(MakerGear, M2). The infill settings were chosen so that the resulting models would be very rigid and durable. Using a hammer, a 3 mm thick, layer of lead was bent to fit the contours of the model. A hole was then cut out to define the field, and the lead was clear coated.
Results: The lead shields created were remarkably accurate and fit the contours of the patients. The hole cut to define the field exposed only a minimally sized site to be irradiated. The rest of the face, including vulnerable OAR, were protected. The length of time during which the patient's presence was required was minimal, as was the time spent by staff to create the mask.
Conclusions: Using this technology to create lead shielding for radiotherapy of skin cancer of the face is an innovative and exciting approach. This could save valuable clinic time and add patient convenience. Some traditional methods require an extra appointment to create a facial mould. The optical scan can be obtained on the day of the clinical visit with no subsequent visit required until first treatment. If there are issues generating the lead shield the patient doesn't need to come in for another visit; the saved 3D optical image can be used to generate another lead shield. The cost of manufacture is also low; centres, such as those in the developing world that may not have the infrastructure to treat skin cancer with electrons could use this method to safely deliver ortho-voltage treatments. A significant number of patients suffer from claustrophobia, and this could be addressed by using this technology.

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CAN WE REDUCE NORMAL TISSUE RADIATION EXPOSURE? – A CRANIOSPINAL IRRADIATION TECHNIQUE WITHOUT JUNCTION MATCHING USING VARIAN ECLIPSE PLATFORM
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Purpose: Medulloblastoma most frequently occurs in the pediatric age group and craniospinal irradiation (CSI) is a standard component of management. CSI is technically challenging due to the possibility of multiple junctions, each with shifts, required to treat the craniospinal axis; more so if the patient requires anesthesia. Several techniques are described in the literature addressing how to avoid junctions however the use of those techniques for all comers is an issue. The aim of this work is to develop a simple image guided IMRT technique for CSI on the Varian Eclipse platform, deliverable on Varian linacs, with intrafraction modulated junctions while reducing dose to normal structures.
Methods and Materials: Using Varian treatment planning software and linacs the proposed technique sets one table height and one lateral position for all plans as well as allows for imaging of each of the two or three isocentres to verify patient set up. Further, the spinal axis is treated using three IMRT fields which allows for increased dose homogeneity while limiting the amount of patient volume being treated to a low dose, while the brain is treated using IMRT with a POP arrangement.
Results: Using the proposed technique we re-planned patients previously treated prone with extended source to skin distance (SSD), with field matching on skin. All planning parameters were compared. The proposed technique reduced plan maximum dose on the order of 10% while also reducing the mean dose to the optic structures and heart. The mean dose to the kidneys was comparable between techniques while the mean dose to the lung was slightly higher with the new technique while the maximum dose to the lungs was lower with the new technique. Using the new technique, two further patients were scanned and planned in supine position. The total PTV length for these patients was 74 and 56 cm respectively. Delivery of general anesthesia and monitoring was easy.
Conclusions: The proposed technique is a simple to deliver, image guided IMRT technique using Varian equipment with intrafraction modulated junctions. This technique allows for easy set up verification and less dose to normal structures.

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THE USE OF RESPIRATORY GATING FOR DELIVERY OF STEREOTACTIC ABLATIVE RADIOTHERAPY (SABR): IS THERE AN IMPACT ON ONCOLOGIC OUTCOMES?
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Purpose: Respiratory gating (RG) has been postulated as a method of reducing the irradiation of normal lung during SABR. RG refers to tumour treatment only during a specific phase or amplitude of the breathing cycle, in distinction to non-gated (NG) free-breathing delivery. The inability to visualize the tumour during RG with most systems has led to the hypothesis that geometric misses could occur, leading to a lower rate of local control (LC). The goal of this study was to assess oncological outcomes in patients receiving RG versus NG treatments.
Methods and Materials: Outcomes for patients treated with SABR in 2010-15 for either primary non-small cell lung cancer (NSCLC) or metastatic disease were reviewed. Patients received a risk-adapted approach, using 3, 5, or 8 fractions (all with BED > 100 Gy10) depending on tumour size and location. Tumour motion was assessed using 4D-CT. RG was generally used when tumour motion was > 7 mm, with RG treatment delivered during end-expiration. Outcomes for RG and NG groups were estimated using Kaplan-Meier analyses, with propensity matching (in a 1:1 ratio with a caliper width of 0.20) to control for baseline differences.
Results: One hundred and nine patients were treated for primary NSCLC and 39 for oligometastatic cancers. Median follow up was 17 months. Median age was 75 (range 42-94), most were male (56%), median FEV1 was 71% predicted (range 23-127% predicted), and median age-adjusted Charlson score was 7 (range 3-13). Most patients (85%) had one lesion treated. In the whole cohort, there were eight local failures (three-year local control rate 88%), and nine regional failures (three-year regional failure rate 85%). Tumour location was the strongest predictor of use of RG (59% for lower lobe tumours versus 15% for others). Patients who received RG were also more likely to be older, with more target lesions, a higher Charlson score, and larger targets (all $p < 0.05$); these differences were no longer significant after matching. Comparing RG versus NG outcomes in matched patients ($n = 52$ in each group), there were no differences in LC ($p = 0.23$) associated with delivery technique.
Conclusions: The use of RG does not appear to adversely affect local control rates. Further research is needed to determine if dosimetric benefits of RG lead to clinically improved outcomes.

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TOTAL BODY IRRADIATION WITH VMAT - A FOCUS ON SCROTAL SHIELDING
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Purpose: Total body irradiation (TBI) is given as part of a conditioning regime for stem cell transplant. Methods of delivery are often labour intensive, not comfortable for the patient, and provide limited capabilities for shielding critical structures without compromising treatment goals of irradiating the whole body, including skin, to a uniform ± 10% of the prescription dose. For example, our previous technique involved full patient bolus packing at extended SSD using lateral treatment fields. The patient's arms were used to provide attenuation for lungs, and there was no ability to shield the gonads without compromising the dose to the pelvic bones.
Methods and Materials: At the Tom Baker Cancer Centre (TBCC), we have implemented a new total body irradiation method that delivers a uniform dose using volumetric modulated arc therapy (VMAT) through gantry speed and MLC motion optimization. The MLC motion is limited to shielding for the lungs and reducing hot spots, and consequently, plans are not highly modulated. This allows us to streamline the treatment planning and quality