

dyspnea 1(1), 1(1) and 2(1), respectively ( $p=0.923$ ). During all sessions, SpO<sub>2</sub> did not change.

#### Conclusion

No difference in subjects' well-being was observed during BHPV sessions between the use of music or VR as distraction techniques. Given these results, the implementation of such distraction devices during BHPV may have only little interest and being time-consuming for the medical staff. However, it seems important to note that the level of stress experienced by healthy volunteers may not reflect the level of stress of patients treated for cancer. Therefore, further analyses should be performed on patient in order to counterweight our current results, given the financial cost their implementation may require.

#### PO-1834 Initial evaluation of a new immobilization system for lung SBRT

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#### Purpose or Objective

The treatments in which high doses are administered in a few sessions (SBRT and SRS) require great precision. The movement due to breathing causes an inconvenience when reproducing that required precision. Different techniques such as gating, tracking or dampening are often used to reduce the effect of respiratory movement. In our service we have chosen to use the latter for SBRT treatments. We have a system designed to reduce the movement of both the lesions and the adjacent organs in thoracic-abdominal regions. In this work we intend to evaluate the accuracy of our immobilization system in the initial positioning of the patient and during the treatment by the use of CBCT images before, during and after the treatment.

#### Material and Methods

From our database, a total of 40 sessions have been analyzed, corresponding to 12 patients treated with lung SBRT. In order to increase the precision and minimize movement, at the time of performing the simulation CT and in each treatment session, the eXacradle compressor (AnatGe) has been used. It consists of three differentiated modules: support, abdominal compression and diaphragmatic compression. It is compressed in a region close to the tumour in order to reduce respiratory movement as much as possible, trying the arc compressor not to interfere with the treatment fields. In each treatment session, the patient is compressed in the same way as in the CT simulation. A minimum of four CBCTs are performed: two before treatment, one intra-fraction and the last at the end of treatment. We compare the CBCTs with our simulation CT allowing displacements (made by our robotic table) at the most 3 mm for translation movements and 3 degrees for rotational movements.



#### Results

An average of the displacements required for the 40 treatment sessions has been made, for the four CBCTs performed. As shown in the table, the displacements required after the positioning CBCT are significantly greater than those of the rest of the CBCT.

	Translational movement (cm)			Rotational movement (°)		
	Vertical	Longitudinal	Lateral	Pitch	Roll	Rotation
Positioning CBCT	0.20 ± 0.30	0.37 ± 0.38	0.35 ± 0.32	0.57 ± 0.61	0.57 ± 0.78	0.45 ± 0.57
Starting CBCT	0.04 ± 0.03	0.07 ± 0.09	0.04 ± 0.04	0.12 ± 0.19	0.14 ± 0.23	0.04 ± 0.26
CBCT intra fraction	0.04 ± 0.03	0.06 ± 0.07	0.03 ± 0.04	0.09 ± 0.14	0.13 ± 0.15	0.16 ± 0.23
CBCT post fraction	0.04 ± 0.03	0.08 ± 0.07	0.05 ± 0.06	0.16 ± 0.26	0.11 ± 0.15	0.17 ± 0.28

#### Conclusion

Analyzing the results we consider that Exacradle (AnatGe) is an appropriate system for lung SBRT treatments. Given the proved reproducibility, after these first patients we decided to reduce the number of CBCT, first to two (the positioning CBCT and the intra-fraction CBCT), and recently only the positioning CBCT, which implies a significant reduction of the total treatment time per patient.

#### PO-1835 Interventions demonstrate potential to promote patient comfort during radiotherapy.

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#### Purpose or Objective

The aim of this review was to search existing literature to identify comfort interventions that can be used to assist an adult patient to undergo complex radiotherapy requiring positional stability of patients for periods  $\geq 10$  minutes. This could be stereotactic radiosurgery, stereotactic ablative body radiotherapy, or during real time adaptation of the radiotherapy plan. The objectives of this review were to: 1) identify comfort interventions that are used for clinical procedures that involve sustained inactivity similar to radiotherapy; 2) define characteristics of comfort interventions for future practice; and 3) determine the effectiveness of the identified comfort interventions.

#### Material and Methods

A systematic search was performed using a PICO criterion with five databases (AMED, CINAHL EMBASE, MEDLINE and PsycINFO). The searches were performed in August 2017 and updated in January 2019 to identify controlled trials that delivered comfort interventions to support patients undergoing clinical procedures. The Preferred Reporting Items for Systematic Reviews and meta-analyses statement and the Template for Intervention Description and Replication guide were used in this review. Following selection, Cochrane Risk of Bias (RoB) was used to evaluate paper quality. Intervention characteristics were examined, and outcome data evaluated for clinical significance based on the following criteria: effect size  $\geq 0.4$  and mean change  $\geq$  Minimal Important Difference for the measure. The protocol was prospectively published on the PROSPERO international register for systematic reviews (CRD42017059688).

#### Results

The literature search identified 5,269 titles. After screening of abstracts and full papers, 46 Randomised Controlled Trials met the inclusion criteria. Thirteen different interventions were reported ranging from

aromatherapy to virtual reality and were grouped into the following 5 categories: Audio-visual, Psychological, Physical, Education/information and Aromatherapy (Fig.1). Aromatherapy interventions were judged to be clinically significant in improving patient comfort based on anxiety outcome measures (effect size  $\geq 0.4$ , mean change  $>$  Minimal Important Difference (MID) and low risk of bias observed). Medium to large effect sizes were reported in many of the interventions which did not exceed the MID for the measure but were deemed worthy of further investigation.



### Conclusion

Aromatherapy interventions were clinically significant and should be considered during radiotherapy. Several interventions were identified that may improve comfort during radiotherapy assisting patients to sustain and endure the same position over time. This is crucial for the perpetual growth of complex radiotherapy necessitating a need for comfort to ensure stability for targeted treatment. Further investigation of these comfort interventions is warranted, including tailoring interventions to patient choice and determining if multiple interventions can be used concurrently to improve their effectiveness.

### PO-1836 Impact of bladder and rectum preparation on in vivo dosimetry for prostate cancer patients

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### Purpose or Objective

In all our treatment sites, a web-based system (PerFRACTION™) was fully implemented in February 2018 for machine-, and patient-specific pretreatment QA and in vivo dosimetry. In this study we wanted to capture and evaluate deviations encountered in routine treatment for prostate cancer. In particular, the effects of bladder and rectum preparation on in vivo dosimetry using

PerFRACTION™ were analyzed. All causes of deviations and the undertaken actions were investigated and categorized.

### Material and Methods

A prospective study was conducted with 2 groups of patients. The control group received information on bladder and rectum filling the conventional way at the intake consultation prior to simulation. The test group was monitored and followed by home nurses of the white-yellow cross. Patients were treated with 20, 25 or 35 fractions depending on their risk profile. All treatments were delivered on Varian TrueBeam and Clinac-iX systems using 6MV VMAT technique. EPIDs (aS1200 and aS1000 flat panel detectors) were used to acquire MV integrated exit dose images, on the first 3 days of treatment and weekly thereafter or more if there were failed fractions (FF). PerFRACTION™ 2D provided automatic detection of irregularities. Results were analyzed using a global gamma analysis with a threshold of 20%, a dose difference tolerance of 5%, a distance tolerance 5mm and a passing tolerance level of 95%.

### Results

The data of 452 prostate patients were extracted from the database: 29 of the test group and 423 of the control group. The amount of exit dose images taken in both groups were comparable: 3219 fractions in total, 226 in the test group (mean of 7.8 per patient in 1 treatment course,  $\sigma=5.1$ ) and 2993 in the control group (mean of 7.1,  $\sigma=4.5$ ). 14% of fractions in the control group and 20% in the test group failed due to various causes. Of these FF, 40% and 31% were related to variations in bladder and rectum filling for the test and control group respectively. Patients were divided into 3 groups, related to the number of FF due to variations in bladder and rectum filling: group A with at most 1 FF is considered well prepared. Group B with 2 to 4 FF is considered being medium prepared and performed better after receiving extra information. Group C with more than 4 FF is considered having issues with preparation. Results are shown in Table 1 and Fig 1. Differences between groups were not statistically significant due to the small number of patients in the test group. Corrective actions related to the deviations of bladder and rectum filling for the test and control groups were also performed and represented 11% and 8% of the FF respectively.

### Conclusion

We hypothesized that better monitoring would improve patients' preparation and therefore quality of treatment. However, this was not confirmed by dosimetric analysis. The authors acknowledge possible bias due to the large difference in the number of patients in both arms of the trial.

### PO-1837 Reproducibility of the bite block during radiotherapy of head-and-neck cancer patients

Abstract withdrawn

### PO-1838 Multiple Brain Mets: impact of patient positioning errors on optimal PTV margin strategy

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### Purpose or Objective

To assess the impact of set-up residual errors on target positioning accuracy and intrafraction motion of frameless linear accelerator (LINAC) dynamic conformal arc (DCA) single-isocenter stereotactic radiosurgery (SRS) for multiple brain metastases.

### Material and Methods

Between September 2016 and February 2018, twenty six consecutive patients  $\geq 18$  years old with 181 metastases <