

AbstractID: 8346 Title: A Dedicated Image Pumping Utility for BrainLAB ExacTrac IGRT System

Purpose: To present a system that automatically pumps localization images from BrainLAB ExacTrac IGRT system to R&V system via DICOM connection to make remote image reviewing feasible. **Method and Materials:** A software system, iPump, was developed exclusively for ExacTrac that is currently unable to communicate with any R&V system. iPump is actually a daemon program that checks IGRT system periodically for new localization images, fuses registered DRR and x-ray images, encodes them in DICOM RT format with numerical overlay of shift values and sends them to the remote R&V system. The built-in instant messaging mechanism automatically notifies, through pager and/or computer messenger, attending radiation oncologists immediately after images were sent so as to allow on-line remote image reviewing with approval records. It can run on any computer with Microsoft Windows NT/2000/XP platform that has read access to patient data directory on ExacTrac computer. **Results:** iPump has been extensively tested and evaluated for about 9 months in our clinic. So far 3,930 fused images have been successfully sent to IMPAC without any human intervention. The notification message can be sent instantly through Windows Messenger or through pager in merely 5 seconds. **Conclusion:** The technical limitation of BrainLAB ExacTrac system on the aspect DICOM RT implementation can be remedied by dedicated image pumping system without extra hardware capital investment. Our clinical experience with iPump indicates that it significantly improves the safety and efficiency of the radiation management processes as well as consolidation of the entire patient's medical record within the same location in the R&V systems. Any further data mining and analyses for research purposes are also streamlined with such data consolidation making this software utility valuable both in clinics and research settings.