

Radiochromic film (RCF) has been demonstrated to be a precise and accurate dosimeter for the acute delivery of larger doses on the order of several Gy or higher. Unfortunately, in applications requiring low doses, such as the measurement of a single fraction of intensity modulated radiation therapy (IMRT) its usefulness is severely limited. Particularly for IMRT quality assurance measurements, the importance of recording of the doses under clinical conditions is known to depend on the total dose delivered. This is due to the fact that multileaf collimator systems behave more accurately when delivering IMRT segments with increasing monitor units. Thus, scaling up the monitor units of a delivery to better match the sensitivity of a dosimeter prevents accurate quality assurance. We present a study of IMRT beam characterization and patient specific quality assurance measurements using a new formulation of radiochromic film with greatly increased absorbed dose sensitivity. The sensitive range of the film has been reduced to range between 0 and 400 cGy, allowing precise and accurate single fraction quality assurance measurements for IMRT and other forms of conformal therapy. This new dose range is comparable to those obtainable with radiographic films without the inherent beam quality limitations caused by the use of silver halides.