
Pediatric Diagnostic Labs for Primary Care: An Evidence-based Approach

Rita Marie John
Editor

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 Springer

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Foreword

This book is written for primary care providers who care for children. The book will meet the need of primary care providers to increase their knowledge of diagnostic labs and how to interpret them. While guidelines have been developed to guide clinicians in ordering diagnostic laboratory tests during a well-child visit, the interpretation of diagnostic labs must be organized. The clinician seeing patients who present with various complaints cannot order tests in a disorganized way. The clinician must rule out the worst-case scenarios and consider which diagnostic laboratory tests will provide the best information to determine the diagnosis.

The ordering of diagnostic laboratory tests and their interpretation was not well taught when I became a nurse practitioner in the late 1970s. Today, many programs have limited time to teach all the different tests and interpret them. This book will fill in that gap and update clinicians who were trained several years ago.

Diagnostic laboratory stewardship involves using the right test for the right patient at the right time (Morjaria & Chapin 2020). The tendency to overutilize diagnostic tests has been well documented in multiple studies, with an estimate that one out of five lab tests is unnecessary (Zhi et al. 2013). Clinicians must understand which test will answer their diagnostic questions. It is important to note that 60% to 70% of medical decisions are based on diagnostic laboratory results (Molinaro et al. 2012). Therefore, understanding the limitation of tests is critical to the proper diagnosis.

Parents have access to diagnostic laboratory tests and get very concerned when they see a result flagged with high and low, even when the result is only .1 over or under the normal value. Carefully explaining the interpretation of the result is key to alleviating anxiety and increasing understanding of the result. Ordering more tests when the results are not significant can lead to over-ordering of diagnostic laboratory tests. The clinician must be able to completely understand the results to explain the results to concerned families.

The format of each chapter is designed to address common presenting complaints in the primary care office. The organization is designed so that the laboratory tests follow an explanation of a variety of diagnoses. The book has 12 chapters, and chapters 2 to 12 are divided by systems. Each of the authors has clinical experience in their section and gives insight into the differential diagnosis and the clinical guidelines if the guidelines are available.

The book's first chapter reviews how to interpret laboratory tests and hopefully increases the reader's understanding of what false-negative or false-positive results mean. The molecular panels can be very helpful in diagnosing infectious diseases. Still, the clinician must understand that ordering diagnostic laboratory tests with a low pretest likelihood may cause diagnostic errors. Baird (2019) pointed out that a low pretest likelihood may increase diagnostic mistakes. Newer and more accurate tests have led to a greater ability to diagnose, but not with absolute certainty (Bindraban et al. 2018). Lippi et al. reported that the rate of inappropriate laboratory tests ranges from 23% to 67%. Therefore, understanding pre- and post-test probability will improve the clinician's diagnostic accuracy.

Chapter 2 reviews the care of pregnant adolescents. Frequently, the primary care provider makes the diagnosis of intrauterine pregnancy. The problems of getting the adolescent involved with proper obstetrical care can depend on insurance and local availability. This chapter gives an insight into the management of pregnant adolescents.

Chapter 3 discusses the care of the newborn. It reviews the interpretation of possible laboratory tests that might be ordered and the importance of newborn screening. Congenital infections are discussed in detail, including the new febrile well-appearing newborn guidelines. Chapter 4 focuses on the well-child and the variety of screening tests that are recommended. There is a discussion regarding the pitfalls of drug screening. Chapter 5 discusses point-of-care (POC) testing. This chapter includes information on COVID testing as well as several common POC tests. POC is a rapidly expanding area, and clinicians must be aware of the availability of point-of-care testing so that patient treatment can be expedited.

Chapter 6 discusses pediatric infectious diseases and the variety of available laboratory tests. Children frequently present to the office with a fever, and a knowledge of infectious diseases diagnostic testing can help pinpoint the child's diagnosis. The limitations and pitfalls of the variety of tests are reviewed to aid the clinician in understanding the results.

Clinicians today have the advantage of genetic diagnostic tests to aid them in determining the cause for the presenting complaint. Many clinicians were trained before the advent of the broad variety of diagnostic genetic tests. The diagnostic potential of the newer technology of genetic tests in pediatric patients allows early timely and specific interventions to improve clinical outcomes. Understanding the limitation of these tests can be very helpful.

Chapter 8 reviews a variety of hematological problems. Chapter 8 reviews a systematic approach to the interpretation of the CBC. The clinician orders hematological tests based on the patient's history, the family history, and the physical exam. The child with anemia may have a problem with another system, such as the gastrointestinal, renal, or endocrine system, or have a rheumatological disorder. Chapters 9–12 review these systems. The reader can improve their knowledge of a variety of laboratory tests.

I hope that the reader will review each chapter utilizing the cases to reinforce the readers. There are boxes of key learning throughout each chapter to reinforce the reader's knowledge. There are several questions with rationales at the end of each chapter for review.

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