anyone publishing in the modern era.

What do you think are the next challenges for radiation oncologists

Integrating immunotherapy into radiotherapy or *vice versa*. The mechanics of immune surveillance, equilibrium and immune escape seems to have almost a galactic complexity, but we may be able to manipulate some processes with radiotherapy. To date, we have only explored the best sequence of radiotherapy combined with immunotherapy (before/during/ after), the optimal fraction size (large) and optimal number of fractions (more than one). I guess different cancers may have different strategies, so it will be a long job.

To whom would you like to dedicate your award?

Without question my wife Tessa, who worked as a child psychiatrist and without whom I would not have received this award.

What do you do in your spare time?

I read classics at university (Latin/Greek/Ancient history/philosophy) and before that I was at university in Spain. Currently I am reading about classical rhetoric and looking again at Cicero's speeches. I am also trying to improve my Spanish.

I love opera. I like walking, cycling, swimming, fishing and sailing in the summer. We have a house near the sea in Wales (UK), which I visit frequently. In winter I like reading, cooking and playing Scrabble with my wife.



Lifetime achievement award

Michael Joiner

Wayne state University
Detroit, Michigan, USA



Michael Joiner (left) and Philip Poortmans (right), ESTRO Past-president

What started your interest in science?

My interest in science started early, with the home chemistry lab I built in my teens in an old shed in my parents' garden. So, unsurprisingly, in high school, which was one of those 'public' schools in England straight out of Harry Potter, I became good at science, or rather physics and chemistry, but with no room to do biology as well.

If you hadn't been a scientist, what would you have been?

At Cambridge University I did natural sciences, but again excluding biology. At the start of my first semester there, they gathered all the new students in the college quadrangle and said to us: "Whoever wants to change to medicine, put your hand up now as this will be your last chance". My hand was half way up – such a difficult decision, but in the end I chose "no". Would I have led a different life? Probably not so different as it has turned out, because I would still have gone towards research, and I have still ended up in a clinical department.

What have been the highlights of your career?

When I graduated, I looked towards a PhD. And still not really understanding why, I was drawn to

the programme run by Gordon Steel at the Royal Marsden, London, initially to figure out if it was possible to use ultrasound to create localised hyperthermia. The answer was yes. At last getting into biology I found there was no going back, and I became one of the many physicists who mutated into radiobiologists.

What has been your involvement within ESTRO?

My association with ESTRO was inevitable from that point, and having by that time moved to the old Gray Laboratory Cancer Research Trust, I immediately accepted Gordon's offer to join him for the very first basic clinical radiobiology course which was held in Granada, Spain, in 1990. I have now done 40, with another two to go later this year.

When do you think you will retire, and what would you like to do then?

Researchers and teachers never really retire – they are addicted to these drugs. As long as I get smiles on the faces of those that I teach, then this is what I will be doing.



Lifetime achievement award

Richard Pötter

Department of Radiation Oncology,
Medical University of Vienna
Vienna, Austria



Richard Pötter (left) and Umberto Ricardi (right), ESTRO President

What have been the highlights of your career?

My many career highlights include:

- experiencing a high-quality education and training in clinical medicine, radiology (CT, MRI, US), radiation oncology, research and clinical trial performance in Münster, Germany;
- moving to Vienna, Austria, in 1993 as full professor and chairman for a large and comprehensive department of radiation oncology, which then moved into the new general hospital, presenting unique opportunities;
- establishing in Vienna several teams of young radiation oncologists, medical physicists, radiation biologists, radiation technologists and nurses, aiming for high quality in health care, research and development (R&D), and education;
- becoming an active member of an ESTRO teaching course ('modern brachytherapy') with a great faculty since 1993 and meeting a huge number of participants;
- becoming co-editor of the GEC-ESTRO *Handbook of Brachytherapy* in 2000 and continuing this challenging task until today;
- within the context of ESTRO and the ESTRO

- School, meeting numerous outstanding people with whom friendships have grown, and developing together the field of radiation oncology, in particular MRI-based radiotherapy and image guided brachytherapy for cervical cancer;
- establishing a GEC-ESTRO core leadership and working group structure in 1998-2002 which has become the backbone of GEC-ESTRO activities;
- becoming chair of the education committee 2006-2016 and establishing a multidisciplinary group of highly motivated people which enabled the establishment of the ESTRO School;
- contributing to the design and implementation of the heavy particle therapy facility MedAustron near Vienna and contributing to European networking and R&D in this field (ENLIGHT, ULICE);
- developing a new method for cervical cancer treatment (IGABT) – disseminated worldwide – with outstanding people in Vienna and in the gynaecological GEC-ESTRO working group and network; and
- providing increasing clinical evidence within an enthusiastic cooperative academic trial and research group (EMBRACE), which is ongoing.

What would you like to do during your retirement?

I retired from my chairmanship at the end of 2016 and I am glad that I am able to continue in research and education at our university. My major focus is on gynaecologic radiation oncology, within the EMBRACE study and research group and the gynaecological GEC-ESTRO network. In addition, I am co-editing the second edition of the GEC ESTRO *Handbook of Brachytherapy*.

I have become much more active in my big family and at home and with friends. I have started playing the clarinet and cello again, taking lessons at a music school, and practising chamber and orchestral music, which is a great pleasure in the beautiful cultural setting of Vienna.



Lifetime achievement awardees and the ESTRO Presidents, on 20 April 2018, Barcelona



Lifetime achievement award

David Thwaites

Institute of Medical Physics, School of Physics, University of Sydney (and The Sydney West Cancer Network, Westmead Hospital) Sydney, Australia; and
Division of Biomedical Imaging (Medical Physics), University of Leeds and Leeds Teaching Hospitals, Leeds UK



David Thwaites (left), Yolande Lievens (right), ESTRO past-President

What are your career highlights and what are you proudest of?

This is a difficult question! I have enjoyed most aspects of my career. My PhD and post-doc were in stopping power for biological and dosimetric materials and this work contributed to International Commission on Radiation Units (ICRU) and other recommendations that are still of interest for charged particle applications, including for particle therapy.

I have been fortunate in seeing other outputs from my scientific research (e.g. in dosimetry, quality assurance, audit, modelling, radiotherapy methods), as well as professional and educational work, being used internationally and, therefore, having an impact on medical physics and radiotherapy practice, including on treatment accuracy and quality, and hence to the benefit of patients. Medical physics has proved to be a very positive career choice, combining fundamental science/physics research with direct application to ‘real world’ clinical problems; the opportunity to bridge these areas and translate research into practice has felt very rewarding.

I hope my involvement in ESTRO, e.g. in the physics committee, Board membership, a

long physics editorship of *Radiotherapy and Oncology*, participation in many physics and multidisciplinary committees and working parties, has contributed to ensuring the physics voice is heard and is strong in ESTRO and has also contributed to the high quality of ESTRO activities. I have very much enjoyed the journal role; it has been a privilege to keep closely in touch with the cutting edge of new science in that way; and also to work closely with Jens Overgaard!

I was deeply honoured to be awarded the Emmanuel van der Schueren award in 2014. Emmanuel was one of the people who initially enthused me into working in ESTRO, with additional ‘pressure’ to participate from Hans Svensson and Andrée Dutreix. These latter two also began my involvement in International Atomic Energy Agency activities, aimed at supporting medical physics and radiation oncology in low and middle income countries, which I have very much valued.

Lastly, I have been proud of my PhD and masters students, post-docs and trainees, achieving their research and clinical training goals and progressing in their own careers. ▼



Many of my research students have been part-time, working as medical physicists and also some radiation oncologists and RTTs, and so their study and research has also helped to build the research 'fabric' in the departments they were employed in or moved on to.

What do you think are the next challenges for medical physicists in oncology?

One constant challenge for us (as for other clinical scientific specialities) is managing time and resources for clinical priorities and service and, on the other hand, as scientists for research and development. In radiation oncology, immediate challenges include the explosion of imaging applications in radiotherapy and the moves towards data and image analytics (machine learning, radiomics etc) linking in part to personalisation of oncology, as well as the challenges and opportunities from automation. Looking ahead there is fascinating potential in broadening the scope of physics in cancer medicine to begin to absorb and translate advances in biophysics and the physical understanding of cancer, and there is a growing medical physics debate concerning how the profession might exploit this.

What does this award mean to you?

Much of my career has had multiple links to ESTRO, beginning with attendance at the first ESTRO conference (London, 1981) soon after I began working in clinical medical physics. I very much appreciate this recognition by ESTRO, not only on the personal level, but also as recognition of the role of medical physics in ESTRO. For that I appreciate the collaboration with many, many colleagues over the years, from all the ESTRO professions and also from ESTRO's staff.

To whom would you like to dedicate your award?

To my wife, Catherine, who has consistently and unstintingly supported my career. She is the one who really deserves this award for living with my long hours and times away.

Beginnings and 'endings'? What started your interest in science and what will you do when you retire?

My interest was sparked internally by curiosity, by wanting to understand how things work and how they might be improved. I still have

that. Externally, it was by good and enthusiastic science teachers. With reference to the second part of the question: retire?!



Lifetime achievement award

Erik Van Limbergen

University Hospital Gasthuisberg
Leuven, Belgium



Erik Van Limbergen (right) and Yolande Lievens (left),
ESTRO past-President

What does this award mean for you?

My first reaction was to feel delighted that ESTRO recognises my long-standing activities within the Society, mainly as a teacher and director of the Groupe Européen de Curiethérapie (GEC)-ESTRO courses, and for my contributions to the GEC-ESTRO working groups for brachytherapy, gynaecology and breast cancer. But a second thought? I wondered if the award is a ‘kiss of death’, not a sudden death, but the official ‘beginning of the end’. I’m not ready to retire yet and I’m glad that there are still opportunities to contribute to teaching, and to work together with Richard Pötter, Peter Hoskin and Dimos Baltas and with many new authors on the second edition of GEC-ESTRO *Handbook of Brachytherapy*.

What are your proudest moments in your career?

The GEC-ESTRO International Commission on Radiation Units and Measurements (ICRU) recommendations for gynaecological brachytherapy. At the beginning, we had a very long and hard discussion with our American colleagues to come to an agreed revision of the ICRU 38 recommendations. We could not arrive

at a solution to delineate targets for 3D planning in gynaecological brachytherapy. So we had to stop the ICRU activity for a few years and start to work in Europe towards a solution with colleagues from Vienna (Austria), Paris (France) and Leuven (Belgium).

Finally, we saw the light and discovered that it is possible to delineate what has been visible as macroscopic disease at the start of treatment and stays visible (high risk clinical target volume [CTV]) or disappears (intermediate risk CTV) and a low risk CTV of initially microscopic disease.

We then found a tool to apply on high dose rate (HDR) patients in Vienna (led by Richard Pötter), low dose rate (LDR) patients in Paris (led by Christine Haie-Méder) and pulsed dose rate (PDR) patients in Leuven to compare doses and volumes coming with different dose rates to the same results. That was a great moment for brachytherapy, bringing LDR and HDR brachytherapy together again, instead of letting them drift further apart.

After all this work, it is incredibly satisfying to see so many colleagues from Norway to ▼

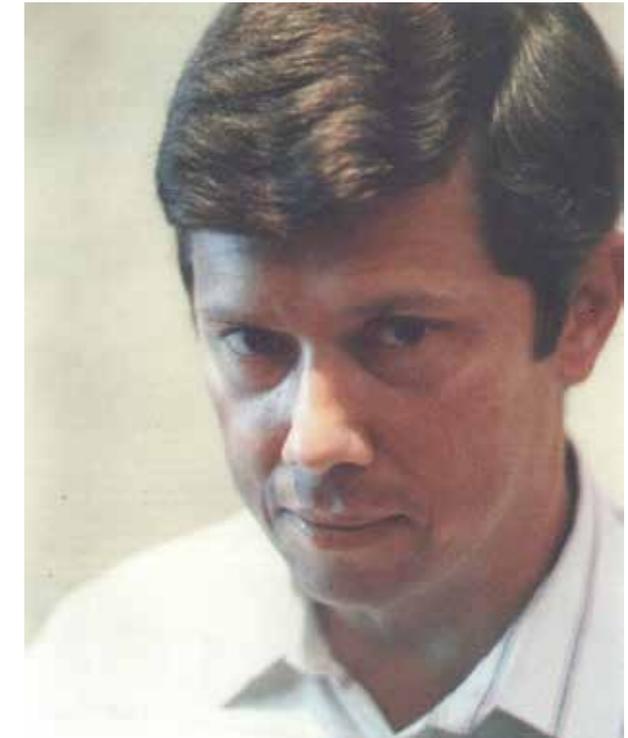
Slovenia and from the UK to India drawing on these first jointly written GEC-ESTRO ICRU recommendations. It is not for nothing that Richard, as the driving force behind this, received the World Congress of Brachytherapy Marie Curie Medal award in 2016 in San Francisco, USA.

To whom would you like to dedicate your award?

Without a doubt to Emmanuel van der Schueren. He was the boss in Leuven when I was a final-year resident in radiation oncology. When I expressed my interest in brachytherapy (the Brach-peak being the most conformal radiation technique) and also a desire to exploit my manual stereotactic skills, and asked him for advice on where to learn this, his answer was: “Paris”. He picked up the phone, called Maurice Tubiana at the Institut Gustave Roussy, and asked him if he could provide a European Organisation for Research and Treatment of Cancer (EORTC) grant for a “young wolf” from Leuven for a year. And I went there. One year in Paris with all these famous experts in brachytherapy: Daniel Chassagne, Alain Gerbaulet, Andrée Dutreix and their co-workers (especially Christine

Haie-Meder) brought me to the centre of brachytherapy activities in Europe: the GEC.

I’m proud that when Emmanuel van der Schueren asked Alain Gerbaulet to integrate the GEC into ESTRO, despite a lot of reluctance among some French-speaking GEC members, I could help at that time by proposing the name GEC-ESTRO. This meant that the GEC people could keep their identity within ESTRO and the name has become a world-famous byword for high-quality brachytherapy.



“I would like to dedicate my award to Emmanuel van der Schueren”. Emmanuel van der Schueren was one of the ESTRO founding fathers.

Emmanuel van der Scheuren award

The ESTRO School - Radiation oncology education of the highest standard for all

Award lecture

Christine Verfaillie

ESTRO office
Brussels, Belgium



Past-President Philip Poortmans introducing Christine Verfaillie, Managing Director Education & Science at ESTRO



Christine Verfaillie (right) and Philip Poortmans (left), ESTRO past-President

To whom would you like to dedicate your award?

I was actually very surprised to receive the Emmanuel van der Scheuren award, and also quite uncomfortable as, in my opinion, ESTRO awards are meant for the professional volunteers within ESTRO. Therefore, I want to dedicate the award to the ESTRO School, to all the teachers, course directors, tutors, and the members of the Education Council who have committed a lot of their time and effort to share their knowledge

and experience with others and with whom it is always a great pleasure to collaborate.

What do you think are the next challenges for radiation oncology, particularly for the education of radiation oncologists and for the ESTRO School?

The environment in which radiation oncology and the ESTRO School are operating continues to change in ways we cannot always predict. ▼

These changes are multiple, such as demographic changes, globalisation and immigration, changes in technology, communication and healthcare organisation, changes in the oncology world, in treatment and practice, and in education.

Society today and tomorrow is and will be innovation-driven, and, in order to work and progress, medical professionals will need different skills to work than in the past. They will need competencies such as communication and collaboration, critical thinking and creativity, and qualities such as adaptability, curiosity and initiative, social and cultural awareness, and leadership.

One of the major challenges for the ESTRO School will be to find and implement ways to facilitate the teaching and learning of these skills to enable medical professionals to tackle complex challenges and manage the changing environment, today and tomorrow.

The ESTRO School has expanded its horizon in the last ten years and the ESTRO School and faculties can't respond to the continuously increasing demand for education from all over the world. 'ESTRO cannot educate the world', at least not through live courses, so we will need to



Christine Verfaillie presenting the ESTRO School activities

reimagine education and fully incorporate new formats such as digital and blended learning and Train The Trainers programmes in order to reach out to everyone and provide high quality education to all.

What is the Emmanuel van der Schueren Award?

The Emmanuel van der Schueren Award is given in honour of the founding father of ESTRO and in recognition of excellent scientific work, enormous contribution within ESTRO to the field of education and promotion of radiation oncology as a discipline.



Donal Hollywood award

Residual setup errors after IGRT are linked to overall survival in lung and oesophageal cancers

Award lecture

Corinne Johnson

Manchester Cancer Research Centre, The University of Manchester, The Christie NHS Foundation Trust
Manchester, UK

What is your next challenge?

I am currently in the process of finishing my PhD. Following its completion, I hope to pursue a joint clinical and research career in radiotherapy physics, with the aim of completing my training to become a registered clinical scientist with HCPC. I hope that an integrated position such as this will allow my research to be more easily implemented into clinical practice, as well as ensuring that it is clinically relevant. In the immediate future I intend to apply the methods developed during my PhD to other patient cohorts, to further validate the results and to see if similar effects can be seen in other cancer sites.

If you hadn't been a scientist, what would you like to have been?

From a young age I have been really interested in both science and art and design. If I hadn't gone into physics, I would have liked to study architecture. I chose physics as it seemed like a less constrained career choice, whilst still feeding my curiosity. Having chosen a scientific career, I now keep up my interest in art by spending a lot of my spare time doing things such as painting, crocheting and pottery.

What does this award mean to you?

It is a real honour to receive this award, and I still can't quite believe it. Being at an early stage in my career, I would say that receiving this award has been one of the highlights so far, and it has increased my confidence in my abilities and my work. It has provided me with an amazing opportunity to share my research with the wider radiotherapy and oncology community and it has been great to receive such a positive response.



Corinne Johnson (right) and Marco Schwarz (left), Physics Track Chair

What is the Donal Hollywood award?

The Hollywood Award is given in the memory of ESTRO President-elect Donal Hollywood, who died from cancer before taking on the duties of President. This annual award is given to the best abstract selected for presentation at an ESTRO congress.



Iridium award

The dose rate effect in brachytherapy

Award lecture

Jean-Jacques Mazon

Sorbonne University – Hospital Pitié-Salpêtrière
Paris, France

What does this award mean to you?

It is a great honour.

Did your parents encourage you in your career, or would they rather you had done something else?

My parents were doctors, my son was a radiation oncologist, my wife and my daughter-in-law are doctors, I was encouraged...

What are you proudest of in your career?

- 1) In 1997, I founded the journal of SFRO (Société Française de Radiothérapie Oncologique), *Cancer/Radiothérapie*, and I am still the editor-in-chief.
- 2) I was one of the editors of the GEC-ESTRO handbook of brachytherapy, published in 2002, and the first editor of several textbooks on radiation therapy in France (the last one in press).
- 3) I chaired SFRO in 2008 and 2009, a few months after the accidents at Epinal and Toulouse. We, along with my colleagues from SFRO and SFPM (Société Française de Physique Médicale), following the Ministry of Health's roadmap, provided a very important work to secure radiotherapy in France, and I think we did it.



From left to right: Bradley Pieters GEC-ESTRO committee chair, Erik Van Limbergen, Jean-Jacques Mazon, Christian Kirisits GEC-ESTRO committee Past chair

What is the GEC-ESTRO Iridium 192 Award?

The GEC-ESTRO Iridium 192 Award is presented to the brachytherapist or physicist who, in the opinion of the GEC-ESTRO committee members, has made a major contribution to the development of brachytherapy.



Klaas Breur award

Biological Precision in Radiotherapy

Award lecture

Gillies McKenna

CRUK/MRC Oxford Institute for Radiation
Oncology
Oxford, UK



President Yolande Lievens introducing Gilles Mc Kenna



Gillies McKenna (right) and Yolande Lievens (left), ESTRO Past president

What have been the highlights of your career?

I have been extremely fortunate to have had a career that has been continuously enjoyable and rewarding. I began my education in one of the earliest US Medical Scientist Training Programs at Albert Einstein College of Medicine in New York, which was not only great fun, but there I met Ruth Muschel, who became my partner in life and in my career.

When I chose to train in radiation oncology I joined the then relatively new programme led by Eli Glatstein, to whom I owe so much, at the US National Cancer Institute with the stellar faculty he had recruited including Alan Lichter, Tim Kinsella, David Pistenmaa and Steve Hancock.

Soon after completing my training I was offered my dream job allowing me to combine patient treatment and bench research by Robert Goodman at the University of Pennsylvania. ▼



Gillies McKenna and colleagues

Then I had the good fortune of succeeding him as head of the department. My time at Penn was also deeply fulfilling because of the wonderful colleagues, students and trainees that we had at that time. During my time there we were also able to plan the Roberts Proton Therapy Center, which has gone on to be such a resounding success, under the leadership of Steve Hahn, who I recruited, and subsequently Jim Metz, who I trained.

The move to Oxford came to me as a last opportunity to set up a research centre from scratch. This award, which I greatly prize, gives me some assurance that, at least by the assessment of my peers, this too has been a success.

What has been your involvement within ESTRO?

I have been coming to ESTRO meetings for many years, and indeed was made an honorary member of ESTRO while I was still in the USA with no thought of returning to Europe. I greatly enjoy ESTRO meetings because they achieve precisely the right balance of clinical reporting and research, and the biologists and physicists are embedded in the Society with the clinicians. No other society in our field achieves this. This is why I am so deeply honoured by this award from the premier society in my field.

What started your interest in science?

I cannot remember a time when I was not interested in science, and my dream throughout my childhood was to be a scientist, in biology or chemistry. My interest in medicine came later in my teens and early twenties, which is one reason I went to America to train in medicine. In the UK in the 1960s and 1970s you had to go to medical school straight from high school, and once you had done a first degree in science, which I had done, there was no way to go back and train in medicine. In the USA, medicine has always been a second degree. This schizophrenia

What is the Klaas Breur award?

As a tribute to Professor Breur's pioneering work, ESTRO created this annual "Gold Medal" award lecture in his name. The Breur Award is the highest honour that can be conferred on an ESTRO member and is awarded in recognition of the major contribution made by the winner to European radiotherapy.

about science and medicine has remained with me throughout my career and at various times I have concentrated on one rather than the other. Perhaps I would have achieved more if I had concentrated in one area, but it has made for a very interesting life.

What are you proudest of in your career?

The thing I am proudest of in my career are all of the young clinicians and scientists I have been able to train or mentor or advise or help. Winning "Gold" medals is of course a very nice thing, and I am very grateful, but I would not exchange my experiences with the younger generation coming after us for all the gold in Byzantium.



Jens Overgaard Legacy award

This is not a Target Volume...

Award lecture

Vincent Grégoire

Université Catholique de Louvain, St-Luc
University Hospital
Brussels, Belgium



Vincent Grégoire (right) and Michael Baumann (left), Editor in Chief of *Radiotherapy & Oncology*

What started your interest in science?

When I was in high school I had the opportunity to meet my best friend's father who was a university teacher in radiation oncology. I was fascinated by his work: he treated patients, he conducted research and taught university students. The field he worked in included three holistic aspects: the clinical, the technical and the biological.

For this reason, I decided to go to Medical School and became a 'research student', which meant that in my spare time I could work in the radiation biology lab. I was able to publish my first works while I was a medical student. In my last year I decided to specialise in radiation oncology. ▼



For my training, I had the opportunity to first go to Amsterdam for a year and a half where I focused on radiation biology; then Houston, Texas, USA, where I focused on cellular oncology for my Phd.

Once I returned to Belgium, I got my first clinical assignment in the head and neck field. Since then, I have been involved in this specific field and tried to combine both the clinical and scientific aspects.

What has been your involvement within ESTRO?

In the late 1990s, soon after I came back from the United States, I was invited by ESTRO to

join the San Miniato meeting, a gathering of approximately 30 'young bright minds' who were all physicists, clinicians and biologists. The purpose of the meeting was to brainstorm on the future of the specialty as well as on the future of ESTRO. This was my very first active involvement in the Society. Since that meeting, I have been steadily involved in different ESTRO committees until the mid-2000s, when I ran for ESTRO President. In 2005 I became ESTRO President-elect and in 2007 I became the ESTRO President. During my presidential years, ESTRO was undergoing a period of struggle. I took the opportunity to lead a renovation phase which paved the way to the Society we know today.

I have just received my second award at ESTRO, the Jens Overgaard Legacy Award, and I feel truly honoured. I am glad to be part of such vibrant society.

What is your next challenge?

I believe that the challenges within my discipline of radiation oncology can be considered as my next challenge.

I foresee four main challenges:

1. Maintain the current position of radiation oncology in the oncology field. Nowadays we cure cancer through surgery, radiation or drugs. It's vital to keep radiation integrated with the other two components of the oncology field despite the competitive world around us. Also, it is important to keep proving that radiation is genuinely useful in improving patients' treatment.
2. Catch properly the technical evolution. Radiation oncology strongly relies on hi-tech, however it is wrong to completely confide in it. Is it pivotal to integrate hi-tech with human knowledge as well as know-how.
3. The same goes for the field of radiobiology: there are plenty of radiobiological hi-tech evolutions. We also need to be able to integrate these with radiation.
4. Middle-income countries and low-income countries seldom have access to proper radiation therapy care. Therefore, we need to acknowledge the value of radiation oncology to better position it in the global arena.



Honorary member award

Imaging in Oncology - let's shape the future together

Award lecture

Regina Beets-Tan

The Netherlands Cancer Institute
Amsterdam, The Netherlands



Regina Beets-Tan

What have been the highlights of your career?

I was fortunate to follow a residency training programme in radiation oncology at the University Hospital Leuven, Belgium, under the leadership of the late Professor Emmanuel van der Schueren. This training provided me with a solid foundation for my years as a resident in radiology. My training in radiation oncology made me realise how imaging can significantly impact on the patient's treatment and health outcome. It was not a coincidence that I continued a career in oncological radiology. I was determined to bridge the world of radiologists with that of clinicians so that we – radiologists – would understand and speak the language of the clinical world and improve outcomes for patients.

What has been your involvement in ESTRO?

I'm grateful to ESTRO for having involved me as faculty in many ESTRO courses over the years. An important milestone was the opportunity to launch, in pleasant and fruitful collaboration with Professor Vincenzo Valentini, an ESTRO-European Society of Radiology (ESOR) joint course on 'Multidisciplinary approaches to

cancer imaging'. The course is now in its seventh year and has successfully attracted teachers and attendees from both radiation oncology and radiology. It is always very rewarding to see how both disciplines can come together and learn from one another.

What does this award mean to you?

It's a great honour for me to receive the award from ESTRO. It's true recognition from my clinical peers and many friends in radiation oncology and it reflects the goal I envisaged for my professional life: bringing the world of radiology closer to the clinical world. Personally, it meant a lot to me to receive the award during the presidency of Professor Yolande Lievens. We were both mates and residents in Leuven, and the ESTRO 37 meeting brought back all the special memories of my early career in radiation oncology.



Honorary member award

Sustaining Radiotherapy Services and Development in Low Middle-Income Countries

Award lecture

Soehartati Gondhowiardjo

Dr Cipto Mangunkusumo National General Hospital
Jakarta, Indonesia



Soehartati Gondhowiardjo (right) and Yolande Lievens (left), ESTRO Past president

What have been the highlights of your career?

Training as a radiation oncologist in Münster, Germany, I found that the experience and interactions I had there really shaped me into who I am today. Even after returning to Indonesia in 1988, obtaining my PhD in 1998, and earning my full professorship in 2003 at the University of Indonesia.

The biggest turning point in my career was the initiation of the Indonesian Radiation Oncology Society (IROS) in Indonesia as a starting point for radiation oncology as an independent clinical discipline. Before 2000, radiation oncology was a radiology sub-specialty programme, but now we have our own national society, national college and residency training programme. I feel blessed that I've had the opportunity to watch over and guide the enormous growth of radiation oncology in our country, not only in terms of number of centres and machines but also quality and safety.

My involvement in regional and international society initiatives was greatly facilitated by initiatives from three major organisations: European Society for Radiotherapy and Oncology (ESTRO), International Atomic Energy Agency (IAEA), and the important but short-lived

International Society of Radiation Oncology (ISRO). Along with several regional colleagues with whom I've worked closely together over the years, I was involved in the conception of the South East Asia Radiation Oncology Group (SEAROG), together with Indonesian Radiation Oncology Society (IROS), Malaysian Oncological Society (MOS), Philippine Radiation Oncology Society (PROS), Singapore Radiological Society (SRS). Advices and words of encouragement from Dr Richard Pötter (ESTRO) and, in memorium, Dr Ketayun Dinshaw (ISRO) helped us form our idea for a new regional society, during a meeting in Indonesia in 2006.

Fast forward to 2014, and the close collaboration we've had through IAEA regional Training Courses (TC) projects have formed close bonds among societies on an even larger scale: Asia. Together with colleagues from Bangladesh Society of Radiation Oncologists (BSRO), Chinese Society of Therapeutic Radiation Oncology (CSTRO), Association of Radiation Oncologists of India (AROI), IROS, Japanese Society for Radiation Oncology (JASTRO), Korean Society for Radiation Oncology (KOSRO), MOS, PROS, SRS, Sri Langka College of Oncologists (SLCO), Thai Society of Therapeutic Radiology and Oncology (THASTRO), we formed ▼



the Federation of Asian Organisations for Radiation Oncology (FARO) with the goal of promoting innovation, research and dissemination of science and technology in radiation oncology in Asia.

Around the time FARO was formed, changes also occurred at the national level. Through our advocacy efforts with the Ministry of Health, the Indonesian National Cancer Control Committee (NCCC) was re-established in 2014, tasked with co-ordinating the cross-sectoral efforts on public awareness, early detection, treatment standardisation, cancer registration and palliative care.

What is your next challenge?

As the current chair of the Indonesian National Cancer Control Committee, I feel that safeguarding the committee will be my next challenge for the near future and the development of radiotherapy as a part of National Cancer Control Programme (NCCP) . As the appointed chairperson this time around, I made it my personal goal to see the committee towards maturity, so that all stakeholders can work together and align their goals instead of running around chasing their own goals.

It isn't an easy task and, considering all the geographical challenges and uniqueness that Indonesia has, specific strategies are required.

What does this award mean to you?

Instead of seeing it as a personal achievement, I would like to see the award as a symbol of collaboration and friendship between me and my European colleagues, whom I respect greatly. Over the years, ideas have been exchanged between me and ESTRO, both formally and informally. I am very grateful for the nomination of this honorary award and look forward to closer collaboration between our regions in the future. I hope that this award can be a motivation for the young generation of radiation oncologists in Indonesia. By being focused and hardworking, the best is yet to come.

To whom would you like to dedicate your award?

I wish to dedicate my award to my country, Indonesia, my family, all of my friends in FARO, SEAROG, IROS and especially to all the medical staff in the Department of Radiotherapy, Dr. Cipto Mangunkusumo National General Hospital (RSCM), and also the Faculty of Medicine at the Universitas Indonesia. They

have had a great impact in my life, helping me in many professional adventures. Much work and many activities would not be possible without their support. I am very lucky to have them.

What has been your involvement within ESTRO?

I knew about ESTRO ever since studying in Germany. My supervisor, Prof Pötter has a good relationship with ESTRO. Before having extensive relations with ESTRO, I had a good relationship with Erasmus MC - Daniel den Hoed Oncologische Centrum Rotterdam and Nijmegen University Hospital. In addition, I've been a stipend recipient of several European countries and organisations, such as the Dutch Foundation, Deutscher Akademischer Austauschdienst (DAAD, Germany) and Osterreichischer Austauschdienst (OeAD, Austria).

The relationship between me and ESTRO has grown extensively. There have been several ongoing collaborations between SEAROG and ESTRO, especially in the field of education and training (e.g. ESTRO School in South East Asia). In addition, FARO and ESTRO will have another collaboration in the upcoming ESTRO meets Asia. I look forward to even closer collaborations in the future.



Honorary member award

Radiotherapy of Hodgkin Lymphoma: Revolutionary Roots, Challenging Present, Bright Horizons

Award lecture

Joachim Yahalom

Memorial Sloan Kettering Cancer Center
New York, USA

To whom would you like to dedicate your award?

To my mentor, Professor Zvi Fuks, whose endless energy, vision and wisdom formed my career both in Jerusalem, Israel and later in New York. I followed in his footsteps in both ESTRO (as a trainee) and in the American medical and research communities. Prof Fuks introduced me to the legendary Professor Samuel Hellman, whose approach to medicine, science and patient care I will cherish as long as I practice medicine.

What have been the highlights of your career?

As a strong believer in the important role of radiotherapy (“The most effective single agent we have”) in the cure of most lymphomas. I tried to find new areas that might benefit from the integration of radiation in an era when many oncologists were educated to believe that chemotherapy alone could solve all challenges with no deleterious consequences.

I designed programmes to incorporate accelerated radiotherapy prior and as part of salvage programmes for Hodgkin and non-Hodgkin lymphomas that have benefited hundreds of patients.

In the mid-1980s, with my colleagues at Memorial Sloan-Kettering Cancer Center, we pioneered the integration of high-dose methotrexate and radiation for the then incurable primary central nervous system lymphoma, and later studied the successful reduction of whole brain dose to avoid toxicity while still maintaining a good quality of life and high cure rate, even in the elderly.

One of the most rewarding experiences that I am quite proud of is the introduction of radiotherapy as the primary treatment for *H.pylori*-independent MALT lymphoma of the stomach, which was previously managed unsuccessfully by mutilating gastrectomy or ineffective chemotherapy. The approach of using radiation treatment alone for marginal zone lymphomas (that are often localised) in any organ of the body, made marginal zone lymphoma – “the disease of the radiation oncologist”.

What are you proudest of in your career?

Without any doubt, I am most proud of conceiving, establishing and leading a strong international group of highly accomplished and dedicated colleagues that I named seven years ago, the International Lymphoma Radiation Oncology Group (ILROG). ▼



Joachim Yahalom (right) and Umberto Ricardi (left), ESTRO President



I started the group with my European and North American colleagues when the role of radiation treatment in lymphomas was derided by many haematologists for reasons that made no sense to us and were proven wrong. We needed to reshape and reform the field. It seems by many measurements that we are on a successful, safer track. We grew to over 1300 members in over 60 countries, published new guidelines for several lymphomas, other haematological malignancies, technologies, and challenging scenarios such as salvage. Our guidelines were at the top of downloaded publications from the *Red Journal* in 2015 and again in 2016. Several more are currently in press.

We are giving education courses and conducting multidisciplinary panels at most radiation oncology and lymphoma meetings worldwide. Recently, we ran a pre-ESTRO course in Barcelona, and we will have a three-day teaching course run by the ESTRO School in September 2018 in Utrecht "Haematological Malignancies" course. If you are planning already for 2019, the American Society for Radiation Oncology (ASTRO) and ILROG are co-sponsoring a two-day course in sunny San Diego, California, USA, in February 2019 and an international major teaching symposium in April 2019 in Tokyo,

Japan. All details and membership information, as well as multiple educational venues, are available at www.ilrog.com.

What is your next challenge?

To see ILROG thrive and move strongly into the new arena of education of our younger generation of radiation oncologists, medical oncologists and haematologists, and to promote less costly and still effective and robust radiation technologies. I believe that the field of radiation oncology should try to avoid the financial toxicity to patients and to society that dependence on new drugs or unjustified technologies can bring.

Another challenge is to educate colleagues in other specialties, as well as lymphoma patients, about modern low-dose and small volume new radiation treatment options. This could reduce the unsubstantiated fear of radiotherapy – a modality that has changed radically over the last few decades. We should promote “less scare and more care”, with the smarter use of our modality. I have recently fully integrated my clinical and academic activities into haematology, hoping to create a model of a real harmonious and open-minded disease management team of haematological malignancies at my cancer centre.

What is the Honorary member award?

Honorary membership is awarded to people who have made a significant contribution to the achievement of the goals of the Society particularly in the field of interdisciplinary or international co-operation.



Haematological malignancies

In collaboration with ILROG (International Lymphoma Radiation Oncology Group)

5-8 September 2018 | Utrecht, The Netherlands

COURSE DIRECTORS:

Lena Specht, Denmark and Joachim Yahalom, USA

www.estro.org/school >



Jack Fowler University of Wisconsin award

First clinical demonstration of online real-time liver tumour motion monitoring on a standard linac

Awarded paper

Jenny Bertholet

Department of Oncology,
Aarhus University Hospital
Aarhus, Denmark



Marco Schwarz (left) Physics Track Chair, Jenny Bertholet (middle), John Bayouth (right), Professor and Chief of Physics at University of Wisconsin

What does this award mean to you?

This award is for the last project of my PhD. Performing motion monitoring online and in real-time on a patient was a major milestone and the cherry on top of three amazing years. I am convinced that motion mitigation should be available on conventional equipment as a standard of care. This award means that my colleagues and I are not the only ones to believe this, and that the community has a real interest in such methods. It is the best encouragement one can hope for to continue in this direction.

What is your next challenge?

I started my post-doc on MR-guided radiotherapy. This brings new challenges with a technology I am less familiar with, but also many new opportunities. We are looking at motion, including dose reconstruction and inter-beam re-planning. Dose-guided radiotherapy (as opposed to anatomy or geometry-guided) is a great concept but a challenging one to implement. The MR-linac is an ideal platform to develop this concept further.

If you hadn't been a scientist, what would you like to have been?

As a child, inspired by my uncle's work and the beautiful Swiss chalets in my village, I wanted to be a carpenter. I realise now that I am too clumsy for this; there is a better chance that I keep all my ten fingers doing physics. Luckily, it turns out that research is more creative than I would have thought.



ESTRO - Accuray award

Oxygen enhanced-MRI is feasible, repeatable and detects radiotherapy-induced NSCLC hypoxia changes

Award lecture

Ahmed Salem

University of Manchester / The Christie NHS Foundation Trust
Manchester, UK



Fabienne Hirigoyenberry-Lanson (left), Vice President Medical & Scientific Affairs Accuray, Ahmed Salem (middle), Umberto Ricardi (right), ESTRO President

What is your next challenge?

We have developed a novel and clinically-translatable MRI biomarker of hypoxia. Our next challenge is to apply this biomarker in future lung cancer radiotherapy trials. We want to see whether our biomarker can predict patients who are at increased risk of tumour recurrence, forming the basis for a biomarker-driven hypoxia-targeted drug trial.

What do you think are the next challenges for radiation oncologists?

We live in a world of rapid medical developments, particularly in the field of oncology. This is especially true given the snowballing number of immunotherapy trials with a growing number of drugs now entering clinical oncology practice.

In parallel, sadly only a few advancements based on radiobiology have made it to the clinic in the past 30 years. Why is this?

We need to critically self-reflect on our failures. What can we do better in the future?

In an environment of fiercely competing therapies, we can no longer afford to repeat the mistakes of the past. The next generation of radiation researchers need to be creative, innovative and savvy in exploring every avenue of synergism between radiotherapy and novel drugs.

What has been your involvement within ESTRO?

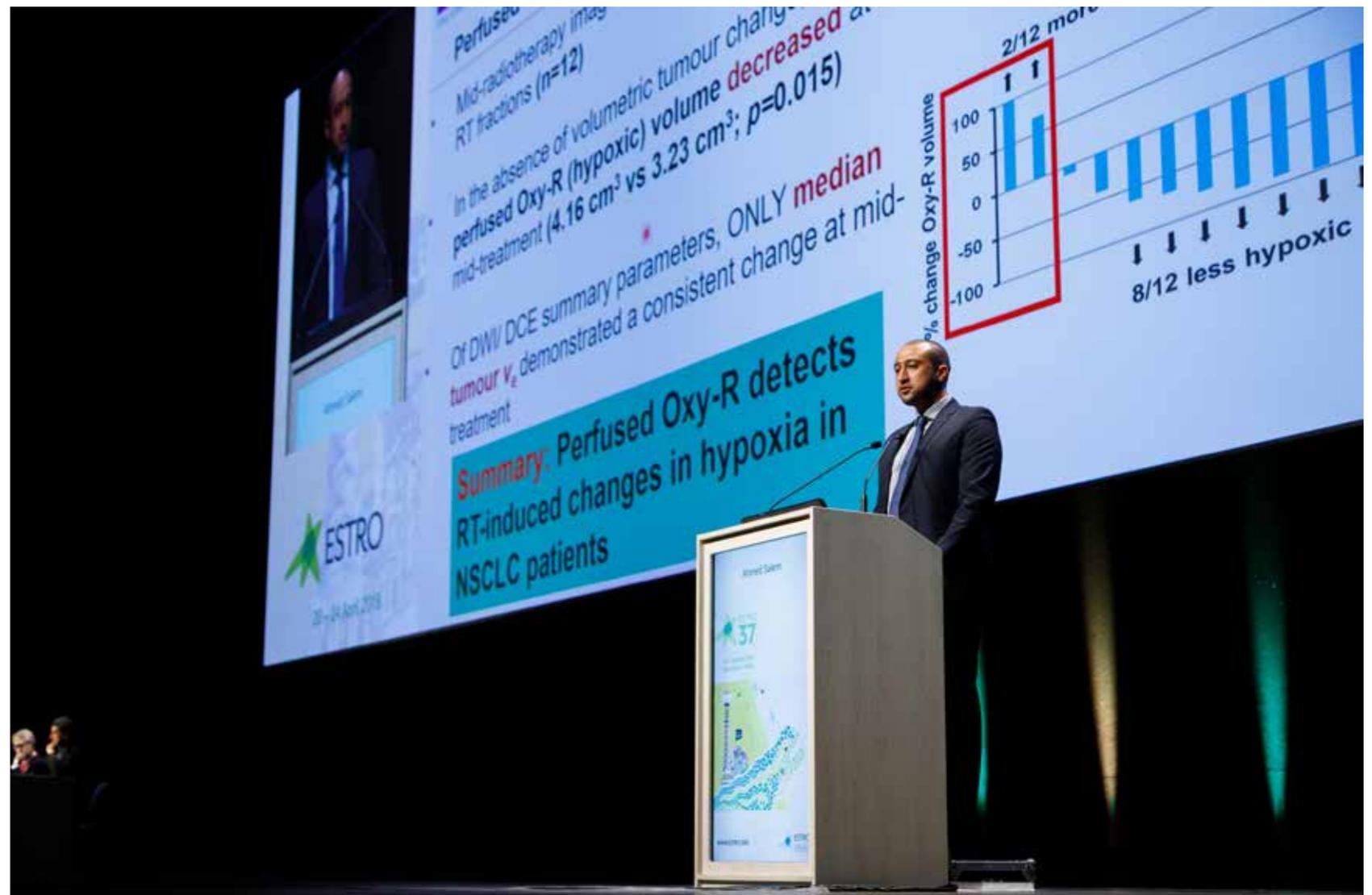
First and foremost, I am a proud ESTRO fellow! I am part of the FALCON workshop operational group, assisting in the organisation of FALCON workshops. I was also privileged to take part in the European Institute for Biomedical Imaging Research/ ESTRO task force, aiming to enhance collaborative research between these organisations.

My involvement in ESTRO has allowed me to meet like-minded colleagues, develop long-term professional and personal relationships and enhance my career. I strongly encourage other ESTRO members to engage with ESTRO ▼

activities as this is beneficial, particularly for young members.

What are you proudest of in your career?

My proudest accomplishment will be when and if I translate our research findings into the clinic, resulting in patient benefit. I hope to accomplish this in my lifetime!



Ahmed Salem is also the winner of the Young Track quiz.

[Read his other interview in the Young Corner on page 132 >](#)



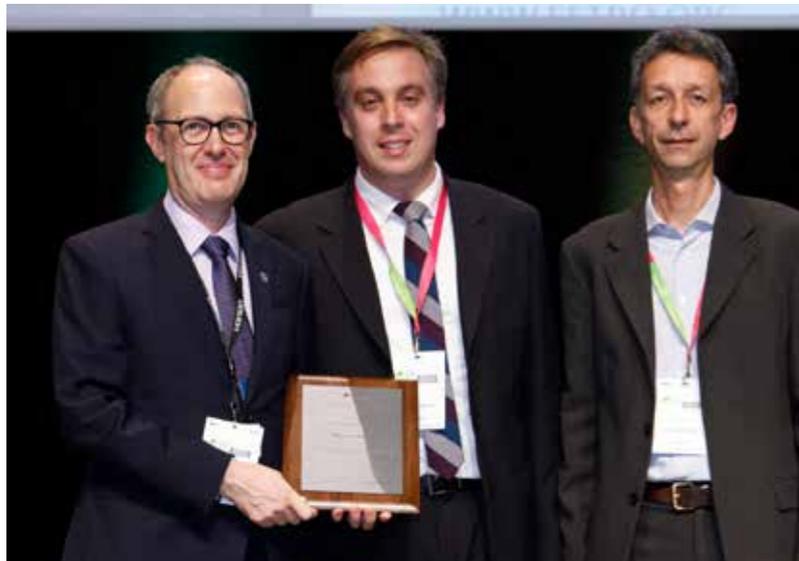
ESTRO - Varian award

Subpathologies and genomic classifier for individualized post-prostatectomy radiotherapy

Award lecture

Alejandro Berlin

Princess Margaret Cancer Centre
Toronto, Canada



Tim Clark (left), Director Marketing, EMEIA, Varian Medical Systems, Alejandro Berlin (middle), Marco Schwarz (right), Physics Track Chair

What do you think are the next challenges for radiation oncologists?

I believe our field (as with other medical disciplines) will need to broaden its outlook, beyond the present specialty-focused perspective. Increasing momentum towards patient-centred and value-based care means we must move in the direction of more integrated practices and care delivery systems. The challenge will be embracing these integrative approaches while maintaining the knowledge and technical skill sets required for practicing modern radiotherapy.

To whom would you like to dedicate your award?

To those that deserve most of the credit for this and other past and future recognition: my wife and kids, for their generosity in allowing me to dedicate time, effort and passion to this career, even when sometimes it is at the expense of time and experiences together; and to our patients, as they constantly place their trust in us to achieve the best possible outcomes, and generously help us to discover new treatments for patients in the future.

What started your interest in science?

My parents and two older siblings, who raised me in a warm and loving environment in which curiosity and asking “why” were highly valued and encouraged. I learned very early on that more than achieving specific results, what truly matters is asking the right questions, not being afraid of challenging the status quo, and make a sincere effort to try to find answers.

What are you proudest of in your career?

At this early stage of my career, what makes me most proud is the regular expressions of appreciation, the growing interest in working with me, and frequent requests for advice from trainees at my centre. I consider this an early sign of success and a tremendous energy boost, reinforcing that I am rowing in the right direction.



ESTRO - Elekta Brachytherapy award

A predictive model for visus loss after uveal melanoma interventional radiotherapy (brachytherapy)

Award lecture

Luca Tagliaferri

Department of Radiation Oncology – GEMELLI-ART (Advanced Radiation Therapy), Gemelli University Hospital - “Università Cattolica del Sacro Cuore” Rome, Italy



Luca Tagliaferri (right), Maarten ter Mors (left), Vice President Brachytherapy Portfolio, Elekta

What have been the highlights of your career?

I graduated in medicine in 2004 from the School of Medicine at the Università Cattolica del Sacro Cuore of Rome and completed my residency programme in radiation oncology in 2008, followed by a PhD in brachytherapy in 2016. Currently, I work at the Interventional Oncology Centre of the Gemelli Advanced Radiation Therapy Centre (Gemelli ART) at the Gemelli University Hospital of Rome.

Since the very beginning of my scientific career, I have focused my clinical and research interests on interventional and metabolic radiotherapy. Medical software development is another of my fields of interest. Moreover, I am an active member of AIRO (Associazione Italiana Radioterapia e Oncologia clinica) and ESTRO. In the context of AIRO, I am currently chair of the Brachytherapy, interventional radiotherapy and intraoperative radiotherapy working group, and in previous years (2015-2016) I coordinated the activities of the Italian radiation oncology study group for metabolic radiotherapy.

What has been your involvement within ESTRO?

I am currently involved in multiple ESTRO activities and congresses. I became an active member of the Head and neck and skin GEC-ESTRO working group in 2012, and I am now the representative of the Consortium for Brachytherapy Analysis (COBRA) large database project. It was a pleasure contributing to the organisation of the fifth GEC-ESTRO workshop, which was recently held in Rome, as a local organiser and at the ESTRO 37 congress in Barcelona, I was appointed as chair of the Head and neck and skin GEC-ESTRO working group.

What is your next challenge?

The work I presented is a predictive model with an internal validation. The Head and neck and skin GEC-ESTRO working group recently developed a data sharing software, COBRA. The first test for data sharing among three centres was recently performed with success. Our next challenge is to use this system for an external validation of the proposed predictive model. This activity has already been approved in the working group and several colleagues are working ▼

on this project together with me, creating an innovative and exciting networking opportunity.

What do you do in your spare time?

Besides my clinical and research activity, I am on the board of the “Attilio Romanini” association, a voluntary association for cancer patients support, which is one of the promoters of the Italian “Day of Relief”. I am married to Francesca and have one daughter and one son, Chiara and Marco. I love skiing or hiking with my family and friends and I am a great Juventus Football Club supporter, so, I really enjoy going to the matches or even watching them on TV, especially with my son who shares this fondness with me.





GEC-ESTRO best junior presentation sponsored by Elekta Brachytherapy

IBTR: second conservative radio-surgical treatment with interstitial BT HDR. From 2D to 3D planning

Award lecture

Chiara Cavallin

Department of Oncology-University of Torino
Turin, Italy



Chiara Cavallin (left) and Dr Cristina Gutierrez (right), ICO Barcelona

What has been your involvement within ESTRO?

Since I started my residency programme in radiation oncology I've registered as an active member of the Society.

I took part in the ESTRO annual meetings in Turin, Vienna and Barcelona, and I submitted my abstract for this year's conference. I consider the annual meeting to be an important event for improving my skills and my knowledge in radiation oncology, and a valuable opportunity to share my personal experience with colleagues coming from other countries.

Moreover, I would like to participate in other ESTRO events in the future; in particular, I hope to attend an ESTRO School course in order to gain more expertise, as these courses are of great value.

What is your next challenge?

First of all, I have to complete my residency programme at the University of Turin, and to expand my knowledge of radiation and clinical oncology in fields and diseases not yet explored. In the meantime, I would like to continue the

projects started within the research groups for gynaecological tumours and haematological malignancies in order to gain experience not only in the treatment of these diseases but also in the conduct of scientific activities. I was very pleased and honoured by the opportunity to present an oral communication from our institution at ESTRO 37, but I feel the need to improve my skills in order to better contribute to the research activities of our department.

In the future, I would like to continue my clinical activity in the fields of lymphomas, head and neck cancers and gynaecological neoplasms, and to participate in scientific projects with colleagues dedicating their efforts to these diseases.

What do you do in your spare time?

I love nature, and particularly the mountains. For that reason, in my spare time I enjoy all the activities performed "outdoor". My favourite ones are hiking and trekking, in the summertime I like swimming.

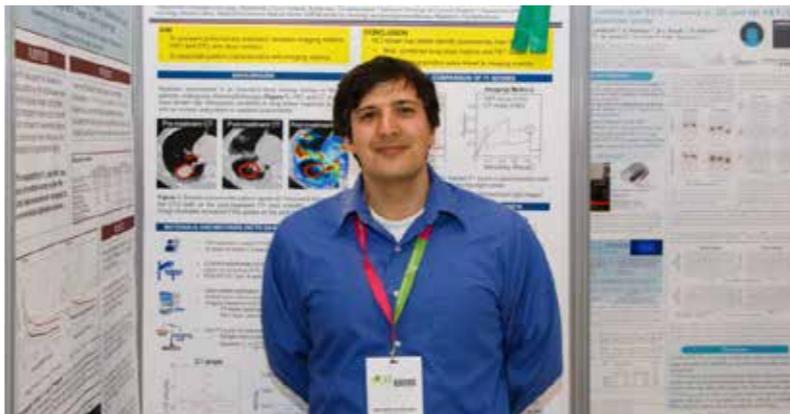
I like reading historical books and playing chess. I love opera and gardening.

Young investigator award sponsored by Elsevier



ESTRO and Elsevier joined forces at ESTRO 37 to highlight the work of young professionals. The best high scoring posters submitted by a young author* were awarded at the poster reception. The awards amount to €1,000 each and are supported by *ctRO*, *phiRO* and *tipsRO*, ESTRO-Elsevier open access publications.

* Below the age 40



ctRO

clinical and translational Radiation Oncology

ctRO AWARD: Simon Duke, Cambridge University Hospitals, UK

Implementing a novel online education programme to support RTQA – the EMBRACE-II experience

phiRO

physics and imaging in Radiation Oncology

phiRO AWARD: Matthew La Fontaine, Netherlands cancer institute, The Netherlands

Relationship of dose, FDG PET, CT lung response imaging, and radiation pneumonitis in NSCLC patients

tipsRO

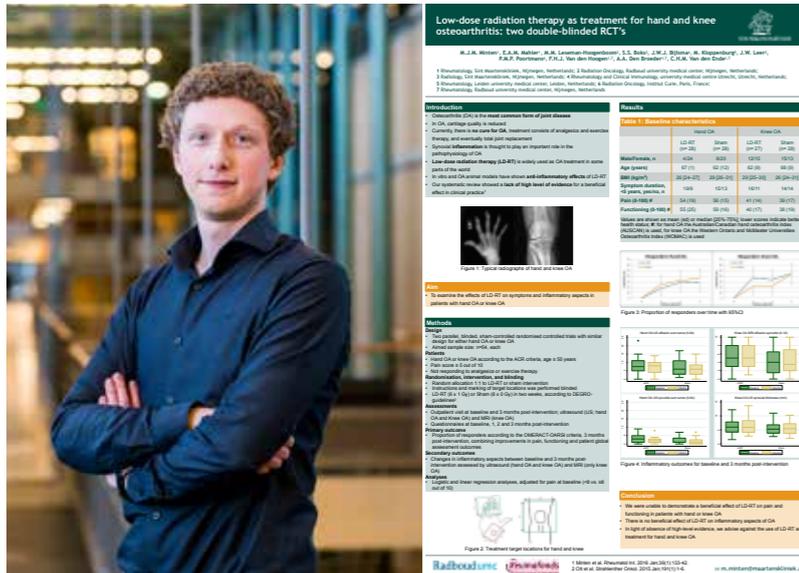
technical innovations and patient support in Radiation Oncology

tipsRO AWARD: Emina Ajanovic, Academic Medical Centre, The Netherlands

The correlation between rotations of the pelvis and geometrical inaccuracy of the para-aortic region

In the picture: a colleague of Emina Ajanovic receiving the award on her behalf.

ESTRO poster awards



BEST CLINICAL POSTER AWARD
 Michiel Minten,
 Sint Maartenskliniek, The Netherlands

Low-dose radiation therapy as treatment for hand and knee osteoarthritis: two double-blinded RCTs

The awardee receives a prize of €1,000



BEST PHYSICS POSTER AWARD
 Mark Gooding,
 Oxford Centre for Innovation, UK

Multi-centre evaluation of atlas-based and deep learning contouring using a modified Turing Test

The awardee receives a prize of €1,000



BEST RTT POSTER AWARD
 Eline de Groot – van Breugel,
 UMC, The Netherlands

Stereotactic ablative RT with focal boosting in prostate cancer: feasibility on a 1.5 T MRI linac

The awardee receives a prize of €1,000



Statistics

PARTICIPANTS OVERVIEW

Total: 6,211



PARTICIPANTS PER SPECIALTY



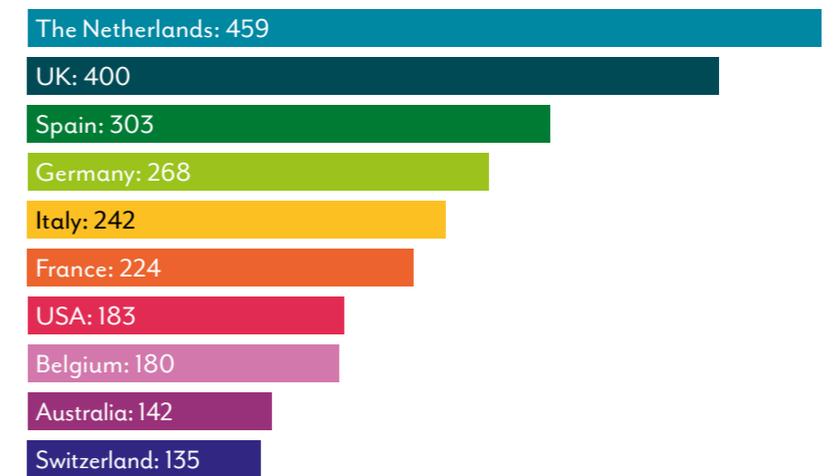
- 44.7 % radiation oncologists
- 28.1 % medical physicists
- 11.4 % RTTs, RT nurses
- 4.5 % clinical oncologists
- 3.2 % other medical specialities
- 2.5 % other non-medical specialities
- 2.2 % radiobiologists
- 1.4 % dosimetrists
- 1.1 % computer scientists
- 0.8 % RO industry - corporate
- 0.1 % quality manager

GEOGRAPHIC OVERVIEW



- 76.6 % Europe
- 12.8 % Asia and Oceania
- 6.9 % North America
- 1.8 % Middle East
- 1.3 % South and Central America
- 0.5 % Africa

PARTICIPANTS PER COUNTRY TOP 10



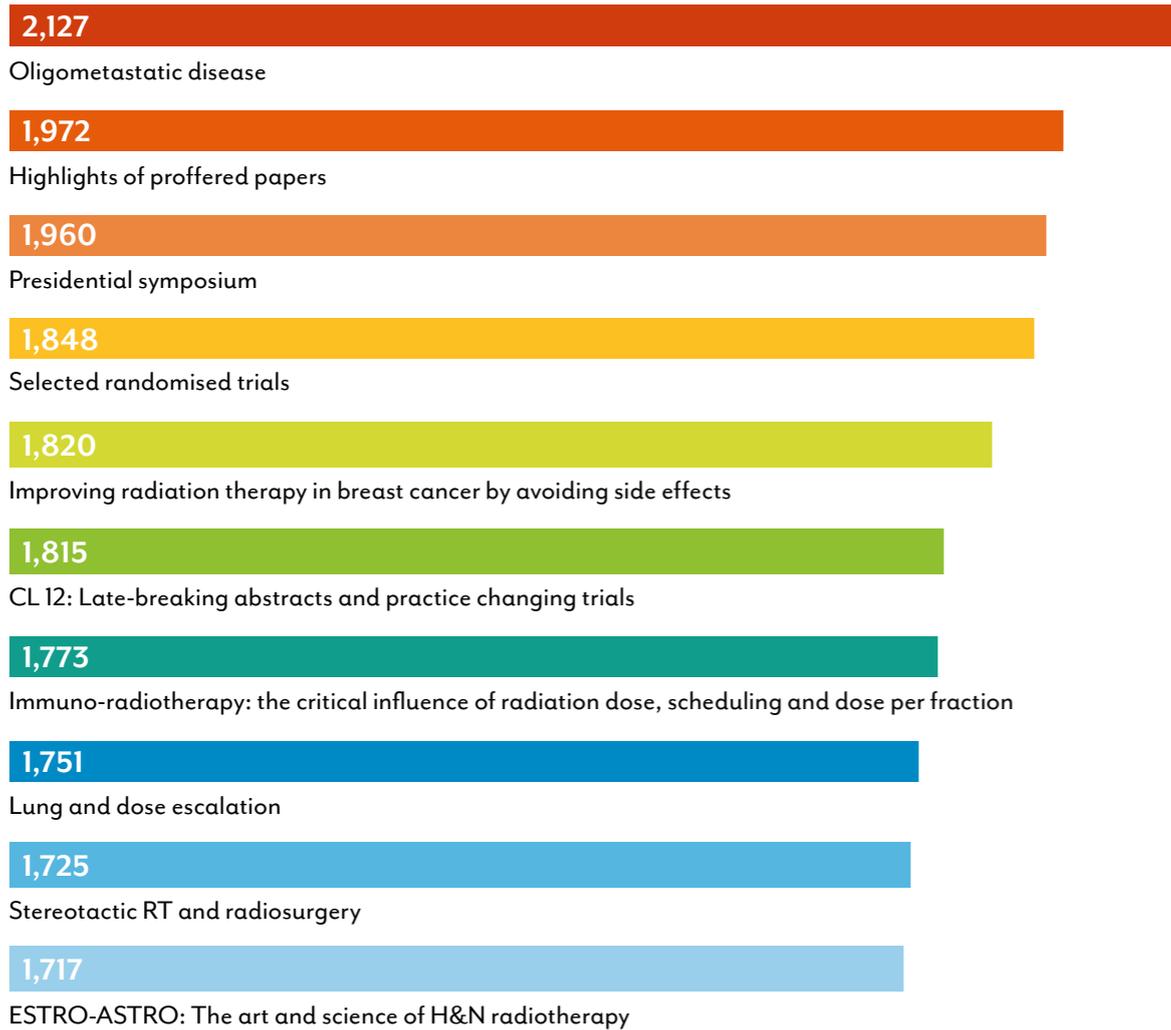


NUMBER OF UNIQUE DOWNLOADS:

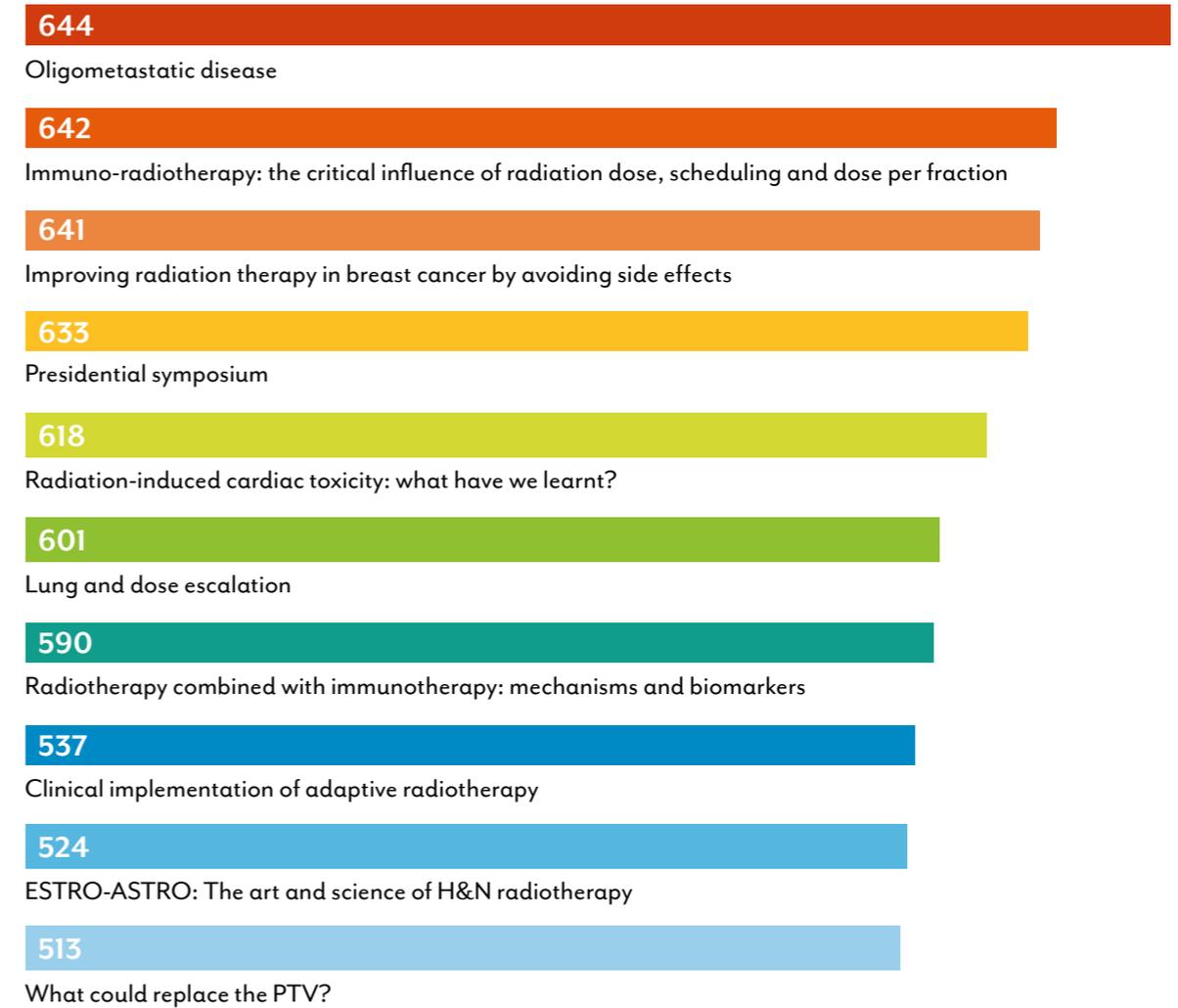
ESTRO 37 app



TOP TEN VIEWED SESSIONS (Unique user)



TOP TEN FAVORITE SESSIONS (Unique user)





CONFERENCES



Twitter: ESTRO 37 special guest



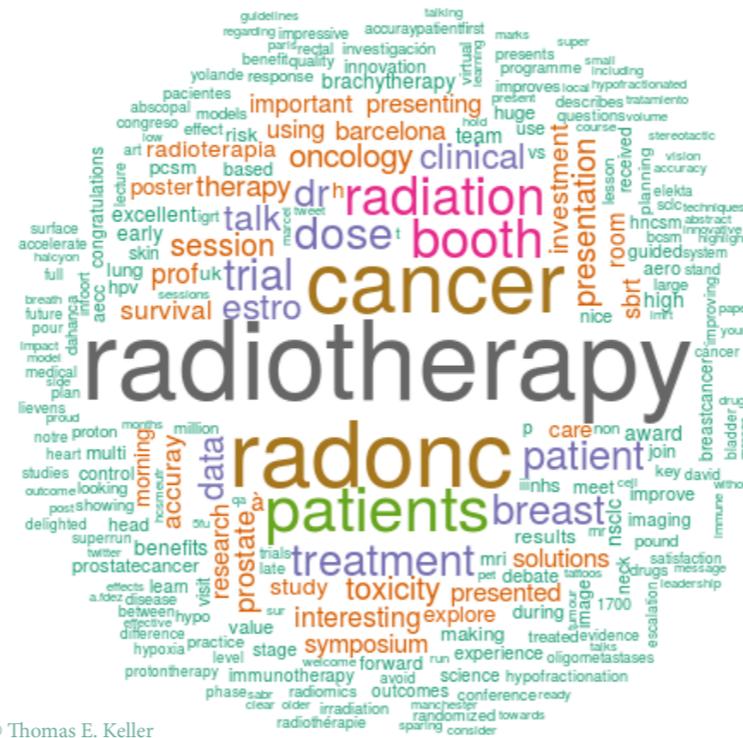
THE NUMBERS

20.363 M	Impressions
8,819	Tweets
1,505	Participants who tweeted
22	Average Tweets/Hour
6	Average Tweets/participant

Statistics compiled between 20/04 to 06/05/2018



RICHARD SIMCOCK



© Thomas E. Keller

Most tweeted words at ESTRO 37

In Barcelona this year we saw delegates at ESTRO 37 get really serious about social media. The power of Twitter was harnessed to disseminate information around the conference, and to a network of scientists and clinicians around the world. Even Jens Overgaard (@ProfOvergaard) sent a tweet!

In excellent preparation for the meeting several Twitter ‘ambassadors’ were appointed, including physicists and clinicians from around the world. They included Sandra Turner from Australia (@sandraturner49), who in her workshops with future radiotherapy leaders spread the message

of shared wisdom through social media and used the example of the excellent ‘Targeting Cancer’ campaign to promote public awareness of radiotherapy. There were even team tweets from the radiotherapy physics team at Manchester (@RT_physics), all using the hashtag #ESTRO37.

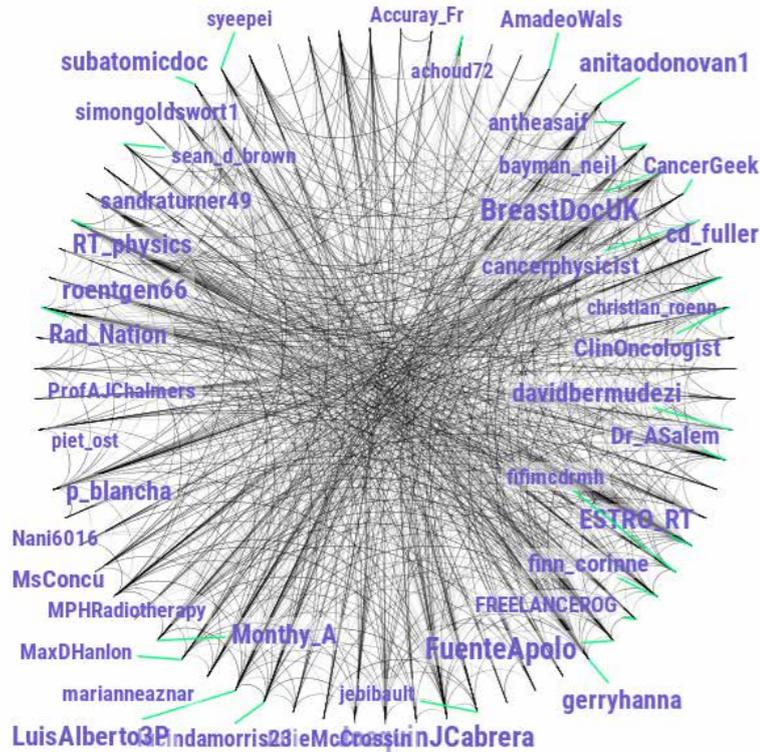
What was very evident from the beginning of the conference was that participants were using Twitter to share learning from the meetings widely with global audiences, and that they were also using the platform to reflect on the impact and importance of the data. There is a relevant criticism of social media that it can become an echo chamber of repeated thoughts; that did not appear to be the case at ESTRO 37. Tweets from Twitter ambassadors such as Ann Appelt (@cancerphysicist) and Pierre Blanchard (@p_blancha), for example, both gave instant reflections and editorial feedback on the conference talks, adding a layer of critique to the shared evidence.

‘Social’ is an important part of ‘social media’. Pleasingly a ‘Tweet-up’ at the end of one of the day’s sessions allowed many of us who had only previously conversed online to meet ‘IRL’ (in real life) and catch up. At one point we had a group made up of individuals from Australia, America,



Mention Relationships

Most mentioned screen names labeled. Darker edges == more mentions. Node size == larger degree



© Thomas E. Keller

Denmark, France and England all talking tweets and data having never met in person before. It is the companionship of colleagues and the ability to network that makes ESTRO a truly useful conference and Twitter adds another avenue for this.

In a further innovation for ESTRO, there was a team-up with Radiation Nation (radiationnation.com @Rad_Nation), who run a monthly online journal club. Following on from the huge success of immunotherapy sessions at

ESTRO 37 (which often saw large queues outside the rooms waiting to get in), the very popular session on immunotherapy and radiotherapy combinations chaired by Anthony Chalmers (@ProfAJChalmers) was followed immediately by a Twitter question and answer session, in which questions could continue to be put to two of the speakers Fiona McDonald (@fifmcdrmh) and Alan Melcher (@alanmelchericr).

The ability of Twitter to allow the conversation to continue after the session and to give all delegates an opportunity to ask questions in this way was a fantastic new aspect of the conference. The Twitter conversation proposed and promoted new trials and allowed participants to hear directly from the experts.

The success of Twitter at the conference was reflected in some of the final metrics at the end of the meeting. In a conference that had just over 6,000 delegates over the course of the conference, 1,505 separate people sent tweets with the hashtag #ESTRO37, reflecting the reach of the conference globally. More than 8,000 tweets were sent, reaching 20 million timelines. In terms of Twitter volume it reflected the growth of ESTRO as a conference and its reach on social media.

For those interested in these Twitter data then there are some excellent stats from the conference collated by computational biologist Thomas Keller (@tek_keller) on his home page. For the rest of you, I look forward to tweeting and meeting at #ESTRO38.

*Dr Richard Simcock,
@BreastDocUK
Consultant Clinical Oncologist,
Sussex Cancer Centre,
Brighton, UK*



4th Super Run

Celebrating 150 years of radiotherapy

A tribute to Marie Curie

22 April 2018

Parc del Camp de la Bota, Barcelona

The 4th Super Run brought together 700 runners, delegates, patients and supporters to celebrate 150 years of radiotherapy and to pay tribute to Marie Curie, to whom the run was dedicated this year. The runners could choose the 5km team relay or the 5km race for individuals.

Congratulations to the winners, the 'Tuebingen false positives' team!



16'39"
1st man: Johan Delcourt
with the fastest time.
A record!

21'30"
1st woman:
Margaret King
with the fastest time

17'06"
time taken by the
'Tuebingen false
positives' team to
complete the 5km
(n°508 on the picture)

523
runners
230 runners in 46 teams
and 290 individuals

1,695 km
cumulated
distance

**total steps
2,224,409**

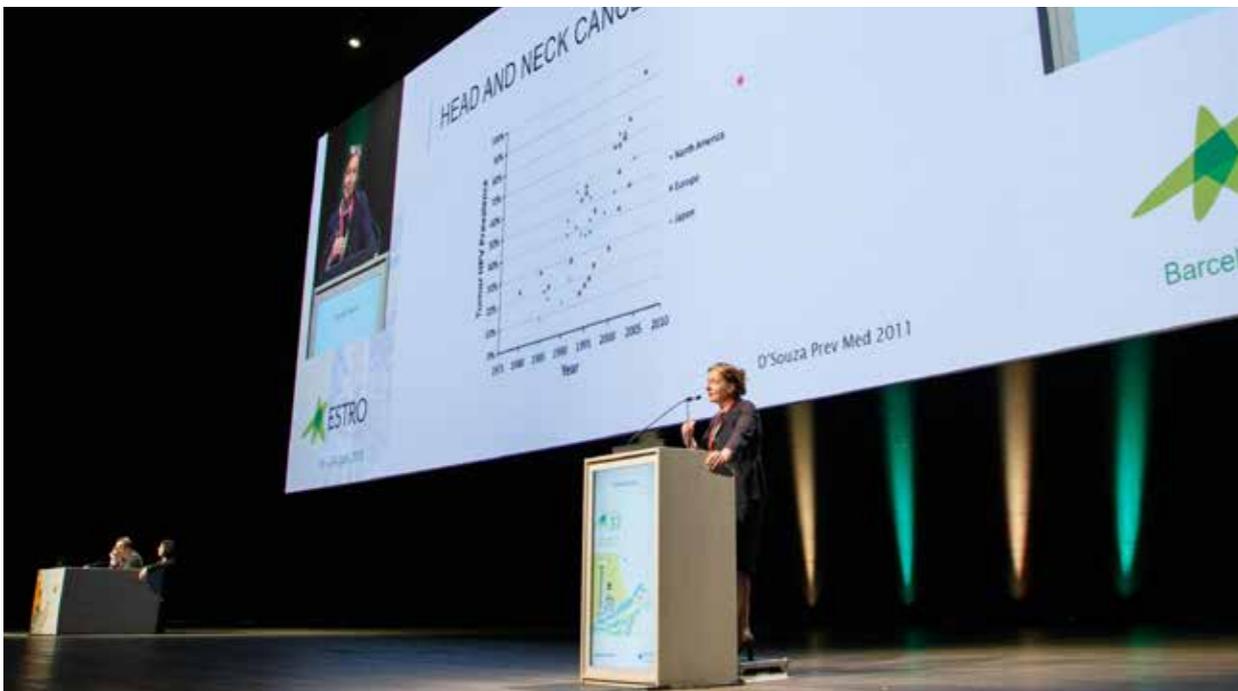


CONFERENCES



Photo album







See more pictures on the ESTRO 37 website: estro37.wordpress.com >





ESTRO 38

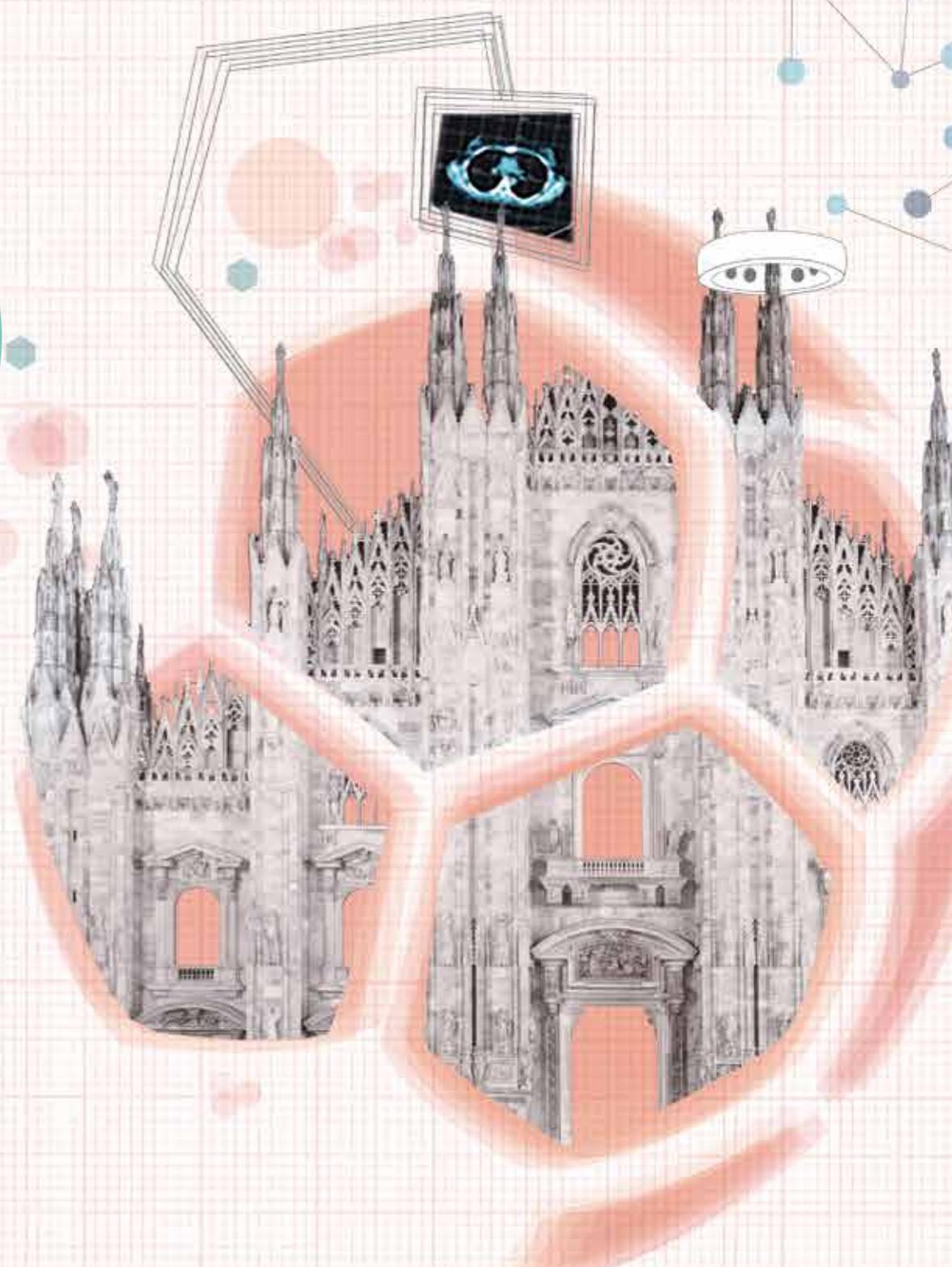
26-30 April 2019
Milan, Italy

Targeting
optimal care,
together

DEADLINES

Abstract submission:
22 October 2018

Early registration:
16 January 2019





ESTRO Meets Asia 2018 ▶▶

7-9 December 2018

Singapore

ENDORSED BY ESTRO



Arab African International Cancer Congress (AAICC) ▶▶

20-21 September 2018

Cairo, Egypt



SBRT: from physics to clinic ▶▶

4-6 October 2018

Florence, Italy



14th Advanced International Breast Cancer Course (AIBCC) ▶▶

20-22 September 2018

Padua, Italy



28th residential course: Modern radiotherapy and unconventional treatments: fractionations, volumes and new drugs ▶▶

8-10 October 2018

Rome, Italy

ESTRO Meets Asia 2018

7-9 December, 2018

Singapore

Early registration rate deadline:
31 July 2018 (23.59 hrs CET)



The first ‘ESTRO Meets Asia’ congress will bring together an international audience of clinicians, medical physicists, radiation therapists (RTTs) and radiobiologists eager to share knowledge and experience in radiation oncology.

ESTRO, in scientific collaboration with the Federation of Asian Organizations for Radiation Oncology (FARO), has developed a scientific programme building on the highlights of its strongest activities. The congress will focus on three areas, each combining not-to-be-missed education and hot scientific topics:

- Radiobiology: DNA damage and repair, cell death mechanisms, combined radiotherapy and chemotherapy, volume and dose-rate effect in radiotherapy, protons and other particles in

radiotherapy

- Interdisciplinary: head and neck, rectal, breast and lung cancers, gynaecological and rare tumours
- Medical physics and radiation technology: treatment planning, quality assurance (QA), image-guided radiation therapy (IGRT), patient positioning and immobilisation, dosimetry, audit and risk assessment, and brachytherapy.

The abstract deadline was 11 June 2018. In total, 289 abstracts were submitted, which augurs well for the event.

[Download the full scientific programme on www.estro.org](http://www.estro.org)

Arab African International Cancer Congress (AAICC): Bronchogenic and genitourinary cancer updates: from guidelines to practice

20-21 September 2018

Cairo, Egypt



The congress has been designed to provide an innovative and comprehensive overview of the latest developments in cancer, as well as answers to the most debatable issues primarily in the areas of prevention, diagnosis and management of bronchogenic and genitourinary cancers.

The congress will bring together the foremost thinkers and experts in oncology, with more than 25 international experts from the Arab world, Africa, Europe and the USA presenting on the latest cancer management and treatment strategies.

Under the theme ‘Bronchogenic and genitourinary cancer updates: from guidelines

to practice’, these distinguished oncologists and scientists will present high-quality and original scientific data in the form of plenary sessions, symposia and oral presentations.

With up to 1,000 clinical attendees expected, you will be able to network with colleagues from many different countries to simulate a creative exchange of ideas that will be highly rewarding.

We are sure that you will enjoy the congress and look forward to welcoming you to Cairo.



14th Advanced International Breast Cancer Course (AIBCC)

20-22 September 2018

Padua, Italy

In many respects, breast cancer research is the front-runner in cancer research. First, this is a common, chronic and lethal disease in which medical interventions are successfully inducing a continuous decline in mortality in spite of increasing incidence. Second, biology drives the entire diagnostic-therapeutic set-up for these patients. This is why, today, a multidisciplinary breast cancer team should include pathologists, molecular biologists, oncogeneticists, as well as the 'classic' clinical specialties.

With this in mind, the programme of the 14th Advanced International Breast Cancer Course (AIBCC), directed by Professor Pier Franco Conte (Padua, Italy) and Professor Gabriel N. Hortobagyi (Houston, USA), will include lectures on molecular characterisation, updated treatments of early and advanced disease, management of difficult cases and hereditary syndromes.

This 14th course will take place in the northern Italian city of Padua from 20-22 September 2018. The aim is to promote an exchange of experiences and opinions and share the most exiting advances. In order to reward scientific excellence and to foster international cooperation, the international scientific committee of the 14th

AIBCC will award the 8th International Prize for Breast Cancer Research to a scientist who has published a breakthrough paper in the previous year. For the first time, we are also inviting participants to present research posters. There will be a prize for the best poster.

SBRT: from physics to clinic

4-6 October 2018

Florence, Italy

Course directors:

Filippo Alongi, Brescia University & Sacro Cuore Hospital, Negrar, Verona, Italy

Pietro Mancosu, Humanitas Cancer Centre, Rozzano, Milan, Italy

Programme highlights will include:

Physics of IGRT, motion management, target definition, target uncertainties estimation, radiomics, audits, nanoparticles, immunology, proton/hadron therapy, planning parameters, auto-planning, MRI/linac, *in vivo* dosimetry, small fields, clinical applications for lung, abdominal targets, prostate and brain, and re-treatment.

Deadline for abstract submission: 27 July 2018

Deadline for registration: 23 September 2018



Modern radiotherapy is increasingly evolving towards a reduction in the number of fractions. Stereotactic body radiotherapy (SBRT), or as more recently defined, SABR (stereotactic ablative body radiotherapy), is a radiation therapy approach in which high radiation doses are delivered in few fractions focused on small extracranial tumours with rapid dose fall off outside the target. In particular, SBRT/SABR is becoming the elective therapy in several anatomic areas, both for primary tumours and for metastatic lesions. These results have been achieved thanks to a multidisciplinary effort with the strong involvement of highly qualified and skilled professionals together with technological progress both in imaging and in treatment delivery.

Since we consider this multidisciplinary approach as the key to success, the Italian Association of Radiation Oncology (AIRO) and the Italian Association of Medical Physics (AIFM) have

organised the 3rd joint symposium on SBRT within the Fuligno monastery area in Florence.

An international faculty, including ESTRO president Umberto Ricardi, the ESTRO physics committee chair and the president of the European Association of Nuclear Medicine (EANM) chairing in 2015-2016, Arturo Chiti, will present the SBRT state of the art. The objective of this course is to provide a current overview of the SBRT methodology. Each session will include both physics and clinical presentations with the opportunity for discussion and questions. The course will end with a debate on the new ICRU91: “Where to normalise the dose”.

A special fee for ESTRO members of €150 (plus VAT) will be applied and will include lunch, coffee break and materials. Furthermore, to facilitate the attendance of both radiation oncologists and medical physicists from the same centre, a further discount will be applied.



28th residential course: Modern radiotherapy and unconventional treatments: fractionations, volumes and new drugs

8-10 October 2018
Rome, Italy

Scientific coordinator: Vincenzo Valentini
Honorary presidents: Carlos A. Perez and Numa Cellini

The implementation of the latest technologies and the refinement of new radiotherapy techniques, our improved knowledge of the biology of cancer and its micro-environment, and the availability of innovative systemic therapies, increasingly open the way to the use of unconventional radiotherapy treatments.

The aim of this course is to offer students the knowledge about the general principles of unconventional treatments and their application in the field of pulmonary, otorhinolaryngology, breast, cutaneous, hepatic, rectal and prostatic neoplastic pathology. Topics related to research in the field of unconventional approaches will be explored in small working groups.

The faculty on the course include: Michael Baumann (Germany), Jean Bourhis (Switzerland), Emmanuilo Fokas (Germany), Nicolas Foray (France), Cai Grau (Denmark), Vincent Gregoire (Belgium), Karin Haustermans (Belgium), Peter Hoskin (UK), György Kovacs (Germany), Philippe Lambin (The Netherlands), Yolande Lievens (Belgium) and Esther Troost (Germany).



ECCO2018
EUROPEAN CANCER SUMMIT

SAVE THE DATE
7-9 September 2018
Vienna, Austria



eccosummit.eu





CALENDAR OF EVENTS



JULY 2018

3-7 JULY 2018 | LJUBJANA, SLOVENIA

AAPM-ISEP: Challenges in Modern Radiation Therapy Physics

www.aapm-isep.si

ESTRO
ENDORSED EVENT

AUGUST 2018

1-3 AUGUST 2018 | TEHRAN, IRAN

2nd International Conference on Head and Neck Cancer

ihncc.ir/en

ESTRO
ENDORSED EVENT

22 AUGUST 2018 | COPENHAGEN, DENMARK

IMRT and VMAT planning in practice at ECMP2018

ecmp2018.org

ESTRO
ENDORSED EVENT

SEPTEMBER 2018

5-8 SEPTEMBER 2018 | LONDON, UK

London Breast meeting

www.londonbreastmeeting.com

ESTRO
ENDORSED EVENT

7-9 SEPTEMBER 2018 | VIENNA, AUSTRIA

ECCO 2018: European cancer summit

www.eccosummit.eu

SCIENTIFIC
COLLABORATION

20-21 SEPTEMBER 2018 | CAIRO, EGYPT

Arab African International Cancer Congress (AAICC)

www.aaicc.net

ESTRO
ENDORSED EVENT

20-21 SEPTEMBER 2018 | MADRID, SPAIN

BLADDR 2018

bladdr.org

ESTRO
ENDORSED EVENT

20-22 SEPTEMBER 2018 | MILAN, ITALY

ESO masterclass in neuro-oncology, Multidisciplinary management of adult brain tumour

www.eso.net/en/education/future/events/eso-masterclass-in-neuro-oncology:-multidisciplinary-management-of-adult-brain-tumours

ESTRO
ENDORSED EVENT



20-22 SEPTEMBER 2018 | PARIS, FRANCE

International conference on immunotherapy radiotherapy combinations 2018

www.radio-immuno.siricsocrate

ESTRO
ENDORSED EVENT

20-22 SEPTEMBER 2018 | PADUA, ITALY

14th Meet the Professor Advanced International Breast Cancer Course

meettheprofessor.accmec.org

ESTRO
ENDORSED EVENT

21-22 SEPTEMBER 2018 | CHIANCIANO TERME, ITALY

6th Annual UPMC International Symposium on Stereotactic Radiosurgery and Stereotactic Body Radiotherapy

www.upmcsanpietro.it/upmc-5th-annual-symposium-of-radiotherapy

ESTRO
ENDORSED EVENT

26-28 SEPTEMBER 2018 | TEHRAN, IRAN

Perspectives of Advanced Radiotherapy in Middle Income Countries

parimics.isco.ir

SCIENTIFIC
COLLABORATION

OCTOBER 2018

4-6 OCTOBER 2018 | FLORENCE, ITALY

3rd Symposium on Stereotactic Body Radiation Therapy: From physics to clinic

www.symposium.it/en

ESTRO
ENDORSED EVENT

8-10 OCTOBER 2018 | ROME, ITALY

28th Residential Course on Modern Radiotherapy and unconventional treatments fractionations, volumes and new drugs

roma.unicatt.it/20180503_-_28_Course_program.pdf

ESTRO
ENDORSED EVENT

12 OCTOBER 2018 | PARIS, FRANCE

International Marie Skłodowska-Curie Meeting: From Radiation to Innovation in Medicine

www.radiate.eu/imscm-2018-conference

ESTRO
ENDORSED EVENT

26-27 OCTOBER 2018

2nd ESTRO Physics Workshop - Science in Development

www.estro.org/congresses-meetings/items/2nd-estro-physics-workshop-science-in-development

 ESTRO EVENT



NOVEMBER 2018

22 NOVEMBER 2018 | POZNAN, POLAND

Young Scientists Forum 2018

www.wco.pl/ysf2018/en

ESTRO
ENDORSED EVENT

22-24 NOVEMBER 2018 | POZNAN, POLAND

Interdisciplinary oncology - time for modern solutions

www.onkologia2018.pl

ESTRO
ENDORSED EVENT

29-30 NOVEMBER 2018 | BRUSSELS, BELGIUM

6th GEC-ESTRO Workshop

www.estro.org/congresses-meetings/items/6th-gec-estro-workshop

 ESTRO EVENT

DECEMBER 2018

7-9 DECEMBER 2018 | SINGAPORE

ESTRO Meets Asia 2018

www.estro.org/congresses-meetings/items/estro-meets-asia-2018

 ESTRO EVENT

8-9 DECEMBER 2018 | SHANGHAI, CHINA

The 3rd World Precision Medicine (China) Summit

wpmcs.com.cn

ESTRO
ENDORSED EVENT

MARCH 2019

14-16 MARCH 2019 | BARCELONA, SPAIN

7TH ICHNO

www.estro.org/congresses-meetings/items/7th-ichno

 ESTRO EVENT

APRIL 2019

26-30 APRIL 2019 | MILAN, ITALY

ESTRO 38

www.estro.org/congresses-meetings/items/estro-38

 ESTRO EVENT



WE ARE HIRING

ESTRO is looking for candidates for three positions for our office in Brussels, Belgium:

PROJECT MANAGER to coordinate and organise scientific courses.

You will be responsible for the smooth, efficient and cost-effective organisation of ESTRO courses. You will ensure that international exchanges of knowledge and experience, in the field of radiotherapy and oncology, are properly promoted and contribute to the scientific credibility of ESTRO.

To apply, please send your CV and cover letter in English (with reference “Education” in the subject line) by 30 June 2018 to recruitment@estro.org. Only shortlisted candidates will be contacted and invited to an interview (this should happen by 15 July 2018).

[More information on www.estro.org](http://www.estro.org) >

EXHIBITION ADMINISTRATOR to coordinate and organise industrial exhibitions.

You will be responsible for the smooth, efficient and cost-effective organisation of industrial exhibitions and related tasks and projects. You will ensure that the information flow between ESTRO, corporate stakeholders and suppliers is optimal and correctly invoiced.

To apply, please send your CV and cover letter in English (with reference “Exhibition” in the subject line) by 25 July 2018 to recruitment@estro.org. Only shortlisted candidates will be contacted and invited to an interview (this should happen by 31 July 2018).

[More information on www.estro.org](http://www.estro.org) >

PROGRAMMES ADMINISTRATIVE ASSISTANT to support the team in the development of conferences scientific programmes.

The programme administrative assistant primarily contributes to the administrative activities of the scientific programme units. In second line, s/he also supports ESTRO’s programme manager in the development of the scientific programmes for ESTRO’s annual congress and other joint events.

To apply, please send your CV and cover letter in English (with reference “Assistant” in the subject line) by 25 July 2018 to recruitment@estro.org. Only shortlisted candidates will be contacted (this should happen by 30 July 2018).

[More information on www.estro.org](http://www.estro.org) >

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ESTRO

Bimonthly newsletter
N° 119 | July - August 2018
European Society for
Radiotherapy & Oncology

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Published every two months and distributed
by the European Society for Radiotherapy
& Oncology.

DEADLINES FOR SUBMISSION OF ARTICLES IN 2018

September-October 2018: July 2018
November-December 2018: 3 September 2018

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