

*Principles and Practice  
of Gynecologic Laser  
Surgery*

# *Principles and Practice of Gynecologic Laser Surgery*

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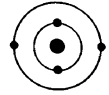
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*Dedicated to our children  
Shawn and Todd  
Viviana and John*



## *Foreword*

One of the first applications of lasers was for surgery on the retina of the eye. That, and the evident analogy to the old dreams of powerful heat rays, led many to predict that lasers would quickly be used for all kinds of cutting and welding, including surgical applications. It was soon apparent that laser surgery could be performed in ways that caused little bleeding. Nevertheless, other surgical applications have been slower to arrive.

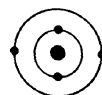
One difficulty has been the enormous range of possibilities provided by the many different kinds of lasers. Infrared, visible, and ultraviolet light beams each interact very differently with human tissues. Light pulses of enormously great peak powers became available from lasers, but their effects differed in surprising ways from those obtained with continuous beams. That provided both opportunities (i.e., treating or removing a very thin surface layer without affecting the underlying tissue) and problems with undesired side effects. Moreover, techniques were needed to deliver a precisely controlled amount of energy just where it was desired. Lasers also had to be engineered and manufactured with the desired power levels and a high reliability.

Thus, it has required the combined efforts of surgeons, medical scientists, physicists, and engineers to overcome these difficulties and to make lasers the increasingly useful surgical tools that they have become. Dr. Bellina is one of the leading pioneers of gynecologic laser surgery. He is a founder of the Gynecologic Laser Society, which has very successfully brought together people of various disciplines to develop and understand the new tools and their possibilities.

*Foreword*

It is entirely possible that future progress in this field will be even more dramatic than anything envisioned now. Surely anything that can be done will rest on the foundation that Dr. Bellina and his colleagues have created, and on the cooperative efforts they have fostered. But the techniques that are available now are dramatically powerful, and deserve the widespread application that this book will help to make possible.

Arthur L. Schawlow  
*Nobel Laureate*  
*Stanford University*  
*Stanford, California*



## *Preface*

The past decade has witnessed the proliferation of several types of lasers, as well as applications for these instruments in medicine. This text will primarily address the molecular gas laser (and provide a brief overview of additional laser models), with particular attention being given to the carbon dioxide laser, as applied to gynecologic procedures.

It was in view of the recent explosive growth in the number of surgical procedures, which have embraced the advantages of the laser, and the untoward effects which can result from limited knowledge of the tool, that we were prompted to write this book. The laser must be approached with respect and caution, and one should be meticulously prepared before attempting to use it. It is with this approach that we have undertaken to prepare this tutorial. We have assumed that the reader knows little or nothing about lasers or their application to surgery and, thus, we have addressed such basic questions as *What is a laser? How and in what circumstances may it be used?* and *What are the advantages of using a laser over other modes of treatment?* In pursuit of answers to these questions, we have endeavored to begin by presenting the laser physics theory in a readily digestible form and to progress to the advanced theory, offering a menu to suit a variety of palates.

The major thrust of the research is the clinical investigation of the carbon dioxide laser and its effect on neoplasias, vulvar dystrophies, and other premalignant diseases of the external genital tract. Step-by-step, both verbally and graphically, the reader will be taken through the selection of laser surgery candidates; preoperative, operative, and postoperative treatment; and management of the patient. We will address the action, reaction, and interaction effects of laser-treated tissues. And, in like fashion, the reader will be

## *Preface*

guided through the technical aspects of preparing the surgical suite, selection of instruments, and ancillary personnel requirements. Safety and biological considerations are outlined and a review of federal and local regulations is included, as well as instructions for obtaining certification.

We hope the text will serve as a source of reference and a stimulus to advance laser surgery to the status of an exact technique in all branches of medicine. It was our intention to make this book readable, practical, and concise, while providing a comprehensive guide to surgical care of the gynecologic patient with this advanced, less traumatic, and most modern of surgical techniques.

Joseph H. Bellina  
Gaetano Bandieramonte





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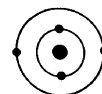
## *Acknowledgments*

participated actively in discussions of the possibilities and limits of, as well as the selection of patients for, laser treatment.

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Last, but not least, we would like to thank our families, in particular Delia, for being understanding during the time that the manuscript was in preparation and allowing us to devote the amount of time we had. We truly appreciate the sacrifice that they have made.

J.H.B.  
G.B.



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