

# **The Reproductive System at a Glance**

**Fourth Edition**

**Linda J. Heffner  
Danny J. Schust**



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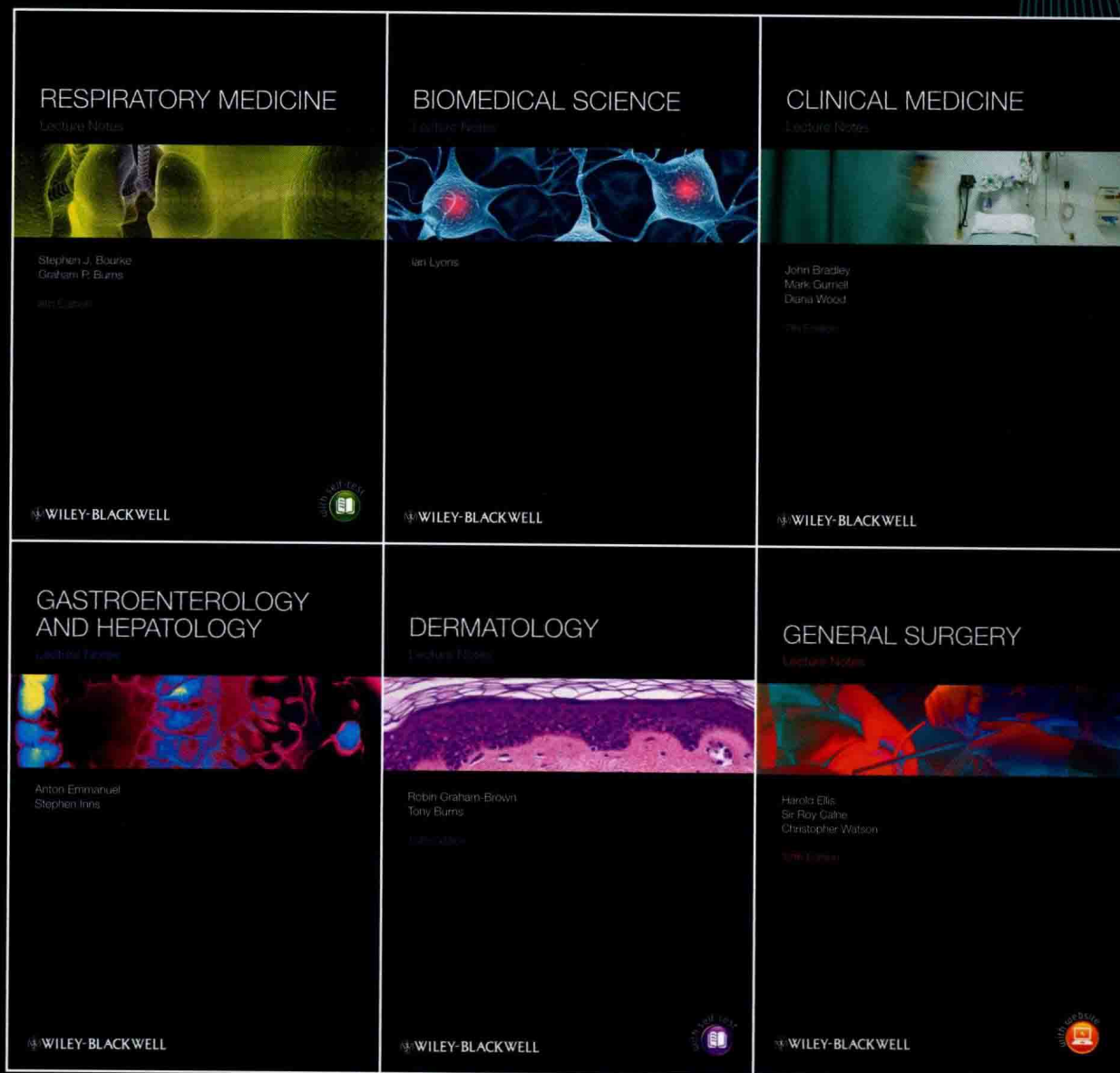
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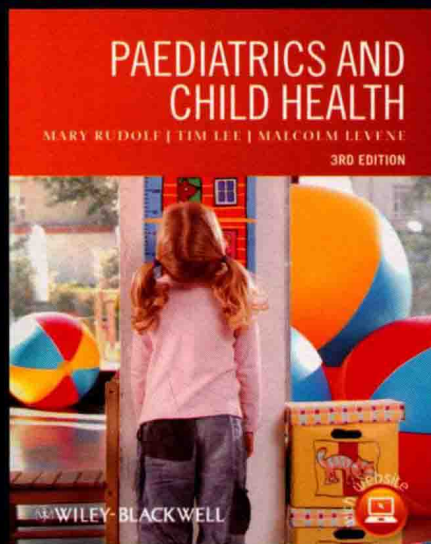
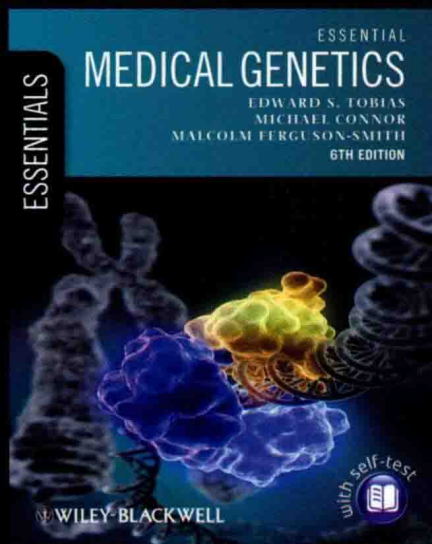
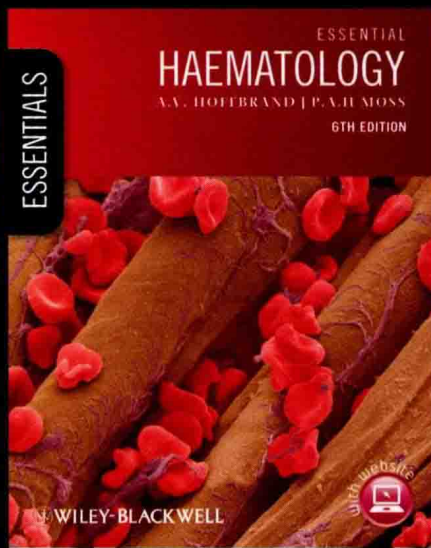
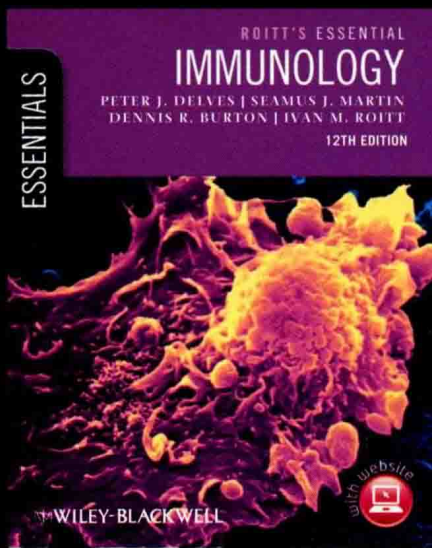
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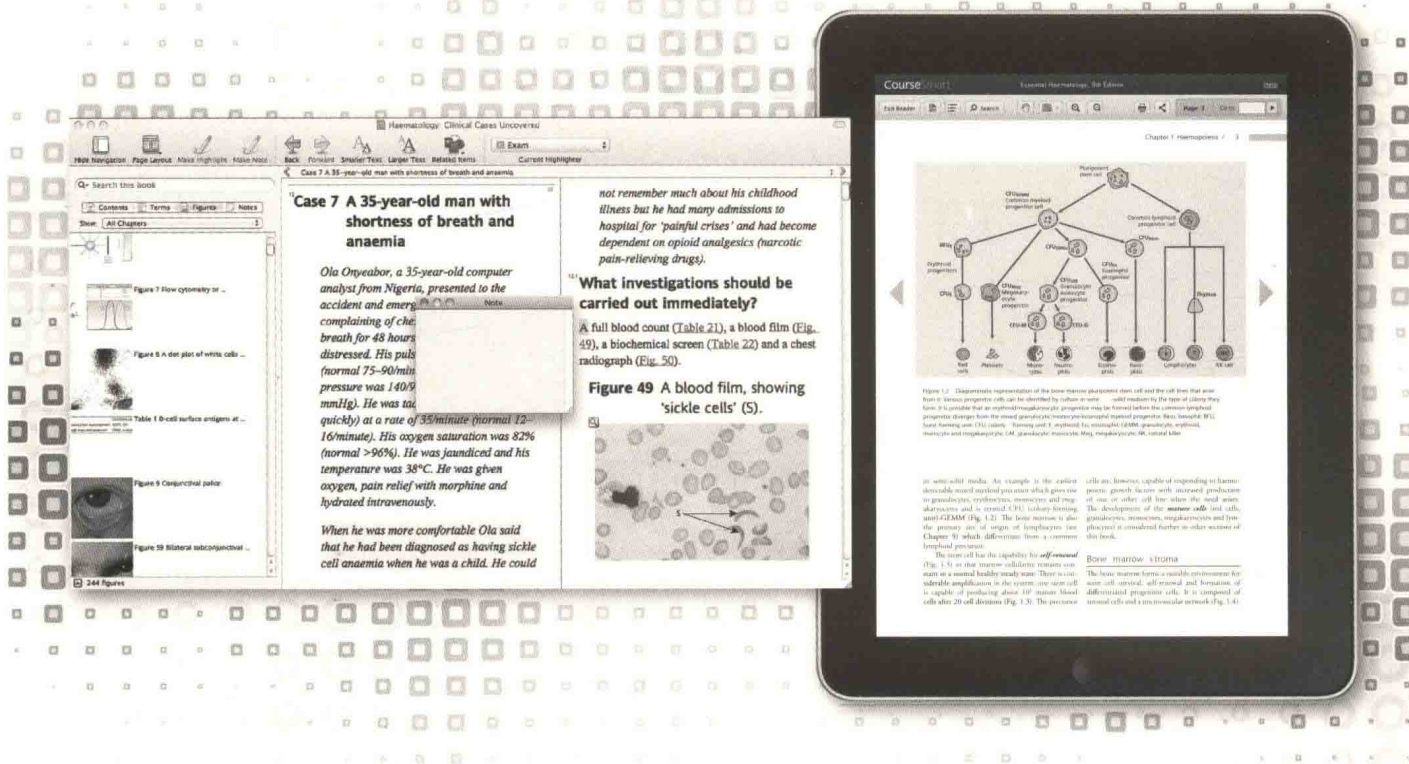
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# Preface

Now in its fourth edition, *The Reproductive System at a Glance* is a comprehensive, easy-to-use collation of all the pertinent information on human reproductive processes and their diseases.

The most notable change between this edition and the last is the inclusion of an expanded supplementary material section. This includes multiple choice and short answer questions with detailed answers for each chapter. These questions are designed to help the student/reader determine if he or she has understood the important concepts. New material has been added to expand on normal maternal physiology in pregnancy and several new figures include pathology or radiologic images. All chapters and figures have been updated where new information is available.

The book remains divided into two parts. Part 1, which consists of 25 chapters, covers the normal human reproductive tract, continuing on through puberty with the resulting mature male and female anatomy and physiology and finally, procreation, pregnancy and menopause. Part 2, which consists of 23 chapters, covers the pathophysiology of anatomic, physiologic and psychologic disorders that interfere with normal reproductive function or health. Seven of these chapters are devoted to the more common malignancies that involve the reproductive organs.

Like its predecessor and the other books in this series, *The Reproductive System at a Glance* is written so that each topic is confined to a discrete vignette with appropriate illustrations or tables in a double page format. In Part 2, each topic also follows a standard format of a description of the disorder followed by its epidemiology, pathophysiology and, whenever it aids in understanding the disorder, a brief description of the commonly used treatments.

Revising a book, while easier than writing the original, remains a major undertaking to which many people contributed. We would like to thank Drs. Elizabeth Stier and David Wang for the helpful reviews on the chapters on human papillomavirus and cervical cancer, and male reproductive disorders, respectively. We would also like to thank the Obstetrics and Gynecology and Women's Health residents at the University of Missouri–Columbia for their invaluable help in creating the MCQ study guide questions for this text and Drs. A.J. Enciso, Taylor Hahn, Greg Blair and Megan Morman for help in fashioning MCQ answers and short answer questions and answers.

Finally, books never appear in print or on bookshelves without publishers. We would like to thank Elizabeth Johnston, Andrew Hallam and Karen Moore at Wiley Blackwell and also Jan East for assistance in producing this new edition. David Gardner was invaluable in revising old and drawing new figures.

Linda J. Heffner  
Danny J. Schust  
Boston and Columbia, 2013

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## 3 Steroid hormone mechanism of action and metabolism

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## 4 Reproductive genetics

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## 12 Puberty in girls

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## 16 Fertilization and the establishment of pregnancy

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Figure 41.1(a): Kirby R, Christmas T (1993) *Anatomy, Embryology and Histopathology in Benign Prostatic Hypertrophy*, p.18. Elsevier.  
Figure 41.1(b): Lepor H, Lawson RK, (1993) *Prostate Diseases*, p.45. Elsevier.

### 42 Ovarian neoplasms

Table 42.1: DiSaia PJ, Creasman RK (1997) Epithelial ovarian cancer. In: *Clinical Gynecologic Oncology*, 5th edn, p.283. Elsevier.

### 44 Cervical cancer

Figure 44.2: Coleman DV, Evans DMD (1998) *Biopsy Pathology and Cytology of the Cervix*. CRC Press/Taylor and Francis.

### 46 Sexually transmitted diseases of bacterial origin

Figure 46.1: Diallabetta G, Hook EW, III (1987) Gonococcal infections. *Infect Dis Clin N Amer* 1: 1,28.

Figure 46.2: Batteiger BE, Jones RB (1987) Chlamydial infections. *Infect Dis Clin N Amer* 1: 1,58.