SIGNS AND SYMPTOMS IN PEDIATRICS

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PREFACE

Some of us thrive on lists. There is something about a list of diagnostic possibilities that satisfies that quest for thoroughness in our compulsive souls. How this list fetish began is unclear, but the "peripheral brains"—the small pocket notebooks crammed with facts—that all medical students carried around may certainly have helped to create the list habit.

Those notebooks have since become obsolete. They are rarely in evidence today. Mine has been replaced by an office file, which is far more capable of holding ever-increasing amounts of information. Without the file I may as well cross the River Styx. When faced with a diagnostic challenge, the file is my refuge. From the file other tributaries arise, clues to solving the diagnostic problems. The other tributaries may comprise journal articles, textbooks, lecture notes, and articles torn from "throw-aways."

What comprises clinical judgment? How do physicians solve diagnostic problems? According to Elstein and colleagues,* the primary factor involved in clinical judgment is *recall*—the ability to conjure up stored information from the deep recesses of the mind. The amount of information that can be stored in the "cerebral files" is astonishing: The storage capacity of the human mind over a lifetime is far greater than that of any modern computer. It is the retrieval of the information that presents the challenge. This is where lists come in. Many times, review of a list of possible causes for a particular sign or symptom may stimulate the necessary recall. This information can then be combined with probability, other signs, clinical appearance, and so forth to select the most likely cause.

This book is a distillation of lists, designed to help in the retrieval of stored bits of information from the cerebral recesses. For each particular sign

* Elstein AS, Shulman LS, Sprafka SA: Medical Problem Solving: An Analysis of Clinical Reasoning. Cambridge, Harvard University Press, 1978

or symptom, a list of diagnostic possibilities is offered. The reader may then employ his problem-solving skills to arrive at a tenable diagnosis.

Obviously, there are signs and symptoms other than those presented in this book; only the most common ones, interspersed with some seen less frequently, have been included. (My own experience will undoubtedly be evident in some of the lists as well as in the choice of the signs and symptoms included.) At the end of many chapters, a brief listing of textbooks or journal articles that might be of particular assistance is also included.

This book, then, is intended to act as a catalyst. In combination with information obtained from the history and physical examination, the list of diagnostic possibilities may encourage a release of that stored knowledge that will help the reader arrive at a definitive diagnosis.

Walter W. Tunnessen, Jr., M.D.

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SECTION 1

GENERAL TOPICS

1

FEVER OF UNDETERMINED ORIGIN

Although fever is a common reason why parents seek medical attention for their children, prolonged fever is a much less frequent complaint. Prolonged fever is generally defined as a temperature of 38.5°C or greater of more than 2 weeks' duration. Fever of undetermined origin (FUO) in this section refers to prolonged fever of undiscernible cause despite careful initial evaluation based on history and physical examination. Some general aspects of FUO are considered first, followed by a list of the most common causes categorized by frequency of occurrence.[1,2]

What temperature is normal? Body temperature depends on many factors, including the time of day, where in the body it is measured, and each person's individual "thermostat setting," and like most other clinical measurements, has a range of normal. With fluctuation associated with the circadian rhythm, body temperature is lowest in early morning and highest in late afternoon. Rectal temperatures are higher than oral temperatures by as much as 0.6°C. Normal rectal temperatures in children may range from 36.2°C (97°F) to 38°C (100.4°F); normal oral temperatures, from 36.0° (96.8°F) to 37.4° (99.3°F). However, although 37.7°C (99.8°F) is quoted as the "normal" rectal temperature, 50% of healthy children may have higher rectal temperatures.

The thermometer is a fairly crude instrument, whose tolerance of error increases at higher temperature levels; nevertheless, it is certainly more accurate than the hand on the forehead. "Low-grade fever," especially as determined by the latter method, occurring in a child every day after school, should be viewed with suspicion: Vigorous physical activity—for example, games such as tag, football, or basketball commonly played on the way home—may temporarily raise body temperature. Temperatures measured too soon after meals may similarly give a false impression of fever. Anxiety can also produce minor temperature elevations. Over-wrapping with clothing may interfere with normal heat escape. Evaluation should rule out these physiologic causes of increased body temperature.

Common causes of prolonged fever in children differ from those in adults. As noted in the study by Pizzo and colleagues,[1] the causes in children over 6 years of age also differ from those in children under 6. Most cases of prolonged fever in children are not due to unusual or esoteric disorders. The majority represent atypical manifestations of common diseases. Similarly,

most children with prolonged fever do not have serious diseases or disorders untreatable by ordinary methods.

Differential diagnosis of FUO may be simplified by the following categorization of possible causes.

I. Infectious Causes (40%)

The leading category of causes of FUO in both the report by Pizzo and colleagues[1] and that of McClung[2] was infectious. The former attributed infectious causes to 52% of 100 children; the latter, to 29%. A combined list of reported disorders from the two studies, ranking the most common first, follows.

- "Viral syndrome"
- Urinary tract infection
- Pneumonia
- Pharyngitis (chronic)
- Sinusitis
- Meningitis
- Streptococcosis (chronic)
- Endocarditis
- Infectious mononucleosis
- Tuberculosis
- Osteomyelitis
- Septicemia
- Tracheobronchitis
- Pulmonary histoplasmosis
- Brucellosis
- Salmonella gastroenteritis
- Malaria
- Peritonsillar abscess
- Generalized herpes simplex
- Typhoid fever

II. Collagen–Vascular Disorders (15%)

- Rheumatoid arthritis
- Systemic lupus erythematosus
- Rheumatic fever
- Henoch-Schönlein syndrome
- Unclassified

III. Neoplastic Disorders (7%)

- Leukemia
- Lymphoma
- Reticulum-cell sarcoma
- Neuroblastoma

IV. Inflammatory Diseases of Bowel (4%)

- Regional enteritis
- Ulcerative colitis

V. Undiagnosed (12%)

Three fourths of the cases of FUO in the two studies were assigned to these five categories; the remainder were sprinkled among a hodge-podge of disorders. Noteworthy, however, was a rather large group of 21 patients labeled "no diagnosis established; evidence of resolving disease" as the probable cause of FUO by McClung. Of these patients, 9 were thought to have repeated upper-respiratory-

tract infection (URI). Whether a child has had repeated URI or back-to-back infections of bacterial or viral cause, this possibility must be considered before an extensive investigation for FUO is undertaken. In 3 other patients, recent infectious hepatitis was the probable cause; in another 2, drug fever; and in 4 more, "streptococcal syndromes."

For those readers who desire further diagnostic stimulation, fuel for roundsmanship, or "I once saw a case of . . . ," the following category is included.

VI. Miscellaneous Causes

Factitious (by either child or parents)
Drug fever
Hepatitis, anicteric or chronic active
Central nervous system fever, an "altered thermostat"
Dehydration due to diabetes insipidus or diabetes mellitus
Salicylate toxicity (chronic)
Abscesses, including retroperitoneal, intracranial, subphrenic, hepatic, and perinephric
Ectodermal dysplasia
Ichthyosis
Familial dysautonomia
Cyclic neutropenia
Familial Mediterranean fever
Hyperthyroidism
Virilizing adrenal hyperplasia
Infantile cortical hyperostosis (Caffey disease)
Allergy
Subdural hematoma
Rat-bite fever
Leptospirosis
Cat-scratch disease
Psittacosis
Sarcoidosis
Diskitis
Dermatomyositis
Periarteritis nodosa
Serum sickness
Other tumors

This list is not complete; however, remember that the great majority of causes of FUO are not unusual, although their presentations may be atypical. In the study by Pizzo and colleagues,[1] the history or physical examination suggested or indicated the final diagnoses in 62 of 100 cases. The pattern, height, or duration of the fever did not relate to the final diagnosis or the severity of disease with any significance, nor did symptoms such as anorexia, fatigue, weight loss, toxic appearance, or response to antipyretics.

Careful re-examination, attention to detail, review of historical information, and, of course, time are the most helpful tools in differential diagnosis of FUO.

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2. McClung HJ: Prolonged fever of unknown origin in children. Am J Dis Child 124:544, 1972

SUGGESTED READING

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Dinarello CA, Wolff SM: Pathogenesis of fever in man. N Engl J Med 298:607, 1978

2

HYPOTHERMIA

Hypothermia refers to the state in which the core body temperature falls below 35°C (95°F). The reduction in temperature reflects a negative balance between heat production and heat loss. The immature infant is especially susceptible to the whims of his environment, but all infants are much more likely to have subnormal body temperatures associated with a number of other insults or derangements ranging from hypoxia and infection to metabolic and endocrinologic problems.

I. Environmental Factors

Hypothermia may occur rather quickly in newborns, especially those delivered in air-conditioned rooms or those exposed to room temperature before amniotic fluids have been dried off. Immature or sick infants must be maintained in a thermoneutral environment, a critical factor in their survival.
Older infants, children, and adults may all become hypothermic when exposed to low wind chill factor or immersion with rapid heat loss.

II. Shock

The body temperature may fall dramatically during states of shock. Dehydration, infection, hemorrhage, intestinal obstruction, and trauma may be precipitating causes.

III. Central Nervous System Insults

Hypothermia may reflect severe insult to the central nervous system, particularly when the temperature central regulating mechanism in the hypothalamic area is involved.

A. Intracranial Hemorrhage or Infarction
B. Trauma (Including Surgical)
C. Severe Birth Asphyxia