AbstractID: 9586 Title: Software Architecture for Real Time Radionuclide Dosimetry

There is a direct need for software architecture that models the processes necessary to conduct clinical trials employing real-time radionuclide dosimetry. Trials involve multiple tasks such as determining eligibility requirements, scheduling patient appointments, timing of blood and urine collections, obtaining and recording predefined patient data, and notifying relevant staff of pending activities. Multiple data types include well counter results and images from nuclear, MRI and CT devices. All information must be carefully combined before patient-specific dosimetry can be carried out. While we have automated the numerical computations for internal emitter dose estimation with our Radionuclide Therapy Treatment Planning System (RTDS), the logistics of obtaining and distributing the prerequisite information continues to be costly and inefficient. This is particularly true for institutions conducting multiple trials simultaneously. We addressed this challenge by identifying and formalizing the semantic organization of the various work steps. The process is conceptualized by determining the discrete data entities underlying the clinical trial structure and the rules that govern correct execution. Our purpose is to develop a specification language based on the open XML standard. In this way, we provide a method to graphically represent work tasks and associated data to users of the proposed software system. Our goal is to map this model to an automated software system for the real-time management of operational tasks in a Radioimmunotherapy (RIT) or other internal emitter therapy environment. We have developed software from our ongoing work that is able to implement some of these actions.