Results:
Monte Carlo calculation showed that out-of-field dose was dominated by scattered radiation caused by the linac head, and the internal body scattering was not significant. This tendency was confirmed for not only very far but also much nearer contralateral breast. Using RAND phantom, measured dose using the glass rod dosimeter agreed with Monte Carlo calculation within an estimated calculation precision.

Conclusions: We have shown that out-of-field dose can be evaluated by Monte Carlo codes, and the dose contributions from internal body scattering and linac head scattering can be separately calculated. Our findings were that the out-of-field doses were mainly from linac head scattering, suggesting that a combination of a delivery with lower monitor units and reduced collimator transmission leads to minimum out-of-field dose. In view of this, the authors believe that VMAT delivery with a multileaf collimator having minimum leaf transmission would minimize out-of-field dose and thus secondary cancer risk.

PO-0799
Comprehensive set of S values for internal dosimetry of I-131 using the ICRP adult voxel phantoms
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Purpose/Objective: To improve the estimates of organ doses from nuclear medicine procedures using iodine 131 (I-131). To this end, we calculated a comprehensive set of S values, defined as organ absorbed doses per unit of nuclear transition in source regions (mGy/(Bq.s)), for I-131 using the latest reference models of the human body, which have been developed by the International Commission on Radiological Protection (ICRP). We compared our results with the S values from the Oak Ridge National Laboratory (ORNL) stylized phantoms, which are currently used in clinical dosimetry.

Materials and Methods: We calculated the I-131 S values for the ICRP reference male and female voxel phantoms (ICRP Publication 110), using the I-131 photon and electron spectra from ICRP Publication 107 and a Monte Carlo radiation transport code, MCNPX2.6. For each phantom, we automatically defined a uniform distribution of I-131 in and a Monte Carlo radiation transport code, MCNPX2.6. For each of the 53 source regions. We directly computed the S values for phantom, we automatically defined a uniform distribution of I-131 in each of the 53 source regions. We directly computed the S values for 42 target organs without the calculation of Specific Absorbed Fraction (SAF). We obtained the S values from the ORNL stylized phantoms from earlier publications for comparison.

PO-0800
Dosimetric comparison of Acuros XB and AAA with Compass-CCC calculations for volumetric modulated arc therapy
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Purpose/Objective: To compare Acuros XB and Anisotropic Analytic Algorithm (AAA) dose calculation algorithms with the Collapsed Cone Convolution (CCC) calculations derived from fluence measurements as available in COMPASS (IBA Dosimetry) for volumetric modulated arc therapy (VMAT).

Materials and Methods: Five clinical cases were planned with VMAT for each of the followings: Brain, Head and Neck, Thorax, Pelvis and stereotactical body treatment, SBRT. All fluences acquired with the iMatrixx-2D detector on a Clinac-iX (Varian, Palo Alto, USA), 6MV, were the input for COMPASS system to calculate the dose distribution with CCC inside the patient. Such dose distributions were then compared with Acuros XB and AAA calculation from Eclipse treatment planning system. Comparison evaluation was based on 3D gamma index with distance-to-agreement and dose difference criteria set to: 3mm/3% and 2mm/2% for targets, organs at risks (OAR), 50 and 10% isodoses volumes. DVH of OAR and PTV from plan differences were also computed and analysed.

Results: Study presented good agreement between Acuros XB or AAA and CCC.

From the 3-D gamma analysis, the percentage of points passing the gamma criteria of 3mm/3% for target are shown in the table:

<table>
<thead>
<tr>
<th>Region</th>
<th>Acuros XB</th>
<th>Acuros AAA</th>
<th>AAA vs Acuros</th>
<th>CCC vs Acuros</th>
<th>CCC vs AAA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brain</td>
<td>99.4±0.5</td>
<td>99.4±0.9</td>
<td>97.6±3.2</td>
<td>99.4±0.5</td>
<td>99.4±0.9</td>
</tr>
<tr>
<td>H&amp;N</td>
<td>99.5±0.6</td>
<td>99.3±1.1</td>
<td>98.1±2.1</td>
<td>99.5±0.6</td>
<td>99.5±0.6</td>
</tr>
<tr>
<td>Thorax</td>
<td>99.9±0.1</td>
<td>99.3±0.5</td>
<td>97.9±1.1</td>
<td>99.9±0.1</td>
<td>99.9±0.1</td>
</tr>
<tr>
<td>Pelvis</td>
<td>99.6±0.4</td>
<td>97.5±4.6</td>
<td>97.9±2.4</td>
<td>99.6±0.4</td>
<td>99.6±0.4</td>
</tr>
<tr>
<td>SBRT</td>
<td>100.0±0.0</td>
<td>97.7±5.0</td>
<td>98.2±3.6</td>
<td>100.0±0.0</td>
<td>100.0±0.0</td>
</tr>
</tbody>
</table>