Although some earlier references can be found, Total Body Irradiation (TBI) in its current form was introduced 20 years ago. As this Radiation Oncology procedure has become a routine capability for many institutions, it seems timely to review the details of commissioning and maintaining a TBI program and to discuss how this procedure has evolved since the early 1980s. It can be argued that TBI is a relatively simple treatment modality except in those cases where physical factors such as photon energy or geometric considerations such as treatment room geometry are compromised. Unfortunately, many institutions are forced to deal with less than ideal conditions when they attempt to establish a TBI program. This report is aimed at describing the level of dose homogeneity that is achievable when the entire body is irradiated, and discussing the tradeoffs that one should expect when deviating from preferred irradiation conditions. It is anticipated that the information given here will prove helpful for physicists trying to evaluate an existing program, as well as physicists attempting to establish a new TBI program.

Major critical normal structures for TBI are the lungs and kidneys. For some TBI protocols, the dose limits for these organ systems are less than the prescribed dose for the target (bone marrow). This presentation will discuss methods for protecting critical structures during TBI.