

AbstractID: 11912 Title: Improving the Radiation Therapy Process Using Industrial Process Development Techniques

One of the emerging research and practical clinical topics is involvement of established modern industrial systems engineering methods to improve quality and safety of radiation oncology facilities. In systems engineering, mathematical modeling techniques are used to analyze the coordination, synchronization, and the integration of complex systems of personnel, information, materials, and resources. Since the 1940s, major industries have been developing processes to improve quality and safety of their operations and products. These efforts have matured over the years and through use of industrial and systems engineering methods many industries have significantly better safety and performance records than today's healthcare institutions, including radiation oncology. The opportunity to employ systems engineering principles to develop radiation oncology facilities into highly reliable organizations has been recently recognized in several high profile publications. This opportunity includes all areas of radiation therapy from patient interactions, through imaging, planning and delivery process, to standardization and benchmarking of our practices. The AAPM has also recognized that there is a need to develop quality assurance programs based on systems engineering principles and has established a TG100 which is developing recommendations for establishment of individual radiation oncology QA programs using industrial process development tools.

This session consists of four presentations which discuss the history of research on quality that led to the development of organization-wide quality programs such as Six Sigma, including discussion of the current approach to quality in radiation oncology as well as where quality should be in the future. An analysis of opportunities for implementation of industrial engineering tools in radiation oncology for improvement of quality, safety, and efficiency is further provided. Two presentations discuss actual clinical processes which were developed using industrial engineering methods and their effects on the respective radiation oncology practices.

Educational Objectives:

- 1) To describe history and development of industrial quality measures
- 2) To describe opportunities for employment of industrial engineering methods for improvement of radiation oncology practices
- 3) To describe development of actual clinical process based on industrial engineering principles and their effects on clinical operations