AbstractID: 7259 Title: Intravascular Brachytherapy

Intravascular brachytherapy has moved from clinical trials to the routine use at many hospitals in the U.S. The use of beta emitters (Sr-90, Y-90, P-32, W-188, and Re-188) has been used in catheter-based systems as well as liquid-filled balloons. Beta emitters have an advantage of simplifying radiation safety but have been questioned in providing adequate dose penetration. It is assumed that gamma sources deliver a more uniform dose than beta sources to the coronary vessel wall. Research from the authors' group will be presented on the dose uniformity to the coronary vessel wall and dose delivered to normal tissue for both gamma and beta catheter-based delivery systems. A three-dimensional (3-D) intravascular ultrasound (IVUS) dose-volume study of patients from a completed clinical trial will be used in this analysis. This dosimetry analysis on beta versus gamma provides a new perspective on the classic "gamma vs. beta" debate for intracoronary radiation therapy. Also, the effects of stent attenuation and source curvature are also presented. With only a few lengths of beta-emitters approved by the FDA for clinical use, there is much speculation on how to treat longer lesions with one source length. Using a 3-D IVUS-based planning system, data will be presented on the treatment of longer lesions for catheter-based systems utilizing dose volume histograms of clinical anatomy. The decision points on picking a radiation system for clinical use such as efficacy, cost, safety, and convenience will be addressed

Educational Objectives include:

1. Discuss the clinical physics and radiation safety associated with beta emitters.
2. Discuss and compare the different radiation delivery systems using beta emitters to treat restenosis.
3. Dosimetric comparison of different source delivery systems using patient anatomical data from IVBT trials.
4. Dosimetric comparison of treating longer lesions using patient anatomical data from IVBT trials.
5. Decision making points on selecting a radiation system will be reviewed.