**PRESIDENT'S SYMPOSIUM**

## Introduction

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Coronary artery disease is the most frequent cause of death in the United States. Nearly a million therapeutic procedures are conducted each year to combat the disease. Most procedures are either bypass surgery or percutaneous transluminal balloon angioplasty (PCTA). Angioplasty is less invasive, less morbid, and less expensive, and the initial success rate is very high. However, forty to sixty percent of patients experience failure within six months due to restenosis of the vessel. Restenosis can occur as a result of several processes, including the proliferation of smooth muscle cells into the arterial lumen. This process is called neointimal hyperplasia. Implantation of a stent can combat some causes of restenosis, but does not prevent neointimal hyperplasia, and may in fact exacerbate it.

External or intraluminal irradiation of arteries following balloon angioplasty or stent implantation can reduce the proliferation of smooth muscle cells and consequent neointimal hyperplasia. Prevention of restenosis by irradiation has been demonstrated in coronary and peripheral arteries, in humans and animal models. Long term follow up studies and phase III randomized trials are now being conducted.

The use of intravascular brachytherapy presents a number of new problems of radiation biology, dosimetry and protection. Medical physicists have been called upon to provide estimates of dose distributions as well as to supervise the use of radioactive materials during clinical trials. Some of these practical issues will be discussed during this symposium. In addition, several speakers will describe the procedures currently being investigated and the clinical results to date. The roles of and relationships between medical professionals will be addressed. As these procedures become more widely used, it is important that medical physicists become familiar with the techniques and the special issues involved.