

The clinical implementation in daily practice of a package consisting of four newly designed types of diodes, covering all needs in a radiation therapy department is presented. Each diode is specifically designed for one of the following tasks: external photon beam therapy (buildup material depending on the energy range for which the detector was intended), electron beam (single type of diode for all energies), intracavitary (for both tele- and brachytherapy) and skin dose in-vivo measurements. These diodes are connected to a dedicated multichannel electrometer allowing for simultaneous measurement of doses in several points, e.g. an entrance and exit photon dose, the skin dose along a matching line for adjacent ports, the dose outside the treatment field at the location of a pacemaker, etc. We installed the windows software of this PC-based diode system on the MLC workstation computer at the linac console. The calibration techniques for each type of diode and clinical situation will be presented along with our in-vivo measurement procedures and results for over 60 patients. The measured diode sensitivity correction factors required for non-reference clinical setups will be discussed and compared with the response of other types of diodes commercially available. It was found that the maximum discrepancy between the measured and expected doses was 2% and 10% for the new and older photon diode types, respectively. Diode induced patient dose perturbations and possible solutions are analyzed. The importance of using the appropriate diode for each task and energy range will be demonstrated.