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This is an overview of your abstract number E35-2112:

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| Session title |  |
| Track | **Abstract submission: RTT** |
| Topic | **RTT track: Position verification** |
| Presentation preference | **Poster presentation** |
| Abstract title | **A clinical investigation of optimal CBCT image matching for non-SABR radical lung cancer patients** |
|  | **L. Malaspina1, A. Baker1, C. Baker2, A. Pope1, M. Warren3.1Clatterbridge Cancer Centre, Radiotherapy, Bebington, United Kingdom.2Clatterbridge Cancer Centre, Physics Department, Bebington, United Kingdom.3The University of Liverpool, School of Health Sciences, Liverpool, United Kingdom.** |
|  | **Purpose or Objective** **Spine-based image registration has traditionally been used for patient setup for non-SABR radical lung cancer radiotherapy. Enhanced visualisation of soft tissue structures through volumetric imaging has led to research of various landmarks that may offer target localisation of increased accuracy compared to spine-based registration. The objectives of this project were to answer the following: Can using carina or tumour as registration landmarks for IGRT offer superior target coverage compared to spine registration? Does the position of tumour affect which registration landmark offers superior target coverage? What are the implications of carina or tumour registration on spinal cord safety?****Material and Methods** **Ten patients with central tumours and ten patients with peripheral tumours were selected. A clinical expert assessed a sample of CBCTs from each patient and selected which thoracic landmark (spine, carina, or tumour) produced the the optimal match. CBCTs from each patient (238 CBCTs in total) were matched using the spine and the optimal match and translational displacements were recorded. The difference between the spine-match displacements and optimal-match displacements were calculated. The shortest distance between the spinal cord and tolerance isodose was measured for each patient.****Results** **Carina- and tumour-matching produced target localisation of increased accuracy compared to spine-matching. The average bone-to-optimal 3D vector displacement was 0.4 cm. The 2D vector (vertical and lateral) displacements were more relevant for spinal cord safety because longitudinal displacements did not affect the spinal cord-to-tolerance isodose distance in this sample. The 90th percentile of the 2D vector bone-to-optimal displacements were 0.6 cm and 0.5cm for the central and peripheral groups, respectively.****Conclusion** **For central and peripheral tumours, carina- and tumour-matching produced the most optimal target coverage, respectively. The spinal cord-to-tolerance isodose distance is important, as any deviation from spine-matching could result in spinal cord tolerance being exceeded. Using a threshold spinal cord-to-tolerance isodose distance, based on the 90th percentile 2D vector bone-to-optimal displacement, is a measurable method of indicating if carina or tumour match introduces a risk of exceeding spinal cord tolerance dose.** |
|  | **I have no potential conflict of interest to disclose** |
| Keyword | **IGRT** |

Kind regards,
ESTRO Office

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