The use of physical wedges to shape isodose curves are common place in the radiation therapy. Recently linear accelerator manufacturers have also begun providing dynamic wedges. The hardening effect found in physical wedges, especially in relation to depth dose data at central axis has long been noted. This effect seems to be less for dynamic wedges. Still very little attention has been given to the change in beam profiles along the nonwedged (or converse) axis of the wedged beam. An investigation was made to compare the beam hardening effect in the converse profiles of physical and dynamic wedged beams at various planes of the field for 6 & 18 MV photon energies.

Profiles were measured along the converse axis for the physical wedge, the dynamic wedge, and for an open field. These measurements were made at the wedge defining depth (10 cm) for various wedges. Half-value layer (HVL) measurements were made in air, using narrow beam geometry. Hardening of the beam for physical wedges, as compared to the open field, could be seen as a 2% decrease along the beam profiles and a 7-14% increase in the HVL's along the converse axis. This difference was much smaller for dynamic wedges (<1% difference in HVL's).

This difference in the effective energies, resulting in beam hardening, between the two types of wedges may be an important consideration for modern 3-dimensional treatment planning systems.