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Edited by Mohamed Aboulghar , Botros Rizk
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Ovarian Stimulation

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Ovarian Stimulation

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and up-to-date information that is in accord with accepted standards
and practice at the time of publication. Although case histories are
drawn from actual cases, every effort has been made to disguise the
identities of the individuals involved. Nevertheless, the authors,
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To a dear friend, an honorable man, a legendary scientist, a Nobel Prize winner and a world renowned leader.

To Professor Robert Geoffrey Edwards, the father of IVF and four million babies worldwide.

We dedicate this book to you in gratitude for your friendship, mentorship and leadership.

The world, East and West, has respected you, and we loved you and honored you.



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Mohamed Aboulghar, M.D. is Professor of Obstetrics and Gynecology, Faculty of Medicine, Cairo University and Clinical Director and founder of The Egyptian IVF-ET Center, Maadi, Cairo, Egypt, (the first IVF center in Egypt). He is also the founder and first president of the Middle East Fertility Society (MEFS) and Editor-in-Chief and founder of the *Middle East Fertility Society Journal* (since 1996).

He has published over 200 papers in top international and regional medical journals, and over 20 chapters in international books.

He received the Egyptian National Award for Excellence in Medical Sciences in 2000, and the Egyptian State Merit Award in Medical Sciences in 2016. He received an Honorary Membership of the European Society of Human Reproduction and Embryology (Berlin 2004), and the Distinguished Service Medal of The Royal College of Obstetricians and Gynaecologists, in September 2018.

For several years, he has been an associate editor for *Human Reproduction* and the *American Journal of Obstetrics and Gynecology*. He is currently a member of the Editorial Board of *Fertility and Sterility*, and a reviewer for *Human Reproduction*, *Human Reproduction Update*, *Fertility and Sterility* and many more international journals.

He has organized 20 international conferences in the Middle East, and chaired 3 pre-congress courses in the American Society for Reproductive Medicine (ASRM) annual conference.

Botros Rizk

Botros Rizk is Medical Director, Elite IVF in Houston and Odessa Texas and former Professor and Head of Reproductive Endocrinology and Infertility and Medical and Scientific Director of USA In vitro fertilization and assisted reproduction at the University of South Alabama for 25 years from 1993 to 2019. Dr Rizk currently leads

Elite IVF, Houston, Texas a premier assisted reproductive technology center in Texas.

Dr. Rizk is the President of the Middle East fertility Society. He currently serves as distinguished Adjunct Professor of Obstetrics and Gynecology in Cairo University, Egypt and served as Distinguished adjunct Professor of Reproductive medicine at King Abdulaziz University, Jeddah, Kingdom of Saudi Arabia. Dr. Rizk is distinguished Adjunct Scientific Director of IVF Michigan Rochester Hills. Dr Rizk is the scientific and Lab Director of Odessa Fertility Lab and Columbus Center for Reproductive Endocrinology and Infertility.

Mentored by Nobel Laureate Professor Robert Edwards, recipient of the Nobel prize in Medicine for achieving the first successful In Vitro fertilization in the world, Dr. Rizk started his career in Reproductive Medicine in London and Cambridge in the era of the legends where most of the current scientific developments and medical protocols were invented. He joined the prestigious University of Cambridge for three years from 1990 to 1993 as Clinical Lecturer and Senior Registrar. Dr. Rizk is board certified by the American Board of Obstetrics and Gynecology and the Royal College of Physicians and Surgeons of Canada and the Royal College of Obstetricians and Gynaecologist in England, as well as, the American Board of Bioanalysts in Embryology and Andrology.

Dr. Rizk's clinical and research interests have focused on ovarian stimulation including the development of the long agonist protocol which became the standard for two decades of IVF. He is internationally considered a leading authority on ovarian hyperstimulation syndrome and made original contributions to the pathophysiology and prevention of the syndrome. Dr. Rizk authored a book solely dedicated to ovarian hyperstimulation syndrome that is considered the standard reference for OHSS. Dr. Rizk is an authority on endometriosis; its novel medical

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About the Editors

management and robotic surgery. Dr Rizk is the principal investigator for tens of clinical trials for the FDA over the last three decades.

Professor Rizk edited and authored twenty eight medical textbooks and more than four hundred manuscripts embracing different aspects of international expert in infertility and assisted

reproduction, as well as, ultrasonography and robotic surgery. Dr. Rizk is one of the early members of European Society for Human Reproduction and a founding member of Middle East Fertility Society. He chaired for several years many ASRM postgraduate courses teaching ART, ovarian stimulation, and ultrasonography.

Foreword

Alan H. DeCherney

National Institute of Child Health and HumM Development

Ovarian Stimulation is a text that is comprehensive, insightful, contains a great deal of new information, and is well organized, making it easy to read. The book is divided into 6 sections and 30 chapters and is authored by leaders in the field from the global community, with representatives from such places as Canada, Europe, the United States, Egypt, and Australia, to name a few.

The chapters evolve from ovarian stimulation through procedures before, during, and after stimulation. Oral and injectable agents for ovulation induction are discussed in great depth, incorporating a fair amount of new material. In addition, therapies, such as intrauterine insemination and laparoscopic ovarian drilling, are critically evaluated.

Ovarian Stimulation also addresses the utilization of GnRH, for both solitary use in ovarian stimulation and for use in combination with other agents. The occasionally serious adverse effect of ovulation induction (i.e., desecrated hyperstimulation syndrome) is looked at in terms of the diagnosis therapy and the use of

novel agents in order to treat the entity, including early aspiration of ascites.

Individual patient scenarios are also addressed, including polycystic ovarian syndrome and the “poor responder.” The discussion of the risk, benefits, and effectiveness of hCG versus LH is included. Of course, much of the data, application, and in-depth understanding come from the author’s experience with in vitro fertilization (IVF), which is covered extensively by looking at natural cycle IVF, in vitro maturation of oocytes, as well as a more traditional approach.

Techniques for monitoring, such as ultrasound and serum estradiol levels, are also discussed in depth.

The text is a comprehensive approach for understanding ovarian stimulation. There is no lack of information as far as this topic is concerned. It is up to date with contemporary, excellent, and established references. The book is a monumental contribution that enriches our knowledge about a very important topic in reproductive endocrinology and infertility.

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Preface to the first edition

Ovarian stimulation has become an integral part of the management of infertility and assisted reproduction. A glance through scientific journals would demonstrate an explosion of publications related to ovarian stimulation. In every world congress and international infertility meeting the ovarian stimulation session is the most popular and lively session of the entire meeting.

This book was authored by the world leaders in infertility and reproductive endocrinology from the United States, Canada, Europe, Australia, the Middle East, and Africa. Each contributor has been the pioneer of the respective area of clinical research and practice.

The book covers in its different sections and chapters all aspects of ovarian stimulation: the different stimulation protocols from which to choose, the management of poor responders and hyper-responders, triggering ovulation and luteal phase support.

We have thoroughly enjoyed putting this book together and we take this opportunity to thank all the authors for their friendship and most valuable contributions.

To our readers, we put into your hands a concise and global book that we hope that you will thoroughly enjoy.

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Preface to the second edition

Ovarian stimulation still occupies the central place in fertility management, particularly in assisted Reproduction. The second edition of this book has significant new contributions in addition to updates of the basic solid structure of the different sections in the first edition. The use of progestin primed stimulation, LH supplementation, freeze all embryos, GnRH agonist to trigger ovulation and luteal support different from progesterone are some of the new lines of treatment that became more widely used in the last decade. Endometrial receptivity and implantation failure are two areas that remain challenging today and are eloquently addressed. Difficult IVF cases and poor responders are some of the new highlights. Ovarian stimulation

in PCOS patients have been divided into ovulation induction and controlled ovarian hyperstimulation for ART in two separate chapters. Many areas covered in this book are still being investigated such as freeze all embryos, and segregation of ART, as well as to the degree of mild stimulation. The advantages as well as the case against these controversial issues have been presented in the first section of the book.

We truly believe that ART has become much safer today because of the use of antagonist and GnRH agonist to trigger. The success and safety continue to move forward favorably. In your hands our beloved readers and colleagues we put a book that reflects today and perhaps tomorrow's contributions.

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