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Conference Chair

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Preface

The objective of this conference is twofold. First, we gather physicians, surgeons, engineers, physicists, and other scientists who are skilled in thermal therapy and the means to deliver and evaluate it. Each presenter is an expert in his or her field and is actively researching thermal therapy projects. Second, we strive to organize the human body by organ site and give comprehensive coverage to thermal treatment. This coverage includes anatomy, physiology, malignant and benign diseases, and conditions as a background, then it progresses to controlled energy delivery utilizing laser, microwave, ultrasound, radiofrequency, and other modalities. Many treatments involve minimally invasive techniques and can be performed in the office.

The conference covers the following sites and disease states: liver, brain, lung, fallopian tubes, superficial cancers, heart, prostate (BPH), eye, skin, shoulder and knee, uterus, prostate (cancer), blood vessels, and breast. Technologies to image tissue with electromagnetic methods are included, as well as magnetic resonance and ultrasound methods to assess temperature. Lastly, tissue damage assessment, both acute and long-term, are covered.

By gathering presenters including surgeons, radiologists, along with other scientists, the technologies and techniques will be presented by hands-on experts, leading to a cross-fertilization among medical specialties. Many of the papers in the proceedings cover a century of human effort to conquer a condition or disease state. Early efforts sometimes used burning red-hot poker or dc pulses to cause tissue eradication, often monitored by a stethoscope held to the abdomen to hear popping and sizzling. The presentations will show the continued progress and development toward a level of sophistication that current techniques have achieved, often under computer guidance. With improvements and the wide availability of imaging modalities, image guidance and improved target-tissue localization are leading to more precise and safer energy delivery.

As we begin the new millennium and end the old one, it is time to reflect on technology and how it is applied to improve the human condition. Presently, thermal therapy is being used more and more to treat cancer, reshape collagen for vision correction, treat BPH in the office, and enable percutaneous treatment with image guidance, all the while offering alternatives to surgical resection. By transitioning to therapy in a minimally invasive environment, large surgical procedures under general anesthesia are avoided. In addition, finite element modeling is allowing instrument design and energy delivery in a more rapid development process, especially in the design and monitoring of thermal delivery.

Current devices on the market are treating BPH for urination difficulties, upper palate and tongue for snoring and sleep apnea resolution, spine treatment for painful disc herniation, nonsurgical tubal ligation for female sterilization, endometrial ablation with a balloon for abnormal menstrual bleeding, capsule shrinkage for shoulder instability, tissue vaporization for arthroscopic knee and shoulder procedures, and breast cancer treatment without lumpectomy or mastectomy. Some of these procedures provide an alternative to otherwise untreatable conditions. Sealing of blood vessels by thermal techniques is also one of the examples of surgical applications of energy delivery. Other devices are placed percutaneously, then expand like a Christmas tree with protruding needles in an array to provide heat treatment to a large volume. These are specially suited to people who are poor surgical candidates.

The proceedings of this conference are indisputably greater than the sum of its parts. I express great appreciation to all of the outstanding presenters and authors, who, by their diligent efforts in making tight deadlines, created valuable contributions to the scientific body of knowledge for years to come.

Thomas P. Ryan