

### 3-D RADIOTHERAPY TREATMENT PLANNING SYSTEM ACCEPTANCE TEST

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**Purpose:** The important subject of 3-D radiotherapy treatment planning system ( 3-D RTP) acceptance test procedure (ATP) is to get the reasonable agreement between the calculated isodose distribution of 3-D RTP and the measured results of water phantom, before the clinical use of 3-D RTP system.

**Materials & Methods:** This report is a acceptance test results of Computerized Medical System - Focus 1.4.0 and Helax - TMS 4.0. Acceptance test procedure includes hardware and software. Hardware includes the function of the link of Network system, the function of the image transfer system, the accuracy of the digitizer, the magnification and accuracy of the plotter, the function of the printer and the patient data backup facility. Software includes the comparison of percentage depth dose for photon beam and for electron beam, isodose distribution check and beam profile check. The comparisons of photon beam include open-field, wedge-field, half-beam, asymmetric jaws, irregular-field, bolus, inhomogeneities, block-field and Multi-Leaf Collimator MLC). The electron oblique incidence is also one of the test items.

**Results:** For Helax-TMS, if the field size is more than  $20 \times 20$ , the open-field horn effect will be increased, the maximum dose deviation about 2%. It's about 3% dose deviation of  $45^\circ$  and  $60^\circ$  wedge filter of the field size more than  $10 \times 10$ . The penumbra error of block and MLC is 2-3 mm compared with water phantom data. For CMS-Focus, the horn effect is independent of field size and the dose deviation about 2%. The field size of wedge filter can open to a maximum of 20 cm and the dose deviation is 2%. The penumbra error of block and MLC, compared to water phantom, about 1-2 mm.

**Conclusion:** In conclusion, the functions of network and include image-transfer are acceptable and the isodose distribution discrepancies are also acceptable for the clinical radiotherapy treatment application.

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Key words: 3-D RTP, ATP, Beam data, Clinical application