Purpose:
To measure skin dose of whole brain irradiation of a humanoid unsliced phantom treated by standard lateral fields with GAFCHROMIC EBT2 films.

Methods:

The head and neck of the whole body phantom was scanned at the slice thickness of 2mm. A whole brain plan using 6MV beam was created with standard parallel opposed lateral fields. The isocenter was placed at the outer canthus to avoid divergence to orbital structures. The plan was normalized to the calculation point and with ≥ 95% of brain volume covered by ≥ 95% of prescription dose. The EBT2 films were carefully cut and labeled with same orientation in the film calibration and skin dose measurement. EBT2 film was calibrated in the reference condition with various dose (0-10Gy). After the phantom was positioned for treatment and correct setup was verified by kV-kV imaging and CBCT, the films were placed at various sites and irradiated. An Epson flatbed color scanner was utilized and the scanner response from the red channel of the RGB image was used as the density value for the estimation of dose. The comparison was made between the measured dose and the planned dose for different head locations.

Results:
Our preliminary results indicated that the measured skin dose agrees with the planned dose within 10% for the sites centered in the treatment fields such as mid right/left sphenoid bones. For the sites outside or near the edge of the treatment fields, such as the right/left orbits and low chin, the measured dose is significantly different from the planned dose (>15%).

Conclusions:
Skin dose of whole brain irradiation could be measured by GAFCHROMIC EBT2 films. The difference between the measured dose and the planned dose varies significantly depending on the location of interest relative to the treatment field. Further investigation is needed.