State Of The Art "Ghost Dose" CT KUB with Deep Learning Reconstruction Heralds the Extinction of Plain Film

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Aim

- To demonstrate CT KUB can be performed at a lower “ghost dose” than national recommendation and X-Ray KUB.
Methods

All CT KUBs from September 2019 → Recorded Dose Length Product (DLP) → Compared this to the national recommendation (CT KUB & XR KUB)
# Comparison of Imaging Modalities with National Recommendations

<table>
<thead>
<tr>
<th>Imaging Modality</th>
<th>Mean DLP (mGy cm)</th>
<th>Mean effective Dose (mSv)</th>
</tr>
</thead>
<tbody>
<tr>
<td>National Recommendation</td>
<td>460</td>
<td>6.6</td>
</tr>
<tr>
<td>Standard CT Scanner-GE Optima 660 (n=40)</td>
<td>321.68</td>
<td>4.8</td>
</tr>
<tr>
<td>X-Ray KUB (n= National Avg)</td>
<td>94</td>
<td>1.4</td>
</tr>
<tr>
<td>Cannon Aquilion One Genesis with AiCE (n = 81)</td>
<td>78.55</td>
<td>1.2</td>
</tr>
</tbody>
</table>
AiCE – How it Works

- Deep Learning Algorithm

- Trained with super low dose input images and high quality output images

- Low dose source image acquired

- Analysed at pixel level to recognise noise

- High quality low dose image produced
Examples

Filtered Back Projection

Reconstructed image using AiCE
Examples
Examples
Conclusion

- Cannon AiCE deep learning reconstruction technology reduces noise.

- ‘Ghost Dose’ has a lower radiation dose than;
  - National recommendation for CT KUBs
  - X-Ray KUBs.

- Images are of diagnostic quality.

- Improving patient safety by reducing radiation exposure.