

**Purpose:** To evaluate the neutron and photon dose equivalent ( $H_n, D$  and  $H_G$ ) at the outer maze entrance with a grid block on a Varian Clinac 23EX accelerator; and to evaluate the neutron activation on the surface of the grid.

**Method and Materials:** A Varian Clinac 23EX accelerator was used to produce 18 MV photons with a 7.62 cm brass grid. The neutron dose equivalent  $H_n, D$  was measured using an Andersson-Braun neutron Rem meter, and the photon dose equivalent  $H_G$  was measured using a Geiger Müller gamma-ray survey meter at the outer maze entrance. The neutron activation dose on the surface of the grid was measured by the Geiger Müller survey meter after the irradiation.

**Results:** With the gantry head tilted close to the inner maze entrance and with the jaws closed, the neutron dose equivalent reached its maximum, which is the same as the non-grid beam. The difference between the grid and non-grid measurement results was within the measurement uncertainty for different gantry angles. The measurement taken at 5 min after the irradiation shows the exposure rate at the surface of the grid can reach up to 360 mR/hr. The neutron activation activities have an average half life about 10 min.

**Conclusions:** This work indicates that the neutron production in GRID therapy does not change from a conventional external beam therapy. However, the users of a grid should be aware of the possible high dose to the radiation worker from the neutron activation on the surface of the grid.