

LABORATORY TESTS
in the diagnosis
and investigation
of ENDOCRINE
FUNCTION

Edited by

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Edition 2

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Preface

The second edition of this book again follows presentation of a postgraduate course at the University of California Medical Center in San Francisco.

The general plan is similar to that of the first edition, with the first chapter in each section being prepared by a clinician who outlines tests now in use in clinical practice. The following chapters generally are by scientific investigators reporting their own work, indicating what is going on in their field, and when possible, pointing out what looks promising for the future. The sophistication and scientific elegance of some of the tests described are remarkable, with smaller and smaller units including nanograms and picograms being measured in reproducible fashion. Of considerable interest again will be future developments considered in the light of predictions given in several of the chapters.

In general, the content of the chapters is similar to material presented at the time of the course. Changes in wording have been made in order to prepare the material for publication, but contributors and occasionally the editor have attempted to do this without altering the facts or spirit of the presentations. Because of the number of contributors, there is some overlap, but this is minimal and has not required any changes. Selected references are included. Because some time has elapsed between the presentation of the course and publication of the book, the various contributors have brought the material up to date in the proof stage.

A volume like this could not be prepared without the help and cooperation of many. First, and most important, sincere thanks to the contributors for their efforts. The original planning of the course was greatly aided by an Advisory Committee composed of Doctors Peter Forsham, Gilbert S. Gordan, and C. H. Li. Also the staff of the Department of Continuing Education in Health Sciences, particularly Dean Seymour M. Farber and Dr. Roger H. L. Wilson, made this

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program possible and were most cooperative in arrangements for taping the talks. Acknowledgment must also be made to the Ayerst Laboratories, particularly Dr. John B. Jewell, for grants to the Ayerst Fund, which was helpful many times during the preparation of the material. Aid from the Walter A. Glaser Foundation is also acknowledged with thanks. I must also thank Mrs. Doris Snow, Mrs. Ilona Roth, and Mrs. Francyse Elliott for invaluable secretarial assistance. It is sincerely hoped that the efforts of all concerned have resulted in a volume that will be of value to the reader and will be interesting and stimulating to him whether he be a clinician or an endocrine scientist.

R. F. E.

Foreword

The development of reliable methods for evaluating endocrine function has been a major concern of both clinical and experimental investigators in the field of endocrinology. The most ideal procedure for the determination of hormonal content in biologic tissues or fluids should be one that is highly specific and sensitive. In addition, it should be comparatively simple for convenient routine use in the laboratory. Before a hormone is isolated in pure form, the method employed for its assay is generally based on biologic activity. Once the hormone is purified, chemical or immunochemical methods for its detection and quantitative determination can be developed. Chemical or immunochemical methods must be correlated with biologic assays, however, because biologic activity may be lost without measurably affecting the chemical or immunologic properties of a hormone.

Since publication of the first edition of this book in 1962, many important advances, particularly in the development of sensitive chemical and immunochemical methods, have been made. Most noteworthy is the development of radioimmunologic techniques for the determination of peptide and protein hormones and of gas chromatographic methods for the detection of steroids. As a means of bringing both clinical and laboratory investigators up to date on these recent advances, the present volume should be extremely useful.

San Francisco

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Section I

PITUITARY

Tests Now in Use in the Clinical Diagnosis of Pituitary Disease

ARTHUR M. STORMENT, JR., M.D., AND
ROBERTO F. ESCAMILLA, M.D.

It should be emphasized that in clinical practice laboratory tests are an aid but do not take the place of a proper history and physical examination. Also, the results of laboratory tests should be interpreted with some clinical judgment. One should not hesitate to repeat a laboratory test, even using a different laboratory if the result does not agree with the clinical impression. One should be aware of the basic physiology behind the laboratory tests, the pitfalls in selecting the tests to be done, and the usual variations from normal in health, other endocrine and other non-endocrine diseases, and the influence of diet, drugs, and other factors on the results.

Of special interest in clinical examination is the observation of: abnormalities of size or bodily proportions or development, unusual activity patterns, visual symptoms, headache, unusual pigmentation or hair growth, abnormalities of sexual function, and polyuria. Routine laboratory examination may help in showing a mild anemia, a low urine specific gravity, a large heart on chest x-ray, or low voltage in the EKG. Pituitary diseases are most frequently chronic, indolent and undramatic in their development and frequently small variations from normal revealed in routine clinical examinations are the only clues in distinguishing those patients with pituitary disease from the large population of patients with seemingly minor or "emotionally induced" complaints.

When pituitary disease is suspected, further investigation using more sensitive and specific tests is in order. Table 1-1 lists tests helpful in this regard.