Overview

Professor of Radiotherapy Physics. This is a joint post between the University of Manchester and the Christie. Marcel is responsible for developing a programme of international leading radiotherapy physics research and innovation to deliver direct patient benefits. The main focus is on accuracy of radiotherapy including target volume definition, treatment planning, image guidance and treatment follow-up.

Work Stream 4 for NCRI Clinical and Translational Radiotherapy Research (CTRad) Working Group

Employment

Chair in Radiotherapy Physics
Academic (Teaching & Research) Professor
Division of Cancer Sciences (L5)
The University of Manchester
1 Aug 2016 → present

Research outputs

Geometric distortion caused by metallic femoral head prosthesis in prostate cancer imaging on an MR linac: in-vivo measurements of spatial deformation

Contouring variation affects estimates of normal tissue complication probability for breast fibrosis after radiotherapy

Unsupervised Correspondence with Combined Geometric Learning and Imaging for Radiotherapy Applications

Single Institution Preliminary Evaluation of a National Study for the Development of Daily Online Magnetic Resonance Image Guided Radiotherapy

Assessing Interaction between Toxicity Outcomes and Dose Surface Maps at the Bladder and Rectum in Prostate Cancer Patients - 2
Predicting cancer relapse following lung stereotactic radiotherapy: an external validation study using real-world evidence

Dysphagia At 1 Year is Associated with Mean Dose to The Inferior Section of The Brainstem

Dose outside of the prostate is associated with improved outcomes for high-risk prostate cancer patients treated with brachytherapy boost

Reply to the Letter by Ma et al

Demystifying the Results of RTOG 0617: Identification of Dose Sensitive Cardiac Subregions Associated With Overall Survival

Probabilistic evaluation of plan quality for time-dependent anatomical deformations in head and neck cancer patients

The value of post Radiotherapy PSA dynamics for prostate cancer risk stratification models

128 - Implementing heart-sparing radiotherapy for lung cancer

137 - Using heart contour volume variability as natural experiment to test the effect heart sparing

The Impact of Training Dataset Size and Ensemble Inference Strategies on Head and Neck Auto-Segmentation

Assessing Interaction between Toxicity Outcomes and Dose Surface Maps at the Bladder and Rectum In Prostate Cancer Patients

Accurate segmentation of head and neck radiotherapy CT scans with 3D CNNs: consistency is key

First-in-Human Technique Translation of Oxygen-Enhanced MRI to an MR Linac System in Patients with Head and Neck Cancer
Cardiac Function Modifies the Impact of Heart Base Dose on Survival: A Voxel-Wise Analysis of Patients With Lung Cancer From the PET-Plan Trial

GAUSSIAN PROCESS CLUSTERING TO STUDY PSA DYNAMICS IN PROSTATE CANCER PATIENTS

Oxygen Enhanced-MRI for Hypoxia Imaging in Head and Neck Cancer

Prostate Magnetic Resonance Imaging Delta-Radiomics during Image-Guided Conventional Fractionation and Stereotactic Ablative Radiotherapy

Heart dose and cardiac comorbidities influence death with a cardiac cause following hypofractionated radiotherapy for lung cancer

Suitability of propagated contours for adaptive replanning for head and neck radiotherapy

Automatic Identification of Segmentation Errors for Radiotherapy Using Geometric Learning

The geometric and dosimetric effect of algorithm choice on propagated contours from CT to cone beam CTs

Causal relation between heart irradiation and survival of lung cancer patients after radiotherapy

Clinical and radiomics prediction of complete response in rectal cancer pre-chemoradiotherapy

Image-based data mining applies to data collected from children
Role of Real-World Data in Assessing Cardiac Toxicity After Lung Cancer Radiotherapy

The impact of an educational tool in cervix image registration across three imaging modalities

PD-0317 A novel method to predict OAR contour errors without a ground truth using geometric learning

Feasibility of low-dose 4DCBCT for patient setup and motion measurement

First-in-human clinical translation of oxygen-enhanced MRI onto an MR Linac

Optimising a 3D convolutional neural network for head and neck computed tomography segmentation with limited training data

Evaluating principal component analysis models for representing anatomical changes in head and neck radiotherapy

Radial Data Mining to Identify Density-Dose Interactions That Predict Distant Failure Following SABR

Clinico-pathological predictors of clinical complete response in rectal cancer

Transfer learning for data-efficient abdominal muscle segmentation with convolutional neural networks

Effect of systemic inflammation biomarkers on overall survival after lung cancer radiotherapy: a single-center large-cohort study

In Reply to Ebert et al.

The impact of gadolinium-based MR contrast on radiotherapy planning for oropharyngeal treatment on the MR Linac
Anatomical Association of Dose Distribution With Radiotherapy-Related Lymphopenia in Oropharynx Cancer

Learning healthcare systems and rapid learning in radiation oncology: Where are we and where are we going?

The Impact of Intra-thoracic Anatomical Changes upon the Delivery of Lung Stereotactic Ablative Radiotherapy

EGFR targeting of [177Lu] gold nanoparticles to colorectal and breast tumour cells: affinity, duration of binding and growth inhibition of Cetuximab-resistant cells.

PO-1695 Accurate H&N 3D segmentation with limited training data using 2-stage CNNs

Towards personalised treatment for prostate cancer biology improves image-based data mining models

Focused VHEE (Very High Energy Electron) Beams and Dose Delivery For Radiotherapy Applications

Flogging a Dead Salmon? Reduced Dose Posterior to Prostate Correlates With Increased PSA Progression in Voxel-Based Analysis of 3 Randomized Phase 3 Trials

A novel use for routine CBCT imaging during radiotherapy to detect COVID-19

Optimising use of 4D-CT phase information for radiomics analysis in lung cancer patients treated with stereotactic body radiotherapy

MRI and CBCT for lymph node identification and registration in patients with NSCLC undergoing radical radiotherapy

Efficient Visualisation of Changes in CBCT During Radiotherapy to Detect Lung Infections

Novel Methodology to assess the Effect of Contouring Variation on Treatment Outcome
Low dose cone beam CT for paediatric image-guided radiotherapy: Image quality and practical recommendations

Automated gross tumour volume contour generation for large-scale analysis of early stage lung cancer patients planned with 4D-CT

Three-dimensional (3D) magnetic resonance volume assessment and loco-regional failure in anal cancer: early evaluation case-control study

Protecting the Heart: A Practical Approach to Account for the Full Extent of Heart Motion in Radiation Therapy Planning

Inter- and intra-fractional stability of rectal gas in pelvic cancer patients during MRgRT

MRI vs CBCT image guidance when treating lymph nodes in patients with locally advanced (LA)-NSCLC

Peritumoural density as a biomarker of distant failure in NSCLC patients treated with SABR

PO-1755: Use of ‘Jigsaw puzzles’ to train convolutional neural networks for segmentation with limited data

Quantification of inter-observer variation before and after an educational intervention in MRgRT

Predictive value of vascular calcification identified in 4D planning CT of lung cancer patients treated with stereotactic body radiation therapy

Cardiovascular mortality and morbidity following radical radiotherapy for lung cancer: Is cardiovascular death under-reported?

Dose surface maps of the heart can identify regions associated with worse survival for lung cancer patients treated with radiotherapy
Cardiac sub-volume targeting demonstrates regional radiosensitivity in the mouse heart

Image guidance in radiation therapy for better cure of cancer

Protecting the heart: a practical approach to account for the full extent of heart motion in radiotherapy planning

Surrogate-free machine learning-based organ dose reconstruction for pediatric abdominal radiotherapy

Novel methodology to investigate the impact of radiation dose to heart sub-structures on overall survival

Radiotherapy-related lymphopenia affects overall survival in patients with lung cancer

Accurate MR Image Registration to Anatomical Reference Space for Diffuse Glioma

Impact of small residual setup errors after image guidance on heart dose and survival in non-small cell lung cancer treated with curative-intent radiotherapy

Experimental verification the Electron Return Effect around spherical air cavities for the MR Linac using Monte Carlo calculation

Characterizing local dose perturbations due to gas cavities in Magnetic Resonance guided Radiotherapy

Inter-fraction robustness of intensity-modulated proton therapy in the post-operative treatment of oropharyngeal and oral cavity squamous cell carcinomas

Impact of Peer Review in Reducing Uncertainty in the Definition of the Lung Target Volume Among Trainee Oncologists
Is tumour sphericity an important prognostic factor in patients with lung cancer?

Retrospective Analyses of Registry Data for Technical Radiation Oncology Questions: Apples Versus Pears or Solid Evidence?

En-face optical coherence tomography for the detection of cancer in prostatectomy specimens: Quantitative analysis in 20 patients

Identification of patterns of tumour change measured on CBCT images in NSCLC patients during radiotherapy

Image Based Data Mining Using Per-voxel Cox Regression

Evaluation of acute esophageal radiation-induced damage using magnetic resonance imaging: a feasibility study in mice

Magnetic resonance guided radiation therapy: a review

P1.16-20 Trial in Progress: Cardiac Toxicity in Patients Undergoing Curative Intent Radiotherapy for Lung Cancer

P1.17-22 Do Statins Improve Outcomes After Radical Radiotherapy for Lung Cancer? An In-Depth Analysis of Over 1100 Patients

The impact of intra-thoracic anatomical changes upon the delivery of lung SABR

In Regard to Zhang et al

Making radiotherapy smarter

Quantitative evaluation of 4D Cone beam CT scans with reduced scan time in lung cancer patients

Comparing two web platforms for uncertainty simulation of external beam radiotherapy
Contour Generation with Realistic Inter-observer Variation

Post-treatment lymphocytopaenia, integral body dose and overall survival in lung cancer patients treated with radical radiotherapy

Evolutionary machine learning for multi-objective class solutions in medical deformable image registration

Influence of tumour laterality on patient survival in non-small cell lung cancer after radiotherapy

72OMulti-centre analysis of cardiac events following radical radiotherapy for lung cancer

OC-0522 Characterising dose changes due to unplanned gas cavities in Magnetic Resonance guided Radiotherapy

OC-0632 Radiotherapy-related lymphopenia affects overall survival in patients with lung cancer

OC-0404 Dose to vascular calcifications is predictive for overall survival in lung cancer patients

Avoiding cardiac toxicity in patients undergoing curative intent radiotherapy for lung cancer

Assessing localised dosimetric effects due to unplanned gas cavities during pelvic MR-guided Radiotherapy using Monte Carlo simulations

Evolutionary multi-objective meta-optimization of deformation and tissue removal parameters improves the performance of deformable image registration of pre- and post-surgery images

FAst Segmentation Through SURface Fairing (FASTSURF): A novel semi-automatic hippocampus segmentation method

New approaches for effective and safe pelvic radiotherapy in high-risk prostate cancer
Optical coherence tomography to detect acute esophageal radiation-induced damage in mice: a validation study

Reduced inter-observer and intra-observer delineation variation in esophageal cancer radiotherapy by use of fiducial markers

The advanced radiotherapy network (ART-NET) UK lung stereotactic ablative radiotherapy survey: national provision and a focus on image guidance

The impact of baseline shifts towards the heart after image guidance on survival in lung SABR patients

One-to-one registration of en-face optical coherence tomography attenuation coefficients with histology of a prostatectomy specimen

Changes in prostate apparent diffusion coefficient values during radiotherapy after neo-adjuvant hormones

Image-based Data Mining to Probe Dosimetric Correlates of Radiation-induced Trismus

Robust radiotherapy planning

Simplex-based navigation tool for a posteriori selection of the preferred deformable image registration outcome from a set of trade-off solutions obtained with multiobjective optimization for the case of breast MRI

Residual setup errors towards the heart after image guidance linked with poorer survival in lung cancer patients: do we need stricter IGRT protocols?

Influence of Tumour Location and Histological Sub-Type of Non-Small Cell Lung Cancer on Patient Survival

Interaction between dose and calcifications is a predictor for overall survival in lung cancer patients receiving radiotherapy
Robustness of an image-based data mining approach in lung cancer patients

Comparison of SUVmax and SUVpeak based segmentation to determine primary lung tumour volume on FDG PET-CT correlated with pathology data

Magnetic Resonance Imaging-Guided Radiation Therapy: A Short Strengths, Weaknesses, Opportunities, and Threats Analysis

Calcifications in lung cancer patients: can they be used as surrogate for overall survival predictions?

EP-1810: Assessing the dose significance of unplanned rectal filling in pelvic MR Guided Radiotherapy

Feasibility of using optical coherence tomography to detect acute radiation-induced esophageal damage in small animal models

Tumour sphericity is an independent predictor for overall survival in non-small cell lung cancer

Magnetic Resonance Imaging-Guided Adaptive Radiation Therapy: A “Game Changer” for Prostate Treatment?

A method to combine target volume data from 3D and 4D planned thoracic radiotherapy patient cohorts for machine learning applications

Interobserver variability in the delineation of the primary lung cancer and lymph nodes on different four-dimensional computed tomography reconstructions

Image Guided Radiation Therapy Strategies for Pelvic Lymph Node Irradiation in High-Risk Prostate Cancer: Motion and Margins

Assessing MR-linac radiotherapy robustness for anatomical changes in head and neck cancer
Comparison of intensity modulated radiotherapy plan optimisation methods for a 1.5 T MR-Linac

Earliest radiological progression in glioblastoma by multidisciplinary consensus review

Feasibility of using optical coherence tomography to detect radiation-induced fibrosis and residual cancer extent after neoadjuvant chemo-radiotherapy: an ex vivo study

Image-guided radiotherapy residual setup errors linked to overall survival in lung cancer patients

Inter-observer variation of hippocampus delineation in hippocampal avoidance prophylactic cranial irradiation

Learning from every patient treated

Prospective evaluation of relationships between radiotherapy dose to masticatory apparatus and trismus

study in nephroureterectomy specimens defining the role of 3-D upper urinary tract visualization using optical coherence tomography and endoluminal ultrasound

The Challenges of Using MRI During Radiotherapy

The impact of training and professional collaboration on the interobserver variation of lung cancer delineations: a multi-institutional study

Use of a novel atlas for muscles of mastication to reduce inter observer variability in head and neck radiotherapy contouring

Visibility of fiducial markers used for image-guided radiation therapy on optical coherence tomography for registration with CT: An esophageal phantom study
Technical Note: Investigating the impact of field size on patient selection for the 1.5T MR-Linac

Radiation dose to heart base linked with poorer survival in lung cancer patients.

Nodal stage migration and prognosis in anal cancer: a systematic review, meta-regression, and simulation study

The Future of Image-guided Radiotherapy

Beyond the margin recipe: The probability of correct target dosage and tumor control in the presence of a dose limiting structure

Optimal combination of anti-scatter grids and software correction for CBCT imaging

ADDED VALUE IN DISCRIMINATION PERFORMANCE OF TUMOUR PARAMETERS AND NOVEL FEATURES DETERMINED USING ROUTINE PRE-TREATMENT MRI IN PATIENTS WITH ANAL CANCER.

A population based statistical model for daily geometric variations in the thorax

Considerable interobserver variation in delineation of pancreatic cancer on 3DCT and 4DCT: A multi-institutional study

Regional analysis of volumes and reproducibilities of automatic and manual hippocampal segmentations

High resolution toxicity analysis of lung cancer patients identifies the base of the heart as a dose sensitive region

Organ at risk inter- and intra-observer contour variation for lung patients on average versus motion compensated 4DCT

Addition of MRI for CT-based pancreatic tumor delineation: a feasibility study

Data mining in oncology: The ukCAT project and the practicalities of working with routine patient data
Imaging biomarker roadmap for cancer studies

Introducing the Cancer Research UK Advanced Radiotherapy Technologies Network (ART-NET)

MRI Guided Radiotherapy: A Short SWOT Analysis

The feasibility of manual parameter tuning for deformable breast MR image registration from a multi-objective optimization perspective

The influence of automation on tumor contouring

Using a contextualized sensemaking model for interaction design: A case study of tumor contouring

An automated workflow for patient-specific quality control of contour propagation

Head and Neck Margin Reduction With Adaptive Radiation Therapy: Robustness of Treatment Plans Against Anatomy Changes

Online 3D EPID-based dose verification : Proof of concept

MRI-guided prostate adaptive radiotherapy - A systematic review

EP-1844: Feasibility of generating mid-position CT from 4DCT using commercial deformable registration systems
Clinical introduction of image lag correction for a cone beam CT system

Effects of anatomical changes on pencil beam scanning proton plans in locally advanced NSCLC patients

Impact of coronal and sagittal views on lung gross tumor volume delineation

Clinical evaluation of respiration-induced attenuation uncertainties in pulmonary 3D PET/CT.

Dose-surface maps identifying local dose-effects for acute gastrointestinal toxicity after radiotherapy for prostate cancer

Overview of 3-year experience with large-scale electronic portal imaging device-based 3-dimensional transit dosimetry

CT-based delineation of organs at risk in the head and neck region: DAHANCA, EORTC, GORTEC, HKNPCSG, NCIC CTG, NCRI, NRG Oncology and TROG consensus guidelines.

Impact of daily anatomical changes on EPID-based in vivo dosimetry of VMAT treatments of head-and-neck cancer.

Dynamic CT perfusion image data compression for efficient parallel processing.

Establishing implantation uncertainties for focal brachytherapy with I-125 seeds for the treatment of localized prostate cancer.

WE-D-BRA-04: Online 3D EPID-Based Dose Verification for Optimum Patient Safety.

Dynamic collimator angle adjustments during volumetric modulated arc therapy to account for prostate rotations.

Comment on 'Multi-modality functional image guided dose escalation in the presence of uncertainties'
Acute toxicity after image-guided intensity modulated radiation therapy compared to 3D conformal radiation therapy in prostate cancer patients.

Target delineation variability and corresponding margins of peripheral early stage NSCLC treated with stereotactic body radiotherapy.

Toward adaptive radiotherapy for head and neck patients: Uncertainties in dose warping due to the choice of deformable registration algorithm.

Portal dosimetry in wedged beams.

Probabilistic evaluation of target dose deterioration in dose painting by numbers for stage II/III lung cancer.

Deformable image registration for adaptive radiation therapy of head and neck cancer: accuracy and precision in the presence of tumor changes.

Inter- and intra-fractional bladder motion during radiotherapy for bladder cancer: a comparison of full and empty bladders.

Clinical implementation and rapid commissioning of an EPID based in-vivo dosimetry system.

4D CT amplitude binning for the generation of a time-averaged 3D mid-position CT scan.

In vivo portal dosimetry for head-and-neck VMAT and lung IMRT: linking γ-analysis with differences in dose-volume histograms of the PTV.

Improved image quality of cone beam CT scans for radiotherapy image guidance using fiber-interspaced antiscatter grid.

Automatic detection system for multiple region of interest registration to account for posture changes in head and neck radiotherapy.
Leukemia and brain tumors among children after radiation exposure from CT scans: design and methodological opportunities of the Dutch Pediatric CT Study.

Occupancy of serotonin transporters in the amygdala by paroxetine in association with attenuation of left amygdala activation by negative faces in major depressive disorder.

Adaptive radiotherapy with an average anatomy model: evaluation and quantification of residual deformations in head and neck cancer patients.

An in silico comparison between margin-based and probabilistic target-planning approaches in head and neck cancer patients.

Motion compensated digital tomosynthesis.

Registration accuracy and image quality of time averaged mid-position CT scans for liver SBRT.

Automatic in vivo portal dosimetry of all treatments.

PET motion compensation for radiation therapy using a CT-based mid-position motion model: methodology and clinical evaluation.

Probabilistic objective functions for margin-less IMRT planning.

Hybrid registration of prostate and seminal vesicles for image guided radiation therapy.

Fusion of planning CT and cystoscopy images for bladder tumor delineation: a feasibility study.

Radiotherapy with rectangular fields is associated with fewer clinical failures than conformal fields in the high-risk prostate cancer subgroup: results from a randomized trial.
Multiple comparisons permutation test for image based data mining in radiotherapy.

Semiautomatic bladder segmentation on CBCT using a population-based model for multiple-plan ART of bladder cancer.

Adaptive margin radiotherapy for patients with prostate carcinoma: what's the benefit?

Validation of deformable registration in head and neck cancer using analysis of variance.

Influence of the number of elongated fiducial markers on the localization accuracy of the prostate.

Acute esophagus toxicity in lung cancer patients after intensity modulated radiation therapy and concurrent chemotherapy.

Evaluation of tumor shape variability in head-and-neck cancer patients over the course of radiation therapy using implanted gold markers.

Automatic bladder segmentation on CBCT for multiple plan ART of bladder cancer using a patient-specific bladder model.

Adaptive radiotherapy for long course neo-adjuvant treatment of rectal cancer.

Contrast-enhanced ultrasound as support for prostate brachytherapy treatment planning.

In-situ imaging of articular cartilage of the first carpometacarpal joint using co-registered optical coherence tomography and computed tomography
Cernohorsky, P., de Bruin, D. M., van Herk, M., Bras, J., Faber, D. J., Strackee, S. D. & van Leeuwen, T. G., Jun 2012, In: Journal of Biomedical Optics. 17, 6, p. 060501

Quantification of the variability of diaphragm motion and implications for treatment margin construction.

Repeat CT assessed CTV variation and PTV margins for short- and long-course pre-operative RT of rectal cancer.
A practical technique to avoid the hippocampus in prophylactic cranial irradiation for lung cancer.

A voxel-based finite element model for the prediction of bladder deformation.

In aqua vivo EPID dosimetry.

Target volume delineation variation in radiotherapy for early stage rectal cancer in the Netherlands.

A novel method for megavoltage scatter correction in cone-beam CT acquired concurrent with rotational irradiation.

Comparative study of respiratory motion correction techniques in cone-beam computed tomography.

Dealing with geometric uncertainties in dose painting by numbers: introducing the ΔVH.

Semi-automatic delineation using weighted CT-MRI registered images for radiotherapy of nasopharyngeal cancer.

Position verification for the prostate: effect on rectal wall dose.

Residual seminal vesicle displacement in marker-based image-guided radiotherapy for prostate cancer and the impact on margin design.

Effects of setup errors and shape changes on breast radiotherapy.

Serotonin and dopamine transporters in relation to neuropsychological functioning, personality traits and mood in young adult healthy subjects.
Simplifying EPID dosimetry for IMRT treatment verification.

Finite element based bladder modeling for image-guided radiotherapy of bladder cancer.

Urinary obstruction in prostate cancer patients from the Dutch trial (68 Gy vs. 78 Gy): relationships with local dose, acute effects, and baseline characteristics.

Catching errors in vivo EPID dosimetry.

Behavior of lipiodol markers during image guided radiotherapy of bladder cancer.

Relating dose outside the prostate with freedom from failure in the Dutch trial 68 Gy vs. 78 Gy.

3D Dosimetric verification of volumetric-modulated arc therapy by portal dosimetry.

Correction strategies to manage deformations in head-and-neck radiotherapy.

First clinical experience with a multiple region of interest registration and correction method in radiotherapy of head-and-neck cancer patients.

Decreased 3D observer variation with matched CT-MRI, for target delineation in Nasopharynx cancer.

Strategies for online organ motion correction for intensity-modulated radiotherapy of prostate cancer: prostate, rectum, and bladder dose effects.

Lipiodol injection for target volume delineation and image guidance during radiotherapy for bladder cancer.

Effects of respiration-induced density variations on dose distributions in radiotherapy of lung cancer.
A simple backprojection algorithm for 3D in vivo EPID dosimetry of IMRT treatments.

Frameless stereotactic body radiotherapy for lung cancer using four-dimensional cone beam CT guidance.

On-the-fly motion-compensated cone-beam CT using an a priori model of the respiratory motion.

Setup uncertainties of anatomical sub-regions in head-and-neck cancer patients after offline CBCT guidance.

Detection of in vivo dynamic 3-D motion patterns in the wrist joint.

Reconstruction of a time-averaged midposition CT scan for radiotherapy planning of lung cancer patients using deformable registration.

The influence of a dietary protocol on cone beam CT-guided radiotherapy for prostate cancer patients.

Impact of anatomical location on value of CT-PET co-registration for delineation of lung tumors.

Comparison of different strategies to use four-dimensional computed tomography in treatment planning for lung cancer patients

99mTc Hynic-rh-Annexin V scintigraphy for in vivo imaging of apoptosis in patients with head and neck cancer treated with chemoradiotherapy.

Variability of four-dimensional computed tomography patient models.

3D in vivo dose verification of entire hypo-fractionated IMRT treatments using an EPID and cone-beam CT.

99mTc-HYNIC-rh-annexin-V scintigraphy: visual and quantitative evaluation of early treatment-induced apoptosis to predict treatment outcome.
On-the-fly motion-compensated cone-beam CT using an a priori motion model.

Will IGRT live up to its promise?

Strategy for online correction of rotational organ motion for intensity-modulated radiotherapy of prostate cancer

Different styles of image-guided radiotherapy.

IMRT optimization including random and systematic geometric errors based on the expectation of TCP and NTCP.

Kilo-voltage cone-beam computed tomography setup measurements for lung cancer patients; First clinical results and comparison with electronic portal-imaging device.

Short-term displacement and reproducibility of the breast and nodal targets under active breathing control.

A fast algorithm for gamma evaluation in 3D.

An adaptive off-line procedure for radiotherapy of prostate cancer.

Replacing pretreatment verification with in vivo EPID dosimetry for prostate IMRT.

Retrospective attenuation correction of PET data for radiotherapy planning using a free breathing CT.

Three-dimensional heart dose reconstruction to estimate normal tissue complication probability after breast irradiation using portal dosimetry.

Clinical experience with EPID dosimetry for prostate IMRT pre-treatment dose verification.
The management of respiratory motion in radiation oncology report of AAPM Task Group 76. 

Mid-ventilation CT scan construction from four-dimensional respiration-correlated CT scans for radiotherapy planning of lung cancer patients. 

Short-term and long-term reproducibility of lung tumor position using active breathing control (ABC). 

Mapping of treatment-induced apoptosis in normal structures: 99mTc-Hynic-annexin V SPECT and CT image fusion 

Impact of geometrical uncertainties on 3D CRT and IMRT dose distributions for lung cancer treatment. 

Comparison of ghosting effects for three commercial a-Si EPIDs. 

Anatomy changes in radiotherapy detected using portal imaging. 

Tumor motion and deformation during external radiotherapy of bladder cancer. 

Reduction of observer variation using matched CT-PET for lung cancer delineation: a three-dimensional analysis. 

Accurate two-dimensional IMRT verification using a back-projection EPID dosimetry method. 

Automatic prostate localization on cone-beam CT scans for high precision image-guided radiotherapy. 

Reproducibility of the bladder shape and bladder shape changes during filling.

Target definition in prostate, head, and neck.

The applicability of simultaneous TRUS-CT imaging for the evaluation of prostate seed implants.

The sensitivity of dose distributions for organ motion and set-up uncertainties in prostate IMRT.

Prostate gland motion assessed with cine-magnetic resonance imaging (cine-MRI).

Fusion of respiration-correlated PET and CT scans: correlated lung tumour motion in anatomical and functional scans.

Respiratory correlated cone beam CT.

Strategies to reduce the systematic error due to tumor and rectum motion in radiotherapy of prostate cancer.

Quantification of shape variation of prostate and seminal vesicles during external beam radiotherapy.

Impact of knee support and shape of tabletop on rectum and prostate position.

The effects of target size and tissue density on the minimum margin required for random errors.

The long-term stability of amorphous silicon flat panel imaging devices for dosimetry purposes.

Automatic localization of the prostate for on-line or off-line image-guided radiotherapy.

A model to predict bladder shapes from changes in bladder and rectal filling.
The stability of liquid-filled matrix ionization chamber electronic portal imaging devices for dosimetry purposes.

Dose-response and ghosting effects of an amorphous silicon electronic portal imaging device.

Leaf trajectory verification during dynamic intensity modulated radiotherapy using an amorphous silicon flat panel imager.

Errors and margins in radiotherapy.

Quantification of local rectal wall displacements by virtual rectum unfolding.

Biologic and physical fractionation effects of random geometric errors.

Reduction of dose delivered to the rectum and bulb of the penis using MRI delineation for radiotherapy of the prostate.

Application of video imaging for improvement of patient set-up.

Three-dimensional dose reconstruction of breast cancer treatment using portal imaging.

Focal spot motion of linear accelerators and its effect on portal image analysis.

The theoretical benefit of beam fringe compensation and field size reduction for iso-normal tissue complication probability dose escalation in radiotherapy of lung cancer.

Evaluation of cost functions for gray value matching of two-dimensional images in radiotherapy.

Feasibility of geometrical verification of patient set-up using body contours and computed tomography data.

Portal imaging to assess set-up errors, tumor motion and tumor shrinkage during conformal radiotherapy of non-small cell lung cancer.
When should systematic patient positioning errors in radiotherapy be corrected?

A model to simulate day-to-day variations in rectum shape.

The effect of set-up uncertainties, contour changes, and tissue inhomogeneities on target dose-volume histograms.

Precise and real-time measurement of 3D tumor motion in lung due to breathing and heartbeat, measured during radiotherapy.

Margins for translational and rotational uncertainties: a probability-based approach.

A method for geometrical verification of dynamic intensity modulated radiotherapy using a scanning electronic portal imaging device.

Inclusion of geometric uncertainties in treatment plan evaluation.

Margins for geometric uncertainty around organs at risk in radiotherapy.

Time trends in organ position and volume in patients receiving prostate three-dimensional conformal radiotherapy.

Irradiation of paranasal sinus tumors, a delineation and dose comparison study.

Field size reduction enables iso-NTCP escalation of tumor control probability for irradiation of lung tumors.


Accurate measurement of the dynamic response of a scanning electronic portal imaging device.

Physical aspects of a real-time tumor-tracking system for gated radiotherapy.
The width of margins in radiotherapy treatment plans.

Target volumes in radiotherapy for high-grade malignant glioma of the brain.

The accuracy of image registration for the brain and the nasopharynx using external anatomical landmarks.

The probability of correct target dosage: dose-population histograms for deriving treatment margins in radiotherapy.

Leaf position verification during dynamic beam delivery: a comparison of three applications using electronic portal imaging.

3-D portal image analysis in clinical practice: an evaluation of 2-D and 3-D analysis techniques as applied to 30 prostate cancer patients.

Comparison of prostate cancer treatment in two institutions: a quality control study.

A general methodology for three-dimensional analysis of variation in target volume delineation.

Quantification and predictors of prostate position variability in 50 patients evaluated with multiple CT scans during conformal radiotherapy.

Computerized design of target margins for treatment uncertainties in conformal radiotherapy.

Definition of the prostate in CT and MRI: a multi-observer study.

Automatic registration of pelvic computed tomography data and magnetic resonance scans including a full circle method for quantitative accuracy evaluation.

Automatic three-dimensional matching of CT-SPECT and CT-CT to localize lung damage after radiotherapy.
First clinical tests using a liquid-filled electronic portal imaging device and a convolution model for the verification of the midplane dose.

New method to obtain the midplane dose using portal in vivo dosimetry.

Registration of MR and SPECT without using external fiducial markers.

The potential impact of CT-MRI matching on tumor volume delineation in advanced head and neck cancer.

Two-dimensional exit dosimetry using a liquid-filled electronic portal imaging device and a convolution model.

Demonstration of a reduction in muscarinic receptor binding in early Alzheimer's disease using iodine-123 dexetimide single-photon emission tomography.

A convolution model to convert transmission dose images to exit dose distributions.

Effect of image artifacts, organ motion, and poor segmentation on the reliability and accuracy of three-dimensional chamfer matching.

Target margins for random geometrical treatment uncertainties in conformal radiotherapy.

The dose response relationship of a liquid-filled electronic portal imaging device.

Interactive three-dimensional inspection of patient setup in radiation therapy using digital portal images and computed tomography data.

Transmission dosimetry with a liquid-filled electronic portal imaging device.

Automatic three-dimensional inspection of patient setup in radiation therapy using portal images, simulator images, and computed tomography data.
The computation of MR image distortions caused by tissue susceptibility using the boundary element method.  

Dosimetric characteristics of a liquid-filled electronic portal imaging device.  

Quantification of organ motion during conformal radiotherapy of the prostate by three dimensional image registration.  

Variation in volumes, dose-volume histograms, and estimated normal tissue complication probabilities of rectum and bladder during conformal radiotherapy of T3 prostate cancer.  

Electronic portal imaging.  

Magnetic resonance image-directed stereotactic neurosurgery: use of image fusion with computerized tomography to enhance spatial accuracy.  

Optimization of automatic portal image analysis.  

Automatic three-dimensional correlation of CT-CT, CT-MRI, and CT-SPECT using chamfer matching.  

Image fusion for stereotactic radiotherapy and radiosurgery treatment planning.  

A comprehensive system for the analysis of portal images.  

An algorithm for automatic analysis of portal images: clinical evaluation for prostate treatments.  

A verification procedure to improve patient set-up accuracy using portal images.  

Verification of lung attenuator positioning before total body irradiation using an electronic portal imaging device.  
Automatic on-line inspection of patient setup in radiation therapy using digital portal images.

A fast algorithm for local minimum and maximum filters on rectangular and octagonal kernels

A review of electronic portal imaging devices (EPIDs).

Automatic verification of radiation field shape using digital portal images.

Sampling methods for a matrix ionization chamber system.

Fast evaluation of patient set-up during radiotherapy by aligning features in portal and simulator images.

Radiation field edge detection in portal images.

Physical aspects of a liquid-filled ionization chamber with pulsed polarizing voltage.

First clinical experience with a newly developed electronic portal imaging device.

An inverse filter for digital restoration of portal images.

A matrix ionisation chamber imaging device for on-line patient setup verification during radiotherapy.

A liquid ionisation detector for digital radiography of therapeutic megavoltage photon beams.

Activities
Beyond Quantec
Marcel Van Herk (Chair)
24 Feb 2020 → 25 Feb 2020

AERO Academy Conference
Marcel Van Herk (Chair)
7 Feb 2020 → 8 Feb 2020

Data mining for adaptive radiotherapy
Marcel Van Herk (Invited speaker)
4D Treatment Workshop for Particle Therapy 2019
Marcel Van Herk (Chair)
23 Nov 2019

George Edelstyn Lecture
Marcel Van Herk (Speaker)
4 Oct 2019

Advanced Treatment Planning
Marcel Van Herk (Member of programme committee)
22 Sept 2019 → 26 Sept 2019

Radiotherapy / Modelling and theranostics
Marcel Van Herk (Speaker)
29 Aug 2019

The 4th Christie Advanced Radiotherapy Summer School
Marcel Van Herk (Chair)
3 Jul 2019

Highlight talk: Restoring a Data General Nova computer used in the first CT scanner
Marcel Van Herk (Speaker)
18 Jun 2019

Comparing two web platforms for uncertainty simulation of external beam radiotherapy
Marcel Van Herk (Speaker)
17 Jun 2019

Dose Calculation and Optimisation
Marcel Van Herk (Speaker)
13 Jun 2019

Tools & technologies for adaptive radiotherapy
Marcel Van Herk (Speaker)
12 Jun 2019

Debate: This house believes that margin reduction is the key to improved outcome. For the motion
Marcel Van Herk (Speaker)
28 Apr 2019

Cutting Edges and Challenges: Data Sharing: Needs, Opportunities and Issues.
Marcel Van Herk (Invited speaker)
27 Mar 2019

Predicting Tumour Control and Survival: Upcoming Results on Treatment Failure and Survival
Marcel Van Herk (Invited speaker)
26 Mar 2019

IGRT for CNS and Head and Neck
Marcel Van Herk (Speaker)
20 Feb 2019
Uncertainties in image registration and contour propagation
Marcel Van Herk (Speaker)
20 Feb 2019

Technology: Planar Imaging, MV and kV
Marcel Van Herk (Speaker)
18 Feb 2019

Learning from every SBRT patient treated
Marcel Van Herk (Invited speaker)
5 Oct 2018

Adaptive planning strategies - Robust & probabilistic planning - Rigid and non-rigid multimodality image registration
Marcel Van Herk (Invited speaker)
25 Sept 2018

Adaptive Radiotherapy
Marcel Van Herk (Invited speaker)
4 Jul 2018

Adaptive Radiotherapy: Adaptive RT Developments
Marcel Van Herk (Invited speaker)
Jul 2018

Radiation Oncology Physics and Systems: Learning from every patient treated
Marcel Van Herk (Keynote speaker)
Jun 2018

ESTRO 23, October 2004
Marcel Van Herk (Participant)
Oct 2004

Prizes
Breur Award
Van Herk, Marcel (Recipient), 2004

Impact Award
Van Herk, Marcel (Recipient), 19 Jun 2018

Netherlands Cancer Institute awards
Van Herk, Marcel (Recipient), 2015

Awards

Projects
15HLTO8 Consortium - EURAMET - EMPIR
Van Herk, M. & Kirkby, K.
1/06/16 → 31/05/19
Datasets

Considerable interobserver variation in delineation of pancreatic cancer on 3DCT and 4DCT: a multi-institutional study
Versteijne, E. (Contributor), Gurney-Champion, O. J. (Contributor), van der Horst, A. (Contributor), Lens, E. (Contributor), Kolff, M. W. (Contributor), Buijsen, J. (Contributor), Ebrahimi, G. (Contributor), Neelis, K. J. (Contributor), Rasch, C. R. N. (Contributor), Stoker, J. (Contributor), Van Herk, M. (Contributor), Bel, A. (Contributor) & van Tienhoven, G. (Contributor), figshare, 23 Mar 2017
DOI: 10.6084/m9.figshare.c.3725035.v1
https://figshare.com/collections/Considerable_interobserver_variation_in_delineation_of_pancreatic_cancer_on_3DCT_and_4DCT_a_multi-institutional_study/3725035/1

Prospective evaluation of relationships between radiotherapy dose to masticatory apparatus and trismus
DOI: 10.6084/m9.figshare.6116009