
INTERPRETATION OF PEDIATRIC TESTS

A HANDBOOK SYNOPSIS OF PEDIATRIC, FETAL,
AND OBSTETRIC LABORATORY MEDICINE

Jacques Wallich, M.D.

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AND OBSTETRIC LABORATORY MEDICINE**

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The response to *Interpretation of Diagnostic Tests (IDT)* since it was first published more than a decade ago has been most gratifying and stimulating. Recent changes in laboratory medicine and pediatrics make it desirable to have a companion volume to *IDT* whose primary emphasis is on the use and interpretation of tests for diagnosis from intrauterine life through childhood. These changes include:

1. Widespread availability of micromethods, particularly in chemistry, which has made pediatric laboratory tests commonplace; nevertheless, greater limitations exist on the amount and frequency of blood removed in children than in adults
2. New methodologies and techniques such as radioimmunoassays, which are becoming indispensable in the diagnosis of certain conditions (e.g., endocrine diseases)
3. New knowledge and experience in therapeutic drug monitoring
4. Advances in laboratory medicine such as quality control, reference values, and normal ranges, and wider understanding of concepts such as sensitivity, specificity, predictive value, and diagnostic efficiency with the resulting implications in ordering and interpreting laboratory tests
5. Improved understanding and diagnosis of some inherited and metabolic conditions and the possibility of predicting and preventing such diseases by testing amniotic fluid, parents' blood, and so forth; this includes determination of fetal maturity to increase fetal salvage as well as genetic counseling to avoid inherited diseases such as Tay-Sachs or sickle cell disease
6. Recognition of significant differences in reference levels in interpreting laboratory tests at various age periods (e.g., serum alkaline phosphatase) and/or stages of disease (e.g., serologic tests and immunoglobulin levels for diagnosis of infectious diseases in the newborn)
7. Recognition of the need for early diagnosis before the appearance of signs and symptoms (i.e., screening of newborns) and prompt therapy to prevent permanent disability (e.g., PKU, congenital hypothyroidism)
8. Special need for rapid diagnosis in pediatrics; for example, possible sepsis requires prompt culturing from multiple sites (blood, urine, CSF, etc.) even in the absence of any localizing signs
9. Recognition of other inherent differences in choice of tests, sequence of work-up, and diagnostic strategies in pediatric as compared to adult patients
10. Recognition of the usefulness of intrauterine fetal monitoring and amniocentesis in certain situations

In combining pediatric and adult clinical pathology in one volume, I would have risked foregoing many advantages that I have

specifically sought such as pocket size, convenient arrangement of material, low cost, and concise format without excessive or extraneous material. In addition, pediatricians preferred not to have their information diluted in texts oriented toward adults, and internists did not wish to be burdened with tests and data that were primarily pediatric in application.

Tests that have come into use since the third edition of *IDT* have been included and outmoded tests have been omitted (e.g., PBI, cephalin flocculation, thymol turbidity, colloidal gold curve). Several flow charts (algorithms) have been used to illustrate diagnostic strategies in complex situations and to serve as memory assists or to permit an overall view of the direction and intent of the laboratory work-up. New sections have been added that are of particular importance to the pediatrician (e.g., drug excretion in breast milk, fetal monitoring of laboratory tests). Tests and diseases that are not of specific and frequent interest to the pediatrician have not been included. The decision of what to include in each edition was based on pediatric literature, feedback from clinicians, and my personal experience in laboratories in different environments (voluntary hospital, medical school, private laboratory). There will undoubtedly be areas of disagreement with this selection.

In general, I have retained the style of *IDT* and have adhered to the original purposes, organization, and content of material which have been so warmly received. In the preface to the first edition, I wrote: "There is no other single adequate source of information presented in this fashion." This statement is still true today.

J. W.

PREFACE TO INTERPRETATION OF DIAGNOSTIC TESTS, THIRD EDITION

Results of laboratory tests may aid in

- Discovering occult disease
- Preventing irreparable damage (e.g., phenylketonuria)
- Early diagnosis after onset of signs or symptoms
- Differential diagnosis of various possible diseases
- Determining the stage of the disease
- Estimating the activity of the disease
- Detecting the recurrence of disease
- Measuring the effect of therapy
- Genetic counseling in familial conditions
- Medicolegal problems, such as paternity suits

This book is written to help the physician achieve these purposes with the least amount of

- Duplication of tests
- Waste of patient's money
- Overtaxing of laboratory facilities and personnel
- Loss of physician's time
- Confusion caused by the increasing number, variety, and complexity of tests currently available. Some of these tests may be unrequested but performed as part of routine surveys or hospital admission multitest screening.

In order to provide quick reference and maximum availability and usefulness, this handy-sized book features

- Tabular and graphic style of concise presentation
- Emphasis on serial time changes in laboratory findings in various stages of disease
- Omission of rarely performed, irrelevant, esoteric, and outmoded laboratory tests
- Exclusion of discussion of physiologic mechanisms, metabolic pathways, clinical features, and nonlaboratory aspects of disease
- Discussion of only the more important diseases that the physician encounters and should be able to diagnose

This book is not

- An encyclopedic compendium of clinical pathology
- A technical manual
- A substitute for good clinical judgment and basic knowledge of medicine

Deliberately omitted are

- Technical procedures and directions
- Photographs and illustrations of anatomic changes (e.g., blood cells, karyotypes, isotope scans)
- Discussions of quality control
- Selection of a referral laboratory
- Performance of laboratory tests in the clinician's own office
- Bibliographic references, except for the most general reference texts in medicine, hematology, and clinical pathology and for some recent references to specific conditions

The usefulness and need for a book of this style, organization, and content have been increased by such current trends as

The frequent lack of personal assistance, advice, and consultation in large commercial laboratories and hospital departments of clinical pathology, which are often specialized and fragmented as well as impersonal

Greater demand for the physician's time

The development of many new tests

The lack of adequate teaching of laboratory medicine in most medical schools. Faculty and administrators still assume that this essential area of medicine can be learned "intuitively" as it was 20 years ago and that it therefore requires little formal training. This attitude ignores changes in the number and variety of tests now available as well as their increased sophistication and basic value in establishing a diagnosis.

The contents of this book are organized to answer the questions most often posed by physicians when they require assistance from the pathologist. There is no other single adequate source of information presented in this fashion. On the basis of numerous comments I have received, it appears that this book has succeeded in meeting the needs not only of practicing physicians and medical students but also of pathologists, technologists, and other medical personnel. It has been adopted by many schools of nursing and of medical technology, physicians assistant training programs, and medical schools. Such widespread acceptance confirms my original premise in writing this book and is most gratifying.

A perusal of the table of contents and index will quickly show the general organization of the material by type of laboratory test or organ system or certain other categories. In order to maintain a concise format, separate chapters have not been organized for such categories as geriatric periods or for primary psychiatric or dermatologic diseases. A complete index provides maximum access to this information.

Obviously these data are not original but have been adapted from many sources over the years. Only the selection, organization, manner of presentation, and emphasis are original. I have formulated this point of view during 30 years as a clinician and pathologist, viewing with pride the important and growing role of the laboratory but deeply regretting its inadequate utilization.

This book was written to improve laboratory utilization by making it simpler for the physician to select and interpret the most useful laboratory tests for his clinical problems.

J. W.

ACKNOWLEDGMENTS

I thank those colleagues in various parts of the world who shared their clinical and laboratory problems with me. The universal need to convert an ever-expanding mass of raw laboratory data into accessible, clinically usable information has become a matter of increasing significance throughout the medical community and a chief concern of mine in producing this book and in other teaching and research efforts. I am rewarded by numerous instances of friendship, criticism, kindness, and help and by learning far more than I could include in these small volumes.

My thanks to the staff of Little, Brown and Company, especially to Lin Paterson for her encouragement of this and previous projects, Libby Feinblatt Dabrowski for her meticulous work and endurance, and Betty Herr Hallinger, who prepared an outstanding index that adds greatly to the utility of this book.

J. W.

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