The efficacy of photon grid therapy was demonstrated in the 1950's during the orthovoltage era. Although the spatial fractionation provided by grid therapy decreased skin dose, high doses to bony structures surrounding tumors rendered orthovoltage radiotherapy obsolete. Recently, promising clinical results have been shown in the delivery of palliative treatments using megavoltage photon grid radiation therapy[1]. However, the use of megavoltage photon grid therapy is limited in the treatment of superficial lesions where critical radiosensitive structures are present beneath tumor volumes. As a result, electron grid therapy is under investigation at the University of Kentucky. The goal of the investigation is to experimentally determine the dose distributions of grided electron beams with energies of 6 to 20 MeV. Optimal grid hole diameters and spacing will be determined for each electron energy. Percent depth dose curves and beam profiles from cerrobend electron grids will be measured using film and LiF TLD's in Solid Water phantom material. Our preliminary results, measured using a cerrobend electron grid with 0.9 cm diameter holes spaced every 1.5 cm, indicate that the peak-to-valley dose ratios vary with depth with the maximum ratio at d_{max}. Large energy degradations also have been observed. The relationship between absorbed dose and grid size, beam energy, radiation field size and depth of treatment will be presented.

1. Mohiuddin, M., Curtis, D.L., Grizos, W.T., and Komarnicky, L., Palliative Treatment of Advanced Cancer Using Multiple Nonconfluent Pencil Beam Radiation: A pilot Study, Cancer 66:114-118 (1990).