

Pediatric Physical Diagnosis for Nurses

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**Pediatric
Physical
Diagnosis
for Nurses**

To the two pediatricians
who have most influenced my
well child care
Dr. Henry K. Silver
and
Dr. Burris Duncan

Mary

To Jim

Marie

Preface

At first glance, the idea of teaching nurses the essentials of physical diagnosis may seem new and perhaps controversial. In 1965, when the authors were students in one of the first Pediatric Nurse Practitioner programs at the University of Colorado, the idea of nurses using stethoscopes, otoscopes, and other instruments traditionally assigned to the physician was heralded with a great deal of skepticism. Many nursing educators feared that, rather than becoming better nurses, these students were rejecting their nursing role in order to be second-rate physicians. It was soon evident that such was not the case, and the term “expanded role of the nurse” began to be accepted for what it really implied—a more thoroughly prepared, more expert nurse-clinician. Nursing had always taught and felt itself responsible for an accurate physical assessment of the patient. Changing from physical assessment to physical diagnosis merely meant increasing the depth of nurses’ observational skill by giving them a more thorough conceptual framework for observation and by adding certain technical skills such as the use of the stethoscope and otoscope. This type of expansion in nursing is not so unusual. When nurses first began taking temperatures and later blood pressure readings (skills which had previously been considered the exclusive prerogative of the physician), these new skills were met with the same ambivalence that we find today as nurses learn the skills of physical diagnosis.

This book, then, provides a detailed guide for the nurse learning the skills of physical diagnosis. It is designed to help any nurse interested in improving her skills of physical assessment. It should be utilized by nurses in hospital settings, public health settings, private clinics, and rural settings, as well as by nurses enrolled in formal education settings such as undergraduate programs, graduate courses, and continuing education programs.

Physical assessment does not begin with inspection. The nurse must have some background knowledge of anatomy and physiology to better understand what she is examining within each section of the body. For this reason, each chapter of the book is divided into a discussion of why an examination of a portion of the body is important, a review of the anatomy, a description of the method to be used in the examination, a description of the instruments to be used, and some discussion of conditions of which the nurse should be aware when examining that particular portion of the body. For easy referral the chapters are listed according to the usual sequence of systems as they occur in a normal physical examination write-up. The student should be able to use the book

as a basic text on physical diagnosis with additional reading in each area for more depth.

It is impossible to individually acknowledge the many people who have influenced the formation of ideas and thoughts for this book. However, the authors do wish to thank our past students who motivated us and prodded us to become more organized and knowledgeable in various aspects of physical diagnosis; our artist, Dorothy Alexander, who faithfully attempted to fulfill our conceptions of how the pictures should look; and our editors at McGraw-Hill, who gently and firmly pushed us to keep moving.

Mary M. Alexander

Marie Scott Brown

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General Approach to the Physical Examination

The physical examination is a tool consisting of certain skills with which the nurse will become proficient by practice. It is a tool that should be used wisely and appropriately. Although the same basic skills and techniques are always used, the system may vary according to the age of the child. For example, the newborn infant does not protest when all his clothing is removed or when he is laid down on the examining table. The examiner can coo at him and make “nonsense” talk in order to watch his responses. The physical examination will usually begin with the feet and finish with the head; then the infant can be returned to his mother’s arms for comfort. A 6- to 8-month-old still may not object to having all his clothes taken off, but he will probably protest on being placed on the isolated examining table. The mother’s lap usually works best for him, and the examiner may want to begin the examination by listening to the child’s chest while he is quiet and then start with the feet, systematically working up to the head. Again, the examiner should not be all business, but should include time for play, for talking to the child, and for getting acquainted. Most 2-year-olds can be very difficult; they do not like to have their clothing removed and usually do not want to be touched by the



Figure 1-1 Child listening to her own heart.

examiner nor want to play. A 2-year-old is frightened and no one, including his mother, seems able to comfort him. The examiner must decide what has to be accomplished, help the child get through the situation as best he can (kicking and biting are not allowed, but crying is), and finish the examination as quickly as possible. The 4- and 5-year-olds are usually delightful to work with. They will gladly remove all clothing (underpants are usually left on for comfort), stand before the examiner, and sit on the examining table or the mother's lap. Whereas the infant is examined while he is lying down, the older child is examined while he is standing or sitting, with little done when he is lying down. (Usually only inspecting the genitalia, palpating the abdomen, and listening to the chest are done in the supine position). A preschooler likes to help, be talked to, listen to his own heart, and usually does not find any of the examination, including ears and mouth, objectionable. In examining the adolescent, however, it is probably best to examine the genitalia last. It is also important to assure the adolescent that all is well (if that is the case) during each part of the examination, especially because bodily concerns are usual in adolescents.

Not only does the physical examination vary with the age of the child, but it varies with the type of physical examination to be performed. A complete physical examination includes using all basic skills and a review of every part of the body, including a complete neurologic examination. The examiner must learn when this is appropriate and when modifications should be used. Certainly any child coming for a well-child visit should have a complete, thorough physical examination. The child who is ill may need a complete physical or just an examination relevant to the complaint. However, the examiner must be careful not to miss important physical findings by taking care of nothing but the presenting complaint. If the child is too ill for the complete examination when the nurse sees him, it is important to make some arrangements for a return visit when this can be done. However, the child who has been in very recently for a complete physical examination does not need another when he comes in with a specific complaint. The nurse must be thorough and methodical in doing the complete physical examination, but she must also know how to adjust the method for the situation and age of the child.

Physical examinations can be done under many conditions, but it is preferable to secure some privacy, the proper equipment, and some time for the nurse and the child to become comfortable in the setting. The atmosphere should be warm, friendly, and unhurried—this may take real effort when the nurse knows she has a full waiting room. The physical examination really begins the minute the child enters the room. The nurse should notice many things while she introduces herself, makes everyone in the room comfortable, and greets the child by name. If the child already appears frightened he should be encouraged to sit on his mother's lap or given his own chair. The child should be allowed to play quietly with some toys while the nurse interviews the mother, thus letting the child adjust gradually to the situation. As the nurse gains confidence in herself, she will become very proficient at completing the history and physical quite rapidly, even though she gives the impression of having plenty of time for both mother and child.

There are certain skills that are important in physical diagnosis, some of which will be new for many nurses, but the cornerstone of physical diagnosis is not a group of esoteric and complex skills; by far the most important thing in physical diagnosis is thoroughness. Every single part of the body must be examined with every applicable method of examination. By the end of the examination, there should be no accessible part of the body which has not been directly inspected and felt by the examiner. Nor should listening, or percussion, be omitted at any point of the examination where it would be helpful. Certainly, the best insurance for thoroughness is a system. Every examiner should adopt a systematic, logical approach to physical examinations. Once the nurse develops such a system, she should adhere to it as rigidly as possible. The examination always begins

with an observation period concerned with the total child—his appearance, his behavior, and his activity. Does he appear to be happy, frightened, ill? Does he seem small or large? Does he have features or characteristics that are particularly striking? What is the general, overall impression the examiner gets from the child?

During the general observation period the nurse must come to a decision on where she will do the examination and if she will have to restrain the child. According to the age, condition of the child, and equipment available, the child may be examined on the examining table, the laps of the nurse and mother, or while standing up. An older child and a young infant can easily be examined on the examining table. The 8- to 15-month-old may be most comfortable on his mother's lap. This can easily be done if the nurse will move her chair in front of the mother's until their knees touch, then the child's buttocks can be supported on the nurse's lap and his head and shoulders on his mother's lap. This provides quite a satisfactory examining table. The nurse may decide during her initial observation that she could use some aid to help during the examinations. Infants will frequently lie quietly if someone will hold a bottle or pacifier in their mouths. Older children may respond to a story or questions about their day, as the nurse begins the physical examination. Some children will hold a doll or stuffed toy or squeeze a toy during the examination. The apprehensive child may quiet down if the nurse does a physical examination on a doll while he watches and helps. If looking in the ears or mouth is particularly upsetting, the nurse may start by examining the mother's ears or mouth while the child watches.

A mirror over the examining table (so long as it is securely fastened) will often quiet the child under 1 year of age, as he watches himself in the mirror. It is much nicer to have a cooperative child and avoid all restraints. But if this is impossible, the nurse must decide how she will restrain the child and if she and the mother can manage or if a third person is needed. Specific ways of restraining will be discussed later.

When doing the physical examination, it is usually best to begin either with the head or the feet and proceed to examine methodically each adjacent part, gradually working up or down to the other end of the child. In this way, one is sure that absolutely nothing has been forgotten. There is an important exception to this rule when working with young children: It is wisest to do those parts of the examination that require a happy cooperative child at the first opportunity; so that if a young baby, for instance, is quiet at the beginning of the examination, the opportunity should be taken to listen to his heart and lungs and to feel his abdomen. The examiner should then return to his usual routine and follow the rest of his system meticulously. A personal preference that seems to the authors to have some usefulness is that a system beginning with the feet and going to the head is most useful in infants and young children, since examination of the ears and throat often results in angry, crying protest,



Figure 1-2 A child doing a physical examination on her doll.

making the rest of the examination difficult. If the examination ends with these items, the mother can quickly comfort the child, and the examiner has already gathered all the important data from the physical examination.

For the older child, however, the more traumatic part of the examination is frequently getting undressed, particularly removing the underpants. In this case, it is often wise to begin with certain tests for neurologic functions, since these resemble games and can be used as rapport-gaining devices. The examination is then begun at the head, since with a good explanation, the ear and throat examination is seldom threatening to a child of 3 years or older. If items of clothing are removed one at a time, the child's confidence will hopefully be gained, and by the time the pants are removed, his fears should be largely resolved. If this procedure is still traumatic, the child should be assured that his pants will be off for a very short time, and that the whole examination will then be finished. Another very helpful device in examining children of this age is to enlist their help in the examination whenever possible. It can make a 4-year-old feel very important if he is allowed to hold the stethoscope for you. He will also be interested in listening to his own heart through it. You can effectively use his own hand to palpate his abdomen (a procedure

which greatly reduces the amount of voluntary guarding, as well as ticklishness encountered in children of this age). Showing him the "flashlight" (otoscope) that you will use and how it turns on and off will often fascinate him, as will a chance to thoroughly investigate the reflex hammer. If the child is exceptionally fearful, it will be wise to take more time in winning his confidence. When there are several children in the family to be examined on one day, it often pays to examine the least fearful child first, giving the others a chance to see just what will happen to them and that it will not be traumatic, and meanwhile letting the first patient feel important by being "first."

Traditionally, there are considered to be four basic methods of physical examination: inspection, palpation, auscultation, and percussion. Other methods of evaluation, such as using the sense of smell and taking specific types of measurement, are also important in certain parts of the examination. Inspection is certainly the most useful of the methods, although it is often the most difficult to learn. This is probably because we are so used to inspecting in everyday life in a rather haphazard manner. The nurse must be constantly on her guard in a physical examination to use her eyes not only for general inspection as we do in everyday life (although the gestalt we receive in this way is important), but also in a more detailed and meticulous fashion, seeing both the whole and each of the minute parts and their relationships. Her background knowledge of what is normal and what constitutes a normal condition is important to her. She must have sufficient knowledge to judge which things are significant and which are not. The vast majority of information will be gained from inspection with the naked eye. For certain parts of the body, however, special instruments, such as the otoscope or ophthalmoscope, will enhance vision.

Palpation generally follows inspection and is, perhaps, less familiar to the nurse. One usually thinks of palpation as meaning the act of touching and feeling, but it must not be forgotten that touch also includes the sense of temperature, vibration, position, and kinesthesia. Different parts of the hands are used for these different sensations. While the fingertips seem to be most discriminating in the area of fine tactile details, the back of the fingers are most sensitive to temperature, and the flat of the palm and fingers perceive vibrations such as cardiac thrills most accurately. All accessible parts of the body should be palpated thoroughly, using both light and deep palpation. Such different qualities as moisture, pulsatility, crepitus, and texture should all be appreciated wherever they are encountered. Information about bones, muscles, glands, masses, organs, vessels, hair, skin, and mucosa can be gained through palpation. Special types of palpation, such as ballottement, will be discussed under the appropriate parts of the examination.

The third method of physical examination is percussion. Basically, percussion is the method of determining the density of various parts of

the body by the sound emitted by these parts when they are struck with the examiner's fingers. They can either be struck directly with the examiner's fingers (direct or immediate percussion), or the examiner may lay the middle finger of one hand flush against the body part to be percussed and then strike this finger with the index or middle finger of his other hand (bimanual, indirect, or mediate percussion). Different densities occur normally in different parts of the body. The terms usually used for these densities from least to most dense are tympany, hyperresonance, resonance, impaired resonance, dullness, and flatness. The sound emitted from gas-filled organs like the intestines or stomach is called tympany, while the sound produced by percussing a bone is said to be flat. Percussion is helpful in discovering unexpected densities, such as a solid mass where there should not be one. Mapping out the borders of certain organs like the heart can also be done by percussion. This is done by gradually comparing the differing densities of the organ one is mapping and the surrounding body tissues.

Auscultation theoretically refers only to sounds transmitted through the stethoscope. This is too narrow a meaning for its use in physical diagnosis, however, since listening with the unaided ear is often equally or even more important. The sound of the child's voice or the pitch of the infant's cry can be of critical importance. Although one first thinks of using the stethoscope to listen to breath and heart sounds, it must not be forgotten that it is equally useful in listening for bruits in the skull or thyroid, or for murmurs in the neck or abdomen.

Smelling, although not traditionally classed with the four methods of physical examination, can be, at times, of great help in evaluating a patient's physical status. Odors from the breath, sputum, vomitus, feces, pus, or urine can be extremely helpful.

Clinical measurements, such as height, weight, head circumference, temperature, pulse, respirations, etc., are quite familiar to the nurse, but their importance must not be overlooked. While the nurse actually may not have to perform the procedures, she is responsible for checking that they have been done and that they are accurate and she must decide whether or not the results are within normal range. Clinical measurements have been universally incorporated into routines because they are extremely important in assessing physical health or illness.

All these techniques are incorporated into a complete, thorough, systematic physical examination. To avoid loss of interest, chilliness, and fatigue in the child, most examinations should be completed within 5 to 10 minutes. The nurse should make positive statements to the child and not allow a choice if there is no choice. The child can be told "Jane, now it is time to take off your clothes," rather than "Jane, will you take off your clothes?" Ideally, all clothing should be removed, but for the uncooperative child, one piece at a time may be removed. An older child may want to have a drape or hospital gown for modesty. The child should be

positioned either on the examining table or the mother's lap, and the nurse must make herself comfortable, either standing beside the table or sitting in front of the mother and child.

Anyone can do one examination in an awkward position, but doing a day full of examinations that way leaves the examiner fatigued and sore. Before beginning, the nurse must get all her equipment ready for use. Depending on the age of the child, she may want to lay out otoscope, stethoscope, reflex hammer, tongue blade, etc., within easy reach or introduce one instrument at a time, showing the child what it is and how it is going to be used. The examiner should begin the examination by moving slowly and avoiding sudden, jerky movements. Be gentle but firm in handling the child and proceed as quickly as possible.

In using all the methods of physical diagnosis, the nurse will gradually become more and more proficient. At the University of Colorado, we teach our students that the most important thing is to be familiar with the normal, and it is the normal which is stressed in this book. However, in order to appreciate the normal, it is frequently necessary to be familiar with the abnormalities if only in order to compare. For this reason, some discussion of common abnormalities is also included. The nurse must remember, however, that her basic responsibility is not one of differential diagnosis. Once she is certain that a condition is abnormal and abnormal to a greater extent than what she can handle then her responsibility is to refer the patient to the physician. Although it may be fun for her to diagnose the exact type of abnormality, this is not necessary and she should not feel it to be her responsibility. For purposes of clarity, the examination is broken down into sections of the body, and under each section where it is appropriate, there will be discussed six basic aspects of the examination: (1) why the child is examined; (2) what to examine: anatomy of area; (3) how to examine; (4) where to examine; (5) what to examine with; and (6) what to examine for.

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SUGGESTED RESOURCES

1 Pamphlets

- "Diagnostic Challenges in Pediatrics," Smith Kline and French Laboratories. (Free)
- "Recommendations for Human Blood Pressure Determination by Sphygmomanometers," American Heart Association. (Free)*
- "Record of Vital Signs," Meade Johnson and Co. (Free)
- "Roche Handbook of Differential Diagnosis," Roche. (Free)
- "Vital Signs Wheel," Meade Johnson and Co. (Free)

2 Films

- "Examination of the Adolescent" (videotape)
 - Black and White, 16 minutes
 - Cost: Free
 - Ross Laboratories
 - Local Detailman
- "Examination of the Uncooperative Child" (videotape)
 - Black and white, 9 minutes
 - Cost: Free
 - Ross Laboratories
 - Local Detailman
- "Measurement of Physical Growth" (videotape)
 - Black and white, 10 minutes
 - Cost: Free
 - Ross Laboratories
 - Local Detailman
- "Physical Examination of the Newborn"
 - Color, 33 minutes
 - Cost: Free
 - The Pfizer Laboratories Film Library
 - 267 West 25th Street
 - New York, New York 10001
- "Physical Examination of the Small Child" (videotape)
 - Black and white, 12 minutes
 - Cost: Free
 - Ross Laboratories
 - Local Detailman
- "Technique of an Effective Examination"
 - Color, 20 minutes
 - Cost: Free
 - Pediatric Basic Film Series
 - Audio-Visual Utilization Center
 - Wayne State University
 - Detroit, Michigan 48202

* Every city has a local chapter.