AbstractID: 9856 Title: From licensing to QA, how to implement HDR brachytherapy into your clinic

Brachytherapy has been utilized as a modality for treating cancer since shortly after the discovery of radium by Madame Curie in the early 1900's. Although radium was the workhorse for brachytherapy treatments in the first half of the 21st century, alternative sources began to emerge in the 1950's as mechanisms to produce radioactive isotopes were discovered. Cesium-137, and a number of other low dose rate (LDR) sources were soon utilized clinically. However, it was not until the 1980's that high dose rate (HDR) brachytherapy emerged as a possible alterative to LDR treatments. Although HDR had the advantage of delivering dose in a shorter time frame, there were several concerns regarding this transition, such as the radiological response of HDR versus LDR treatments, and staff safety. Prior to the era of HDR units, most sources were loaded manually resulting in occupational dose to staff participating in LDR procedures. However, before HDR programs could be utilized clinically, alternatives for manual loading were necessary as the resulting exposure to staff would be prohibitively high. In response, remote afterloading HDR units emerged, allowing sources to be delivered to patients remotely. However, along with this advancement in technology came increasing regulatory and quality assurance requirements.

Although there are a number of similarities between LDR and HDR treatments, there are substantial differences in the clinical implementations of these treatment programs. During this presentation, we will discuss relevant federal regulatory requirements, NRC licensing, AAPM recommendations and task group reports, available HDR equipment, and logistical planning in order to develop a successful HDR program.

Educational Objectives:

1. Discuss the necessary steps to prepare for the clinical implementation of a HDR brachytherapy program.
    a. NRC licensing
    b. Equipment purchase
    c. Room design and shielding
    d. Acceptance testing and commissioning
    e. Quality assurance
2. Discuss logistics for HDR workflow.