Application of thermoplastice material for field shaping in orthovoltage photon beam

The feasibility of use of thermoplastice material for field shaping in orthovoltage therapy was investigated. Conventionally, lead has been used for field shaping in orthovoltage radiation therapy. Recently, a compensator material, named Thermo-Shield, was presented for field shaping in electron beams. Thermo-Shield is composed of non-toxic, high atomic weight metal particles that are dispersed in a thermoplastic matrix. It is manually-moldable and conforms to human anatomy or any shape at temperature of 108-132^{o}F. It is re-usable and can be continuously reshaped for a better fit to treatment field. Dosimetric characteristics of both thermoplastice material and lead were studied and compared for Philips RT250 orthovoltage photon beams ranging from 75 to 250 kVp for both 5x5 and 10x10 cm^2 field sizes. It is found that Thermo-shield should be 4 to 5 times thicker than lead to achieve the same transmission (less than 5%). However, it did not cause significant degradation in penumbra. Clinical procedure for the use are discussed.