# Te Linde's
# OPERATIVE GYNECOLOGY

TENTH EDITION

John A. Rock
Howard W. Jones III

INCLUDES DVD OF SURGICAL PROCEDURES

Wolters Kluwer Health | Lippincott Williams & Wilkins

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# TE LINDE'S OPERATIVE GYNECOLOGY


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# TO DR. GEORGE W. MORLEY

This tenth edition of *Te Linde's Operative Gynecology* is dedicated to our friend, admired and respected colleague, and contributor to previous editions of this book, Dr. George W. Morley, who passed away February 20, 2005 at age 81.

The last century was filled with spectacular progress in gynecologic surgery. Through his enthusiastic teaching, writings, mentoring to hundreds, compassionate and competent care of patients in the operating room and beyond, and especially his wise leadership of almost every national organization in gynecology and obstetrics, George was an active participant and contributor to this progress. Always totally loyal to his specialty, his institution, and the truth, he was fond of saying that we see farther by standing on the shoulders of giants who have gone before us. Now, we who knew George are able to see farther, do more, and do better for those we serve by having stood on his shoulders.

Dr. Te Linde and all the editors, authors, and publishers of *Te Linde's Operative Gynecology* since its beginning in 1946, are pleased and honored to dedicate this new edition to the memory of a gentle giant, George W. Morley, with our promise that the path of progress in gynecologic surgery will continue in this new century.

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# FOREWORD

Once again, the editors, authors, artists, and publishers have collaborated to produce a completely updated revision of *Te Linde's Operative Gynecology*, the most widely read textbook on this subject in the world. It has been translated into several foreign languages, and the eighth edition was the first to be translated into Chinese. This textbook is essential to the care of women with gynecologic disease.

There is a long history of publication of classic textbooks by distinguished members of the faculty of the Department of Gynecology and Obstetrics at Johns Hopkins. The list includes *William Obstetrics* and notable literary works of Kelly, Cullen, Novak, Wharton, Everett, Woodruff, Howard and Georgeanna Jones, Rock, and others. Many of these textbooks have been carried on in succeeding editions in the last 100 years. By describing and emphasizing "the Hopkins way" of caring for patients, these books have had great influence on the practice of gynecologists and obstetricians. *Te Linde's Operative Gynecology* is a prime example of this Hopkins tradition.

In the first edition in 1947, Dr. Te Linde wrote only about gynecologic operations that he had personal experience with, and advised subsequent editors to do the same. Since then, the subject of gynecologic surgery has become so large that it is no longer possible for any one or two gynecologic surgeons to be masters of the entire field, partly the result of development of subspecialties in gynecologic surgery. Therefore, it has been necessary to include authors other than the Hopkins authors who also qualify as experts in various aspects of the subject. The current edition includes 75 authors. This has resulted in a more complete national and even international presentation. This venerable textbook includes not only the usual and customary problems in gynecology that may require surgery for relief, but also the special, difficult, complicated, and unusual problems encountered occasionally.

The last century saw spectacular advances in the surgical treatment of gynecologic diseases. Consider that a tumor as common as uterine leiomyomata was a lethal disease in some women when the 20th century began. Because of the heroic surgical innovations of Howard Kelly and Thomas Cullen and others at Johns Hopkins and elsewhere, women who live in countries where modern gynecologic surgery is practiced no longer endure long suffering or die of this benign tumor. Similar advances have also been made in the management of cervical cancer, endometriosis, ectopic pregnancy, pelvic infections, uterine prolapse and vaginal relaxations, urinary incontinence, fistulas, infertility, congenital anomalies, etc. Throughout the century, progress in gynecologic surgery was chronicled by many textbooks. For example, Kelly's *Operative Gynecology* was the helpful companion of gynecologic surgeons in the first half of the 20th century, and *Te Linde's Operative Gynecology* served a similar function in the second half.

In addition to the scholarly work of the authors of chapters, one must also pay tribute to the brilliant artwork that has accompanied and explained the text. Originally, in Dr. Kelly's *Operative Gynecology*, the highest standard was set by the close collaboration, often in the operating room, between Dr. Kelly and his choice of Max Brodel as his personal artist. Their work together produced many masterpieces that are still outstanding teaching aides today. Brodel started the Hopkins School of Art in Medicine, and many of the graduates of this school, especially Leon Schlossberg, have contributed to every edition of *Te Linde's Operative Gynecology* and other texts. One cannot underestimate the value of their work in teaching gynecologic surgery. Because of the numerous illustrations, *Te Linde's Operative Gynecology* could qualify as an atlas of surgical technique, but it is much more.

Although an important part of the education and training of the gynecologic surgeon, *Te Linde's Operative Gynecology* cannot alone teach technical skills or substitute for spending years at the elbow of a seasoned, wise, and experienced mentor working in a proper health care facility, both of which are a necessary minimum in creating and maintaining an environment in which gynecologic surgery can be studied and learned and practiced. Proper technical skills are important in the successful performance of even the simplest operation. However, the most serious mistakes in the practice of gynecologic surgery may be made by those who know "how," but have not learned "when" and "why." The ability to perform a large number of gynecologic operations with a low morbidity and mortality rate, although desirable, is not *ipso facto* evidence that gynecologic surgery is being practiced correctly. The gynecologic surgeon must first study and understand the basic-science aspects of female reproductive organ function and the pathology, clinical manifestations, and psychosocial aspects of gynecologic disease. It takes time to evaluate patients properly, some moreso than others. This may be difficult in a busy gynecologic practice, but it is necessary in order that proper recommendations can be made for or against surgery. And, after one chooses the right patient for operation, one must choose the right operation for the patient. It is a mistake to do an abdominal hysterectomy when a vaginal hysterectomy would have significant advantages. One must select from a variety of operations available, and the one that most properly fits the needs of the individual patient depends upon many variables. It is a serious mistake to know only one operation and do it on every patient regardless of the circumstances. And remember always the admonition of John Burch that the golden rule of pelvic surgery is the conservation of useful

function—for example, the conservation of normal ovaries at the time of hysterectomy in most premenopausal women.

When indicated, alternatives to surgical therapy should be offered. As an advocate for patients and as a guardian of professional integrity and responsibility, gynecologic surgeons must insist on working in a proper health care environment, evaluate the results of care carefully, and change indications for surgery and surgical techniques as warranted and based on valid data. New methods and innovations in surgical therapy must be subjected to proper analysis before adopted as standard practice. Arrangements should be made for long-term follow-up to determine the results of treatment. As Dr. Te Linde was fond of saying, "Never take a young gynecologic surgeon's opinion about the value of a new operation because he/she has not yet been able to follow patients long enough."

Although the decision to operate may at times seem complicated, it can be simplified. According to Dr. J.M.T. Finney, there are only three valid reasons to operate:

- To save life (as in ruptured ectopic pregnancy, cervical cancer, etc.)
- To relieve suffering (as in pain from endometriosis, urinary incontinence, etc.)
- To correct significant anatomical deformities (as in uterine prolapse, Meyer-Rokitansky-Kuster-Hauser Syndrome, etc.)

Now, modern gynecologic surgery can offer a fourth reason to operate:

- To allow the creation of life (as in tubal reconstructive surgery, various *in vitro* fertilization operations, etc.)

This is an indication that is unique to gynecologic surgery and a great gift to humankind.

If, in making the decision to operate, one cannot fit the patient into one of these categories, perhaps the decision is wrong and needs review, and even review by a consultant.

*Te Linde's Operative Gynecology* will help the gynecologic surgeon learn the important details of performing procedures correctly. More importantly, it will help the gynecologic surgeon learn how to evaluate patients correctly. Today, such great emphasis is placed on learning to use new technology and new instruments that basic fundamentals of clinical evaluation of the patient care are forgotten or ignored. The greatest improvements in the practice of gynecologic surgery will come from listening to the patient rather than mastering new technology. In my judgment, the absolutely most important chapter ever written about gynecologic surgery is Chapter 3 on Psychosocial Aspects of Pelvic Surgery, written first by Dr. Malcolm Freeman and now by Dr. Betty Ruth Speir. This chapter should be required reading for anyone practicing gynecologic surgery.

And what of the future? Gynecologic surgery is a dynamic field of medicine, always changing to benefit the health of women by curing or alleviating the symptoms of gynecologic disease. We can expect exciting new developments in the 21st century, although it will be difficult for the next century to exceed the fantastic progress made in the last century. Gynecologic surgery will change and benefit because the future of biomedical science is wide open. Incredible discoveries in the past 50 years will inevitably effect gynecologic surgery, discoveries including massive improvements in technology, new and better vaccines, stem-cell research, DNA research, nanoscience, etc. We can look forward to new developments such as the implantation of a tissue-engineered product which, once implanted, slowly disappears while the host replaces it with his or her own tissue. The knowledge and skills required of gynecologic surgeons will be completely different by the end of the 21st century.

In the current tenth edition, each chapter is well written, well illustrated, easy to read and understand, and comprehensive yet specific, with the most modern, up-to-date information. It is hard to imagine a more thorough review of gynecologic surgery. It is also hard to imagine anyone who plans to learn, practice, and teach gynecologic surgery without this textbook. It can be used as a ready reference, a ready consultant with ease. It can be considered as a partner or companion in practice.

All who contributed to this new edition of *Te Linde's* deserve our congratulations for a job well done. It will be a great help to those who work to improve and maintain the quality of life for women.

*John D. Thompson, MD*

# PREFACE

The rapid pace of the introduction of new surgical techniques for the treatment of gynecologic disease has required the timely revision of *Te Linde's Operative Gynecology*. Until 1992 the text was revised every 7 to 9 years. Since then the interval to revision has significantly shortened to 4 to 5 years due to the rapid advances in the field of surgery. Dr. Richard Te Linde wrote the first edition. Today up to 72 contributors have shared their personal insights and surgical approaches for the treatment to improve the health of women. *Te Linde's Operative Gynecology* has been, and hopefully will continue to be, a major influence in maintaining and improving the quality of gynecologic surgery.

The tenth edition of *Te Linde's Operative Gynecology* presents the basic, sound principles for established gynecologic surgical technique. Major advances in the field of education of the gynecologic surgeon and the changing environment in which we practice gynecologic surgery are presented. John Deutsh, P. L. Malone, Leon Schlossburg, and others have contributed excellent medical illustrations throughout the last 10 editions. We appreciate the new medical illustrations prepared by Jennifer Smith in Chapters 17, Diagnostic and Operative Laparoscopy; 19, Control of Pelvic Hemorrhage; 23, Surgical Conditions of the Vulva; 32A, Abdominal Hysterectomy; 32C, Laparoscopic Hysterectomy; 34, Ectopic Pregnancy; 35A, Obstetric Problems; 36C, Paravaginal Defect Repair; 36D, Posterior Compartment Defects; 37, Stress Urinary Incontinence; 43, Intestinal Tract in Gynecologic Surgery; 50, Pelvic Exenteration; and 51, Surgical Reconstruction of the Pelvis in Gynecologic Cancer Patients; and by Joe Chovan in Chapter 18, Operative Hysteroscopy. The addition of color to the text offsets important figures and tables.

In view of the major focus on best surgical practices in surgical specialties, we have introduced a new section in each chapter that discusses the major take-home points. These best surgical practices present the opinion of the authors. Each clinical situation is unique, and readers should exercise their professional judgment accordingly. The information presented in the best practices is educational in nature and not a set of guidelines for use in any given situation. The authors, editors, and publisher are not responsible for errors or omissions or for any consequences from application of this or any other information in this book and make no warranty, expressed or implied, with respect to the contents of the publication.

Also new to this edition are definitions, which have been added as a part of the introduction of each chapter. The self-test questions in the Appendix have been revised and will allow the reader to "self test" after reviewing a specific topic. Perhaps more importantly, the editors have added for the first time a DVD of several surgical procedures previously introduced as "surgery in the retroperitoneal space," with accompanying text. Hopefully this will be a regular feature of future editions and will add an appreciation of the "Art of Surgical Techniques."

The authors wish to sincerely thank all the contributors and gratefully acknowledge the assistance of Barbara Schmitt, Lynne Black, Patsy Shepard, and the Lippincott Williams & Wilkins editorial team of Sonya Seigafuse, Ryan Shaw, Nicole Dernoski, Mark Flanders, and Rosanne Hallowell for their attention to details and hard work in the preparation of this book. As always, we are deeply indebted to those authors and editors who have labored to write the previous editions of this text. The current edition would not exist without their dedication. We owe a sincere debt of gratitude to Drs. Richard W. TeLinde, Richard F. Mattingly, and John D. Thompson.

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# CHAPTER 1 ■ OPERATIVE GYNECOLOGY BEFORE THE ERA OF LAPAROSCOPY: A BRIEF HISTORY

GERT H. BRIEGER AND HOWARD W. JONES, Jr.

Gynecology, spelled *gynaecology*, is defined by the Oxford English Dictionary as "that department of medical science which treats of the functions and diseases peculiar to women." The word was first used as such in the middle of the 19th century. In 1867, gynecology represented the physiology and pathology of the nonpregnant state. Although most histories of gynecology trace its roots back to antiquity, the field of medicine we call by that name today really has had a fairly recent origin. The successful removal of an ovarian tumor by Ephraim McDowell in 1809 was as rare an event as it was a spectacular one. In the preceding centuries, the history of gynecologic surgery was closely tied to the history of general surgery, and the obstacles that had to be overcome were the same. Infection, hemorrhage and shock, and pain were all effective barriers to any but emergency surgical procedures in the days before anesthesia.

"The history of gynecology," Howard Kelly wrote in 1912, "seems to me more full of dramatic interest than the evolution of any other medical or surgical specialty." Himself an accomplished historian of medicine, among his many other skills, Kelly noted that, "It was, notably, anesthesia which robbed surgery of its horrors, asepsis which robbed it of its dangers, and cellular pathology which came as a godsend to enable the operator to discriminate between malignant and non-malignant growths." Here, in a nutshell, we have the landmarks of much of the history of gynecology of the last 150 years. Ann Dally was correct when she noted that until recently, much of what has been written about the history of gynecology was written by gynecologists themselves, who picked their own heroes. With the rise of the new history of women and the social history of medicine since the 1970s, a much more balanced view has emerged.

There are many ways to approach the history of a medical and surgical specialty such as gynecology. The usual practice in textbooks that make an attempt to include some history is to tell the story in terms of who discovered what and who did which operation first. These facts are of interest but hardly constitute the history of the field. Besides the surgical operations of gynecology, the techniques devised, and the instruments to carry them out, there is much to be learned from the changing picture of diseases and their diagnoses; from the professionalization of the field, including the societies, journals, and textbooks that have been created; and from the education required to master the science and practice of operative gynecology. It is in these terms, rather than in tracing simply the great ideas and their creators, that this historical introduction proceeds.

Any major medical textbook can itself serve as a convenient window through which we can see history unfold. Robert Hahn has vividly described the changing world view of obstetrics by examining the succeeding editions of *Williams' Obstetrics* since its first edition in 1903. Likewise, the 50 years that have elapsed since the first edition of Richard Wesley Te Linde's *Operative Gynecology* provide an equal opportunity to describe the major developments in the companion field of gynecology.

## BARRIERS TO SURGICAL PROGRESS

In ancient times, the lack of real anatomic knowledge was a barrier to the development of surgery. It is sometimes said that because the ancient Egyptians had effective techniques for the evisceration of bodies for mummification, they must have had a good knowledge of the body. However, removal of the internal organs during the embalming process was performed by technicians who did not concern themselves with the structure of the bodies they were preparing.

Anatomy was pursued in Alexandria during the Hellenistic period, but it had few, if any, practical applications until a later time. By the end of the 13th century, anatomic dissection again became more common, but often it was limited to one or two public dissections a year or the study of animals. Surgeons were responsible for the few autopsies that were performed to determine the cause of death. This was especially important if a crime was suspected or drowning had to be established.

Soranus, the Roman physician and writer who practiced in the reign of the Emperors Trajan (98–117) and Hadrian (117–138), is perhaps best known for his text entitled *Gynecology*. This book is somewhat mistitled because it is mostly devoted to what we would call obstetrics. Soranus wrote about prenatal and postnatal problems, as well as those associated with delivery itself. This ancient text has been translated and has an excellent introduction by Owsei Temkin. Recently, it has been reissued in a paperback edition.

Although Soranus's *Gynecology* still makes interesting reading, it hardly qualifies as an early text on the subject of operative gynecology. However, like other physicians of his time, Soranus clearly noted that the best midwife was one who was trained in all branches of therapy, "... for some cases must be treated by diet, others by surgery, while still others must be cured by drugs."

Although there were instances of anatomical study in earlier times, we generally begin the story with the work of Andreas Vesalius and the publication of his *De humani corporis fabrica* in 1543. Before this time, anatomic knowledge was not tied

to the teaching and practice of medicine. The tradition of the surgeon-anatomists, of whom Vesalius was a stellar example, culminated in the late 18th century with the work of the English surgical teacher John Hunter (1728–1793) and his older brother William (1718–1783). It was William's classic book about the gravid uterus with its detailed engravings that shed new light on the structures of the female pelvis.

In the 19th century, for all types of surgery, the problems of pain, hemorrhage, and infection had to be solved before operations could be undertaken safely. The problems of surgical dressings and postoperative infections were generally a matter of trial and error. The Scottish surgeon and gynecologist Sir James Simpson (1811–1870) urged his surgical colleagues to perform their operations on the kitchen tables of their patients to avoid the dangers of hospital infections, or "hospitalism" as it came to be called.

In the 1840s, the Hungarian obstetrician Ignaz Semmelweis (1818–1865) showed clearly that puerperal fever could be prevented by disinfecting the hands of doctors before they examined their patients during the course of delivery. Despite good statistical evidence, his method of washing hands in chlorinated lime solution was not widely adopted. In fact, it met with outright resistance from most physicians. In this country, the Harvard anatomist and writer Oliver Wendell Holmes (1809–1894) met similar disbelief and resistance when he suggested in 1842 that it was the physicians themselves who were carrying the dreaded puerperal infections to their patients.

In the middle 1860s, Joseph Lister (1827–1912), while working in Glasgow, began experiments using carbolic acid, a phenol derivative, to clean the instruments, sutures, and dressings he was using in his operations. He based his work on an understanding of the germ theory of disease, which was then just in its infancy as a major theory of disease causation. Lister believed it was important to prevent the germs present in the air or on instruments and sutures from entering the wound, which would prevent the formation of the heretofore much desired laudable pus. Lister, too, met much opposition to his method of antisepsis. Partly because of the frequent changes in the system he was developing, which made it difficult for others to follow him, and because of the inadequate understanding of the germ theory by most surgeons, it took nearly two decades for antiseptic surgery to become routine. In Lister's case, as was also true for Holmes and Semmelweis, some of the resistance undoubtedly stemmed from the fact that doctors never like being told that what they are doing is actually causing harm to their patients.

Lister encountered a great deal of opposition, particularly in his own country. Lawson Tait (1845–1899), an active and polemical gynecologist who settled in Birmingham, was staunchly opposed to Lister's system of antisepsis. Tait paid much attention to general cleanliness when he was operating, and he actually achieved quite good results. However, his older colleague, Spencer Wells (1818–1897) of London, was a devoted follower of the antiseptic system in his many ovarian operations, perhaps because he had a clear grasp of the role of microbes. In 1864, the year before Lister began using carbolic acid in Glasgow and 3 years before he published his first results, Wells published a paper in the *British Medical Journal* entitled "Some Causes of Excessive Mortality after Surgical Operations." Wells clearly described the recent work on germs by Louis Pasteur (1822–1895) in France. There is no definite proof that Lister was aware of the paper, but it is hard to imagine that he did not know what was appearing in the national medical journal. Thus, gynecologists probably had a much greater hand in the development of safe surgery in the last century than is usually acknowledged.

## BEGINNINGS OF GYNECOLOGIC SURGERY IN 19TH-CENTURY AMERICA

Opening the abdominal cavity to remove extrauterine pregnancies was successfully accomplished several times in the later 18th century but did not become routine until the advent of anesthesia and antisepsis/asepsis. Ephraim McDowell (1771–1830) (Fig. 1.1) made surgical history with his successful removal of a large ovarian cyst in his patient Jane Todd Crawford, who in 1809 rode 60 miles to her doctor's house in Danville, Kentucky, to undergo an untried operation without any assurance of cure and without the benefit of anesthesia. Although McDowell is often referred to as a backwoods physician, he was in fact a well-trained surgeon. His Edinburgh training probably gave him confidence in his diagnosis and courage to attempt a surgical cure rather than have his patient face certain death from her relentlessly growing tumor. During his study tour in Scotland, he probably heard that in the previous century, the popular surgical teacher John Hunter had suggested such an operation, believing that "women could bear spaying just as well as did animals."

The drama of McDowell's case is best described in the words of the surgeon himself:

> In December, 1809, I was called to see a Mrs. Crawford, who had for several months thought herself pregnant. She was affected with pains similar to labor pains, from which she could find no relief. So strong was the presumption of her being in the last stage of pregnancy, that two physicians, who were consulted on her case, requested my aid in delivering her. The abdomen was considerably enlarged, and had the appearance of pregnancy, though the inclination of the tumor was to one side, admitting of an easy removal to the other. Upon examination, per vaginum, I found nothing in the uterus; which induced the conclusion that it must be an enlarged ovarium. Having never seen so large a substance extracted, nor heard of an attempt, or success attending any operation, such as this required, I gave to the unhappy woman information of her

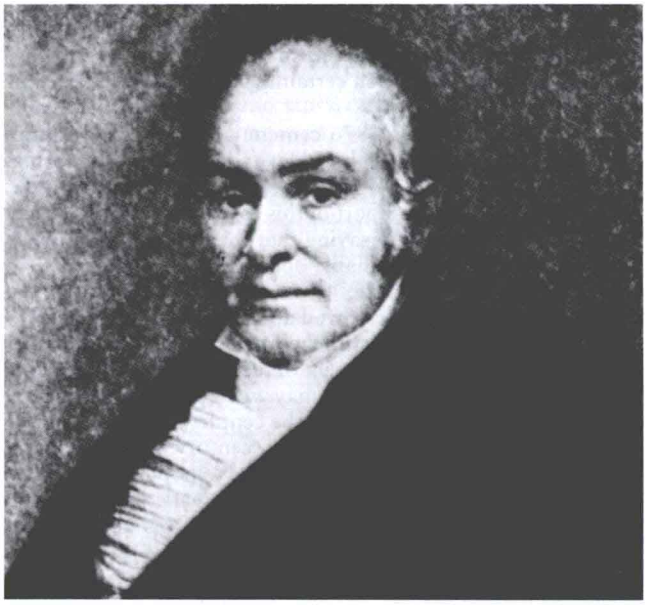

FIGURE 1.1. Ephraim McDowell (1771–1830). One of the earliest abdominal surgeons.