IMRT provides the ability to shape dose distributions so tumorcidal doses can be delivered to the target volume while sparing nearby normal tissues. However, the dynamic nature of the treatment, coupled with the complexities of the treatment planning algorithms, result in a large uncertainty as to the actual dose distributions delivered. Using a unique resource, we outline a means for obtaining accurate dose distribution measurements in vivo. Using the combined resources of the University of Washington and the Veterinary School of Washington State University, dogs that present with naturally-occuring tumors in the head/neck and in the mediastinum are treated using IMRT. Both institutions have similar linacs equipped with identical MLC's (Elekta Oncology Systems). The dogs undergo a treatment planning CT at WSU, which is then transferred to UW for the production of an intensity modulated plan using inverse planning techniques. The MLC prescription files are transferred to WSU. Catheters loaded with TLD's (1x2 mm) are placed in the radiation field via airways. A CT performed at treatment provides accurate anatomical registration of the TLD's. After treatment, the TLD's are read out and correlated with the treatment planning CT. A large number of dogs present with tumors at these sites, and they represent two extreme cases of IMRT. Head and neck tumors provide the best opportunity for accurate dose delivery; treatment of mediastinal tumors requires means for addressing intra-fraction organ motion as well as severe tissue inhomogeneities. Results of benchmarks of this in vivo model and preliminary measurements will be presented.