

Progress in Infertility

Infertility

Second Edition

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Second Edition

Second Printing

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TO OUR WIVES
Patrisha and Georgia

Preface

Seven years have elapsed since the publication of the first edition of *Progress in Infertility*. During this interval, important advances in many aspects of reproductive biology have directly affected the problems of infertility and conception control. In this second edition, the editors have made every effort to review all areas of research, both clinical and laboratory, that give promise of bringing something of substance to this expanding field. Outstanding investigators have been invited to present their most cogent and clinically applicable material in an effort to diminish the time lag between theoretical impression and clinical application.

We have, however, maintained the general format of the first edition, retaining those chapters concerned with the essential components of basic infertility study as well as the disease processes that affect the reproductive process; each has been revised and updated.

Several chapters that appeared in the first edition have been deleted in order to provide space for important new observations. Chapters in Part VI on assay methods for gonadotropins, thyrotropins, estrogen, progesterone, androgen, and thyroid hormones have been either completely rewritten or revised. Methods using radioimmunoassays were just being introduced in 1968. The latest modifications of these methods are now available, and they are thoroughly presented and evaluated in this edition.

During the past seven years, laparoscopy has evolved as a popular diagnostic and therapeutic procedure. It has superceded culdoscopy in many hospitals as the optimal method of completing the infertility survey, and somewhat incongruously, it has become one of the prime factors in conception control. One of the editors (S. J. B.) has coauthored a new chapter which is both instructive and critical.

Methods of ovulation induction utilizing clomiphene, chorionic gonadotropin, and menopausal gonadotropin have been put to the test of extensive clinical usage, and the last preparation finally received F.D.A. approval in 1971. Therapeutic regimens for these compounds are now available, and specific indications and contraindications for their use are outlined by recognized authorities.

Perhaps the most important and long-awaited development in the field of ovulation induction has been the isolation and subsequent preparation of hypothalamic releasing hormones for clinical trials. Although clomiphene and menopausal gonadotropins have proved to be extremely effective for ovulation induction in properly selected patients, the pregnancy success rate of the former is less than anticipated, and the cost, adverse side effects, intricacies of administration, and high rate of multiple births associated with the latter have limited its use to specialists in the field. Dr. Roger Guillemin is noted for his original research describing the regulation of pituitary function by hypothalamic releasing factors; the chapter "Hypothalamus and Anterior Pituitary," which he coau-

thored with Max Amoss, is another outstanding contribution. It serves both as a review of hypothalamic-pituitary relationships and as an introduction for the clinician to a more physiological approach to ovulatory control. The specific effect of FSH- and LH-releasing hormones becomes even more intriguing, since there is now immunohistological as well as cytohistological evidence that FSH and LH are present in the same cell type in the human pars distalis.

Intrauterine devices for conception control, just beginning to gain general acceptance at the time, received only brief mention in the first edition. Because of their wide acceptance both in this country and abroad and particularly because of the development of the new copper-containing units, Drs. Alvaro Cuadros and Howard J. Tatum were asked to review past experiences and to offer prospective thoughts concerning the future of the newer devices.

The oral contraceptives have weathered the test of time and the attacks of "antipill" factions. Several have been removed from the market in the United States, and the emphasis has been on lowered estrogen content and appropriate patient selection for specific compounds. The "minipill," containing a progestin only, was marketed by three companies in 1973 after years of clinical and laboratory trials. One of the editors (R. W. K.) has completely rewritten the chapter on oral contraceptives, which now emphasizes metabolic and long-term effects.

The editors are pleased to present in this edition a chapter by Dr. Arthur T. Hertig, Emeritus Professor of Pathology at Harvard Medical School, on implantation of the early conceptus. Dr. Hertig, with Dr. John Rock, collaborated on the studies that led to their dramatic descriptions of the earliest stages of implantation in the human. In this chapter, which is illustrated in the impeccable Hertig style, the reader will find a complete review of the trials and tribulations of the blastocyst together with plausible explanations of the causes of early abortion. The editors predict that this review, perhaps the most comprehensive ever presented, will eventually be recognized as a classic in its own right.

During the decade from 1960 to 1970, cytogenetics emerged as an integral segment of reproductive anatomy and provided etiological bases for previously unexplained "congenital" abnormalities and metabolic derangements. Shortly after 1970, innovative staining techniques permitted more precise delineation of karyotypical abnormalities and elucidation of previously unexplained diseases. Dr. Kurt Benirschke has revised his chapter to include these progressive developments, and Dr. John McLean Morris has contributed a new chapter, "Gonadal Anomalies and Dysgenesis." Together, these presentations provide a comprehensive, last-minute overview of an intriguing and rapidly developing field.

The prostaglandins continue to evoke headlines in medical and general news media, and extensive clinical research with these compounds is continuing. They have not, as yet, attained the degree of effectiveness originally predicted by early investigators. Prostaglandins E_2 and $F_{2\alpha}$ are capable of stimulating uterine contractions during the first and second trimester of pregnancy as well as at term. When injected intravenously, however, these substances are rapidly metabolized, so that large quantities are required to induce labor and the incidence of side effects is high. Since intramuscular injections are painful, instillation into the amniotic sac, either transabdominally or transcervically, may be less traumatic. Dr. Mark Bygdeman, a veteran investigator of prostaglandins, and his colleagues present a masterful review of these unusual compounds.

In the first edition, immunological reactions were introduced as potential but unrecognized and ill-understood contributory causes of failure in reproduction. While much

still remains to be elucidated, there is clear evidence in the new chapters on immunology that we are entering a new era of understanding of the vital role of antigen-antibody reactions in reproduction and in mishaps of pregnancy.

The physiology of spermatogenesis and its genetic implications are gradually being unraveled and promise to be so vital that the editors predict that before long we will see the emergence of a new subspecialist—the andrologist, or male infertility specialist—to complement the gynecologist's approach to infertility. These indications are clearly seen in the new chapter by C. A. Joël. Aging of the sperm and its effects are brought to light by E. S. E. Hafez; and W. Richard Dukelow and Seiichiro Fujimoto admirably discuss capacitation.

Special mention must be made of the brilliant work of P. G. Edwards and P. C. Steptoe on the in vitro fertilization of the human egg and its potential for intrauterine implantation. Their chapter is written in magnificent style.

It is virtually impossible to mention here the myriad new pieces of information incorporated in this edition, just as it is equally impossible, because of time factors in publishing, to include in this book everything that recently has appeared on the scene. It is, however, the editors' firm conviction that this edition not only contains the most up-to-date and advanced approaches to infertility management, but like the first edition, also serves to herald the approach and the excitement of the new things to come.

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CHAPTER 48

Contents

Preface xiii

Contributing Authors xvii

1. A Rational Approach to the Evaluation of Infertility

S. J. BEHRMAN AND ROBERT W. KISTNER

I. CERVICAL, UTERINE, AND ENDOMETRIAL FACTORS

2. The Cervical Factor	17
VAL DAVAJAN AND ROBERT M. NAKAMURA	
3. Congenital Anomalies	47
HOWARD W. JONES, JR., AND THEODORE A. BARAMKI	
4. Myomectomy in Infertility	85
LAWRENCE J. MALONE AND FRANCIS M. INGERSOLL	
5. Endometrial Diseases in Infertility	91
DEAN L. MOYER	

II. TUBAL FACTORS

6. Hormonal Regulation of Egg Transport Through the Mammalian Oviduct	JAN BRUNDIN	119
7. Sperm Transport	E. S. E. HAFEZ	143
8. Intraluminal Tubal Environment	LUIGI MASTROIANNI, JR., AND BENJAMIN G. BRACKETT	175