The Team-Based Approach to Undiagnosed and Rare Diseases

Robert M. Kliegman, MD*, Barbara E. Ruggeri, MLIS, Molly Marquardt Smith, BA

KEYWORDS

• Undiagnosed or rare diseases • Team approach • Multidisciplinary

KEY POINTS

- Patients with undiagnosed and rare diseases (URDs) are often misdiagnosed.
- A team approach to the appropriate diagnosis of patients with URDs has been successful.
- Parents appreciate the team approach and ability to have the evaluation at one institution.

None of us is as smart as all of us.

—Ancient Japanese Proverb

Patients with URDs may be on a diagnostic odyssey for years or even decades. (See Robert M. Kliegman and colleagues' article, "How Doctors Think Common Diagnostic Errors in Clinical Judgment—Lessons from an Undiagnosed and Rare Disease Program," in this issue.) Many have complex symptoms that do not suggest an obvious diagnosis, whereas a significant number have been misdiagnosed and inappropriately treated for a disease they do not have. The process of diagnosing and appropriately managing URDs is fraught with challenges. Most patients begin the diagnostic odyssey for their complex medical condition under the care of a single physician but eventually seek further evaluation via referrals to multiple individual subspecialists. These referrals may lead to fragmenting of the medical record across various health care systems or even misalignment of diagnostic impressions and evaluation strategies within the same health care system. An additional challenge in pediatrics is that disease progression or developmentally related changes in the patient's physiology, such as the onset of puberty, may alter a patient's phenotype over time. Furthermore, most children, independent of their underlying pathophysiology, undergo developmental changes in their ability to communicate their symptoms, leading to a dynamically evolving understanding of their phenotype. Finally, patients who remain undiagnosed or misdiagnosed for many

Department of Pediatrics, Medical College of Wisconsin, Children's Hospital of Wisconsin, 999 North 92nd Street, Suite C450, Milwaukee, WI 53226, USA
* Corresponding author. Children's Corporate Center, Children's Hospital of Wisconsin, 999 North 92nd Street, Suite C450, Milwaukee, WI 53226
E-mail address: rkliegma@mcw.edu

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years often develop adverse behavioral or psychological reactions to their chronic medical condition or may acquire unintended or unrecognized side effects of inappropriate treatments that complicate the diagnostic evaluation.

Common medical disorders comprise most patient encounters in both general and subspeciality practices. The traditional diagnostic approach of an individual physician taking a history, conducting a physical examination, generating a differential diagnosis, and obtaining any indicated laboratory and imaging studies frequently yields a diagnosis for most patients presenting with common ailments. Undiagnosed diseases may represent atypical or poorly recognized manifestations of a common disease or, as often noted in pediatric patients, the presentation of a rare and often genetic disorder. (See Robert M. Kliegman and colleagues' article, "How Doctors Think Common Diagnostic Errors in Clinical Judgment—Lessons from an Undiagnosed and Rare Disease Program," in this issue.) For the physician who cares for patient after patient with the more common disorders in general practice, the usual response to a patient's complaint is to consider that complaint within the scope of their practice. Uncomplicated disorders, such as the common cold, headaches, asthma, abdominal pain, or constipation, are readily recognized and diagnosed by a single physician familiar with both the patient and the management of common ailments. When a diagnosis fails to fit the usual pattern of disease, however, because of duration, the unanticipated involvement of other organ systems, abnormal responses to therapy, or additional atypical features, the patient may be referred to a specialist. This specialty referral may result in an appropriate diagnosis but may also be subject to the cognitive biases inherent within that medical specialty. Within each specialty, there is often a comfort zone in managing that specialty's organ-specific symptoms; there may be less familiarity when symptoms do not fit. Each practice has an experiential proficiency with the diseases that are highly prevalent within their specialty. In contrast, individual rare disorders have a very low prevalence, and many practitioners may not have ever cared for or even read about patients with rare disorders. (See Robert M. Kliegman and colleagues' article, "How Doctors Think Common Diagnostic Errors in Clinical Judgment—Lessons from an Undiagnosed and Rare Disease Program," in this issue.) Cumulatively, there are too many individual rare disorders for any single practitioner to be aware of, let alone be able to diagnose, without the help of a team. When the traditional approach to medical diagnosis leaves patients undiagnosed, they require a team-based approach exemplified by the Japanese proverb, "None of us is as smart as all of us."

TEAM DYNAMICS

The authors' URD team includes providers from most pediatric subspecialties, including hospitalists, geneticists, radiologists, and pathologists. Other essential health professionals on the team include a medical librarian and an access-coordinating specialist. Each subspecialist brings to the evaluation experience and expertise as both a pediatrician and a subspecialty physician and is instrumental in providing insights into the nuances associated with particular symptoms or the disease processes considered in the differential diagnosis. For example, although arthritis is a criterion in the recently modified Jones criteria for rheumatic fever,[1] the observation that the arthritis is migratory, polyarticular, and exquisitely tender may not be discussed in published articles or textbooks or even in the criteria themselves. Such subtleties are frequently observed, however, in patients with URD, and awareness of these clinical pearls improves the diagnostic process.

The composition of a team is aided in great part by the incorporation of established members whose regular participation in multiple patient case team reviews over time