ZAPOROZHYE STATE MEDICAL UNIVERSITY
DEPARTMENT OF PROPEDEUTICS OF CHILDREN DISEASES

Kyzyma N.V., Ivanko O.G., Krut A.S., Radutnaya E.A.,
Pidkova V.Y., Pashenko I.V., Nedelskaya E.V.

HANDBOOK

"PEDIATRIC STUDENT'S CASE HISTORY AND PECULIARITIES OF PEDIATRIC PHYSICAL EXAMINATION"

FOR THE THIRD-YEAR STUDENTS OF THE MEDICAL FACULTY
(ENGLISH MEDIUM OF INSTRUCTION)

Zaporozhye 2013

Contributors:
Kyzyma N.V.
PhD, associate professor of the Propedeutics of Pediatrics Department, ZSMU
Ivanko O.G.
M.D., Professor and Head of the Propedeutics of Pediatrics Department, ZSMU
Krut A.S.
PhD, associate professor of the Propedeutics of Pediatrics Department, ZSMU
Radutnaya E.A.
PhD, assistant of the Propedeutics of Pediatrics Department, ZSMU
Pidkova V.Y.
PhD, associate professor of the Propedeutics of Pediatrics Department, ZSMU
Pashenko I.V.
PhD, assistant of the Propedeutics of Pediatrics Department, ZSMU
Nedelskaya E.V.
master of the Propedeutics of Pediatrics Department, ZSMU

Автори:

Кизима Н.В. к.мед.н., доц.каф.пропедевтики дитячих хвороб ЗДМУ
Іванько О.Г. д.мед.н., зав.каф. пропедевтики дитячих хвороб ЗДМУ
Круть О.С. к.мед.н., доц.каф.пропедевтики дитячих хвороб ЗДМУ
Радутна О.А. к.мед.н., асистент каф. пропедевтики дитячих хвороб ЗДМУ
Підкова В.Я. к.мед.н., доц.каф.пропедевтики дитячих хвороб ЗДМУ
Пащенко І.В. к.мед.н., асистент каф. пропедевтики дитячих хвороб ЗДМУ
Нєдельська Є.В. магістр каф.пропедевтики дитячих хвороб ЗДМУ

Reviewers:

Head of the Department of faculty pediatric in ZSMU, professor, M.D. **Nedelskaya S.N.**

Professor of hospital pediatrics and children infectious diseases department, M.D. **Reznichenko J.G.**

Pediatric student's case history and peculiarities of Pediatric Physical Examination : handbook for the third-year students of the Medical faculty (English medium of instruction) / N. V. Kyzyma, O. G. Ivanko, A. S. Krut [et al.]. – Zaporizhzhia : [ZSMU], 2013. – 164 p.

The handbook can be used by teachers and students at practical classes and for module control in supervision of patients, as well as for independent work in case of filling in a case history of the patient in the discipline "Propedeutic pediatric".

The textbook contains tables, charts and glossary of medical terms which is required for patient interviewing.

The content of the textbook corresponds to the requirements of "Educational qualification characteristics of the specialist in specialty 7.120101 "General Medicine".

Approved at the meeting of Central Methodical Board
23.05 2013 Protocol No.5

CONTENS

GENERAL APPROACHES TO EXAMINING CHILDREN

Ordinarily the examining sequence follows a head-to-toe direction to provide a general guideline for assessment of each body area in order to minimize omitting segments of the examination. In examining children, this orderly sequence is frequent altered to accommodate the child's developmental needs, a though written recording follows the traditional model. Using developmental and chronologic age as the main criteria for assessing each body system accomplishes sever goals:

1. Minimizes stress and anxiety associated with assessment of various body parts.
2. Fosters a trusting pediatrician-child-parent relationship.
3. Allows for maximum preparation of the child.
4. Preserves the essential security of the parent-child relationship, especially with young children.
5. Maximizes the accuracy and reliability of assessment findings.

Most of the suggestions for performing a physical assessment according to different ages are based on logic and developmental principles. Since no child fits precisely into one age category, the guidelines for positioning, sequence, and preparation must be based on the preliminary assessment made by the physician during the interview of the child's developmental achievements and needs. For example, even when the best approach is used, many toddlers are uncooperative and unable to be consoled for almost all of the physical examination. However, some seem intrigued by the new surroundings and unusual equipment and respond more like preschoolers than like toddlers. Likewise, some early preschoolers may require more of the "security measures" employed with younger children, such as continued mother-child contact, and less of the preparatory measures used

with preschoolers, such as playing with the equipment before and during the actual examination.

Some young children refuse to be examined for a variety of reasons, including fear of medical procedures, fear of separation from parents, and manipulative behavior. Some children may even fear the examiner because of prior physical abuse at home. Each of these situations requires individual attention.

Certain behaviors signal readiness to cooperate, such as the child's willingness to talk to the physician, make eye contract, accept the offered equipment, allow physical touching, smile, or choose to sit on the examining table rather than the parent's lap. Failure to observe these behaviors shows a need to delay the examination until the child "warms up”. Several approaches can be used to facilitate this:

1. Talk to the parent while essentially "ignoring" the child and gradually focus on him or a favorite object, such a doll.

2. Make complimentary remarks about the child's dress or appearance.

3. Tell a funny story or play a simple magic trick.

4. Have a nonthreatening "friend" available, such as a hand puppet to "talk" for the nurse.

5. Allow choices whenever possible, such as "Would you like to sit up on the table or in your mom's lap?"

6. Begin the examination with those activities that can be presented as games, such as tests for the cranial nerves or parts of the Denver Developmental Screen Test (DDST) and end with the more traumatic procedures, such as examining the ears and mouth.

Positioning may also be altered because of physical distress. For example, the child who is having difficulty breathing may not be able to lie down; thus as much of the physical examination as possible should be performed in a

sitting or slightly reclining position or the examination should be completed at another time.

With skill and the child's cooperation, the physical examination should be completed rapidly. The time consideration is important because an adequate initial interview may require as much as an hour, and a developmental screening test may take about 10 to 20 minutes. When combined with an unnecessarily prolonged physical assessment, the child and parent can become exhausted and less cooperative. Establishing one's own systematic sequence of performance for each age-group will greatly enhance one's ability to skillfully and thoroughly execute a complete physical appraisal.

ADAPTING INTERVIEWING TECHNIQUES TO SPECIFIC SITUATIONS

Interviewing patients may precipitate several behaviors and situations that seem particularly vexing or perplexing. Your skill at handling these situations will evolve throughout your career. Always remember the importance of listening to the patient and clarifying the patient's agenda.

The Silent Patient.

Novice interviewers may be uncomfortable with periods of silence and feel obligated to keep the conversation going. Silence has many meanings and many purposes. Patients frequently fall silent for short periods to collect thoughts, remember details, or decide whether they can trust you with certain information. The period of silence usually feels much longer to the clinician than it does to the patient. The clinician should appear attentive and give brief encouragement to continue when appropriate (see facilitative techniques on pp ___-___ and pp. ___-___).

During periods of silence, watch the patient closely for nonverbal cues, such as difficulty controllin emotions. Alternatively, patients with depression or dementia may lose their usual spontaneity of expression, give short answers to questions, then quickly become silent afterwards. You may need to shift your inquiry to the symptoms of depression or begin an exploratory mental status examination At times, silence may be the patient's response to how you are asking questions. Are you asking too many direct questions in rapid sequence? Have you offended the patient in any way, for example, by signs of disapproval or criticism? Have you failed to recognize an overwhelming symptom such as pain, nausea, or dyspnea? If so, you may need to ask the patient directly, "You seem very quiet. Have I done something to upset you?" Finally, some patients are naturally laconic. Be accepting and try asking the patient for su estions about other sources to help you gather more information. With the patient's permission, talking with family members or friends may be worthwhile.

The Talkative Patient.

The garrulous, rambling patient may be just as difficult. Faced with limited time and the need to "get the whole story," you may grow impatient, even exasperated. Although this problem has no perfect solutions, several techniques are helpful. Give the patient free rein for the first 5 or 10 minutes and listen closely to the conversation. Perhaps the patient simply has lacked a good listener and is expressing pent-up concerns. Maybe the patient's style is to tell stories. Does the patient seem obsessively detailed or unduly anxious? Is there a flight of ideas or disorganized thought process that suests a psychosis or confabulation? Try to focus on what seems most important to the patient. Show your interest by asking questions in those areas. Interrupt if you must, but courteously. Remember that part

of your task is to structure the interview. It is acceptable to be directive and set limits when necessary. A brief summary may help you change the subject yet validate any concerns. "Let me make sure that I understand. You've described many concerns. In particular, I heard about two different kinds of pain, one on your left side that goes into your groin and is fairly new, and one in your upper abdomen after you eat that you've had for months. Let's focus just on the side pain first. Can you tell me what it feels like?" Finally, do not show your impatience. If there is no more time, explain the need for a second meeting. Setting a time limit for the next appointment may be helpful. "I know we have much more to talk about. Can you come again next week? We'll have a full hour then."

The Anxious Patient.

Anxiety is a frequent and normal reaction to sickness, treatment, and the health care system itself. For some patients, anxiety is a filter for all their perceptions and reactions; for others it may be part of their illness. Again, watch for nonverbal and verbal cues. Anxious patients may sit tensely, fidgeting with their fingers or clothes. They may sigh frequently, lick dry lips, sweat more than average, or actually tremble. Carotid pulsations may betray a rapid heart rate. Some anxious patients fall silent, unable to speak freely or confide. Others try to cover their feelings with words, busily avoiding their own basic problems. When you detect anxiety, reflect your impression back to the patient and encourage him or her to talk about any underlying concerns. Be careful not to transmit your own anxieties about completin the interview to the patient!

The Crying Patient.

Crying signals strong emotions, ranging from sadness to anger or frustration. If the patient is on the verge of tears, pausing, gentle probing, or responding with empathy

allows the patient to cry. Usually crying is therapeutic, as is your quiet acceptance of the patient's distress or pain. Offer a tissue and wait for the patient to recover. Make a facilitating or supportive remark like "I'm glad that you got that out." Most patients will soon compose themselves and resume their story. Aside from cases of acute grief or loss, it is unusual for crying to escalate and become uncontrollable. Crying makes many people uncomfortable. If this is true for you, as a clinician, you will need to work through your feelings so that you can support patients at these significant times.

The Confusing Patient.

Some patients are confusing because they have multiple symptoms. They seem to have every symptom that you ask about, or "a positive review of systems." Although they may have multiple medical illnesses, a somatization disorder is more likely. With these patients, focus on the meaning or function of the symptom and guide the interview into a psychosocial assessment. There is little profit to exploring each symptom in detail. At other times you may be baffled, frustrated, and confused yourself. The history is vague and difficult to understand, ideas are poorly related to one an other, and language is hard to follow. Even though you word your questions carefully, you cannot seem to get clear answers. The patient's manner of relating to you may also seem peculiar, distant, aloof, or inappropriate. Patients may describe symptoms in bizarre terms: "My fingernails feel too heavy" or "My stomach knots up like a snake." Using various facilitative techniques, try to learn more about the unusual qualities of the symptoms. Perhaps there is a mental status change such as psychosis or delirium, a mental illness such as schizophrenia, or a neurologic disorder. Watch for delirium in acutely ill or intoxicated patients and for demen tia in the elderly. Such patients give

histories that are inconsistent and cannot provide a clear chronology about what has happened. Some may even confabulate to fill in the gaps in their memories.

When you suspect a psychiatric or neurologic disorder, do not spend too much time trying to get a detailed history. You will only tire and frustrate both the patient and yourself. Shift to the mental status examination, focusing on level of consciousness, orientation, and memory. You can work in the initial questions smoothly by asking "When was your last appointment at the clinic? Let's see that was about how long ago?" "Your address now is? and your phone number?" You can check these responses against the chart, assuming that the chart is accurate, or by getting permission to speak with family members or friends and then doing so.

The Angry or Disruptive Patient.

Many patients have reasons to be angry: they are ill, they have suffered a loss, they lack their accustomed control over their own lives, and they feel relatively powerless in the health care system. They may direct this anger toward you. It is possible that hostility toward you is justified were you late for your appointment, inconsiderate, insensitive, or angry yourself? If so, acknowledge the fact and try to make amends. More often, however, patients displace their anger onto the clinician as a reflection of their pain. Accept angry feelings from patients and allow them to express such emotions without getting angry in return. Beware of joining such patients in their hostility toward another provider, the clinic, or the hospital, even when you are privately in sympathy. You can validate their feelings without agreeing with their reasons. "I understand that you felt very frustrated by the long wait and answering the same questions over and over. The complex nature of our health care system can seem very unsupportive when you're not feeling well." After the patient has calmed

down, you can help find steps that will avert such situations in the future. Rational solutions to emotional problems are not always possible, however, and people need time to express and work through their angry feelings. Some angry patients become hostile and disruptive. Few people can disrupt the clinic or emergency department more quickly than patients who are angry, belligerent, or uncontrolled. Before approaching such patients, alert the security staff—as a clinician, you have the right to feel and be safe. It is especially important to stay calm, appear accepting, and avoid being challenging in return. Keep your posture relaxed and nonthreatening and your hands loosely open. At first, do not try to make disruptive patients lower their voices or stop if they are cursing you or the staff. Listen carefully and try to understand what they are saying. Once you have established rapport, gently suest moving to a different location that is not upsetting to other patients or families.

The Patient With a Language Barrier.

Nothing will convince you more surely of the importance of the history than having to do without one. When your patient speaks a different language, make every possible effort to find an interpreter. A few broken words and gestures are no substitute for the full story. The ideal interpreter is a neutral objective person who is familiar with both languages and cultures. Beware of using family members or friends as interpreters—confidentiality may be violated, meanings may be distorted, and transmitted information may be incomplete. Untrained interpreters may try to speed up the interview by telescoping lengthy replies into a few words, losing much of what may be significant detail. As you begin working with the interpreter, establish rapport and review what information would be most useful. Explain that you need the interpreter to translate everything, not to condense or summarize. Make your

questions clear, short, and simple. You can also help the interpreter by outlining your goals for each segment of the history. After going over your plans with the interpreter, arrange the room so that you have easy eye contact and nonverbal communication with the patient. Then speak directly to the patient, asking "How long have you been sick?" rather than "How long has the patient been sick?" Having the interpreter close by keeps you from movin your head back and forth as though you were watching a tennis match! When available, bilingual written questionnaires are invaluable, especially for the Review of Systems. First be sure patients can read in their language; otherwise, ask for help from the interpreter. Some clinical settings have speakerphone translators; use them if there are no better options.

The Patient With Reading Problems.

Before giving written instructions, it is wise to assess the patient's ability to read. Literacy levels are highly variable, and marginal reading skills are more prevalent than commonly believed. People cannot read for many reasons, including language barriers, learning disorders, poor vision, or lack of education. Some people may try to hide their inability to read. Asking about educational level may be helpful but can be misleading. "I understand that this may be difficult to discuss, but do you have any trouble with reading?" Ask the patient to read whatever instructions you have written. Literacy skills may be the reason the patient has not followed through on taking medications or adhered to recommended treatments. Simply handing the patient written material upside-down to see if the patient turns it around may settle the question. Respond sensitively, and remember that illiteracy and lack of intelligence are not synonymous.

The Patient With Impaired Hearing.

Communicating with the deaf presents many of the same challenges as communicating with patients who speak a different language. Even individuals with partial hearing may define themselves as Deaf, a distinct cultural group. Find out the patient's preferred method of communicating. Patients may use American Sign Language, which is a unique language with its own syntax, or various other communication forms combining signs and speech. Thus, communication is often truly crosscultural. Ask when hearing loss occurred relative to the development of speech and other language skills and the kinds of schools that the patient has attended. These questions help you determine whether the patient identifies with the Deaf or the Hearing culture. If the patient prefers sign language, make every effort to find an interpreter and use the principles identified above. Although very time-consuming, handwritten questions and answers may be the only solution, though literacy skills may also be an issue.

When patients have partial hearing impairment or can read lips, face them directly, in good light. Speak at a normal volume and rate, and do not let your voice trail off at the ends of sentences. Avoid covering your mouth or lookin down at papers while speaking. Remember that even the best lip readers comprehend only a percentage of what is said, so having patients repeat what you have said is important. Hearing deficits vary. If the patient has a unilateral hearing loss, sit on the hearing side. If the patient has a hearing aid, find out if he or she is using it. Make sure it is working. Eliminate background noise such as television or hallway conversation as much as possible. Patients who wear glasses should use them so that they can pick up visual cues that will help them understand you better. Written questionnaires are also useful. When closing, supplement any oral instructions with written ones. A person who is hard of hearing may or may

not be aware of the problem, a situation you will have to tactfully address.

The Patient With Impaired Vision.

When meeting with a blind patient, shake hands to establish contact and explain who you are and why you are there. If the room is unfamiliar, orient the patient to the surroundings and report if anyone else is present. Remember to use words whenever you respond to such patients, because postures and gestures are unseen. Encourage visually impaired patients to wear glasses, if available, to ease communication.

The Patient With Limited Intelligence.

Patients of moderately limited intelligence can usually give adequate histories. In fact, you may even overlook their limitations and omit their dysfunction from disability evaluations or give them instructions they cannot understand. If you suspect such problems, pay special attention to the patient's schooling and ability to function indeendently. How far have such patients gone in school? If they didn't finish, why not? What kinds of courses are (were) they taking? How did they do? Have they had any testing done? Are they living alone? Do they get help with any activities, for example, transportation or shopping? The sexual history is equally important and often overlooked. Find out if the patient is sexually active and provide any information needed about pregnancy or sexually transmitted diseases. If you are unsure about the patient's level of intelligence, you can make a smooth transition to the mental status examination and assess simple calculations, vocabulary, memory, and abstract thinking.

For patients with severe mental retardation, you will have to obtain the history from the family or caregivers. Identify the person who accompanies them, but always show interest first in the patient. Establish rapport, make eye contact, and engage in simple conversation. As with children, avoid "talking down" or using affectations of

speech or condescending behavior. The patient, family members, caretakers, or friends will notice and appreciate your respect.

The Poor Historian.

Some patients are totally unable to give their own histories because of age, dementia, or other limitations. Others may be unable to relate certain parts of the history, such as events during a seizure. Under these circumstances, you must try to find a third person who can give you the story. Even when you have a reasonably comprehensive knowledge of the patient, other sources may offer surprising and important information. A spouse, for example, may report significant family strains, depressive symptoms, or drinking habits that the patient has denied.

For patients who are mentally competent, you must obtain their consent before you talk about their health with others. Assure patients that any information he or she has already told you is confidential, and clarify what can be shared. Even if patients can communicate only by facial expressions or gestures, you must maintain confidentiality and elicit their input. It is usually possible to divide the interview into two parts one with the patient alone and the other with both the patient and the second person. Each part has its own value. Remember that data from others are also confidential. The basic principles of interviewing apply to your conversations with relatives or friends. Find a private place to talk. Introduce yourself, state your purpose, inquire how they are feeling under the circumstances, and recognize and acknowledge their concerns. As you listen to their versions of the history, be alert to the quality of their relationship with the patient. It may color their credibility or give you helpful ideas for planning the patient's care. It is also important to establish how they know the patient. For example, when a child is brought in for health care, the accompanying adult may not be the primary or even frequent caregiver, just the most available ride. Always seek out the best-nformed source.

Occasionally, a relative or friend insists on being with the patient during your evaluation. Try to find out why and also the patient's wishes.

The Patient With Personal Problems.

Patients may ask you for advice about personal problems outside the range of their health care. For example, should the patient quit a stressful job, move out of state, or have an abortion? Before responding, explore the different approaches the patient has considered and their pros and cons, whom else they have discussed the problem with, and what supports are available for different choices. Letting the patient talk through the problem with you is usually much more valuable and therapeutic than any answer you could give.

GUIDELINES FOR WORKING WITH AN INTERPRETER

Choose a professional interpreter in preference to a hospital worker, volunteer, or family member. Use the interpreter as a resource for cultural information. Orient the interpreter to the components you plan to cover in the interview; include reminders to translate everything the patient says. Arrange the room so that you and the patient have eye contact and can read each other's nonverbal cues.

Seat the interpreter next to you and allow the interpreter and the patient to establish rapport. Address the patient directly. Reinforce your questions with nonverbal behaviors. Keep sentences short and simple. Focus on the most important concepts to communicate. Verify mutual understanding by asking the patient to repeat back what he or she has heard. Be patient. The interview will take more time and may provide less information.

PHYSICAL ASSESSMENT SKILLS

The traditional four categories of assessment skills include inspection, palpation, percussion, and auscultation. Each involves a set of tools to facilitate its performance, usefulness, and accuracy. Although the trend has been to incorporate more specialized and technical equipment into nursing assessment, the physician is equipped with all of the tools necessary for a fairly comprehensive and detailed physical examination. The use of the senses of sight, smell, hearing, and sometimes taste are necessary for inspection. The hands and fingers are the main tools of palpation and percussion, and the ear can be used for auscultation. Although several specific instruments refine the examination, it is important to remember that few of them can replace the human tools of skill, knowledge, and interpretation.

Inspection (observation)

Inspection is the most valuable, least mechanical and most difficult skill to learn. It involves the use of the senses, primarily vision, to make judgments, comparisons, and decisions. Because inspection is a highly subjective process, it requires skill, repetition, and practice to establish reliable findings for distinguishing among ranges of normal, borderline, and abnormal.

Methods of inspection (observation). One of the keys to competent inspection is the conscious, systematic, and active use of one's senses. As the nurse examines each body part, the visible areas are deliberately inspected for such factors as color, texture, firmness, hygiene, masses, hair distribution, tone, movement, behavior, tension, flaccidity, symmetry, location, position, and temperature. As each of these aspects is observed, it is compared to what constitutes normal anatomy and physiology. Although it is not the nurse's objective to "diagnose" an abnormality by labeling it as a specific disorder, defect, or disease, it is the nurse's responsibility to recognize and record its presence.

Inspection may be combined with specific instruments for better visualization, such as the otoscope for the ear, and with measurements to validate subjective impressions. For example, the physician may observe that the child appears thin for his age; this impression is substantiated by recording height and weight on a growth chart, comparing the values, and judging those measurements in terms of genetic background, previous growth trends, physical status, and nutritional intake. After establishing a thorough data base, the nurse then proceeds to draw conclusions and formulate nursing diagnoses.

Frequently competent inspection involves intangible skills for which no yardstick exists. The most common example relates to measuring emotional state or behavior. An experienced physician may look at a child and know that he is ill without any further assessment. Often, however, the nurse is unable to state specifically what behaviors have led to that conclusion. One way of developing assessment skills is to consciously analyze behaviors, such as appearance, movement, relationships, activity, verbal interaction, mood, and orientation and to record what is observed, not what is interpreted

Palpation

Palpation is primarily the use of touch or the tactile sense to detect both superficial and deeper characteristics of the body. It is combined with inspection, since in many instances it validates a visual impression, such as texture of the skin. Palpation uses touch to assess temperature, position, form, size, consistency, moisture, and movement, such as vibration or pulsation. It is used to examine all accessible parts of the body, such as organs, glands, blood vessels, bones, muscles, hair, skin, and mucosa. A thorough knowledge of anatomy is essential in differentiating palpation of normal body structures from abnormal ones, such as masses.

Methods of palpation. Palpation involves the use of the fingers and hands for

superficial and deep examination of body parts. A general guide to palpating includes using:

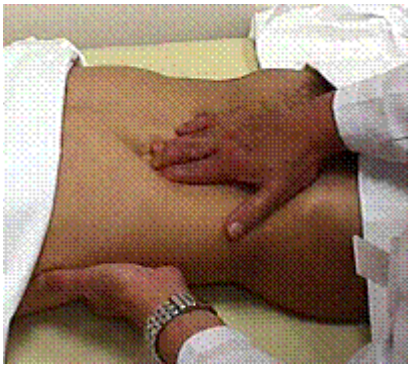
Fingertips for small areas, such as the neck for lymph glands or the infant's skull for fontanels, or when fine tactile discriminations are made, such as texture of the skin.

Fingertips and dorsa (back) of the hands for temperature differences.

Palmar surfaces of the fingers and hand for detecting vibration, such as heart thrills or the point of maximum impulse of the heart on the chest wall/

Grasping action of the fingers to evaluate consistency, position, and size of organs or masses.

When deeper organs are palpated, particularly those in the abdomen, a bimanual maneuver may be used. One hand is placed on the abdomen, and the other hand applies pressure to the first hand. Palpation is done with the cushion and palmar surfaces of the contact hand, not with the fingernails (which should be kept short and trimmed). In small children the distal palmar surfaces of the fingers are directly applied to the skin, and the other hand may or may not be used to apply pressure to the contact hand.



Frequently the nonpalpating hand is placed against the child's back directly underneath the area to be palpated. In this way the organ is "caught" or felt between both hands. The physician should use a bilateral and symmetric approach in order to compare the findings on one side of the body with those on the other side.

For any type of palpation to be effective, but especially for deep palpation of internal organs, the child must be relaxed; otherwise the tense muscles act like a wall between the hand and the organ. To help the child relax:

1. Position him comfortably, such as in a semireclining position in a parent's lap.

2. Warm the hands before touching the skin.

3. Use distraction such as telling stories or talking to the child.

4. Teach the child to use deep breathing and concentrate on an object.

5. Give the infant a bottle or pacifier.

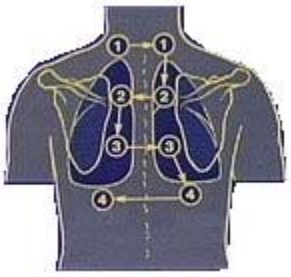
6. Begin with light superficial palpation and gradually progress to deeper palpation.

7. Palpate any tender or painful areas last.

8. Have the child hold the parent's hand and squeeze it if the palpation is uncomfortable.

9. Use the nonpalpating hand to comfort the child, such placing the free hand on the child's shoulder while palpating the abdomen.

Percussion



Percussion is the striking or tapping of the body surface to produce sounds that correlate with the type of underlying tissue density. The principles of percussion are the same as those used to produce sounds in a musical instrument, such as the drum. For example, hollow, air-filled spaces, such as the lungs, create a low-pitched, well-sustained note called ***resonance.*** Dense, solid objects, such as organs or masses, create a high-pitched, short, thudding sound called ***dullness.*** Percussion sounds are described in terms of ***tones*** and ***notes***. Because sounds are difficult to describe in words, practice in percussing different areas of the body and comparing the emitted sounds is fundamental to developing skill and competence.

Lungs percussion

Methods of percussion. Techniques for percussion may be direct or indirect. ***Direct*** percussion is striking or ling the body surface directly with the finger. It

is useful for percussing well-defined areas, such as a bone or the borders of an organ. It is also advantageous for greater accuracy when examining infants or small children, where body organs are in proximity.

In the ***indirect*** method the tapping is performed by striking a stationary finger positioned on the body. Some practitioners prefer this method because there is less perception by the patient of being hit or struck than in the direct approach. Indirect percussion is performed by (1) placing the index or middle finger against the body area to be percussed and (2) using the tip of the middle finger of the other hand to strike the base of the distal phalanx of the nonpercussing finger. No other finger of the nonpercussing hand touches the chest wall. In order for the sound produced to be clear and not damped or muffled, quick, firm, sharp taps are necessary, similar to playing staccato notes on the piano. The physician holds her forearm stationary and delivers the blows by using a loose hinge-joint action of the wrist. An excellent way of practicing correct percussion is by striking keys on a piano. If the blow is not sharp with a quick rebound of the finger, the note will be of a distinctly different sound than one that is staccato-like.

Definition of percussion sounds	
percussion sounds	examples
Tones* Intensity — amplitude or loudness of tone	Loud tones — produced by more hollow, air-filled spaces, such as the lungs Soft tones — produced by more dense or solid masses, such as the heart
Pitch — frequency or number of vibrations per second; the greater the number of vibrations, the higher the pitch; the fewer the number, the lower the pitch	Low-pitched — air-filled lungs High-pitched — consolidated lung
Duration — time period of vibrations and length of time the sound lasts	Long duration — normal lungs Short duration — high-density organ, such as the heart
Quality or timbre — subjective evaluation that depends on the source of the sound	The same musical note from two different instruments produces a different quality or timbre of sound; for example, sounds of equal loudness and pitch from different organs, such as the lungs and heart, produce sounds of varying quality
Notes **Resonance** — clear hollow note, low pitch, long duration, relatively loud (heart with ease) **Tympany** — clear hollow note, higher pitched than resonance, musical with rich overtones (quality), long duration **Hyperresonance** — cross between resonance and tympany; lower pitch than normal resonance, high intensity, and long duration **Dullness** — high-pitched, short duration, soft (low intensity), and thudding **Flatness** — absolute dullness, high-pitched, very short, nonmusical in quality	Normal lungs Tympanic sound can be produced by lightly tapping an air-filled cheek with the finger; similar sound when percussing an airfilled stomach Usually indicates less density, such as increased amount of air or decreased amount of tissue; usually pathologic, such as pneumothorax or asthma Related to increased density and solidity, such as the heart Solid tissue, such as the thigh

*These same terms are used to describe any sound and are used in physical assessment to record auscultatory sounds.

Auscultation

Auscultation is similar to percussion in that it involves evaluation of body sounds. It differs in that it concerns those sounds produced by the body, such as sounds arising from the heart, lungs, and abdomen. The characteristics of auscultatory sounds are the same as those used to describe percussion tones, that is, intensity, pitch, duration, and quality.

Methods of auscultation and types of stethoscopes. As with percussion, the direct or indirect method of listening for sounds can be used. In the ***direct*** method the examiner's ear is applied directly to the body surface. In some instances loud sounds, such as grade VI murmurs or expiratory wheezes, can be heard by placing the ear close to the child, but not directly against the skin. The direct approach has disadvantages in terms of patient modesty, aversion to skin-to-skin contact, or possible infection to the examiner from skin lesions.

Indirect auscultation involves the use of a stethoscope to transmit internal body sounds to the ear. The main types of stethoscopes are the open bell and the closed diaphragm. The ***open-bell,*** or ***Ford, chestpiece*** consists of a short cone or funnel-shaped horn joined to a binaural headset and eartips with flexible tubing. It has the advantage of conducting sounds with virtually no distortion of pitch or timbre and is better for the perception of certain low-pitched sounds, such as diastolic murmurs. However, it must be placed firmly against the body surface for an airtight seal. Normally the diameter of the bell does not exceed 2.5 cm (1 inch). A larger-width bell would not permit a tight seal on bony or small surfaces, thus resulting in admittance of ambient sounds. This restriction in size limits the volume of sound it can accumulate.

The larger, flatter, and less bulky ***closed-diaphragm,*** or ***Bowles, chestpiece*** is sealed by its own diaphragm. These features afford it several advantages. Its larger diaphragm admits a greater quantity of sound and is more sensitive to

high-pitched sounds. The diaphragm filters out and suppresses low-frequency vibrations, so that sounds appear to be of higher pitch than when heard through the bell. The self-sealing diaphragm obviates the need for an airtight skin seal, so that a larger diaphragm is still accurate when placed on a bony or small chest. However, a close-fitting seal is still recommended in order to decrease the admittance of environmental sounds. In infants and small children, especially premature infants, the use of a specially sized pediatric diaphragm is recommended both to achieve sufficient skin contact and to localize sounds in segmented areas of the chest. For example, an adult-size diaphragm almost completely covers the landmarks used to localize heart sounds, whereas a smaller-size diaphragm permits placement of the stethoscope over appropriate thoracic sites, facilitating differentiation of heart sounds.

The length of the flexible tubing may vary considerably without significantly affecting the transmission of sound. A sufficient length is about 50 cm (20 inches). The binaural headset should be light, flexible, and comfortable, and the earpieces should fit snugly to occlude the ear canals and prevent entry of extraneous noise. The ear tubes are inclined anteriorly in order to conform to the natural direction of the auditory canals. If they are positioned incorrectly, they are usually uncomfortable and decrease the perception of transmitted body sounds. The importance of comfortable, closefitting earpieces cannot be overemphasized.

Use of the stethoscope. Using the stethoscope properly involves knowledge of how it works and factors that interfere with its performance. As with percussion, skill requires considerable practice, particularly in listening to normal body sounds. Although descriptions of auscultatory sounds are discussed in examination of the specific body system, general practical measures include the following:

1. Make sure the child is relaxed and not crying, talking, or laughing.

2. Check that the room is a comfortable temperature and as quiet as possible.

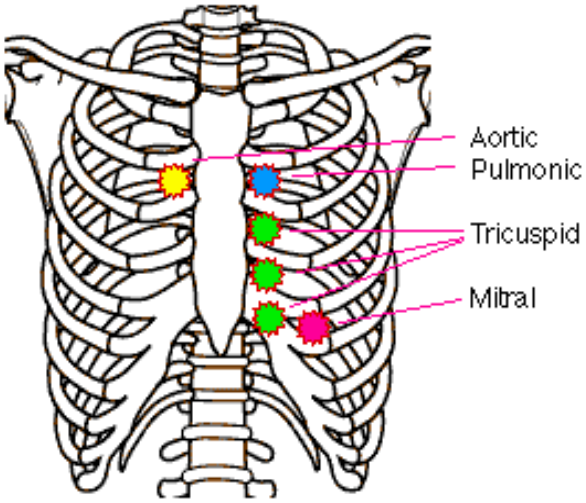
3. Warm the stethoscope before placing it against the skin.

4. Apply firm pressure on the chestpiece but not enough to prevent vibrations and transmission of sound.

5. Avoid placing the stethoscope over hair or clothing, moving it against the skin, breathing on the tubing, or sliding one's fingers over the chestpiece, which may cause sounds that falsely resemble pathologic findings.

Auscultation, like inspection, requires the mental discipline of concentrating on one aspect of many simultaneous stimuli. The physician must consciously listen for one sound, such as breathing, while deliberately disregarding other sounds, such as the heartbeat or environmental noises. This is particularly important in children, whose thin chest wall effectively transmits sounds throughout the thoracic cavity. The physician must also establish a systematic, symmetric approach to auscultation that proceeds from one area of the body to another. Because accurate auscultation requires additional time for the beginning practitioner, it is always thoughtful to explain to parents or older children why one is listening for so long, in order to allay their fears that some abnormality is suspected.

Auscultation of the heart. Auscultation is an art that can be improved upon with practice and determination. The diaphragm of the stethoscope is placed firmly on the chest for high-pitched sounds; a lightly placed bell is optimal for low-pitched sounds. The physician should initially concentrate on the characteristics of the



individual heart sounds and their variation with respirations, and later on murmurs. The patient should be supine, lying quietly, and breathing normally.

Auscultation involves listening for **heart sounds** with the stethoscope. The heart sounds are produced by the opening and closing of the valves and the vibration of blood against the walls of the heart and vessels. Normally two sounds—S_1 and S_2—are heard. The 1st heart sound is best heard at the apex, whereas the 2nd sound should be evaluated at the upper left and right sternal borders. S_1 is caused by the closure of the ***tricuspid*** and ***mitral*** valves. S_2 is the result of the closure of the ***pulmonic*** and ***aortic*** valves). Aortic valve closing occurs slightly before pulmonic valve closing. . Normally the split of the two sounds in S_2 is distinguishable and widens during inspiration, since inspiration prolongs right ventricular filling and delays pulmonic valve closure. "Physiologic splitting" is a significant normal finding that should be elicited. Two other heart sounds—S_3 and S_4—may be produced. S_3 is the result of vibrations produced during ventricular filling. It is normally heard only in some children and young adults, but it is considered abnormal in older individuals. S_4 is caused by the recoil of vibrations between the atria and ventricles following atrial contraction at the end of diastole. It is rarely heard as a normal heart sound; usually it is considered indicative of further cardiac evaluation.

Another important category of heart sounds is ***murmurs,*** which are produced by vibrations within the heart chambers or in the major arteries from the back and forth flow of blood. Murmurs are classified as:

1. Innocent, occurring in individuals with no anatomic or physiologic abnormality.

2. Functional, occurring in individuals with no anatomic cardiac defect but with a physiologic abnormality such as anemia.

3. Organic, occurring in individuals with a cardiac defect with or without a physiologic abnormality.

Sequence of auscultation heart sounds*

Auscultatory site	Chest location	Characteristics of heart sounds
Aortic area	Second right intercostal space close to sternum	S_2 heard louder than S_1; aortic closure heard loudest
Pulmonic area	Second left intercostal space close to sternum	Splitting of S_2 heard best, normally widens on inspiration; pulmonic closure heard best
Erb's point	Second and third left intercostal space close to sternum	Frequent site of innocent murmurs and those of aortic or pulmonic origin
Tricuspid area	Fifth right and left intercostal space close to sternum	S_1 heard as louder sound preceding S_2 (S_1synchronous with carotid pulse)
Mitral or apical area	Fifth intercostal space, left midclavicular line (third to fourth intercostal space and lateral to left midclavicular line in infants)	S_1 heard loudest; splitting of S_1 may be audible because mitral closure is louder than tricuspid closure S_3 heard best at beginning of expiration with child in recumbent or left side-lying position, occurs immediately after S_2, sounds like word "Ken-tuc-ky" S_1- S_2- S_3 S_4 heard best during expiration with child in recumbent position (left side-lying position decreases sound), occurs immediately before S_1, sounds like word "Ten-nes-see" S_4- S_1- S_2
*Use both diaphragm and bell chestpieces when auscultating heart sounds. Bell chestpiece is necessary for low-pitched sounds of murmurs, S_3, and S_4.		

Auscultation of the lung. Auscultation involves using the stethoscope to evaluate breath and voice sounds. In the lungs breath sounds are classified as vesicular or bronchovesicular, bronchial and tracheal.

Voice sounds are also part of auscultation of the lungs. Normally voice sounds or vocal

resonance is heard, but the syllables are indistinct. Both the intencity and quality of sound transmitted through chest piece of the stethoscope are looked for when child is asked to repeat some words (one, two, three) or made to cry.

Characteristics of Breath Sounds

Type	Duration of Sounds	Intensity of Expiratory Sound	Pitch of Expiratory Sound	Locations Where Heard Normally
Vesicular	Inspiratory sounds last longer than expiratory ones.	Soft	Relatively low	Over most of both lungs
Broncho-vesicular	Inspiratory and expiratory sounds are about equal.	Intermedia te	Intermediate	Often in the 1st and 2nd interspaces anteriorly and between the scapulae
Bronchial	Expiratory sounds last longer than	Loud	Relatively high	Over the manubrium, if heard at all
Tracheal	Inspiratory and expiratory sounds are about	Very loud	Relatively high	Over the trachea in the neck

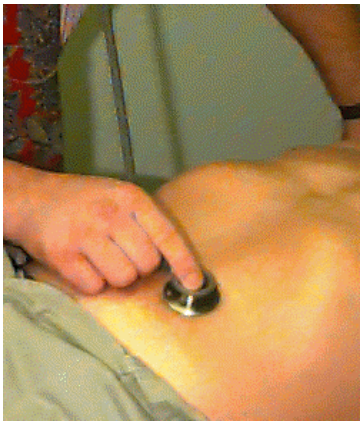
Various pulmonary abnormalities produce ***adventitious sounds*** that are not normally heard over the chest. They occur in addition to normal or abnormal breath sounds.

DISCONTINUOUS SOUNDS (CRACKLES) are intermittent, nonmusical, and brief—like dots in time
Fine crackles are soft, high pitched, and very brief.
Coarse crackles are somewhat louder, lower in pitch, and not quite so brief.
CONTINUOUS SOUNDS are notably longer than crackles—like dashes in

time—but do not necessarily persist throughout the-respiratory cycle. Unlike crackles, they are musical.
Wheezes are relatively high pitched and have a hissing or shrill quality.
Rhonchi are relatively low pitched and have a snoring quality

The other adventitious sound is the ***pleural friction rub***. Inflamed and roughened pleural surfaces grate against each. These movements produce creaking sounds known as a pleural rub. A rub is usually confined to a relatively small area of the chest wall, and typically is heard in both phases of respiration. The most common site for a friction rub to be heard is the lower anterolateral chest wall, the area of greatest thoracic mobility.

Auscultation of the abdomen. Each of the four quadrants should be auscultated using the diaphragm and bell stethoscope. Unlike listening to the heart or lungs, in which the stethoscope rests gently on the skin, to hear bowel sounds the stethoscope must be pressed firmly against the abdominal surface. With the diaphragm stethoscope this usually presents no difficulty, but with the bell stethoscope, especially one with a short cone, the skin may occlude the opening and prevent transmission of sound.



The most important sound to listen for is ***peristalsis,*** or ***bowel sounds,*** which sound like short metallic clicks and gurgles. A sound may be heard every 10 to 30 seconds and its frequency per minute should be recorded (for example, 5 bowel sounds/minute). However, the physician may need to listen for several seconds before audible peristalsis can be heard. Bowel sounds may be stimulated by stroking the abdominal surface with a fingernail. Absent bowel sounds or hyperperistalsis is recorded and reported, since either usually denotes abdominal disorder.

Various other sounds may be heard in the abdominal cavity. Normally the pulsation of the aorta is heard in the epigastrium. Sounds that resemble murmurs (called bruits), hums, or rubs are always referred for further evaluation.

DIAGNOSTIC SKILL

The collection and analysis all available clinical data about a patient including complaints, case history, physical examination as well as results of laboratory and instrumental tests must lead you up to determine the diagnosis.

The diagnosis is the medical conclusion about the clinical case done in scientific definition of concrete disease. Depending on diagnostic conditions like a length of case, sufficiency of information about the patient etc., the following types of diagnosis must be distinguished.

The preliminary or provisional diagnosis (d.provisionalis, lat.) is formed right after admission the patient in hospital or outpatient department. The preliminary (or provisional) diagnosis must be based on a current clinical fact and as a rule should be allowed in first 3 days after admission. The Preliminary diagnosis of suspected disease is required for further development of clinical investigation and initial stages of treatment planning. The Preliminary diagnosis must be changed on definitional diagnosis when the all necessary data about the patient will be obtained.

The conjectural or hypothetical (probable) diagnosis (d.probabilis) means not enough motivated by current available data medical conclusion. It usually requires an acknowledgement in process of long (more than 3 days) patient`s observation (for instance, in case of suspected chest TB). Some times in hospitals they use the question sign (?) after disease`s nomination to confirm hypothetical character of diagnosis (for example, lobar pneumonia?). The

conjectural diagnosis can be distinguished also by following additional types.

The symptomatic diagnosis (d.symptomatica) shows only separate main manifestation of disease (for instance, the anemia, palsy and others).

The syndromatic diagnosis (d.syndromatica) is formed on a base of the most prominent syndrome. The syndrome is a complex of signs and symptoms united by logical intercoupling. The syndromatic diagnosis (for instance, heart failure or delay of psychic development in child, etc) should exist only in conditions of impossibility to determine the concrete disease now.

The information about the type of diagnosis as preliminary, conjectural etc. is very important for medical stuff rending a help for the sick person because it determines case development. In all events it is necessary to strive as quickly as possible to install ***final, clinical, nosological diagnosis***. Such diagnosis implies undertaking the differential diagnostic procedure with other similar diseases and must be confirmed by efficacy of commenced treatment. These sections of diagnostic working up are studied on 4, 5 and 6 courses of the medical faculty. The mastering all stages of diagnostics is the most important component of medical education.

Title page of Pediatric History:

Zaporozhye State Medical University

Propedeutics of Pediatrics Department

STUDENT'S CASE HISTORY

The patient's name, surname_____

Age _____

Diagnosis_____ __

Student_____ _

Group_____

Year of education_____

Teacher_____ _

Date of giving the SCH for checking up_____

Mark_____

Teacher’s signature_____

Date_____

Zaporozhye – 20__

Accurate date and time of examination

_____

*Then use Russian phrases from next part "***Pediatric history questionnaire"**

I. Identifying Data:

1. Patient's name.
2. Age in months and days.
3. Sex (male, female).
4. Date of the admission to the hospital.
5. The diagnosis of the doctor who referred the patient to the hospital

II. Chief Complaints (CC):

Ask the parents or the child about the causes of his (their) visit. First, enumerate complaints, second – ask about the details of the complaints. Be as specific as possible and try to record what the patient or his parents say accurately, without interpretation. How do patient feels? What's patients sleep and appetite?

III. Review of Systems.

IV. History of Present Illness (HPI)
(Anamnesis morbi)

1. Development of the disease is described in chronological order since the moment of it's onset to the moment of examination. The cause of the disease. Development of symptoms: the date of the disease onset (acute or gradual); the first symptoms and signs of the disease; describe duration of remission and the patient's state in this period;
2. Preliminary examination and diagnosis, results of laboratory investigation;

3. Information about medical treatment: its effect.
4. Aim of the patient’s hospitalisation and its way (planned or urgent admission).

V. Past Medical History (PMH)
Anamnesis vitae

Previous infections and somatic diseases (in chronological order). Mark the character of the disease, peculiarity of the clinical characteristic, pay attention to the food and drug intolerance.

Perinatal History:

1.The child was born after I, II,… pregnancy.

2.Obstetric history: maternal age, mother's health during pregnancy; life, job, nutrition condition during pregnancy, term of gestation, and any complications (gestosis, anemia). Labor: length in hours, type: spontaneous, induced (стимулированные). Peculiarity of the delivery: method – natural, forceps (наложение щипцов), breech (ягодичное предлежание плода), cesarean section (кесарево сечение), spontaneous (самопроизвольные), anesthetic (обезболивание). Place of delivery: hospital, home, in transit. Information about previous pregnancies: abortions, their causes, the term of pregnancy when abortion happened. Information about stillborn, early child death in the family and causes of child death.

3.The newborn's condition: specific data include (1) weight and length, head and chest circumferences at birth; (2) loss of weight following delivery; (3) time of regaining birth weight; (4) condition of health immediately after birth, such as quality of cry, level of activity, and color of skin; (5) Apgar score (some mothers may be aware of this); and (6) possible problems, such as fever, convulsions, hemorrhage, snuffle, skin eruptions, desquamation, paralysis, birth injuries, bone deformities or congenital abnormalities, the term of the umbilical cord and healing of the umbilical wound. The

term of the newborn discharging from maternity house. Home-nursing.

Nutrition:

4.Feeding of the newborn. When did the newborn have the first breast feeding, did the newborn have any difficulties during the first breast feeding? Feeding of the infant at first year of life (breast feeding, mixed feeding, artificial feeding). Type of feeding formula used. The term of introduction of solid food, ceasing (wearing) of breast feeding. Feeding of the child at the moment of admission to the hospital.

Developmental History:

5.Characteristics of physical development of the child: weight, height, head, chest circumference gain. The most important previous growth patterns to record are (1) approximate weight at 6 months, 1 year, 2 years, and 3 years of age; (2) approximate length at 1 and 3 years; and (3) dentition, including age of onset, number of teeth, and symptoms during teething.

6.Developmental milestones include: (1) age of holding up head steady, (2) age of sitting alone without support, (3) age of walking without assistance, and (4) age of saying first words with meaning. Mark when the child started to fix the objects by eyes and to smile.

7.Describe the patient’s education: when did he (she) go to kinder-garden (school), about school success, hobbies, free time activities and etc. Child's behaviour in the family, in children’s collective, at school, progress at school.

Immunizations:

8. Information about tuberculin testing, if testing was done, the child's positive or negative intradermal Mantoux reaction should be recorded, date of testing.
9. Information about prophylactic immunization, adverse reactions to vaccination.

Allergies.

Ask about allergic reactions (local or general) on the food, medicine, pollen and dust.

Family history

(To identify the presence of genetic traits or diseases that have familial tendencies and to inform about chronic infections in a family member)

Parents' age, health condition of other members of the family, including children (brothers and sisters) age, health condition. Is there a family history of heart disease, hypertension, cancer, diabetes mellitus, obesity, congenital abnormalities, allergy, asthma, tuberculosis, mental retardation, convulsions, syphilis or other venereal diseases, alcoholism, psychiatric diseases, hepatitis.

Social History:

1. The child's hygienic regime, who takes care after the child, sleep condition, bathing.
2. Family prosperity and living conditions.
3. Parents' working conditions. Free time activities, dietary regimen, and etc.
4. Draw up genealogical tree.

VI. Physical Examination

Status Present Objectives

1. **General condition of the patient** (assess as good, (mild) moderate, severe, life threatening).

According to the Level of consciousness (LOC), Vital Signs: Respiratory rate (RR), blood pressure (BP), pulse (P) and body temperature (T^0).

Patient's position is active, passive, forced, fixed. Behavior (appropriate), mood (good, bad, anxiety, fear, posture, emotional lability, apathy), contact with parents and physician, reaction to examination, the facial expression (calm, excited, dolorosa, lifeless, Hippocratic, masklike, etc.) and general appearance of the child (looks good, alert or ill ever severly).

2. Physical development and its assessment.

Weight (P) in kg, height (L) in cm, circumference of the head (H) in cm. Values for weight, length and head circumference are plotted on a growth charts, and the child's measurements in percentiles are compared to those of the general population.

Parameter	Values for measure	Percentile interval	Assessment of data
Height (length), cm			
Weight, kg			
Head circumference, cm			

Assessment of physical development

The final conclusion: the ***level of physical development*** is good or more less than average, very high, low, etc.; the ***harmony of development*** (correspondence of weight to height). Suspect hypotrophy (for infants), nutritional marasmus or underfeeding or obesity.

3. Developmental Assessment. Delayed abilities for age on developmental screening Denver-test for age less then 7 yr.

4. Nervous system.

Level of consciousness (LOC): alert and oriented to person, place, and time; loss of consciousness (lethargy, confusion, coma).

Examination of the child's head: size, shape, asymmetry, for infants assess anterior fontanel (size, tension (bulging), closed abnormally late or early), sutures, dilated veins, cephalohematoma.

Cranial nerves:

I. (Olfactory N.) – smell;

II. (Optic N.) – vision, visual fields, ocular fundi;

II (Optic N.), III (Oculomotor N.) - papillary reactions;

III (Oculomotor N.), IV (Trochlear N.), VI (Abducens N.) – movements of eyes in respond to movement of object or bright light;

V (Trigeminal N.) – corneal reflexes, facial sensation and jaw movements;

VII (Facial N.) – movements of mimic muscles, sensivity anterior two thirds of tongue;

VIII (Auditory N.) – hearing;

IX (Glossopharyngeal N.), X (Vagus N.) – swallowing and rise of the palate, gag reflex;

XI (Accessory N.) – neck and shoulders movements;

XII (Hypoglossal N.) – movements of tongue.

Cranial Nerve Strategy

I	**Olfactory**	Testable in older children.
II	**Visual acuity**	Use Snellen chart after age 3 years. Test visual fields as for an adult. A parent may need to hold the child's head.
III, IV, VI	**Extraocular movements**	Have the child track a light or an object (a toy is preferable). A parent may need to hold the child's head.
V	**Motor**	Play a game with a soft cotton ball to test sensation. Have the child clench the teeth and chew or swallow some food.
VII	**Facial**	Have the child "make faces" or imitate you as you make faces (including moving your eyebrows), and observe symmetry and facial movements.
VIII	**Acoustic**	Perform auditory testing after age 4 years. Whisper a word or command behind the child's back and have the child repeat it.
IX, X	**Swallow and gag.**	Have the child stick the "whole tongue out" or "say 'ah'." Observe movement of the uvula and soft palate. Test the gag reflex.
XI	**Spinal accessory**	Have the child push your hand away with his head. Have the child shrug his shoulders while you push down

		with your hands to "see how strong you are."
XII	**Hypoglossal**	Ask the child to "stick out your tongue all the way."

Strategies to assess
cranial nerves in newborns and infants

Cranial Nerve	Strategy
I **Olfactory**	Difficult to test
II **Visual acuity**	Have baby regard your face and look for facial response and tracking.
II, III **Response to light**	Darken room, raise baby to sitting position to open eyes. Light and test for optic blink reflex (blinking in response to light). Use the otoscope (without a speculum) to assess papillary responses.
III, IV, VI **Extraocular movements**	Observe tracking as the baby regards your smiling face move side-to-side. Use light if needed.
V **Motor**	Test rooting reflex. Test sucking reflex (watch baby suck breast, bottle, or possibly pacifier).
VII **Facial**	Observe baby crying and smiling, note symmetry of face and forehead.
VIII **Acoustic**	Test acoustic blink reflex (blinking of both eyes in response to loud noise). Observe tracking in response to sound.
IX, X **Swallow. Gag**	Observe coordination during swallowing. Test for gag reflex.
XI **Spinal accessory**	Observe symmetry of shoulders.
XII	Hypoglossal Observe coordination of

Hypoglossal	swallowing, sucking, and tongue thrusting. Pinch nostrils, observe reflex opening of mouth with tip of tongue to midline.

Examination of motor system: 1. posture or gait (describe physiological variants or pathological posture – spasticity, "frog-leg" position, ets; pathological gait – spastic, unilateral paralytic, ataxic, waddling gait). Abnormal unconscious movements, chorea), 2. motor disorders (palsy, paresis), athetosis, tics, tremor.

Muscles: development (shape and contour of the body both in relaxed and tensed state); muscle bulk (hypotrophy, hypertrophy); muscle tone (good, dystonia, hypotonia, hypertonia); muscle strength (good or loss).

Deep tendon reflexes: biceps, triceps, brachioradial, knee and Achilles (symmetric, moderete,brisk or low).

For newborn's and infants assess reflexes – Moro's reflex, tonic neck reflex, stepping reflex, Babinsky'sign, planter reflex, palmar grasp, traction, root reflex, sucking reflex, swallow and gag reflex (reflex is present or not).

Romberg test: stand up steady pose with closed eyes (with minimal weaving).

Babinsky's sign (pyramidal) for children older 2 yr.

Meningeal signs: Brudzinski neck and leg signs, neck rigidity, Kerning's sign (positive or negative).

5. Skin: color (usual for skin type, pale, cyanotic, hyperemic, icteric, dark, etc.), abnormal pigmentation (depigmentation (vitiligo), hypopigmentation, hyperpigmentation); rashes (type, size, colour, distribution,localisation); scars (cause, site, size, shape, colour, connection with underlying tissues, mobility, and etc.); striae; hemorrhagic elementes; hemangiomas; Mongolian (blue), cafe-au-lait spots, etc. Describe the hair (color, thickness, pathological changes,

etc.) and nails (form, color, pathological changes). Palpation: skin temperature, wetness of skin, skin elasticity.

6. Visible mucous membranes and conjunctivae: color, clear or not.

7. Subcutaneous tissue: its development (normal, poor, excessively developed) and distribution (uniform, deposits). Edema (location and distribution). Turgor.

8. Lymph nodes: palpation of lymph nodes (localization and their size in cm if enlarged, their consistence, tenderness, mobility, connection with underlying tissues and skin. You should routinely attempt to palpate suboccipital, pre- and postauricular, anterior cervical, posterior cervical, sub-maxillary, sublinqual, axillary, inguinal lymph nodes.

9. Muscle system characteristics: muscle mass: degree of development (well-muscled, atrophied, etc.), muscle tone, muscle strength.

10. Bone system:

Head: bone shape, symmetry, craniotabes.

Chest: shape, symmetry, Harrison's groove, flatting of the ribs, pigeon chest, funnel chest, shoulder height.

Spine: signs of scoliosis,

Extremities: deformations, symmetry, flatfoot.

Joints: configuration, range of motion (ROM); active and passive, skin over the joints (smooth, freely movable joints with no swelling, full ROM), hip: Ortolani sing; (for infant)

11. Respiratory system

Inspection: cyanosis, finger clubbing, nasal flaring, the type of respiration (thoracic, abdominal, mixed; deep or shallow). Assess respiration rhythm ((regular, irregular, or periodic respiration: Chene-Stoke's, Biot's, respiration). Respiratory rate (per minute); type of dyspnea (inspiratory, expiratory, mixed); the use of

accessory muscles in respiration. Assess the shape and symmetry of the thorax, veins, retractions (intercostal, subcostal), and pulsations. Grunting.

Palpation: Elasticity of the chest (the chest is elastic, elasticity of chest is decreased, the chest is rigid). Pain in the chest wall ("surface" pain) (the chest is painless, pain of the chest wall is localized or non-localized). Vocal fremitus (equally intensive vibrations over the both sides of the chest, or asymmetric decreased, increased on the one site, indicate localization).

Percussion: Comparative percussion of the lungs (clear pulmonary sound or resonance, hyperresonance, tympanic, dullness, flatness). Indicate localization.

Topographic percussion: Assess the lower border of the lungs and describe them according to vertical topographic lines (the lower borders of the lungs are displaced downward or upward on one or on the both sides, the lower border of the lungs is in a form of Damoisean curve); identify the diaphragmatic excursion (respiratory mobility of the lower border of lung along the midaxillary line in cm).

Auscultation: breathing sound (vesicular, bronchial, bronchovesicular, tracheal, amphoric, diminished breath sounds, "mute lungs"). Adventitious respiration sounds (crackles fine and coarse, wheezes, rhonchi, pleural friction rubs). Bronchophony. Indicate localization.

12. Cardiovascular system

Inspection. Presence of the chest deformity in the precordium (if the chest deformity is present, describe them, cardiac "humpback", a precordial bulge to the left of the sternum; a substernal thrust; an apical heave).

Presence of the apex beat (the apex beat is not determined, the apex beat is determined (indicate location by attitude to the left medioclavicular line), a

hyperdynamic precordium, a silent precordium with a barely detectable apical.

Presence of the pathological signs in the precordium: the cardiac beat, the pulsation in the 3^{rd} – 4^{th} interspaces to the left of the sternum, in the 2^{nd} interspaces to the left and to the right of the sternum, in the epigastric region, in the liver region.

Aortic pulsation, peripheral arteries or subcutaneous veins (invisible, visible, indicate location).

Palpation. Assess the apical impulse:

- location (note the interspace(s) that the impulse occupies, and measure its in cm from the left midclavicular line),
- diameter (less than 1-2.5 cm and occupies only one interspace),
- amplitude (it's usually small and feels like a gentle tap, high-amplitude or hyperkinetic, low-amplitude, or hypokinetic),
- strength (middle strength, strong, weak, like a dome).

Presence of the thrills, pulsation of the aorta or pulmonary artery (the epigastric area and the left and right 2^{nd} interspaces), liver pulsation.

Pulse examination. **Pulse** rate, rhythm, symmetry, contour, strength. Comparison of the pulse rate on both hands (bilaterally equal rate and rhythm). Rhythm of the pulse waves (rhythmic, arrhythmic), pulse rate per minute, (pulse satisfactory tension, hard or soft; full or empty; middle size, the large or small, threadlike; quick and high or slow and small).

Percussion. The borders of relative cardiac dullness (right, upper, left).

Auscultation. Assess heart rate for child's age, note rate, rhythm, pitch, intensity, duration, timing in cardiac cycle, quality, location and radiation of S_1 and

S_2, splits, murmurs, clicks, innocent or functional systolic murmurs.

Rhythm (regular, irregular, extrasystolia, fibrillation, etc). The heart sounds (two, three, splitting of the second sound over). The heart rate is ___ per minute (according to the age norm, tachycardia, bradicardia), it should be the same as the radial pulse, pulse deficit.

Character of the heart sounds (clear and distinct, or muffled, diffuse, or distant). The heart sounds intensity is sufficient, or the heart sounds are dull, voiceless, and loud). The first heart sound at the apex is increased, snapping or diminished, the 2^{nd} sound over the aorta is increased or diminished, and the 2^{nd} sound over the pulmonary artery is increased or diminished, or splitted.

Murmurs are not heard, or murmurs should be described as to their intensity, pitch, timing (systolic or diastolic), variation in intensity, time to peak intensity, area of maximal intensity, and radiation to other areas.

Examination of the **blood pressure** (BP):

1. Systolic (SBP); 2. Diastolic (DBP); 3. Pulse pressure (PP)

13. Digestive system and abdominal cavity characteristic

Inspection: the oral cavity: mucosa, throat, tonsils (color - normal, pink, hyperemia, dry or moist, coated tongue, follicles, fissures, geographic tongue); teeth (temporary, permanent, teeth formula, caries).

Shape and size of the abdomen (flat, symmetrical abdomen with no bulges, masses, distention, or diastasis recti; distended abdomen, scaphoid abdomen, board-like abdomen, frog abdomen), visible peristalsis, respiratory movement, umbilical veins, hernia.

Examination of the perianal area (gaping anus, mucosal prolapse of the rectum, fissures of the anus).

Palpation superficial: no masses or areas of tenderness or increased muscular resistance. Soft abdomen, abdominal distension, tense abdomen, "acute”/surgical abdomen, location of painful points.

Deep palpation. Palpation of the large and small intestines. Presence or no organ enlargement (note location, size, consistency, border, tenderness).

Liver palpation: nonpalpable liver or its edge palpable 1-2 cm or more below the right costal margin, its consistency - soft, firm, shape smooth; type of margin - rounded, sharp, tenderness.

Nonpalpable spleen. The tip of the spleen is normally felt during inspiration. It is sometimes palpable 1 to 2 cm below the left costal margin in infants and young children.

Percussion of the abdomen: tympany in all four quadrants, dullness over liver and spleen.

Liver percussion by Kurlov: from the 5^{th} or 7^{th} intercostals space at the right MCL to a point or just below the right costal margin; at the midsternal line, at the left costal margin (note the sizes).

Detect ascites (fluid wave, fluctuation).

Auscultation: intestinal peristalsis, or bowel sounds (loud sound or hyperperistalsis; absence; or normally e.g., 5 bowel sounds per minute)

Stool, its character, color, consistence, pathological admixture, frequency of stool (orange-yellow, pale grey, dark-brown, green, bloody; homogenous, sourish stool, shaped, dryish, foul, starvation stool, dyspeptic stool - loose, watery, in form of discrete flakes, admixture of mucus and blood, bulky, grayish).

14. Urinary system

Inspection of lumbal region, bimanual palpation of kidneys (nonpalpable kidneys or solid, firm, smooth kidneys, if palpable), ***palpation and percussion*** of the urinary bladder (a smooth, elongated fluctuating tumescence is palpated above the symphysis pubis, percussion produces a flat sound above it). Painful points (pain in the lower abdomen, pain in the urethra, bladder pain, low back pain), renal colic. Pasternacky's sign. Pain on urination, frequency, urgency, hematuria, nocturia, polyuria.

15. Endocrine system characteristic.

Disorders of growth (gigantism, nanism), and body weight (malnutrition, obesity), allocation of subcutaneous adipose tissue. Condition of thyroid gland (lobular and isthmus size). Observation of genitals (development of genitals correlate with the age, degree of development of secondary sexual characteristic). Delay or precocious puberty.

16. Laboratory data investigation (complete blood count, urinalysis, coprogram, bacteriologic tests, biochemical examination, ECG, X-ray examination). Assess the laboratory findings. ***Make and write conclusion about every analysis and pathological deviation.***

17. Summary diagnostic conclusion: you should write most likely diagnosis (syndrome or name of disease) according to the patient's complaints, illness history, the findings of physical examination and paraclinical investigation.

PEDIATRIC HISTORY QUESTIONNAIRE

For answers "Pediatric history questionnaire" about **Identifying Data, Chief Compliant, History of Present Illness, Past Medical History** you can use information, medical documents from individual development child's medical card or / and ask child / mother these questions:

I. ПАСПОРТНЫЕ ДАННЫЕ (Identifying Data):

1. Как Вас зовут? Как зовут Вашего ребенка?
2. Когда Вы поступили в отделение больницы?
3. Какой диагноз при поступлении? (you can use «Направление в больницу» from individual development child's medical card).

II. ЖАЛОБЫ ПАЦИЕНТА (Chief Compliant):

На что Вы жалуетесь? Что Вас беспокоит?

III. ОПРОС ЖАЛОБ ПО СИСТЕМАМ ОРГАНОВ (Review Of Organs Systems)

1. Вас беспокоят слабость, вялость?
2. Вы раздражительны, плаксивы?
3. Есть ли у Вас сыпь, зуд, изменения волос и ногтей? Почему эти изменения появились?
4. У Вас есть проблемы со зрением?
5. Есть боль в ушах? Вы слышите хорошо?
6. У Вас болит горло? Вам больно глотать, говорить?
7. Вас беспокоит кашель? Когда (ночью, днем, после физической нагрузки), какой (сухой, влажный, приступообразный, болезненный)?
8. Вы дышите тяжело, громко, со свистом? После чего (стресс, физическая нагрузка, курение, прием лекарств, контакт с аллергеном, респирторная инфекция) возникает «тяжелое» дыхание?
9. В каком положении тела легче дышать?

10. Вы чувствуете или чувствовали боль в груди? Покажите место боли.
11. У Вас были обмороки (faints)?
12. Вас беспокоят сердцебиение и перебои в сердце (palpitation)?
13. Вас беспокоит тошнота, рвота?
14. Сколько раз в день испражнения (stool pass)? Какие испражнения? В испражнениях есть вода, кровь или слизь?
15. У Вас бывают запоры (constipation)?
16. Вас беспокоят боли в животе? Боль появилась остро или появляется периодически? В каком месте? Какая боль: острая, неопределенная? Когда Вы чувствуете боль: после еды (какой), после стресса, во время мочеиспускания (voiding)?
17. Сколько раз в день мочеиспускания? Сколько раз ночью мочеиспускания?
18. Сколько стаканов объем мочи за 1 мочеиспускание, за сутки?
19. Вас беспокоит зуд, боль, гиперемия, выделения (discharge) в области гениталий?
20. Вас беспокоит боль в суставах?
21. Вас беспокоит затруднение движения в суставах?
22. Вас беспокоит боль в костях? Какая? Опишите.
23. Вас беспокоит боль в позвоночнике? Какая? Опишите.
24. Вас беспокоит головная боль? После чего она началась?
25. Вас беспокоят судороги (muscles crumps, spazm)?
26. Вас беспокоят спазмы в мышцах, бесконтрольные движения мышц?
27. У Вас повышенный или пониженный аппетит?
28. Вас беспокоит жажда (thirst)?
29. Вас беспокоит сильная потливость (perspiration)?

IV. АНАМНЕЗ БОЛЕЗНИ (History of Present Illness):

1. Когда у Вас появились жалобы (симптомы болезни) ВПЕРВЫЕ (дата: минут, час, день)?
2. Эти симптомы появились первый раз?
3. Вы обращались за медицинской помощью?
4. Вы получали терапию?
5. Какую терапию Вы получали? (Название лекарства, процедуры. Доза, курс). Ваше состояние улучшилось или ухудшилось за этот период?
6. Что повлияло на динамику Ваших симптомов?
7. Какие новые симптомы появились?
8. Как часто у Вас появляться такие симптомы?
9. Какие факторы способствуют появлению симптомов (обострению болезни)?
10. Какие причины обращения и госпитализации в этот раз?

V. АНАМНЕЗ ЖИЗНИ (Past Medical History):

1. Какие болезни (острые и хронические) были раньше?
2. Какие инфекции (коклюш (pertussis), корь (measles, rubeola), ветряная оспа (chickenpox), паротит (parotitis), краснуха (rubella, German measles), гепатит (hepatitis)) были у ребенка?
3. Пациент лечился в стационаре раньше?
4. Какие операции делали?

Perinatal History:

1. От какой по счету беременности ребенок?
2. Предыдущие беременности благополучные или нет (аборты, смерть новорожденных)?
3. Сколько лет родителям на момент рождения ребенка?
4. Чем болела мама во время беременности (анемия, угроза прерывания беременности, отеки, повышение артериального давления)?
5. Условия жизни и работы беременной были хорошие или плохие?

6. Питание беременной было достаточное?
7. На каком сроке гестации произошли роды?
8. Роды были физиологические или патологические (кесарево сечение, использование ручного пособия, щипцов)?
9. Сколько часов длились роды?
10. Ребенок закричал сразу? Через сколько минут?
11. Оценка состояния по шкале Апгар на 1 и 5 минуте.
12. Какие медицинские манипуляции проводились ребенку (отсасывание слизи из верхних дыхательных путей, «искусственное дыхание», инъекции)?
13. Какого цвета была кожа у младенца?
14. Ребенок был активен?
15. Через какое время после родов ребенка приложили к груди?
16. С каким весом, ростом, окружностью грудной клетки родился ребенок?
17. Была ли (сколько грамм, %) физиологическая потеря массы тела у ребенка? Когда восстановилась масса тела до исходных величин?
18. Как протекал период новорожденности: была ли лихорадка, судороги, геморрагическая, гнойная (какая?) сыпь, желтуха, параличи, воспаление пупочной ранки?

Nutrition:

1. Как долго ребенок получал грудное вскармливание?
2. Были ли проблемы во время кормления грудью?
3. Когда начали использовать прикорм? Какие продукты использовали?
4. Ребенок хорошо усваивал прикорм?
5. Использовали молочные смеси в питании ребенка?
6. Какие молочные смеси использовали? Ребенок хорошо их усваивал?
7. Чем сейчас питается ребенок?

8. Какие показатели веса (кг), роста (см) и окружности головы (см) были у ребенка в грудном возрасте (ежемесячно), в возрасте 2 года, в 3 года. Соответствовали эти показатели возрастным?

Developmental Hystory:

1. В каком возрасте грудной ребенок начал улыбаться спонтанно и когда Вам в ответ?
2. В каком возрасте ребенок начал держать самостоятельно голову, сидеть, ползать, стоять, ходить с поддержкой и самостоятельно?
3. В каком возрасте ребенок начал держать игрушки в руке?
4. В каком возрасте ребенок начал использовать ложку, чашку?
5. В каком возрасте ребенок начал узнавать маму (отца)?
6. В каком возрасте ребенок начал говорить «агу», «А-А-А»; первые слоги «ма», «па», «ба»; первые слова «ма-ма», «па-па», «гав»; первые фразы «ма-ма дай»; первые предложения?

Immunizations: Какие прививки и в каком возрасте ребенок получил?

Allergies:

1. У ребенка была аллергия на пищу (название пищи), лекарства (название лекарства), пыльцу (название растения), пыль?
2. Какие это были симптомы?

Family Hystory:

1. Возраст родителей.
2. Есть ли проблемы со здоровьем в семье? Чем болеют члены семьи?

3. Кто в семье болеет диабетом, эпилепсией, астмой, аллергией, онкологическими болезнями, болезнями сердца, артериальной гипертензией, болезнями почек, туберкулезом?
4. В семье курят, употребляют алкоголь?

Social History:

1. Материальный статус (prosperity) семьи хороший или плохой?
2. У ребенка есть отдельная комната?
3. У ребенка есть личные вещи, игрушки, книги?
4. Ребенок соблюдает режим питания, отдыха и занятий в течение дня?
5. Сколько времени ребенок физически активен?
6. Чем занимается семья в свободное время?
7. Ребенок занимается спортом, музыкой или имеет хобби?

Diagnostic skill of leading symptoms and syndroms

Chest Pain

Chief Complaint: Chest pain.

History of Present Illness: Duration of chest pain, location, character (squeezing, sharp, dull). Progression of pain, frequency, aggravating and relieving factors (inspiration, exertion, eating). Weight loss, fever, cough, dyspnea, vomiting, heartburn, abdominal pain. School function and attendance. Relationship of pain to activity (at rest, during sleep, during exercise). Does the pain interfere with the patient's daily activities? Have favorite sports or other activities continued?

Cardiac Testing: Results of prior evaluations, ECGs, echocardiograms.

Past Medical History: Exercise tolerance, diabetes, asthma, trauma.

Medications: Aspirin.

Family History: Heart disease, myocardial infarction, angina.

Social History: Significant life events, stresses, recent losses or separations. Elicit drugs, smoking.

Physical Examination

General Appearance: Visible pain, apprehension, distress. Note whether the patient looks “ill” or well. Positions that accentuate or relieve the pain.

Vital Signs: Pulse (tachycardia), BP, respirations (tachypnea), temperature. Growth chart and percentiles.

Skin: Cold extremities, pallor.

Chest: Chest wall tenderness. Swelling, trauma, dermatomal lesions, breast development, gynecomastia, xiphoid process tenderness. Crackles, rhonchi, wheeze.

Heart: First and second heart sounds; third heart sound (S3), S4 gallop (more audible in the left lateral position), murmur.

Abdomen: Bowel sounds, tenderness, masses, hepatomegaly, splenomegaly.

Back: Vertebral column deformities, tenderness.

Extremities: Unequal or diminished pulses (aortic coarctation).

Laboratory Evaluation: Electrolyte, CBC, chest X-ray.

Dyspnea and Congestive Heart Failure

Chief Complaint: Shortness of breath.

History of Present Illness: Rate of onset of dyspnea (gradual, sudden), dyspnea on exertion, chest pain. Past episodes, aggravating or relieving factors, cough, fever, drug allergies. Difficulty keeping up with peers during play. Feeding difficulty, tachypnea or diaphoresis with feedings, diminished volume of feeding, prolonged feeding time. Poor weight gain.

Past Medical History: Hypertension, asthma, diabetes.

Medications: Bronchodilators, digoxin, furosemide.

Past Treatment or Testing: Cardiac testing, x-rays, ECGs.

Physical Examination

General Appearance: Respiratory distress, dyspnea, pallor. Note whether the patient looks "ill" or well.

Vital Signs: BP (supine and upright), pulse (tachycardia), temperature, respiratory rate (tachypnea), growth percentiles, growth deficiency.

HEENT: Jugular venous distention.

Chest: Intercostal retractions, dullness to percussion, stridor, wheezing, crackles, rhonchi.

Heart: Lateral displacement of point of maximal impulse, hyperdynamic precordium; irregular, rhythm; S3 gallop, S4, murmur.

Abdomen: Hepatomegaly, liver tenderness, splenomegaly.

Extremities: Cool extremities, edema, pulses, cyanosis, clubbing.

Laboratory Evaluation: O_2 saturation, chest x-ray (cardiomegaly, effusions, pulmonary edema).

Hypertension

Chief Complaint: High blood pressure.

History of Present Illness: Current blood pressure, age of onset of hypertension. Headaches, vomiting (increased intracranial pressure), dysuria, nocturia, enuresis,

abdominal pain (renal disease). Growth delay, weight loss, fevers, diaphoresis, flushing, palpitations (pheochromocytoma).

Perinatal History: Neonatal course, umbilical artery/vein catheterization (renal artery stenosis).

Past Medical History: Lead exposure; increased appetite, hyperactivity, tremors, heat intolerance (hyperthyroidism).

Medications Associated with Hypertension: Oral contraceptives, corticosteroids, cocaine, amphetamines, nonsteroidal antiinflammatory drugs.

Family History: Hypertension, preeclampsia, renal disease, pheochromocytoma.

Social History: Tobacco, alcohol.

Physical Examination

General Appearance: Confusion, agitation (hypertensive encephalopathy).

Vital Signs: Tachycardia (hyperthyroidism), fever (connective tissue disorder). BP in all extremities, pulse, asymmetric, respiratory rate.

Skin: Pallor (renal disease), café au lait spots, hypopigmented lesions (Von Recklinghausen's disease, tuberous sclerosis), lymphedema (Turner's syndrome), rashes (connective tissue disease), striae, hirsutism (Cushing's syndrome), plethora (pheochromocytoma).

HEENT: Papilledema, thyromegaly (hyperthyroidism), moon faces (Cushing's syndrome); webbing of the neck (Turner's syndrome, aortic coarctation).

Chest: Crackles (pulmonary edema), wheeze, intercostal bruits (aortic coarctation); buffalo hump (Cushing's syndrome).

Heart: Delayed radial to femoral pulses (aortic coarctation). Laterally displaced apical impulse (ventricular hypertrophy), murmur.

Abdomen: Bruit below costal margin (renal artery stenosis); Masses (pheochromocytoma, neuroblastoma, Wilms' tumor). pulsating aortic mass (aortic aneurysm), enlarged kidney (polycystic kidney disease, hydronephrosis); costovertebral angle tenderness; truncal obesity (Cushing's syndrome).

Extremities: Edema (renal disease), joint swelling, joint tenderness (connective tissue disease). Tremor (hyperthyroidism, pheochromocytoma), femoral bruits.

Neurologic: Rapid return phase of deep tendon reflexes (hyperthyroidism).

Laboratory Evaluation: Potassium, BUN, creatinine, glucose, uric acid, CBC. UA with microscopic analysis (RBC casts, hematuria, proteinuria). 24 hour urine for metanephrine; plasma catecholamines (pheochromocytoma), lipid profile. Echocardiogram, ECG, renal ultrasound.

Chest X-ray: Cardiomegaly, indentation of aorta (coarctation), rib notching.

Wheezing

Chief Complaint: Wheezing.

History of Present Illness: Onset, duration and progression of wheezing; current and baseline peak flow rate; severity of attack compared to previous episodes; fever, frequency of hospitalizations; home nebulizer use; cough.

Aggravating factors: Exercise, cold air, viral or respiratory infections, exposure to dust mites, animal dander. Seasons that provoke symptoms; foreign body aspiration.

Past Medical History: Previous episodes, pneumonia, recurrent croup, allergic rhinitis, food allergies. Baseline arterial blood gas results; pulmonary function testing.

Perinatal History: Prematurity (bronchopulmonary dysplasia), **Family History:** Asthma, allergies, hay fever, atopic dermatitis.

Physical Examination General Appearance: Respiratory distress, anxiety, pallor. Note whether the patient looks well, ill, or somnolent.

Vital Signs: Peak expiratory flow rate (PEFR). Temperature, respiratory rate (tachypnea), depth of respirations, pulse (tachycardia), BP (widened pulse pressure), pulsus paradoxus (>15 mmHg is significant pulmonary compromise).

Skin: Flexural eczema, urticaria.

Nose: Nasal flaring, chronic rhinitis, nasal polyps.

Mouth: Pharyngeal erythema, perioral cyanosis, grunting.

Chest: Sternocleidomastoid muscle contractions, intracostal retractions,
supraclavicular retractions, barrel chest. Expiratory wheeze, rhonchi, decreased breath sounds, prolonged expiratory phase.

Heart: Distant heart sounds, third heart sound (S3); increased intensity of pulmonic component of second heart sound (pulmonary hypertension).

Abdomen: Retractions, paradoxical abdominal wall motion (abdomen rises on
inspiration), tenderness.

Extremities: Cyanosis, clubbing, edema.

Laboratory Evaluation: CBC, electrolytes. Pulmonary function tests, urinalysis. **ABG:** Respiratory alkalosis, hypoxia.

Chest X-ray: Hyperinflation, flattening of diaphragms; small, elongated heart.

Stridor and Oropharyngeal Obstruction

Chief Complaint: Difficulty breathing.

History of Present Illness: Time of onset of stridor, respiratory distress. Fever, sore throat, headache, malaise. Voice changes (muffled voice), drooling. Hoarseness, exposure to infections. Trauma or previous surgery.

Increased stridor with stress; worsening in the supine position; improvement with the neck extended (congenital laryngomalacia). Cough, cyanosis, regurgitation, choking with feedings, drooling, foreign body. History of intubation (subglottic stenosis), hemangiomas.

Perinatal History: Abnormal position in utero, forceps delivery, shoulder dystocia. Respiratory distress or stridor at birth.

Physical Examination

General Appearance: Adequacy of oxygenation and ventilation, airway stability. Anxiety, restlessness, fatigue, obtundation. Grunting respirations, muffled voice, hoarseness, stridor.

Vital Signs: Respiratory rate, tachypnea, shallow breathing. Pulse oximetry. Tachycardia, fever. Growth percentiles.

Head: Congenital anomalies.

Skin: Perioral cyanosis, nail cyanosis, clubbing.

Nose: Nasal flaring.

Mouth: Bifid uvula, cleft palate. Symmetrical palate movement. Brisk gag reflex,
tonsil symmetry. Tongue symmetry, movement in all directions, masses.

Neck: Masses, external fistulas, mid-line trachea.

Heart: Murmurs, abnormal pulses, asymmetric blood pressures.

Chest: Wall movement and symmetry, retractions, chest diameter, accessory
muscle use (severe obstruction), hyperresonance, wheezes.

Abdomen: Retractions, paradoxical abdominal wall motion (abdomen rises on inspiration), tenderness.
Extremities: Cyanosis, clubbing, edema.

Hoarseness

Chief Complaint: Hoarseness.
History of Present Illness: Age and time of onset, duration of symptoms, rate of onset, respiratory distress. Fever, hemangiomas, sore throat; prolonged loud crying or screaming (vocal chord polyps or nodules). Trauma or previous surgery; exposure to infections, exacerbating or relieving factors.
Perinatal History: Abnormal position in utero, shoulder dystocia, hyperextended neck during delivery (excessive neck traction).Respiratory distress or stridor at birth.
Past Medical History: Intubation (subglottic stenosis); prior episodes of croup, upper respiratory tract infections. Neurologic disorders (hydrocephalus, Arnold-Chiari malformation), trauma, previous surgery.
Physical Examination
General Appearance: Hoarseness, abnormal sounds/posture, muffled voice; hyponasal speech, hypernasal speech, quiet, moist stridor, inspiratory stridor, biphasic stridor; tachypnea.
Vital Signs: Respiratory rate (tachypnea), tachycardia, temperature. Delayed growth parameters.
Mouth: Tongue symmetry, movement in all directions, masses. Cleft lip, cleft palate, bifid uvula, enlarged tonsil(s). Mouth-breathing, grunting, nasal flaring;
Neck: Congenital anomalies; neck mass, masses or external fistulas, mid-line trachea.
Cardiac: Murmurs, asymmetric blood pressures.
Chest: Asymmetric chest expansion, retractions, increased anteroposterior chest diameter; accessory muscle use, abnormal vocal fremitus, wheezes, asymmetric wheezes;

upright posture, neck extended, opisthotonic posture, torticollis.

Extremities: Cyanosis, clubbing.

Fever

Chief Complaint: Fever.

History of Present Illness: Degree of fever; time of onset, pattern of fever; cough, sputum, sore throat, headache, abdominal pain, ear pain, neck stiffness, dysuria; vomiting, rash, night sweats. Diarrhea, bone or joint pain, vaginal discharge.

Past Medical History: Ill contacts. Exposure to mononucleosis; exposure to tuberculosis or hepatitis; tuberculin skin testing; travel history, animal exposure; recent dental procedure.

Medications: Antibiotics, anticonvulsants.

Allergies: Drug allergies.

Family History: Familial Mediterranean fever, streptococcal disease, connec
tive tissue disease.

Social History: Alcohol use, smoking.

Review of Systems: Breaks in the skin (insect bites or stings), weight loss,
growth curve failure. Previous surgery or dental work. Heart murmur, AIDS risk factors.

Physical Examination

General Appearance: Lethargy, toxic appearance. Note whether the patient looks "ill" or well.

Vital Signs: Temperature (fever curve), respiratory rate (tachypnea), pulse (tachycardia). Hypotension (sepsis), hypertension (neuroblastoma, pheochromocytoma). Growth and weight percentiles.

Skin: Rashes, nodules, skin breaks, bruises, pallor. Icterus, splinter hemorrhages; delayed capillary refill, petechia (septic emboli, meningococcemia),

ecthyma gangrenosum (purpuric plaque of Pseudomonas). Pustules,
cellulitis, furuncles, abscesses.

Lymph Nodes: Cervical, supraclavicular, axillary, inguinal adenopathy.

Eyes: Conjunctival erythema, retinal hemorrhages, papilledema.

Ears: Tympanic membrane inflammation, decreased mobility.

Mouth: Periodontitis, sinus tenderness; pharyngeal erythema, exudate.

Neck: Lymphadenopathy, neck rigidity.

Breast: Tenderness, masses, discharge.

Chest: Dullness to percussion, rhonchi, crackles.

Heart: Murmurs (rheumatic fever, endocarditis, myocarditis).

Abdomen: Masses, liver tenderness, hepatomegaly, splenomegaly; right lower quadrant tenderness (appendicitis). Costovertebral angle tenderness, suprapubic tenderness (urinary tract infection).

Extremities: Wounds; IV catheter tenderness (phlebitis) joint or bone tenderness (septic arthritis). Osler's nodes, Janeway's lesions (endocarditis). Clubbing, vertebral tenderness.

Rectal: Perianal skin tags, fissures, anal ulcers (Crohn disease), rectal flocculence, fissures, masses, occult blood.

Pelvic/Genitourinary: Cervical discharge, cervical motion tenderness, adnexal tenderness, adnexal masses, genital herpes lesions.

Cough and Pneumonia

Chief Complaint: Cough

History of Present Illness: Duration of cough, fever. Sputum color, quantity, consistency. Sore throat, rhinorrhea, headache, ear pain; vomiting, chest pain,

hemoptysis. Travel history, exposure to tuberculosis, tuberculin testing. Timing of the cough, frequency of cough; cough characteristics. Dry, "brassy" cough (tracheal or large airway origins). Cough that is most notable when attention is drawn to it (psychogenic cough). Exposure to other persons with cough.

Past Medical History: Previous hospitalizations, prior radiographs. Diabetes, asthma, immunodeficiencies, chronic pulmonary disease.

Medications: Antibiotics

Immunizations: H influenzae, streptococcal immunization.

Allergies: Drug Allergies

Perinatal History: Respiratory distress syndrome, bronchopulmonary dysplasia,
congenital pneumonias.

Psychosocial History: Daycare or school attendance, school absences,
stressors within the family, tobacco smoke.

Family History: Atopy, asthma, cystic fibrosis, tuberculosis, recurrent infections. **Review of Systems:** General state of health; growth and development; feeding history, conjunctivitis, choking, abnormal stools, neuromuscular weakness.

Physical Examination

General Appearance: Respiratory distress, cyanosis, dehydration. Note whether the patient looks “ill” well.

Vital Signs: Temperature (fever), respiratory rate (tachypnea), pulse (tachycar
dia), BP, height and weight percentiles.

Skin: Eczema, urticaria.

Lymph Nodes: Cervical, axillary, inguinal lymphadenopathy

Ears: Tympanic membrane erythema.

Nose: Nasal polyps.

Throat: Pharyngeal cobblestone follicles, pharyngeal erythema, masses, tonsillar enlargement.

Neck: Rigidity, masses, thyroid masses.

Chest: Chest wall deformities, asymmetry, unequal expansion. Increased vocal fremitus, dullness to percussion, wheezing, rhonchi, crackles; bronchial breath sounds with decreased intensity.

Heart: Tachypnea, gallops, murmurs (rheumatic fever, endocarditis, myocarditis).

Abdomen: Hepatomegaly, splenomegaly.

Extremities: Cyanosis, clubbing.

Neurologic: Decreased mental status, gag reflex, muscle tone and strength, swallowing coordination.

Laboratory Evaluation: CBC, electrolytes, BUN, creatinine; O_2 saturation, UA. WBC (>15,000 cells/dL), blood cultures. Sputum or deep tracheal aspirate for Gram's stain and culture. Tuberculin skin test (PPD), cultures and fluorescent antibody techniques for respiratory viruses.

Chest X-ray: Segmental consolidation, air bronchograms, atelectasis, pleural effusion.

Tuberculosis

Chief Complaint: Cough and fever.

History of Present Illness: Tuberculin skin test (PPD) results; duration of cough, sputum, fever, headache. Stiff neck, bone pain, joint pain. Prior treatment for tuberculosis. Exposure to tuberculosis. Chest roentgenogram results. Sputum color, quantity, consistency, hemoptysis. Urban, low-income population, homeless.

Travel History: Travel to South America, Southeast Asia, India.

Past Medical History: Previous pneumonia, previous hospitalizations, prior radiographs, AIDS risk factors. Diabetes, asthma, steroids, immunodeficiencies, chronic pulmonary disease.

Medications: Antihistamines.

Allergies: Drug allergies.

Family History: Source case drug resistance. Tuberculosis, recurrent
infections, chronic lung disease.

Review of Systems: General state of health; growth and development; feeding history, abnormal stools, neuromuscular weakness.

Social History: Daycare or school attendance.

Physical Examination

General Appearance: Respiratory distress. Note whether the patient looks "ill" or well.

Vital Signs: Temperature (fever), respiratory rate (tachypnea), pulse (tachycardia), BP, growth percentiles.

Skin: Rashes, cyanosis, urticaria.

Lymph Nodes: Lymphadenopathy (cervical, supraclavicular, axillary, inguinal). **HEENT:** Tympanic membrane erythema, neck stiffness.

Chest: Increased vocal fremitus. Increased percussion resonance, rhonchi,

crackles, bronchial breath sounds with decreased intensity.

Cardiac: Distant heart sounds, murmur, rub.

Abdomen: Masses, tenderness, hepatomegaly, splenomegaly.

Extremities: Clubbing, edema.

Neurologic: Mental status, muscle tone and strength.

Laboratory Evaluation: CBC, electrolytes, BUN, creatinine; O_2 saturation, liver function tests; UA, early morning gastric aspirate to obtain swallowed sputum for acid-fast bacilli stain and culture. Histological examination of lymph nodes, pleura, liver, bone marrow biopsies.

Chest X-ray: Segmental consolidation, hilar node enlargement, segmental atelectasis.

Ear pain

Chief Complaint: Ear pain.

History of Present Illness: Ear pain, fever, irritability. Degree of fever; time of onset; cough, sore throat, headache, neck stiffness, diarrhea.

Past Medical History: Previous episodes of otitis media, pneumonia, asthma, diabetes, immunosuppression, steroid use.

Allergies: Antibiotics.

Family History: Recurrent ear infections.

Physical Examination

Ears: Bulging, opacified, erythematous tympanic membrane; poor visualization of landmarks, absent light reflex , retraction, decreased mobility with insufflation of air.

Nose: Nasal discharge, erythema.

Throat: Pharyngeal erythema, exudate.

Chest: Breath sounds.

Heart: Rate and rhythm, murmurs.

Abdomen: Tenderness, hepatomegaly.

Laboratory Evaluation: CBC, electrolytes, tympanocentesis.

Pharyngitis

Chief Complaint: Sore throat.

History of Present Illness: Sore throat, fever, cough, irritability, ear pain. Nasal discharge, headache, abdominal pain; prior streptococcal pharyngitis, past streptococcal pharyngitis, scarlet fever, rheumatic fever.

Past Medical History: Previous episodes of otitis media, pneumonia, asthma,
diabetes, immunosuppression.

Allergies: Antibiotics.

Family History: Streptococcal throat infections.

Physical Examination

General Appearance: Note whether the patient appears well or toxic.

Vital Signs: Temperature (fever), pulse, blood pressure, respiratory rate.

Skin: Rash ("sandpaper" feel, scarlet fever).

Lymph Nodes: Tender cervical adenopathy.

Ears: Tympanic membrane erythema, bulging.

Nose: Mucosal erythema.

Throat: Erythema, vesicles, ulcers, soft palate petechiae. Tonsillar exudate.

Mouth: Foul breath.

Abdomen: Tenderness (mesenteric adenitis), hepatomegaly, splenomegaly. **Laboratory Evaluation:** Rapid antigen detection test, throat culture.

Epiglottitis

Chief Complaint: Sore throat.

History of Present Illness: 3 to 7 years of age and an abrupt onset of high fever, severe sore throat,

dysphagia, drooling. Refusal to swallow, drooling; quiet, hoarse voice.

Past Medical History: Immunosuppression.

Medications: Immunosuppressants.

Vaccinations: Haemophilus influenza immunization.

Physical Examination

General Appearance: Inspiratory stridor, "toxic" appearance. Respiratory distress (sitting in tripod posture with neck extended), apprehension.

Chest: Stridor, decreased breath sounds.

Heart: Murmurs.

Abdomen: Tenderness, splenomegaly.

Extremities: Cyanosis.

Laboratory Evaluation: Lateral neck x-rays.

Croup (Viral Laryngotracheobronchitis)

Chief Complaint: Cough.

History of Present Illness: Mild upper respiratory symptoms, followed by sudden onset of a barking cough and hoarseness, often at night.

Past Medical History: Immunosuppression.

Past Medical History: Prematurity, respiratory distress syndrome, bronchopulmonary dysplasia.

Medications: Antibiotics.

Vaccinations: Haemophilus influenza immunization.

Physical Examination

General Appearance: Low-grade fever, non-toxic appearance. Comfortable at rest, barky, seal-like cough. Restlessness, altered mental status.

Vital Signs: Respirations (tachypnea), blood pressure, pulse (tachycardia), temperature (low-grade fever).

Skin: Pallor, cyanosis.

Chest: Inspiratory stridor, tachypnea, retractions, diminished breath sounds.

Abdomen: Retractions, paradoxical abdominal wall motion (abdomen rises on inspiration), tenderness.
Laboratory Evaluation: Anteroposterior neck radiographs: subglottic narrowing, ("steeple sign"); pulse oximetry.
Bronchiolitis
Chief Complaint: Wheezing.
History of Present Illness: Duration of wheezing, cough, mild fever, nasal discharge, congestion. Cold weather months. Oxygen saturation.
Past Medical History: Chronic pulmonary disease (ie, prematurity, bronchopulmonary dysplasia), heart disease, immunocompromise.
Medications: Bronchodilators.
Allergies: Aspirin, food allergies.
Family History: Asthma, hayfever, eczema.
Social History: Exposure to passive cigarette smoke.
Physical Examination
General Appearance: Comfortable appearing, non-toxic.
Vital Signs: Temperature (low-grade fever), respirations, pulse, blood pressure.
Ears: Tympanic membrane erythema.
Nose: Rhinorrhea.
Mouth: Flaring of the nostrils.
Chest: Chest wallretractions, wheezing, fine crackles on inspiration, diminished
air exchange.
Heart: Murmurs.
Abdomen: Paradoxical abdominal wall motion with respiration (ie, abdomen
collapses with each inspiration).
Laboratory Evaluation: CBC, electrolytes, pulse oximetry. Nasopharyngeal
washings for RSV antigen.
Chest X-ray: Hyperinflation, flattened diaphragms, patchy atelectasis.

Meningitis

Chief Complaint: Fever and lethargy.

History of Present Illness: Duration and degree of fever; headache, neck stiffness, cough; lethargy, irritability (high-pitched cry), vomiting, anorexia, rash.

Past Medical History: Pneumonia, otitis media, endocarditis. Diabetes, sickle cell disease; recent upper respiratory infections. Travel history.

Perinatal History: Prematurity, respiratory distress.

Medications: Antibiotics.

Social History: Home situation.

Family History: Exposure to H influenza or neisseria meningitis.

Physical Examination

General Appearance: Level of consciousness; obtundation, labored respirations. Note whether the patient looks "ill," well, or malnourished.

Vital Signs: Temperature (fever), pulse (tachycardia), respiratory rate (tachypnea), BP (hypotension).

Skin: Capillary refill, rashes, petechia, purpura (meningococcemia).

Head: Bulging or sunken fontanelle.

Eyes: Extraocular movements, papilledema, pupil reactivity, icterus.

Neck: Nuchal rigidity. Brudzinski's sign (neck flexion causes hip flexion); Kernig's sign (flexing hip and extending knee elicits resistance).

Chest: Rhonchi, crackles, wheeze.

Heart: Rate of rhythm, murmurs.

Extremities: Splinter hemorrhages (endocarditis).

Neurologic: Altered mental status, weakness, sensory deficits.

Laboratory Evaluation:

CSF Tube 1 -Gram stain, culture and sensitivity, bacterial antigen screen (12 mL). **CSF Tube 2** - Glucose, protein (1-2 mL).

CSF Tube 3 - Cell count and differential (1-2 mL).

Electrolytes, BUN, creatinine. CBC with differential, blood cultures, smears and cultures from purpuric lesions: cultures of stool, urine, joint fluid, abscess;

Urinary Tract Infection

Chief Complaint: Pain with urination.

History of Present Illness: Dysuria, frequency (voiding repeatedly of small amounts), malodorous urine, incontinence; suprapubic pain, low-back pain, fever, chills (pyelonephritis), vomiting, irritability; constipation. Urine culture results (suprapubic aspiration or urethral catheterization).

Past Medical History: Urinary infections.

Age	Signs/Symptoms
Neonate/infant	Hypothermia, hyperthermia, failure to thrive. vomiting, diarrhea, sepsis, irritability, lethargy, jaundice, malodorous urine
Toddler	Abdominal pain, vomiting, diarrhea, constipation, abnormal voiding pattern, malodorous urine, fever, poor growth
School age	Dysuria, frequency, urgency, abdominal pain, incontinence or secondary enuresis, constipation, malodorous urine, fever
Adolescent	Dysuria, frequency, urgency, abdominal

	pain, malodorous urine, fever

Physical Examination

General Appearance: Dehydration, septic appearance. Note whether the patient looks toxic or well.

Vital Signs: Temperature, respiratory rate, pulse, BP.

Chest: Breath sounds.

Heart: Rhythm, murmurs.

Abdomen: Suprapubic tenderness, costovertebral angle tenderness (pyelonephritis), renal mass, nephromegaly. Lower abdominal mass (distended bladder), stool in colon.

Pelvic/Genitourinary: Circumcision, hypospadia, phimosis, foreskin; vaginal discharge.

Laboratory Evaluation: UA with micro, urine Gram stain, urine C&S. CBC with differential, electrolytes. Ultrasound, voiding cystourethrogram,

Lymphadenopathy and Lymphadenitis

Chief Complaint: Swollen lymph nodes.

History of Present Illness: Duration of generalized or regional adenopathy. Fever, pattern, spiking fevers, relapsing fever, rash, arthralgias. Sore throat, nasal discharge, cough, travel history. Animal exposure (cat scratch, kittens). Localized trauma or skin infection, exposure to tuberculosis, blood product exposure. Conjunctivitis, recurrent infections.

Past Medical History: Developmental delay, growth failure.

Social History: Intravenous drug use, high-risk sexual behavior.

Medications: Phenytoin.

Review of Systems: Weight loss, night sweats, bone pain. Pallor, easy bruising.

Physical Examination

General Appearance: Dehydration, septic appearance. Note whether the patient looks toxic or well.

Vital Signs: Temperature (fever), pulse (tachycardia), blood pressure, wide pulse pressure (hyperthyroidism). Growth percentiles.

Lymph Nodes: Generalized or regional adenopathy. Location, size of enlarged lymph nodes; discreteness, mobility, consistency, tenderness, fluctuation. Supraclavicular or posterior triangle lymphadenopathy.

Skin: Lesion in the area(s) drained by affected lymph nodes. Sandpaper rash (scarlet fever), punctums, pustules, splinter hemorrhages (endocarditis), exanthems or enanthems, malar rash (systemic lupus erythematosus).

Eyes: Conjunctivitis, uveitis.

Chest: Breath sounds, wheeze, crackles.

Heart: Rhythm, murmurs.

Abdomen: Tenderness, masses, hepatomegaly splenomegaly.

Extremities: Joint swelling, joint tenderness, extremitylesions, nasopharyngeal masses.

Laboratory Evaluation: Throat culture, EBV, CMV, toxoplasmosis titers, CBC and differential, ESR, PPD. Blood cultures, chest X ray, VDRL. Needle aspiration of the node, after saline infusion, for Gram's stain and acid-fast stains, and culture for aerobes, anaerobes, and mycobacteria. Cat scratch bacillus (Bartonella henselae) titer.

Acute Abdominal Pain and the Acute Abdomen

Chief Complaint: Abdominal pain.

History of Present Illness: Duration of pain, location of pain; characteristics of pain (diffuse, burning, crampy, sharp, dull); constant or intermittent; frequency. Effect of eating, defecation, urination, movement. Characteristics of last bowel movement. Relation to last menstrual period.

Relationship to meals. What does the patient do when the pain occurs? Fever, chills, nausea, vomiting (bilious, undigested food, blood, sore throat, constipation, diarrhea, hematochezia, melena, anorexia, weight loss.

Past Medical History: Diabetes, asthma, prematurity, surgery. Endoscopies, X-rays.

Medications: Aspirin, NSAIDs, narcotics, anticholinergics, laxatives.

Family History. Abdominal pain in family members, peptic ulcer disease, irritable bowel syndrome.

Social History: Recent travel, change in food consumption, drugs or alcohol.

Review of Systems: Growth delay, weight gain, emesis, bloating, distension. Headache, fatigue, weakness, stress- or tension-related symptoms.

Physical Examination

General Appearance: Degree of distress, body positioning to relieve pain, nutritional status. Signs of dehydration, septic appearance.

Vitals: Temperature (fever), pulse (tachycardia), BP (hypertension, hypotension), respiratory rate and pattern (tachypnea).

Skin: Jaundice, petechia, pallor, rashes.

HEENT: Pale conjunctiva, pharyngeal erythema, pus, flat neck veins.

Lymph Nodes: Cervical axillary, periumbilical, inguinal lymphadenopathy, Virchow node (supraclavicular mass).

Abdomen Inspection: Distention, visible peristalsis (small bowel obstruction). **Auscultation:** Absent bowel sounds (late obstruction), high-pitched rushes (early obstruction), bruits.

Palpation: Masses, hepatomegaly, liver texture (smooth, coarse), splenomegaly. Bimanual palpation of flank, nephromegaly. Rebound tenderness, hernias, (inguinal, femoral, umbilical); costovertebral angle tenderness.

Retained fecal material, distended bladder (obstructive uropathy).

Rovsing's Sign: Manual pressure and release at left lower quadrant causes referred pain at McBurney's point (appendicitis).

Percussion: Liver and spleen span, tympany.

Rectal Examination: Impacted stool, masses, tenderness; gross or occult blood. **Perianal Examination:** Fissures, fistulas, hemorrhoids, skin tags, soiling (fecal or urinary incontinence).

Male Genital Examination: Hernias, undescended testes, hypospadias.

Female Genital Examination: Urethra, distal vagina, trauma; imperforate hymen. Pelvic examination in pubertal girls. Cervical discharge, adnexal tenderness, masses, cervical motion tenderness.

Extremities: Edema, digital clubbing.

Neurologic: Observation of the patient moving on and off of the examination table. Gait.

Laboratory Evaluation: CBC, electrolytes, liver function tests, amylase, lipase, UA, pregnancy test.

Chest X-ray: Free air under diaphragm, infiltrates.

Acute Abdomen X-ray Series: Flank stripe, subdiaphragmatic free air, distended loops of bowel, sentinel loop, air fluid levels, calcifications, fecaliths.

Recurrent Abdominal Pain

Chief Complaint: Abdominal pain.

History of Present Illness: Quality of pain (burning, crampy, sharp, dull); location (diffuse or localized). Duration of pain, change in frequency; constant or intermittent. Effect of eating, vomiting, defecation, urination, inspiration, movement and position. Characteristics of bowel movements. Relation to last

menstrual period. Vomiting (bilious, undigested food, blood), constipation, diarrhea, hematochezia, melena; dysuria, hematuria, anorexia, weight loss. Relationship to meals; triggers and relievers of the pain (antacids). Relationship to the menstrual cycle. What does the patient do when the pain occurs? How does it affect activity? School attendance, school stress, school phobia. What fears does the child have? What activities has the child discontinued?

Past Testing: Endoscopies, x-rays, upper GI series.

Past Medical History: Diabetes, asthma, surgery, diabetes, prematurity. Prior treatment for a abdominal pain.

Family History: Abdominal pain in family members, urolithiasis, migraine, peptic ulcer disease, irritable bowel syndrome, hemolytic anemia, chronic pain.

Social History: Recent travel, change in schools, change in water and food consumption, marital discord, recent losses (grandparent, pet), general family function. Review of a typical day, including meals, activities, sleep pattern, school schedule, time of bowel movements; drugs/alcohol, sexual activity, sexual abuse.

Review of Systems: Growth, weight gain, stool pattern, bloating, distension, hematemesis, hematochezia, jaundice. Headache, limb pain, dizziness, fatigue, weakness. Stress- or tension-related symptoms.

Physical Examination

General Appearance: Degree of distress, septic appearance. Note whether the patient looks "ill" or well.

Vitals: Temperature (fever), pulse (tachycardia), BP (hypertension, hypotension), respiratory rate (tachypnea). Growth percentiles, deceleration in growth, weight-for-height.

Skin: Pallor, rashes, nodules, jaundice, purpura, petechia.

HEENT: Pale conjunctiva, scleral icterus.
Lymph Nodes: Cervical, periumbilical, inguinal lymphadenopathy, enlarged supraclavicular node.
Chest: Breath sounds, rhonchi, wheeze.
Heart: Murmurs, distant heart sounds, peripheral pulses.
Abdomen Inspection: Abdominal distention, scars, visible peristalsis. **Auscultation:** Quality and pattern of bowel sounds; high-pitched bowel sounds (partial obstruction), bruits.
Palpation: Palpation while noting the patient's appearance, reaction, and distractibility. Tenderness, rebound, masses, hepatomegaly; liver texture (smooth, coarse), splenomegaly; retained fecal material. Bimanual palpation of flank (nephromegaly), hernias (inguinal, femoral, umbilical); costovertebral angle tenderness.
McBurney's point tenderness: Located two thirds of the way between
umbilicus and anterior superior iliac spine, appendicitis.
Rovsing's sign: Manual pressure and release at left lower quadrant causes referred pain at McBurney's point, appendicitis.
Percussion: Tympany, liver and spleen span by percussion.
Perianal Examination: Fissures, fistulas, hemorrhoids, skin tags, underwear soiling (fecal or urinary incontinence).
Rectal Examination: Impacted stool, masses, tenderness; gross or occult blood. **Male Genital Examination:** Hernias, undescended testes, hypospadias.
Female Genital Examination: Hymeneal ring trauma, imperforate hymen,
urethra, distal vagina. Pelvic examination in pubertal girls. Cervical discharge, adnexal tenderness, masses, cervical motion tenderness.

Extremities: Brachial pulses, femoral pulses, edema. Digital clubbing, loss of nailbed angle (osteoarthropathy).

Neurologic Examination: Observation of the patient moving on and off of the examination table; gait.

Laboratory Evaluation: CBC, electrolytes, BUN, liver function tests, amylase, lipase, UA, pregnancy test.

Chest X-ray: Free air under diaphragm, infiltrates.

X-rays of Abdomen (acute abdomen series): Flank stripe, subdiaphragmatic
free air, distended loops of bowel, air fluid levels, mass effects, calcifications, fecaliths.

Persistent Vomiting

Chief Complaint: Vomiting.

History of Present Illness: Character of emesis (effortless, forceful, projectile, color, food, uncurdled milk, bilious, feculent, blood, coffee ground material); abdominal pain, retching, fever, headache, cough. Jaundice, recent change in medications. Ingestion of spoiled food; exposure to ill contacts. Overfeeding, weight and growth parameters, vigorous hand or finger sucking, maternal polyhydramnios. Wheezing, irritability, apnea. Emesis related to meals; specific foods that induce emesis (food allergy or intolerance to milk, soy, gluten). Pain on swallowing (odynophagia), difficulty swallowing (dysphagia). Diarrhea, constipation. Proper formula preparation, air gulping, postcibal handling. Constant headache, worse with Valsalva maneuver and occurring with morning emesis (increased ICP). Possibility of pregnancy (last menstrual period, contraception, sexual history). Prior X-rays, upper GI series, endoscopy.

Past Medical History: Diabetes, peptic ulcer, CNS disease. Travel, animal or pet exposure.

Medications: Digoxin, theophylline, chemotherapy, anticholinergics, morphine, ergotamines, oral contraceptives, progesterone, erythromycin.

Family History: Migraine headaches.

Physical Examination

General Appearance: Signs of dehydration, septic appearance. Note whether the patient looks "ill" or well.

Vital Signs: BP (hypotension, hypertension), pulse (tachycardia), respiratory rate, temperature (fever). Growth percentiles.

Skin: Pallor, jaundice, flushing, rash.

HEENT: Nystagmus, papilledema; ketone odor on breath (apple odor, diabetic ketoacidosis); jugular venous distention. Bulging fontanelle, papilledema.

Lungs: Wheezes, rhonchi, rales.

Abdomen: Tenderness to percussion, distention, increased bowel sounds, rebound tenderness (peritonitis). Nephromegaly, masses, hepatomegaly, splenomegaly, costovertebral angle tenderness.

Extremities: Edema, cyanosis.

Genitourinary: Adnexal tenderness, uterine enlargement.

Rectal: Perirectal lesions, localized tenderness, masses, occult blood.

Neurologic Examination: Strength, sensation, posture, gait, deep tendon reflexes.

Laboratory Evaluation: CBC, electrolytes, UA, amylase, lipase, LFTs, pregnancy test, abdominal X-ray series.

Hepatosplenomegaly

Chief Complaint: Liver or spleen enlarged.

History of Present Illness: Duration of enlargement of the liver or spleen. Acute or chronic illness, fever,

jaundice, pallor, bruising, weight loss, fatigue, joint pain, joint stiffness. Nutritional history, growth delay. Neurodevelopmental delay or loss of developmental milestones.

Past Medical History: Previous organomegaly, neurologic symptoms. General health.

Perinatal History: Prenatal complications, neonatal jaundice.

Medications: Current and past drugs, anticonvulsants, toxins.

Family History: Storage diseases, metabolicdisorders, hepaticfibrosis, $alpha_1$ antitrypsin deficiency. History of neonatal death.

Social History: Infections, toxin, exposures, drugs or alcohol.

Physical Examination

General Appearance: Wasting, ill appearance, malnutrition.

Vital Signs: Blood pressure, temperature, pulse, respirations. Growth curve.

HEENT: Head size and shape, icterus, cataracts (galactosemia), Kayser-Fleischer rings (Wilson disease). Coarsening of facial features (mucopolysaccharidoses).

Skin: Excoriations, spider angiomas (chronic liver disease, bilary obstruction of the biliary tract); pallor, petechiae, bruising (malignancy, chronic liver disease); erythema nodosum (inflammatory bowel disease, sarcoidosis).

Lymph Nodes: Location and size of lymphadenopathy.

Lungs: Crackles, wheeze, rhonchi.

Abdomen: Distension, prominent superficial veins (portal hypertension), umbilical hernia, bruits. Percussion of flanks for shifting dullness. Liver span by percussion,

hepatomegaly. Liver consistency and texture. Spleen size and texture, splenomegaly.

Perianal: Hemorrhoids (portal hypertension), fissures, skin tags, fistulas (inflammatory bowel disease).

Rectal Exam: Masses, tenderness.

Extremities: Edema, joint tenderness, joint swelling, joint erythema (juvenile rheumatoid arthritis, mucopolysaccharidoses). Clubbing (hypoxia, intestinal disorders, hepatic disorders).

Acute Diarrhea

Chief Complaint: Diarrhea.

History of Present Illness: Duration and frequency, of diarrhea; number of stools per day, characteristics of stools (bloody, mucus, watery, formed, oily, foul odor); fever, abdominal pain or cramps, flatulence, anorexia, vomiting. Season (rotavirus occurs in the winter). Amount of fluid intake and food intake.

Past Medical History: Recent ingestion of spoiled poultry (salmonella), spoiled milk, seafood (shrimp, shellfish; Vibrio parahaemolyticus); common food sources (restaurants), travel history. Ill contacts with diarrhea, sexual exposures.

Family History: Coeliac disease.

Medications Associated with Diarrhea: Magnesium-containing antacids, laxatives, antibiotics.

Immunizations: Rotavirus immunization.

Physical Examination

General Appearance: Signs of dehydration. Note whether the patient looks septic, well, or malnourished.

Vital Signs: BP(hypotension), pulse (tachycardia), respiratory rate, temperature (fever).

Skin: Turgor, delayed capillary refill, jaundice.

HEENT: Dry mucous membranes.

Chest: Breath sounds.

Heart: Rhythm, gallops, murmurs.
Abdomen: Distention, high-pitched rushes, tenderness, splenomegaly, hepatomegaly.
Extremities: Joint swelling, edema.
Rectal: Sphincter tone, guaiac test.
Laboratory Evaluation: Electrolytes, CBC with differential. Gram's stain of stool for leukocytes. Cultures for enteric pathogens, stool for ova and parasites x 3; stool and blood for clostridium difficile toxin; blood cultures.
Stool occult blood. Stool cultures for cholera, E. coli 0157:H7, Yersinia; rotavirus assay.

Chronic Diarrhea

Chief Complaint: Diarrhea.
History of Present Illness: Duration, frequency, and timing of diarrheal episodes. Volume of stool output (number of stools per day). Effect of fasting on diarrhea. Prior dietary manipulations and their effect on stooling. Formula changes, fever, abdominal pain, flatulence, tenesmus (painful urge to defecate), anorexia, vomiting, myalgias, arthralgias, weight loss, rashes.
Stool Appearance: Watery, formed, blood or mucus, oily, foul odor.
Travel history, laxative abuse, inflammatory bowel disease. Sexual exposures, AIDS risk factors. Exacerbation by stress.
Past Medical History: Pattern of stooling from birth. Growth deficiency, weight
gain. Three-day dietary record, ill contacts.
Medications and Substances Associated with Diarrhea: Laxatives, magnesium-containing antacids, cholinergic agents, milk(lactase deficiency), gum (sorbitol).

Family History: Family members with diarrhea, milk intolerance, coeliac disease.

Social History: Water supply, meal preparation, sanitation, pet or animal exposures.

Physical Examination

General Appearance: Signs of dehydration or malnutrition. Septic appearance. Note whether the patient looks "ill," well, or malnourished.

Vital Signs: Growth percentiles, pulse (tachycardia), respiratory rate, temperature (fever), blood pressure (hypertension, neuroblastoma; hypotension, dehydration).

Skin: Turgor, delayed capillary refill, jaundice, pallor (anemia), hair thinning, rashes, erythema nodosum, pyoderma gangrenosum, maculopapular rashes (inflammatory bowel disease), hyperpigmentation (adrenal insufficiency).

Eyes: Bitot spots (vitamin A deficiency), adenopathy.

Mouth: Oral ulcers (Crohn disease, coeliac disease), dry mucous membranes; cheilosis (cracked lips, riboflavin deficiency); glossitis (B12, folate deficiency); oropharyngeal candidiasis (AIDS).

Lymph Nodes: Cervical, axillary, inguinal lymphadenopathy.

Chest: Thoracic shape, crackles, wheezing.

Abdomen: Distention (malnutrition), hyperactive, bowel sounds, tenderness, masses, palpable bowel loops, palpable stool. Hepatomegaly, splenomegaly.

Extremities: Joint tenderness, swelling (ulcerative colitis); gluteal wasting (malnutrition), dependent edema.

Genitalia: Signs of child abuse or sexual activity.

Perianal Examination: Skin tags and fistulas.

Rectal: Perianal or rectal ulcers, sphincter tone, tenderness, masses, impacted stool, occult blood, sphincter reflex.

Neurologic: Mental status changes, peripheral neuropathy (B6, B12 deficiency), decreased perianal sensation. Ataxia, diminished deep tendon reflexes, decreased proprioception.

Laboratory Evaluation: Electrolytes, CBC with differential. Wright's stain for fecal leucocytes; cultures for enteric pathogens, ova and parasites x 3; clostridium difficile toxin. Stool carbohydrate content. Stool for occult blood, neutral fat (maldigestion); split fat (malabsorption).

Constipation

Chief Complaint: Constipation.

History of Present Illness: Stool frequency, consistency, size; stooling pattern birth to the present. Encopresis, bulky, fatty stools, foul odor. Hard stools, painful defecation, straining, streaks of blood on stools. Dehydration, urinary incontinence, enuresis. Abdominal pain, fever. Recent change in diet. Soiling characteristics and time of day. Are stools formed or scybalous (small, dry, rabbit-like pellets)? Withholding behavior.

Dietary History: Excessive cow's milk or limited fiber consumption; breastfeeding.

Past Medical History: Recent illness, bed rest, fever.

Medications Associated with Constipation: Opiate analgesics, aluminumcontaining antacids, iron supplements, antihistamines, antidepressants.

Social History: Recent birth of a sibling, emotional stress, housing move.

Family History: Constipation.

Physical Examination

General Appearance: Dehydration or malnutrition. Septic appearance, weak cry. Note whether the patient looks “ill,” well, or malnourished.

Vital Signs: BP (hypertension, pheochromocytoma), pulse, respiratory rate, temperature. Growth percentiles, poor growth.
Skin: Café au lait spots (neurofibromatosis), jaundice.
Eyes: Decreased pupillary response, icterus.
Mouth: Cheilosis (cracked lips, riboflavin deficiency), oral ulcers (inflammatory bowel, coeliac disease), dry mucous membranes, glossitis (B12, folate deficiency), oropharyngeal candidiasis (AIDS).
Abdomen: Distention, peristaltic waves, weak abdominal musculature (muscular dystrophy, prune-belly syndrome). Hyperactive bowel sounds, tenderness, hepatomegaly. Palpable stool, fecal masses above the pubic symphysis and in the left lower quadrant.
Perianal: Anterior ectopic anus, anterior anal displacement. Anal fissures, excoriation, dermatitis, perianal ulcers. Rectal prolapse. Soiling in the perianal area. Sphincter reflex: Gentle rubbing of the perianal skin results in reflex contraction of the external anal sphincter.
Rectal: Sphincter tone, rectal ulcers, tenderness, hemorrhoids, masses. Stool in a cavernous ampulla, occult blood.
Extremities: Joint tenderness, joint swelling (ulcerative colitis).
Neurologic: Developmental delay, mental retardation, peripheral neuropathy (B6, B12 deficiency), decreased perianal sensation.
Laboratory Evaluation: Electrolytes, CBC with differential, calcium.
Abdominal X-ray: Air fluid levels, dilation, pancreatic calcifications.

Headache

Chief Complaint: Headache

History of Present Illness: Quality of pain (dull, band-like, sharp, throbbing), location (retro-orbital, temporal, suboccipital, bilateral or unilateral); age of onset; time course of typical headache episode; rate of onset (gradual or sudden); time of day, effect of supine posture. Increasing frequency. Progression in severity. Does the headache interfere with normal activity or cause the child to stop playing? Awakening from sleep; analgesic use. "The worst headache ever" (subarachnoid hemorrhage).

Aura or Prodrome: Visual scotomata, blurred vision; nausea, vomiting, sensory disturbances.

Associated Symptoms: Numbness, weakness, diplopia, photophobia, fever, nasal discharge (sinusitis), neck stiffness (meningitis).

Aggravating or Relieving Factors: Relief by analgesics or sleep. Exacerbation by light or sounds, straining, exercising, or changing position. Exacerbation by foods (cheese), emotional upset, menses.

Past Medical History: Growth delay, development delay, allergies, past illnesses. Head injuries, motion sickness. Anxiety or depression

Medications: Dosage, frequency of use, and effect of medications. Birth control pills.

Family History: Migraine headaches in parents. Parental description of their headaches.

Social History: School absences. Stressful events. Emotional problems at home or in school. Cigarettes, alcohol, illegal drugs.

Review Systems: Changes in personality, memory, intellectual skills, vision, hearing, strength, gait, or balance. Postural lightheadedness, weakness, vertigo.

Physical Examination

General Appearance: Note whether the patient looks "ill" or well; interaction with parents; sad or withdrawn?

Vital Signs: BP (hypertension), pulse, temperature (fever), respiratory rate. Height, weight, head circumference; growth percentiles. Weight loss, lack of linear growth.

Skin: Pallor, petechiae, bruises. Alopecia, rashes, and painless oral ulcers. Café au lait spots in the axillae or inguinal areas (neurofibromatosis). Facial angiofibromas (adenoma sebaceum).

Head: Macrocephaly, cranial tenderness, temporal tenderness. Dilated scalp veins, frontal bossing. Sinuses tenderness (sinusitis) to percussion, temporal bruits (arteriovenous malformation).

Eyes: Downward deviation of the eyes ("sunset-ring" increased intracranial pressure), extraocular movements, pupil reactivity; papilledema, visual field deficits. Conjunctival injection, lacrimation (cluster headache).

Nose: Rhinorrhea (cluster headache).

Mouth: Tooth tenderness, gingivitis, pharyngeal erythema. Masseter muscle spasm, restricted jaw opening (TMJ dysfunction).

Neck: Rigidity, neck muscle tenderness.

Extremities: Absent femoral pulses, lower blood pressures in the legs (coarctation of the aorta).

Neurologic Examination: Mental status, cranial nerve function, motor strength, sensation, deep tendon reflexes. Disorientation, memory impairment, extraocular muscle dysfunction, spasticity, hyperreflexia, clonus, Babinski sign, ataxia, coordination.

Laboratory Evaluation: Electrolytes, ESR. CBC with differential, INR/PTT, MRI scan.

Seizures, Spells and Unusual Movements

Chief Complaint: Seizure

History of Present Illness: Time of onset of seizure, duration, tonic-clonic movements, description of seizure,

frequency of episodes, loss of consciousness. Past seizures, noncompliance with anticonvulsant medication. Aura before seizure (irritability, behavioral change, lethargy), incontinence of urine or feces, post-ictal weakness or paralysis, injuries. Can the patient tell when an episode will start? Warning signs, triggers for the spells (crying, anger, boredom, anxiety, fever, trauma). Does he speak during the spell? Does the child remember the spells afterward? What is the child like after the episode (confused, alert)? Can the child describe what happens?

Past Medical History: Illnesses, hospitalizations, previous functioning, rheumatic fever. Electroencephalograms, CT scans.

Medications: Antidepressants, stimulants, antiseizure medications.

Family History: Similar episodes in family, epilepsy, migraine, tics, tremors, Tourette syndrome, sleep disturbance. Rheumatic fever, streptococcal infection liver disease, metabolic disorders.

Physical Examination

General Appearance: Post-ictal lethargy. Note whether the patient looks well or ill. Observe the patient performing tasks (tying shoes, walking).

Vital Signs: Growth percentiles, BP (hypertension), pulse, respiratory rate, temperature (hyperpyrexia).

Skin: Café-au-lait spots, neurofibromas (Von Recklinghausen's disease). Unilateral port-wine facial nevus (Sturge-Weber syndrome); facial angiofibromas (adenoma sebaceum), hypopigmented ash leaf spots (tuberous sclerosis).

HEENT: Head trauma, pupil reactivity and equality, extraocular movements; papilledema, gum hyperplasia (phenytoin); tongue or buccal lacerations; neck rigidity.

Chest: Rhonchi, wheeze (aspiration).

Heart: Rhythm, murmurs.
Extremities: Cyanosis, fractures, trauma.
Perianal: Incontinence of urine or feces.
Neuro: Dysarthria, visual field deficits, cranial nerve palsies, sensory deficits,
focal weakness (Todd's paralysis), Babinski's sign, developmental delay. **Laboratory Evaluation:** Glucose, electrolytes, CBC, urine toxicology, anticonvulsant levels, RPR/VDRL, EEG, MRI, lumbar puncture.

Apnea

Chief Complaint: Apnea.
History of Present Illness: Length of pause in respiration. Change in skin color (cyanosis, pallor), hypotonia or hypertonia, resuscitative efforts (rescue breaths, chest compressions). Stridor, wheezing, body position during the event, state of consciousness before, during and after the event. Unusual movements, incontinence, postictal confusional state. Regurgitation after feedings. Vomitus in oral cavity during the event. Loud snoring, nocturnalenuresis, excessive daytime sleepiness; prior acute life threatening events (ALTEs). Medications accessible to the child in the home.
Past Medical History: Abnormal growth, developmental delay, asthma.
Perinatal History: Prenatal exposure to infectious agents, maternal exposure to opioids, difficulties during labor and delivery. Respiratory difficulties after birth.
Immunizations: Pertussis.
Family History: Genetic or metabolic disorders, mental retardation, consang
uinity, fetal loss, neonatal death, sudden infant death syndrome, elicit drugs, alcohol.
Social history: Physical abuse, previous involvement of the family with child protective services.

Physical Examination

General Appearance: Septic appearance, level of consciousness.

Vital Signs: Length, weight, head circumference percentiles. Pulse, blood pressure, respirations, temperature.

Skin: Cool, mottled extremities; delayed capillary refill, bruises, scars.

Nose: Nasal flaring, nasal secretions, mucosal erythema, obstruction, septal deviation or polyps.

Mouth: Structure of the lips, tongue, palate; tonsillar lesions, masses.

Neck: Masses, enlarged lymph nodes, enlarged thyroid.

Chest: Increased respiratoryeffort, intercostal retractions, barrel chest. Irregular respirations, periodic breathing, prolonged pauses in respiration, stridor. Grunting, wheezing, crackles.

Heart: Rate and rhythm, S1, S2, murmurs. Preductal and postductal pulse delay (right arm and leg pulse comparison).

Abdomen: Hepatomegaly, nephromegaly.

Extremities: Dependent edema, digital clubbing.

Neurologic: Mental status, muscle tone, strength. Cranial nerve function, gag reflex.

Laboratory Evaluation: Glucose, electrolytes, BUN, creatinine, calcium, magnesium, CBC, ECG, O_2 saturation.

Delirium, Coma and Confusion

Chief Complaint: Confusion.

History of Present Illness: Level of consciousness, obtundation (awakebut not alert), stupor (unconscious but awakable with vigorous stimulation), coma (cannot be awakened). Confusion, impaired concentration, agitation. Fever, headache. Activity and symptoms prior to onset.

Past Medical History: Suicide attempts or depression, epilepsy (post-ictal state).

Medications: Insulin, narcotics, drugs, anticholinergics.

Physical Examination

General Appearance: Incoherent speech, lethargy, somnolence. Dehydration, septic appearance. Note whether the patient looks "ill" or well.

Vital Signs: BP (hypertensive encephalopathy), pulse, temperature (fever), respiratory rate.

Skin: Cyanosis, jaundice, delayed capillary refill, petechia, splinter hemorrhages; injection site fat atrophy (diabetes).

Head: Skull tenderness, lacerations, ptosis, facial weakness. Battle's sign (ecchymosis over mastoid process), raccoon sign (periorbital ecchymosis, skull fracture), hemotympanum (basal skull fracture).

Eyes: Pupil size and reactivity, extraocular movements, papilledema.

Mouth: Tongue or cheek lacerations; atrophic tongue, glossitis (B12 deficiency).

Neck: Neck rigidity, masses.

Chest: Breathing pattern (Cheyne-Stokes hyperventilation), crackles, wheezes.

Heart: Rhythm, murmurs, gallops.

Abdomen: Hepatomegaly, splenomegaly, masses.

Neuro: Strength, cranial nerves 2-12, mini-mental status exam; orientation to person, place, time, recent events; Babinski's sign, primitive reflexes (snout, suck, glabella, palmomental grasp).

Laboratory Evaluation: Glucose, electrolytes, BUN, creatinine, O_2 saturation, liver function tests. CT/MRI, urine toxicology screen.

Differential Diagnosis of Delirium: Hypoxia, meningitis, encephalitis, systemic infection, electrolyte imbalance, hyperglycemia, hypoglycemia (insulin overdose), drug

intoxication, stroke, intracranial hemorrhage, seizure; dehydration, head trauma, uremia, vitamin B12 deficiency, ketoacidosis, factitious coma.

Polyuria, Enuresis and Urinary Frequency

Chief Complaint: Excessive urination.

History of Present Illness: Time of onset of excessive urination. Constant daytime thirst or waking at night to drink. Poor urinary stream, persistent dribbling of urine; straining to urinate. Excessive fluid intake, dysuria, recurrent urinary tract infections; urgency, daytime and nighttime enuresis, fever. Gait disturbances, history of lumbar puncture, spinal cord injury. Lower extremity weakness; back pain, leg pain. Use of harsh soaps for bathing. Feeding schedule, overfeeding, growth pattern, dehydration. Vomiting, constipation. Abdominal and perineal pain, constipation, encopresis

Past Medical History: Urinary tract infections, diabetes, renal disease.

Social History: History of foreign body insertion or sexual abuse.

Family History: Family members with polydipsia, polyuria; early infant deaths, infants with poor growth or dehydration; genitourinary disorders. Parental age of toilet training.

Physical Examination

General Appearance: Signs of dehydration, septic appearance.

Vital Signs: Blood pressure (hypertension), pulse (tachycardia), temperature, respirations. Growth percentiles, growth failure.

Chest: Breath sounds.

Heart: Murmurs, third heart sound.

Abdomen: Masses, palpable bladder. Perineal excoriation; lumbosacralmidline defects, sacral hairy patch, sacral

hyperpigmentation, sacral dimple or sinus tract, hemangiomas.

Rectal Examination: Rectal sphincter laxity, anal reflex (sacral nerve function). **Extremities:** Asymmetric gluteal cleft, gluteal lipoma, gluteal wasting. **Neurologic Examination:** Deep tendon reflexes, muscle strength in the legs and feet. Perineal sensation, gait disturbance.

Hematuria

Chief Complaint: Blood in urine.

History of Present Illness: Color of urine, duration and timing of hematuria. Frequency, dysuria, suprapubic pain, flank pain (renal colic), abdominal or perineal pain, fever, menstruation.

Foley catheterization, stone passage, tissue passage in urine, joint pain. Strenuous exercise, dehydration, recent trauma. Rashes, arthritis (systemic lupus erythematosus, Henoch-Schönlein purpura). Bloody diarrhea (hemolytic-uremic syndrome), hepatitis B or C exposure.

Causes of Red Urine: Pyridium, phenytoin, ibuprofen, cascara laxatives, rifampin, berries, flava beans, food coloring, rhubarb, beets, hemoglobinuria, myoglobinuria.

Past Medical History: Recent sore throat (group A streptococcus), streptococcal skin infection (glomerulonephritis). Recent or recurrent upper respiratory illness (adenovirus).

Medications Associated with Hematuria: Warfarin, aspirin, ibuprofen,
naproxen, phenobarbital, phenytoin, cyclophosphamide.

Perinatal History: Birth asphyxia, umbilical catheterization.

Family History: Hematuria, renal disease, sickle cell anemia, bleeding
disorders, hemophilia, deafness (Alport's syndrome), hypertension.

Social History: Occupational exposure to toxins.

Physical Examination

General Appearance: Signs of dehydration. Note whether the patient looks "ill" or well.

Vital Signs: Hypertension (acute renal failure, acute glomerulonephritis), fever, respiratory rate, pulse.

Skin: Pallor, malar rash, discoid rash (systemic lupus erythematosus);
ecchymoses, petechiae (Henoch-Schönlein purpura).

Face: Periorbital edema (nephritis, nephrotic syndrome).

Eyes: Lens dislocation, dot-and-fleck retinopathy (Alport's syndrome).

Throat: Pharyngitis.

Chest: Breath sounds.

Heart: Rhythm, murmurs, gallops.

Abdomen: Masses, nephromegaly (Wilms' tumor, polycystic kidney disease, hydronephrosis), abdominal bruits, suprapubic tenderness.

Back: Costovertebral angle tenderness (renal calculus, pyelonephritis). **Genitourinary:** Discharge, foreign body, trauma, meatal stenosis.

Extremities: Peripheral edema (nephrotic syndrome), joint swelling, joint
tenderness (rheumatic fever), unequal peripheral pulses (aortic coarctation). **Laboratory Evaluation:** Urinalysis with microscopic, urine culture; creatinine,
BUN, CBC; sickle cell screen; urine calcium-to-creatinine ratio, INR/PTT. Urinalysis of first-degree relatives (Alport's syndrome or benign familial hematuria), renal ultrasonography.

Specific Laboratory Evaluation: Complement levels, anti-streptolysin-O and anti-DNAse B (poststreptococcal glomerulonephritis), antinuclear antibody, audiogram (Alport's syndrome), antiglomerular basement membrane antibodies (Goodpasture's syndrome), antineutrophil

cytoplasmic antibodies, purified protein derivative (PPD).

Advanced Laboratory Evaluation: Voiding cystourethrogram, intravenous pyelography, CT scan, MRI scan, renal scan, renal biopsy.

Proteinuria

Chief Complaint: Proteinuria.

History of Present Illness: Protein of 1+ (30 mg/dL) on a urine dipstick. Protein above 4 mg/m^2/hour in a timed 12- to 24-hour urine collection (significant proteinuria). Prior proteinuria, hypertension, edema; short stature, hearing deficits.

Past Medical History: Renal disease, heart disease, arthralgias.

Medications: Chemotherapy agents.

Family History: Renal disease, deafness.

Physical Examination

General Appearance: Signs of dehydration. Note whether the patient looks "ill"
or well.

Vital Signs: Temperature (fever).

Ears: Dysmorphic pinnas.

Skin: Café-au-lait spots, hypopigmented macules, rash.

Extremities: Joint tenderness, joint swelling.

Laboratory Evaluation: Urinalysis for spot protein/creatinine ratio. Recumbent and ambulating urinalyses. CBC, electrolytes, BUN, creatinine, total protein, albumin, cholesterol, antistreptolysin-O titer (ASO), antinuclear antibody, complement levels. Renal ultrasound, voiding cystourethrogram.

Swelling and Edema

Chief Complaint: Swollen ankles.

History of Present Illness: Duration of edema; distribution (localized or generalized); intermittent or persistent swelling, pain, redness. Renal disease; shortness of breath, malnutrition, chronic diarrhea (protein losing enteropathy), allergies. Periorbital edema, ankle edema, weight gain. Poor exercise tolerance, fatigue, inability to keep up with other children. Poor feeding, fussiness, restlessness. Bloody urine (smoky or red), decreased urine output, jaundice. Poor protein intake (Kwashiorkor), dietary history.

Past Medical History: Menstrual cycle, sexual activity, premenstrual bloating, pregnancy, rash.

Medications: Over-the-counter drugs, diuretics, oral contraceptives, antihypertensives, estrogen, lithium.

Allergies: Allergic reactions to foods (cow's milk).

Family History: Lupus erythematosus, cystic fibrosis, renal disease, Alport syndrome, hereditary angioedema, deafness.

Social History: Exposure to toxins, illicit drugs, alcohol, chemicals.

Physical Examination

General Appearance: Respiratory distress, pallor. Note whether the patient looks "ill" or well.

Vitals: BP (upright and supine), pulse (tachycardia), temperature, respiratory rate (tachypnea). Growth percentiles, poor weight gain. Decreased urine output.

Skin: Xanthomata, spider angiomata, cyanosis. Rash, insect bite puncta, erythema.

HEENT: Periorbital edema. Conjunctival injection, scleral icterus, nasal polyps, sinus tenderness, pharyngitis.

Chest: Breath sounds, crackles, dullness to percussion.

Heart: Displacement of point of maximal impulse; silent precordium, S3 gallop, friction rub, murmur.

Abdomen: Distention, bruits, hepatomegaly, splenomegaly, shifting dullness.

Extremities: Pitting or non-pitting edema (graded 1 to 4+), erythema, pulses, clubbing.

Laboratory Evaluation: Electrolytes, liver function tests, triglycerides, albumin, CBC, chest x-ray, urine protein.

Rash

Chief Complaint: Rash.

History of Present Illness: Time of rash onset, location, pattern of spread (chest to extremities). Location where the rash first appeared; what it resembled; what symptoms were associated with it; what treatments have been tried. Fever, malaise, headache; conjunctivitis, coryza, cough. Exposure to persons with rash, prior history of chicken pox. Sore throat, joint pain, abdominal pain. Exposure to allergens or irritants. Sun exposure, cold, psychologic stress.

Past Medical History: Prior rashes, asthma, allergic rhinitis, urticaria, eczema,
diabetes, hospitalizations, surgery.

Medications: Prescription and nonprescription, drug reactions.

Family History: Similar problems among family members.

Immunizations: Vaccination status, measles, mumps, rubella.

Social History: Drugs, alcohol, home situation.

Physical Examination

General Appearance: Respiratory distress, toxic appearance.

Vital Signs: Temperature, pulse, blood pressure, respirations.

Skin: Complete skin examination, including the nails and mucous membranes.Color or surface changes, texture changes, warmth. Distribution of skin lesions (face, trunk, extremities), shape of the lesions, arrangement of several lesions (annular, serpiginous, dermatomal); color of the lesions, dominant hue and the color pattern, surface characteristics (scaly, verrucous), erythema, papules, induration, flat, macules, vesicles, ulceration, margin character, lichenification, excoriations, crusting.

Eyes: Conjunctival erythema.

Ears: Tympanic membranes.

Mouth: Soft palate macules; buccal mucosa lesions.

Throat: Pharyngeal erythema.

Lymph Nodes: Cervical, axillary, inguinal lymphadenopathy.

Chest: Rhonchi, crackles , wheezing.

Heart: Murmurs.

Abdomen: Tenderness, masses, hepatosplenomegaly.

Extremities: Rash on hands, feet, palms, soles; joint swelling, joint tenderness.

Laboratory Diagnosis: Virus isolation or antigen detection (blood, nasopharynx, conjunctiva, urine). Acute and convalescent antibody titers.

Bruising and Bleeding

Chief Complaint: Bruising

History of Present Illness: Time of onset of bruising; trauma, spontaneous ecchymoses, petechiae; bleeding gums, bleeding into joints, epistaxis, hematemesis, melena. Bone pain, joint pain, abdominal pain. Is the bleeding lifelong or of recent onset? Hematuria, extensive bleeding with trauma. Weight loss, fever, pallor, jaundice, recurring infections.

Past Medical History: Oozing from the umbilical stump after birth, bleeding at injection sites. Prolonged bleeding after minor surgery (circumcision) or after loss of primary teeth.

Family History: Bleeding disorders, anticoagulant use, availability of rodenticides or antiplatelet drugs (eg, aspirin or other nonsteroidals) in the home. Child abuse.

Social History: History of child abuse, family stress.

Physical Examination

General Appearance: Ill-appearance.

Vital Signs: Tachypnea, tachycardia, fever, blood pressure (orthostatic changes), cachexia.

Skin: Appearance and distribution of petechiae (color, size, shape, diffuse, symmetrical), ecchymotic patterns (eg, belt buckle shape, doubled-over phone cord); folliculitis (neutropenia). Hyperextensible skin (Ehlers-Danlos syndrome). Partial albinism (Hermansky-Pudlak syndrome). Palpable purpura on legs (vasculitis, Henoch-Schönlein purpura).

Lymph Nodes: Cervical or axillary lymphadenopathy

Eyes: Conjunctival pallor, erythema.

Nose: Epistaxis, nasal eschar.

Mouth: Gingivitis, mucous membrane bleeding, oozing from gums, oral petechiae.

Chest: Wheezing, rhonchi.

Heart: Murmurs.
Abdomen: Hepatomegaly, splenomegaly, nephromegaly.
Rectal: Stool occult blood.
Extremities: Muscle hematomas; anomalies of the radius bone (thrombocytopenia absent radius [TAR] syndrome). Bone tenderness, joint tenderness, hemarthroses; hypermobile joints (Ehlers-Danlos syndrome.
Past Testing: X-ray studies, endoscopy.

Developmental Delay

Chief Complaint: Delayed development.
Developmental History: Age when parents first became concerned about delayed development. Rate and pattern of acquisition of skills; developmental regressions. Parents' description of the child's current skills. How does he move around? How does he use his hands? How does he let you know what he wants? What does he understand of what you say? What can you tell him to do? What does he like to play with? How does he play with toys? How does he interact with other children?
Behavior in early infancy (quality of alertness, responsiveness). Developmental quotient (DQ): Developmental age divided by the child's chronologic age x 100. Vision and hearing deficits.
Perinatal History: In utero exposure to toxins or teratogens, maternal illness or trauma, complications of pregnancy. Quality of fetal movement, poor fetal weight gain (placental dysfunction). Apgar scores, neonatal seizures, poor feeding, poor muscle tone at birth. Growth parameters at birth, head circumference.
Past Medical History: Illnesses, poor feeding, vomiting, failure to thrive. Weak sucking and swallowing, excessive drooling.
Medications: Anticonvulsants, stimulants.

Family History: Illnesses, hearing impairment, mental retardation, mental illness, language problems, learning disabilities, dyslexia, consanguinity.

Social History: Home situation, toxin exposure, lead exposure.

Physical Examination

Observation: Facial expressions, eye contact, social, interaction with caretakers and examiner. Chronically ill, wasted, malnourished appearance, lethargic/fatigued.

Vital Signs: Respirations, pulse, blood pressure, temperature. Height, weight, head circumference, growth percentiles.

Skin: Café au lait spots, hypopigmented macules (neurofibromatosis), hemangiomas, telangiectasias, axillary freckling. Cyanosis, jaundice, pallor, skin turgor.

Head: Frontal bossing, low anterior hairline; head size, shape, circumference, microcephaly, macrocephaly, asymmetry, cephalohematoma; short palpebral fissure, flattened mid-face (fetal alcohol syndrome), chin shape (prominent or small).

Eyes: Size, shape, and distance between the eyes (small palpebral fissures, hypotelorism, hypertelorism, upslanting or downslanting palpebral fissures). Retinopathy, cataracts, corneal clouding, visual acuity. Lens dislocation, corneal clouding, strabismus.

Ears: Size and placement of the pinnae (low-set, posteriorly rotated, cupped, small, prominent). Tympanic membranes, hearing.

Nose: Broad nasal bridge, short nose, anteverted nares.

Mouth: Hypoplastic philtrum. Lip thinness, downturned corners, fissures, cleft, teeth (caries, discoloration), mucus membrane color and moisture.

Lymph Nodes: Location, size, tenderness, mobility, consistency.

Neck: Position, mobility, swelling, thyroid nodules.
Lungs: Breathing rate, depth, chest expansion, crackles.
Heart: Location and intensity of apical impulse, murmurs.
Abdomen: Contour, bowel sounds, tenderness, tympany; hepatomegaly, splenomegaly, masses.
Genitalia: Ambiguous genitalia (hypogonadism).
Extremities: Posture, gait, stance, asymmetry of movement. Edema, clinodactyly, syndactyly, nail deformities, palmar or plantar simian crease.
Neurological Examination: Behavior, level of consciousness, intelligence, emotional status. Equilibrium reactions (slowly tilting and observing for compensatory movement). Protective reactions (displacing to the side and observing for arm extension by 7 to 8 months).
Motor System: Gait, muscle tone, muscle strength (graded 0 to 5), deep tenon reflexes.
Primitive Reflexes: Palmar grasp, Moro, asymmetric tonic neck reflexes.
Signs of Cerebral Palsy: Fisting with adducted thumbs, hyperextension and scissoring of the lower extremities, trunk arching. Poor suck-swallow, excessive drooling.
Diagnostic Studies: Karyotype for fragile X syndrome, fluorescent in situ hybridization (FISH), DNA probes. Magnetic resonance imaging (MRI) or CT scan.
Metabolic Studies: Ammonia level, liver function tests, electrolytes, total CO_2, venous blood gas level. Screen for amino acid and organic acid disorders. Organic acid assay, amino acid assay, mucopolysaccharides assay, enzyme deficiency assay.
Other Studies: Audiometry, free-thyroxine (T4), thyroid-stimulating hormone (TSH), blood lead levels, electrotromyography, nerve conduction velocities, muscle biopsy.

MEDICAL TERMS GLOSSARY

The Health History

Clarification: additional information that makes something clear or understandable. A technique used when interviewing the client.

Close-ended question: question that elicits facts and is structured for a one- or two-word response.

Cognition: mental processes (knowing, learning, thinking and judging) that make a person aware and provide perception of the world.

Development: gradual process of change and differentiation from a simple to a more complex level.

Genogram: chart drawn to illustrate a family's health history and relationship patterns.

Health history: collection of information obtained from a patient and other sources that include psychosocial and cultural concerns as well as physical data. The data provide a base upon which the nurse can make a management plan of the client's diagnosis, treatment, and care.

Objective data: information about the client's problems obtained by inspection, palpation, perceptions, auscultation, and diagnostic studies.

Open-ended question: question that elicits perceptions and feelings and is structured for a full sentence response.

Subjective data: information obtained when a client describes a problem and an interviewer records the description in the client's words.

Validation: confirmation of information; questioning technique for ensuring the questioner's understand.

Physical Assessment Skill

Auscultation: physical assessment technique in which the examiner listens for sounds in the body to evaluate

the condition of the heart, lungs, pleurae, intestines, and other organs. The examiner usually uses a stethoscope to auscultate the frequency, intensity, quality, and duration of these sounds.

Ballottement: palpation technique used to evaluate a floating structure by bouncing it gently and feeling it rebound. It may be used, for example, to check fetal position.

Blunt percussion: percussion performed by striking a body surface directly with the fist to elicit tenderness, *not* to create a sound.

Direct (immediate) percussion: percussion performed by striking the fingers directly on the body surface.

Febrile: pertaining to or characterized by fever.

Indirect (mediate) percussion: percussion performed by striking a finger of one hand against a finger of the other hand, which is placed over an organ.

Inspection: physical assessment technique in which the examiner uses sight, hearing and smell to make informed observations.

Palpation: physical assessment technique in which the examiner uses the sense of touch to feel pulsations and vibrations or to locate body structures and assesses their texture, size, consistency, mobility, and tenderness.

Percussion: physical assessment technique in which the examiner taps on the skin surface with the fingers to assess the size, borders and consistency of certain internal organs, and to detect and evaluate the amount of fluid in a body cavity.

Pleximeter: mediating device (such as a finger) used to receive light taps during percussion.

Plexor: device (such as a finger) used to tap mediating device (pleximeter) or to tap the body directly during percussion.

Alopecia: partial or complete hair loss caused by normal aging, endocrine disorders, drug reactions, chemotherapeutic agents, or skin disorders.

Anhidrosis: abnormally decreased perspiration, which may be caused by neurologic and skin disorders; congenital, atrophic, or traumatic changes to sweat glands; and use of certain drugs.

Annular: ring-shaped; characteristic of a skin lesion surrounding a clear, normal skin area.

Demarcation: clear border or end point, as a skin lesion with a clearly marked border.

Diffuse: generalized or widespread, in contrast to localized or regionalized.

Discrete: separate and distinct; characteristic of individual, well-demarcated lesions.

Ecchymosis: bruise; large, irregularly shaped hemorrhagic area, ranging from purple or purplish blue to green, yellow, and brown.

Eczema: superficial dermatitis characterized by oozing vesicles and crust formation.

Exanthem: lesion that characterizes an eruptive disease, such as rubeola or varicella.

Hirsutism: excessive body hair, especially a masculine distribution in women caused by heredity, hormonal dysfunction, porphyria, or medication.

Hyperhidrosis: abnormally increased perspiration that is often caused by heat, hyperthyroidism, strong emotion, or infection.

Intertrigo: erythematous irritation involving the skin folds, such as the axillae, the folds underneath the breasts, or the inner thighs.

Lichenification: skin thickening and hardening, often caused by repeated scratching of a pruritic lesions.

Macule: skin eruption with thickened or discolored areas that are flush with the skin surface.

Nevus: pigmented, congenital skin blemish, usually benign, but may become malignant. Also called a mole or birthmark.

Papule: small, solid, raised skin lesion.

Paronychia: infection of skin fold at a nail margin.

Petechiae: small, 1- to 3-mm, red or purple hemorrhagic spots, possibly from muscular leaks or decreased platelet count.

Pruritus: itching that usually leads to scratching, this often results in secondary infection; can be cause by skin irritation.

Telangiectasis: spot on the skin, usually formed by superficial vasodilatation.

Vesicle: small, thin-walled, raised skin lesion filled with clear fluid; a blister.

Musculoskeletal System

Abduction: limb movement away from the body's midline.

Adduction: limb movement toward the body's midline.

Ankylosis: fixation and immobilization of a joint.

Ataxia: impaired ability to coordinate movement.

Atony: lack of normal tension in a muscle; flaccidity.

Atrophy: decrease in size; often used to describe change in muscle size.

Crepitus: abnormal crackling or grating sound or sensation produced, in the musculoskeletal system, when irregular bone edges rub together.

Dorsiflexion: backward bending of a joint.

Effusion: collection of fluid not normally present.

Extension: movement that increases the angle between two articulating bones.

Fasciculi: bundles of skeletal muscle fibers.

Flaccid: weak, soft, and flabby; often used to describe muscles that lack tone.

Flexion: movement that decreases the angle between two articulating bones.

Hypertrophy: increase in size of a cell or group of cells, such as muscles.

Kyphosis exaggerated:dorsal convexity of the thoracic spine.

Lordosis exaggerated: dorsal concavity of the lumbar spine.

Osteocyte: bone cell.

Osteoporosis: bone condition resulting in quantitative loss of bone mass although, qualitatively, the mineral-to-matrix ratio remains normal.

Range of motion: amount of movement measured in degrees of a circle through which a joint can be extended or flexed.

Scoliosis: abnormal lateral curvature of the spine.

Subluxation: partial or incomplete dislocation of joint's margins.

Tonus: normal muscle tone maintained by partial, contraction and relaxation of muscles.

Valgus: abnormal position in which a part of a limb is bent or twisted outward or away from midline.

Varus: abnormal position in which a part of a limb is turned inward toward midline.

Anosmia: loss of sense of smell, indicating malfunction of cranial nerve 1 (olfactory).

Aphasia: inability to understand or use language (or both) secondary to damage to the language control centers in the frontal and temporal brain lobes.

Areflexia: absent deep tendon reflexes, characteristic of distant motor neuron disorders.

Ataxia: unsteady gait characterized by a wide base of support and staggering.

Cognitive: higher skills of the cerebral cortex, such as judgment, reasoning, abstraction, and intellect.

Confusion: potentially reversible disorientation and disturbance of thought processes.

Dysesthesia: unpleasant abnormal sensation or pain caused by stimuli that are not normally painful.

Level of consciousness: degree of wakefulness and orientation. Wakefulness represents subcortical reticular system activity; orientation represents cerebral cortex activity.

Neuropathy: disease or disorder of a nerve.

Paralysis: loss of ability to move. Hemiplegia is paralysis of one side of the body and characteristically results from a brain injury. Paraplegia is paralysis of the lower extremities, and quadriplegia is paralysis of all four extremities. Both result from spinal cord damage, but at different levels.

Paresis: weakness. Hemiparesis is weakness of one side of the body.

Paresthesia: disturbance of sensation characterized by tingling, prickling, or numbness.

Proprioception: sense of position; the ability to know the position of a body part without having to look at it.

Seizure: paroxysmal involuntary disturbance of brain function that may manifest as an impairment or loss of

consciousness, abnormal motor activity, behavioral abnormalities, sensory disturbances, or autonomic dysfunction. Seizures may be focal or generalized, and tonic-clonic, tonic, clonic, myoclonic, or atonic.

Respiratory System

Accessory muscles: muscles used for forced inspiration and active expiration, including the internal intercostal, pectoral, scalenus, sternocleidomastoid, trapezius, and abdominal rectus muscles.

Angle of Louis: angle located between the manubrium and the body of the sternum.

Apnea: cessation of breathing.

Biot's breathing: periods of hyperpnea alternating with apnea (similar to Cheyne-Stokes except that the depth remains constant).

Bradypnea: respiratory rate less than the normal range for age-group, which may indicate a physiologic or pathologic process such as a central nervous system disturbance or metabolic alkalosis.

Bronchophony: increased referred voice sounds auscultated in the periphery of the lungs. When auscultating a client who exhibits bronchophony, the word "ninety-nine" reverberates clearly over areas of consolidation and sounds muffled over other areas.

Cheyne-Stokes respirations: gradually increasing rate and depth with periods of apnea.

Clubbing: abnormal enlargement of the distal phalanges associated with peripheral tissue hypoxia, characterized by the loss of the angle between the skin and nail base.

Costal angle: area between the two lower borders of the rib cage near the xiphoid process.

Crackles: short, moist, explosive sounds produced by air passing through liquid in the airways. Also called **rales**.

Cyanosis: bluish or purplish color of the skin and mucous membranes caused by reduced oxygen levels in the arterial blood.

Dyspnea: subjective feeling of shortness of breath.

Egophony: increased referred voice sounds auscultated in the periphery of the lung. When auscultating a client who exhibits egophony, the sound "e" will sound like "a" and have a nasal, bleating quality.

Elastance: tendency of lung tissue and the chest wall to recoil and return to their original sizes.

Eupnea: respiratory rate within normal range for an age-group.

Hypercapnia: elevated carbon dioxide levels in arterial blood, which may appear in a client with chronic obstructive pulmonary disease.

Hyperpnea: deep, rapid, or labored respirations that occurs normally with exercise and abnormally with pain, fever, or metabolic acidosis.

Hyperventilation: ventilation rate that exceeds the rate metabolically necessary for respiratory gas exchange. It results from an increased frequency of breathing, an increase in the amount of air inhaled and exhaled, or both, and causes an excessive oxygen intake along with a loss of carbon dioxide. It may occur with anxiety and metabolic acidosis.

Hypopnea: Shallow respirations occurring normally in well-conditioned athletes and abnormally in those with brain stem damage.

Hypoventilation: abnormally reduced respiratory rate and depth occurring when alveolar air participating in gas exchange is not sufficient to meet the body’s needs.

Hypoventilation causes excessive carbon dioxide retention.

Hypoxemia: abnormal oxygen deficiency in arterial blood caused by decreased alveolar oxygen tension or hypoventilation.

Hypoxia: oxygen deficiency caused by a reduced oxygen-carrying capacity of the blood (as seen in anemia), insufficient oxygen in inspired air (as at high altitudes or in heavily polluted areas), impaired tissue use of oxygen (as in edema in an arm or leg), or a blood flow inadequate to transport oxygen (as in shock).

Kussmaul breathing: hyperventilation, gasping and labored respiration, usually seen in diabetic coma or other states of respiratory acidosis.

Metabolic acidosis: condition resulting from excess absorption or retention of acid or from excess excretion of bicarbonate.

Metabolic alkalosis: condition resulting from excess excretion of acid or from retention of bicarbonate.

Respiratory acidosis: condition resulting from decreased excretion of carbon dioxide by the lungs.

Respiratory alkalosis: condition resulting from excess excretion of carbon dioxide by the lungs. This condition decreases hydrogen ion concentrations.

Respiratory excursion: palpation technique that evaluates symmetry of chest expansion. A finding of asymmetry could indicate pneumothorax or pleural effusion on the side with reduced excursion.

Rhonchi: bubbling sounds produced by air passing through fluid-filled airways. Also called **gurgles**.

Seesaw (paradoxic) respirations: chest falls on inspiration and rises on expiration.

Stridor: is a harsh inspiratory sound. It’s usually caused by laryngeal or tracheal obstruction.

Tachypnea: persistent, rapid, shallow breathing, which is occurs as a protective splinting measure against the pain of pleurisy or a fractured rib.

Tactile fremitus: voice sounds palpated on the chest wall surface. Normally, the palpation of vibrations made by voice sounds decreases as the examinator's hands move from the center to the periphery of the lungs. Equal or increased tactile fremitus indicates consolidation in the palpated area.

Ventilation: gas movement and distribution into and out of the pulmonary airways.

Wheezes: musical sounds of lower pitch than crackles, produced by air passing through narrowed airways.

Whispered pectoriloquy: increased voice resonance auscultated in the periphery of the lung. In a patient with whispered pectoriloquy, the words "one-two-three" sound clear over areas of consolidation but muffled over normal areas.

Cardiovascular System

Afterload: pressure in the arteries leading from the ventricle that must be overcome for ejection to occur.

Angina: chest pain characterized as a squeezing or crushing sensation or a feeling of heaviness or tightness; caused by an inadequate oxygen supply to the myocardium when the work load of the heart is increased.

Apical pulse: heart rate auscultated by placing a stethoscope over the apex of the heart.

Atherosclerosis: disorder characterized by accumulation of lipids, calcium, and blood clotting products; in the inner layer of arterial walls. As the debris accumulates, the vessel lumen narrows, causing ischemia in the organs supplied by the vessel. In the coronary arteries, ischemia occurs when the vessels are narrowed by 70% or more.

Blood pressure: pressure exerted by the circulating blood volume on arterial walls. Blood pressure depends on myocardial contractile force, blood volume, size and patency of the arterial lumen, and arterial wall elasticity.

Bradycardia: circulatory condition characterized by a slow heart rate, below 60 beats/minute in the adult, and 100 beats/minute in newborn.

Bruit: abnormal, murmurlike heart sound auscultated over a major vessel with turbulent blood flow.

Cardiac cycle: period from the beginning of one heartbeat to the beginning of the next.

Cardiac output: amount of blood ejected from the heart in 1 minute.

Click: high-pitched abnormal heart sound auscultated at the apex during mid- to late systole; it usually precedes a late systolic murmur.

Contractility: capacity for shortening or contracting in response to a stimulus, as in the ventricle, which contracts after electrical stimulation.

Currigan's pulse: bounding pulse in which a great surge precedes a sudden absence of force or fullness; also called a water-hammer pulse.

Cyanosis: bluish discoloration of the skin and mucous membranes; a common sign of cardiovascular disease.

Diastole: period of ventricular relaxation when blood crosses the open mitral and tricuspid valves and fills the ventricular chambers.

Dyspnea: shortness of breath; a common symptom of cardiovascular disease.

Edema: fluid accumulation in interstitial tissues that causes swelling; a common sign of cardiovascular disease.

Gallop: abnormal heart rhythm characterized by a low-pitched extra sound during diastole; a general term for the extra heart sounds, S_3 and S_4.

Heave: strong outward thrust palpated over the chest during systole; also called a lift.

Hyperlipidemia: excess lipids in the plasma.

Hypertension: elevated blood pressure that consistently exceeds 140/90 mm Hg in adult.

Ischema: decreased blood supply to a body organ or tissue, which interferes with normal organ or tissue function.

Murmur: vibrating, blowing, or rumbling noise that is longer than a heart sound and may be heard over any cardiac auscultatory site. It results from turbulent blood flow through the heart and may be pathologic or nonpathologic.

Myocardial infarction (MI): interruption of the local blood supply to part of the heart muscle that causes necrosis (death) of muscle tissue.

Orthostatic (postural) hypotension: abnormally low blood pressure occurring when a person stands.

Palpitations: sensation of pounding, racing, or skipped heartbeats; a common symptom of cardiovascular disease.

Pericardial friction rub: a harsh, scratching, scraping, or creaking sound auscultated at the third left intercostal space that may occur throughout systole or diastole or both.

Preload: blood volume in the ventricle at the end of diastole.

Pulse: regular expansion and contraction of arteries produced by pressure waves that occur as the left ventricle ejects blood.

Pulse pressure: difference between the systolic and diastolic blood pressures, normally 30 to 50 mm Hg.

Pulsus alternans: abnormal pulse rhythm with regular alternation of weak and strong beats.

Pulsus bigeminus: abnormal pulse rhythm in which premature beats alternate with sinus beats.

Pulsus bisferiens: abnormal pulse rhythm with a strong upstroke, downstroke, and second upstroke during systole.

Pulsus paradoxus or paradoxical pulse: abnormal pulse rhythm with markedly decreased amplitude during inspiration.

Regurgitation: backward flow of blood through the heart across a valve that does not close completely.

S_1, or first heart sound: normal heart sound that signals the beginning of systole.

S_2, or second heart sound: normal heart sound that signals the beginning of diastole.

S_3, or ventricular gallop: low-pitched extra heart sound auscultated in the tricuspid or mitral area during early to mid-diastole; caused by left ventricular failure associated with such disorders as myo-cardial infarction or mitral insufficiency.

S_4, or atrial gallop: low-pitched extra heart sound auscultated in the tricuspid or mitral area late in diastole just before S_1; caused by such disorders as hypertension or aortic stenosis.

Septal defect: defect or opening in the wall separating two heart chambers.

Snap: high-pitched abnormal heart sound auscultated medial to the apex along the lower left sternal border just after S_2.

Splitting: auscultation of a single heart sound as two separate sounds. Splitting can occur with S_1, or S_2 and may be normal or abnormal.

Stroke volume: output of each ventricle at every contraction.

Summation gallop: abnormal heart sound that combines S_3 and S_4 into a single loud sound auscultated in mid-diastole.

Syncope: faintness, especially after changing positions; a common symptom of cardiovascular disease.

Systole: period of ventricular contraction when the ventricles eject blood through the open aortic and pulmonic valves into the aorta and pulmonary artery.

Tachycardia: circulatory condition characterized by a fast heart rate, exceeding 100 beats/min in adult and 160-180 beats/min in newborn.

Thrill: fine vibration, caused by turbulent blood flow, which may be palpated over the precordium.

Valvular insufficiency: inability of the heart to close properly, resulting in regurgitation (backward flow) of blood.

Valvular stenosis: narrowing or constriction heart valves that prevents them from opening properly.

Gastrointestinal System

Abdominal distention: visible enlargement of the abdominal cavity commonly caused by liquid, gas, or tumors.

Ascites: collection of fluid in the abdominal cavity.

Borborygmi: audible abdominal sounds produced by hyperperistaltic movements, usually caused by hunger.

Chyme: thick nearly liquid food bolus that forms in the stomach from the digestive process.

Constipation: retention of feces associated with bowel hypoactivity.

Deglutition: process of swallowing.

Diarrhea: frequent elimination of loose stool.

Digestion: breakdown of food and fluid into simple chemicals that can be absorbed into the bloodstream and transported throughout the body.

Dyspepsia: indigestion.

Dysphagia: difficulty swallowing.

Encopresis: fecal incontinence.

Fat emulsification: breakdown of large fat particles in the intestine to smaller particles, largely through the action of bile acids.

Flatus: intestinal air or gas passed through the rectum.

Hematemesis: vomiting of bright red blood commonly caused by a bleeding ulcer or esophageal bleeding.

Mastication: the process of chewing.

Melena: abnormal black, tarry stool containing digested blood, usually caused by upper GI tract bleeding.

Peristaltic movements: contractions that move GI contents distally towards the large intestine.

Projectile vomiting: forceful vomiting that is propelled away from the body.

Referred pain: pain that spreads or radiates to another anatomic location.

Segmenting movements: localized ring contractions in the bowel that result in the mixing of the intestinal contents.

Striae: lines resulting from rapid or prolonged skin stretching.

Tenderness: abdominal pain appears when pressure is applied to the abdomen (with the hand).

Renal System

Albuminuria: albumin in the urine (as in glomerulonephritis).

Bacteriuria: condition of the urine tract infection (including processes without clear clinical presentations) in the urine taken from the mean portion of stream the 10^5 (100000) and more microorganisms in 1 ml can be found out.

Calculus: pathologic stone, formed of mineral salts, usually found in a hollow organ or duct, such as the ureter. A calculus may cause inflammation or obstruction.

Diuresis: volume urine output.

Elimination: removal of the body's waste products by the skin, kidneys, lungs, and intestines; final excretion phase.

Enuresis: involuntary urination during sleep; bedwetting.

Excretion: process of removing or shedding substances by body organs or tissues during natural metabolic activity; usually begins at the cellular level.

Homeostasis: state of chemical and physical equilibrium of fluids in the body's internal environment.

Hydrostatic pressure: pressure exerted by a fluid.

Hypercalciuria: elevated urine calcium level.

Insensible fluid loss: water lost from the body through evaporation, for example, that lost from the lungs during expiration.

Leukocyturia: frequent symptom of inflammatory process in urinary tract. The leukocytouria as a sign means the presence of more than 5 leukocytes in visual field during the microscopic investigation of urine sediment.

Micturition: urination; the act of voiding, emptying, or evacuating urine from the body.

Nephritis: kidney (renal) disease characterized by kidney inflammation and dysfunction.

Nephrolithiasis: kidney stone, urinary calculi.

Nocturia: excessive urine excretion at night; may stem from renal disease or excessive fluid consumption shortly before bedtime.

Oliguria: diminished capacity to form and eliminate urine; may result from a fluid or electrolyte imbalance, a renal lesion, or urinary tract obstruction.

Osmotic pressure: pressure exerted on a semipermeable membrane separating a solution from a solvent, when only the solvent, not the solutes, can permeate the membrane.

pH: hydrogen ion concentration, reflecting a solution's acidity or alkalinity on a scale of 1 to 14. Normal urine pH, for example, ranges from 4.5 to 8.0.

Polydipsia: excessive thirst, characteristically accompanying diabetes mellitus.

Polyuria: excretion of an abnormally large urine volume; may result from diuretics, diabetes mellitus, diabetes insipidus, alcohol intake, or excessive fluid intake.

Pyuria: pus in the urine.

Specific gravity: relative weight of a fluid compared to the weight of an equal amount of water, determined by the amount of solids in the fluid. For example, urine with a specific gravity of 1.010 is 1.010 times heavier than water.

Uremic frost: pale, frostlike deposit of white or yellow urate crystals on the skin. Sometimes accompanying renal failure and uremia, uremic frost forms when urea compounds and other metabolic waste products cannot be excreted through small superficial capillaries to the skin, where they collect on the surface.

Urinary frequency: abnormally frequent urination, or urge to urinate, without an increase in total daily urine output.

Immune System and Blood

Anemia: abnormal decrease in red blood cells (RBCs) per cubic millimeter (mm^3) of blood, hemoglobin quantity (common less then 110 g/l), or volume of packed RBCs per deciliter of blood. Anemia occurs when balance between blood loss (through bleeding or RBC destruction) and blood production is disrupted.

Basophil: least common granulosyte, having cytoplasmic granules containing serotonin and histamine and irregulary shaped, two-lobed, segmented nucleus. Normal values 0.3% to 2%. Above-normal level (basophilia) – leukemia, chronic inflammation, polycythemia vera, postsplenectomy; below-normal level – acute allergic reactions, hyperthyroidism, stress reactionsas in MI and bleeding peptic ulcer, hypersensitivity reactions, prolong steroid therapy.

B cell or **B lymphocyte:** white blood cell (WBC), originating in the bone marrow, that produces anribodies; responsible for humoral immunity.

Ecchymosis: flat, purple-blue, hemorrhagic bruise on the skin or mucous membranes caused by blood escaping into tissue from a blood vessel.

Eosinophil: granulocyte with two lobes that responds phagocytically to allergens and parasites. Normal findings eosinophils 0.3% to 7%.

Eosinophilia: above-normal level of eosinophils in blood. Possible causes: hyperimmune, allergic, and degenerative reactions; parasitic disease, Addison's disease, lung and bone cancer, chronic skin infections, Hodgkin's disease, subacute infections.

Eosinopenia: below-normal level of eosinophils in blood. Possible causes: increased adrenal steroid production from stress, infectious mononucleosis, hypersplenism; congestive heart failure; Cushing's syndrome; aplastic and pernicious anemias; use of ACTH or thyroxine.

Erythrocyte or red blood cell: rounded, biconcave disk-shaped nonnuclear cell that contains hemoglobin and transports oxygen and carbon dioxide throughout the body. Normal values of erythrocyte (RBC) count: child – 4.6 to 4.8 million/mm^3; full-term neonate – 4.4 to 5.8 million/mm^3.

Erythrocyte (osmotic) fragility: this test measures RBC resistance to hemolysis on exposure to a series of increasingly dilute saline solutions to confirm morphologic abnormalities and diagnose hereditary spherocytosis.

Erythrocyte sedimentation rate (ESR): this test measures the time required for RBCs in a whole blood sample to settle to the bottom of a verticale tube, displacing the plasma upward, which retards settling of other blood elements. The ESR is a sensitive, but nonspecific. Normal values is 2 to 20 mm/hour. Rates gradually increase with age. Above-normal level – pregnancy, acute or chronic inflammation, tuberculosis, paraproteinnemias, rheumatic fever, rheumatoid arthritis, some cancers, anemias. Below-normal level – polycythemia, sickle cell anemia, hyperviscosity, low plasma protein levels.

Hematocrit (HCT): concentration of RBCs in total blood volume, expressed as a percentage. Normal findings: child -36% to 40%; neonate – 55% to 68%.

Hematopoiesis: formation and development of blood cells from precursors.

Hemoglobin (Hb): oxygen-carrying RBC pigment; formed by the developing erythrocyte in bone marrow. A conjugated protein carrying four heme grops and globin, hemoglobin can carry and release oxygen. It is expressed as grams of hemoglobin per deciliter of blood. Normal values: child – 11 to 13 g/dl; neonate – 17 to 22 g/dl (or 170 to 220 g/l).

Hemostasis: process that terminated bleeding by a complex mechanism including vasoconstriction and coagulation.

Humoral immunity: acquired specific immunity in which B cells and immunoglobulins play a major role, responding to antigens such as bacteria and foreign tissue.

Immunoglobulin: antibody, one of a class of proteins that interacts specifically with antigens, usually at the cell surface.

Immunoproliferative disease: disorder characterized by abnormal proliferation of cells that normally provide immunity, such as leukocytes and lymphocytes.

Liukocyte or **white blood cell:** cell that constitutes an important part of the body's defense and immune system. Leukocytes may be subdivided into two groups, granulocytes and agranulocytes, or into five cell types: neutrophils, eosinophils, basophils, monocytes, and lymphocytes. Normal values of leukocyte (WBC) count 4,100 to 10,900/mm^3.

Leukocytosis: above-normal level leukocytes in the blood. Possible causes: infection (usually); leukemia; tissue necrosis from burns, myocardial infarction (MI).

Leukopenia: below-normal level leukocytes in the blood. Possible causes: bone marrow depression related to viral infections, toxic reactions, typhoid fever, radiation, alcoholism, diabetes.

Lymphadenopathy: lymph node condition characterized by hypertrophy or proliferation of lymphoid tissue.

Lymphocyte: mononuclear leukocyte produced chiefly by lymphoid tissue. The smallest of the WBCs, lymphocytes give rise to T cells and B cells, which are instrumental in cell-mediated and humoral immunity, respectively. Normal findings of lymphocytes in the blood 16.2% to 60% and depend on age of child.

Lymphocytosis: above-normal level lymphocytes in the blood. Possible causes: infections such as pertussis, brucellosis, syphilis, tuberculosis, hepatitis, infectious mononucleosis, mumps, rubella, and cytomegalovirus; thyrotoxicosis; hypoadrenalism; ulcerative colitis; immune disease; lymphocytic leukemia.

Lymphopenia: below- normal level lymphocytes in the blood. Possible causes: severe debilitating illness such as congestive heart failure, renal failure, and advanced tuberculosis; high levels of adrenal corticosteroid related to immunodeficiency or immunosuppressive drugs.

Macrophage: large, mononuclear, highly phagocytic WBC that stimulates antibody production. Found in blood vessel walls and in loose connective tissue, macrophages derive from monocytes and from pert of the reticuloendothelial system.

Megakaryocyte: large, multilobed bone marrow cell that releases thrmbocytes (platelets).

Monocyte: mononuclear phagocytic leukocyte, the largest of the WBCs. When monocytes enter peripheral tissues, they swell and transform into fixed populations of cells called tissue macrophages. Normal findings in the blood 0.6% to 9.6 %.

Monocytosis: above-normal level monocytes in the blood. Possible causes: viral infections, bacterial and parasitic infestations, collagen diseases, hematologic disorders.

Neutrophil: granulocyte with single, multilobed nucleus. Neutrophils account isfor 30% to 70% of circulating WBCs depending on child’s age. This cells migrate to infection sites by diapedesis. They are phagocytic.

Neutrophilia: above-normal level neutrophils in the blood. Possible causes: bacterial and parasitic infections, metabolic disturbances (gout, diabetic or uremic coma, eclampsia), hemolysis, use of certain drugs (diuretic mercurials, sulfonamides), tissue breakdown (burns, MI, tumor).

Neutropenia: below-normal level neutrophils in the blood. Possible causes: acute viral infections, blood diseases, toxic agents, hormonal diseases.

Petechia: tiny, flat, round, red or purple spot on skin caused by minute submucosal or intradermal hemorrhage.

Polycythemia: abnormal increase of RBCs in the blood.

Purpura: any of several hemorrhagic states characterized by purplish red patches on skin caused by blood escaping into tissues, skin, or mucous membranes. Small pirpurae are petechiae; large purpurae are ecchymoses.

Reticulocyte: immature RBC characterized by a meslike network. Released into circulation by the bone marrow, reticulocyte release rate about equals the rate of RBC removal by the spleen, so the reticulocyte count reflects the blood cell activity rate in the bone marrow.

T cell or **T lymphocyte:** thymic lymphocyte responsible for cell-mediated immunity.

Thrombocyte or **platelet cell:** disk-shaped blood cell essential for coagulation. Formed in a megakaryocyte, thrombocytes are released in clumps into the blood, where they contribute to hemostasis. Normnal platelet count is 130,000 to 370,000/mm^3.

Thrombocytosis: above-normal level thrombocyte in the blood. Possible causes: primary thrombosytosis, polycythemia vera, chronic myelogenous leukemia, hemorrhage, infectious disorders, carcinomas, iron-deficiency anemia, splenectomy, pregnancy, inflammatory disordes.

Thrombocytopenia: below-normal level thrombocyte in the blood. Possible causes: bone marrow diseases, folic acid or vitamin B12 deficiency; disseminated intravascular coagulation (DIC); increased platelet destruction from drugs, immunotherapy, or mechanical injury.

Endocrine System

Acromegaly: endocrine condition characterized by gradual, marked enlargement and elongation of the bones of the face, jaw, hands, and feet, caused by excess production of growth hormone in adults.

Addison's disease: endocrine disorder of the adrenal cortex, caused by decreased cortisol and aldosterone secretion, characterized by a bronze coloration of the skin and potentially life-threatening crises.

Aldosteron: mineralocorticoid produced by the adrenal cortex that regulates the sodium and potassium balance in the blood.

Antidiuretic hormon (ADH): hormone secreted by the hypothalamus and stored in the posterior lobe of the pituitary gland; reduce urine production by increasing the water reabsorption in the renal tubules.

Cretinism: endocrine disorder of the thyroid gland, caused by deficient thyroid hormone secretion in a pediatric client, characterized by a lack of physical growth.

Cushing's syndrome: endocrine disorder, caused by excess corticosteroid production, characterized by hirsutism, obese trunk and abdomen, and thin extremities.

Diabetes insipidus: endocrine disorder of the posterior lobe of the pituitary gland, caused by ineffective or decreased vasopression secretion.

Diabetes mellitus: endocrine disorder of the pancreas involving chronically elevated blood glucose levels resulting from insufficient or ineffective insulin production, decreased insulin receptors, or post-receptor defects.

Endocrine glands: glands that release hormones directly into the bloodstream.

Feedback mechanism: return of information on hormone levels that signals specific endocrine gland response.

Goiter: thyroid enlargement.

Hirsutism: increased hair in masculine pattern in females.

Hormone: chemical substance produced by an endocrine gland that exerts a specific regulatory effect on the activity of a certain organ or organs.

Hyperglycemia: excessive blood glucose levels.

Hyperparathyroidism: endocrine disorder of the parathyroid glands, caused by excess parathyroid hormone secretion and characterized by back pain and fractures.

Hyperthyroidism: endocrine disorder of the thyroid gland caused by excess thyroid hormone secretion and characterized by heat intolerance, anxiety, and weight loss.

Hypoglycemia: insufficient blood glucose levels.

Hypoparathyroidism: endocrine disorder of the parathyroid glands, caused by decreased or ineffective use of parathyroid hormone and characterized by neuromuscular irritability and increased deep tendon reflexes.

Hypothyroidism: endocrine disorder of the thyroid gland caused by deficient or ineffective thyroid hormone levels and characterized by fatigue, dry skin, and puffy face.

Inhibiting factor: tropic hypothalamic hormone that inhibits release of the anterior pituitary hormones.

Panhypopituitarlsm: endocrine disorder of the pituitary gland, caused by decreased pituitary hormone secretion; characterized in children by retarded growth and in adults by decreased libido, extreme fatigue, and apathy.

Pheochromocytoma: rare tumor of the adrenal medulla that secretes excessive catecholamines at inappropriate times.

Receptor mechanism: mechanism in which hormones bind to macromolecules on the cell membranes or in the cells

so that hormonal action can take place at the cellular level.

Releasing factor: tropic hypothalamic hormone that stimulates release of the anterior pituitary hormones.

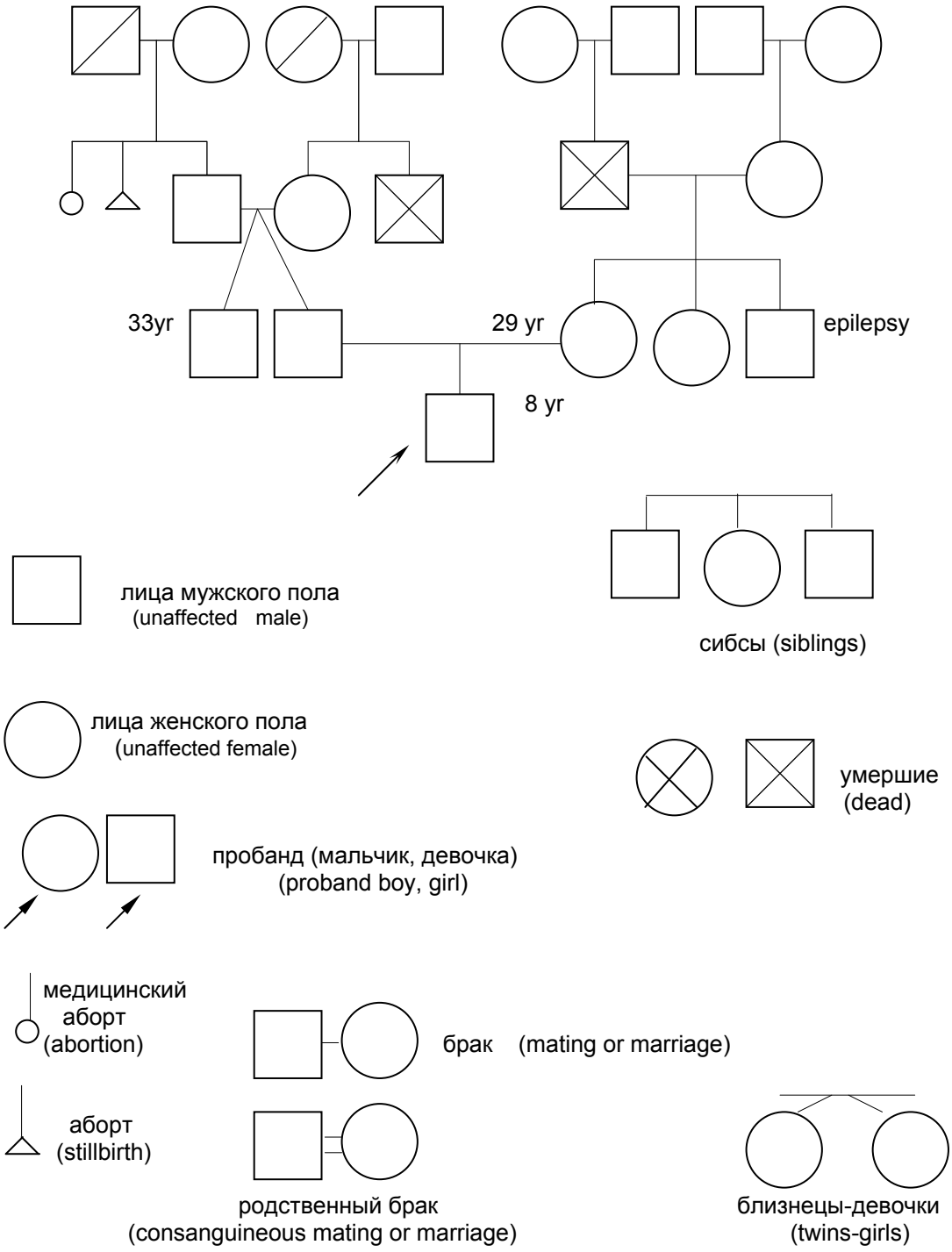
Target sites: locations of hormonal action in the body.

COMMON MEDICAL ABBREVIATIONS

AB apex beat **A:G** albumen globulin ratio **AI** aortic incompetence **AN** antenatal **AP** antero-posterior **AS** alimentary system **ASD** atrial septal defect **ASO** antistreptolysin O **A& W** alive and well	**LP** lumbar puncture **LV** left ventricle, lumbar vertebra
BF breast fed **BP** blood pressure **BS** breath sounds; bowel sounds **BWt** birth weight	**MCD** mean corpuscular diameter **MCH** mean corpuscular haemoglobin **MCHC** mean corpuscular haemoglobin concentration **MCV** mean corpuscular volume **ml** millilitre **MMR** measles, mumps & rubella vaccination
CBC complete blood count (US) **CHF** chronic heart failure; congestive heart failure (US) **CNS** central nervous system **c/o** complains of **creps** crepitations (UK) (rales US) **CSF** cerebrospinal fluid	**NAD** no abnormality detected **NND** neo-natal death
ECG/EKG (US) electrocardiogram **ENT** ear, nose and throat **ESR** erythrocyte sedimentation rate	**OA** on admission **O/E** on examination
FBC full blood count (UK) **fl** femtolitre (10^{-15}l) **FTND** full term normal delivery	**P** pulse; protein **PDA** patent ductus arteriosus **Pl.** plasma **PR** pulse rate
g gram **GC** general condition **GIS** gastrointestinal system	**RBC** red, blood cell count; red blood corpuscles **RS** respiratory system **RR** respiratory rate
Hb/Hgb haemoglobin **Hct** haematocrit **H & P** history and physical examination **HR** heart rate **HS** heart sounds	**SG** specific gravity **SM** systolic murmur
IM intramuscular **IQ** intelligence quotient **IU** international unit **IVP** intravenous pyelogram	**T** temperature **TB** tuberculosis

KUB kidney, ureter and bladder	**USS** ultrasound scan **VSD** ventricular septal defect **WBC** white blood cell count; white blood corpuscles **WNL** within normal limits **XR** X-ray

ГЕНЕТИЧЕСКАЯ КАРТА (Genealogical tree)



Development of Permanent teeth in child

AGE	GIRLS	BOYS
5	11	
6	6 11 6 6 11 6	6 6 6 11 6
7	6 2112 6 6 2112 6	6 2112 6 6 2112 6
8	6 2112 6 6 2112 6	6 2112 6 6 2112 6
9	654 2112 456 6 43211234 6	6 2112 6 6 4 2112 4 6
10	654321123456 654321123456	6 43211234 6 654321123456
11	76543211234567 76543211234567	654321123456 76543211234567
15	76543211234567 76543211234567	76543211234567 76543211234567

Rules of thumb for growth

Weight

1. Weight loss in first few days: 5-10% of birth weight (BW)
2. Return to BW: 7-10 days of age.
   Double BW: 4-5 mo,
   Triple BW: 1yr
   Quadruple BW: 2 yr.
3. Average weights: 3,5 kg at birth
   10 kg at 1 yr.
   20 kg at 5 yr.
   30 kg at 10 yr.
4. Daily weight gain: 20-30 g for first 3-4 mo
   15-20g or rest of the first year
5. Average annual weight gain: 2 kg between 2 yr and puberty (spurts and plateaus may occur).

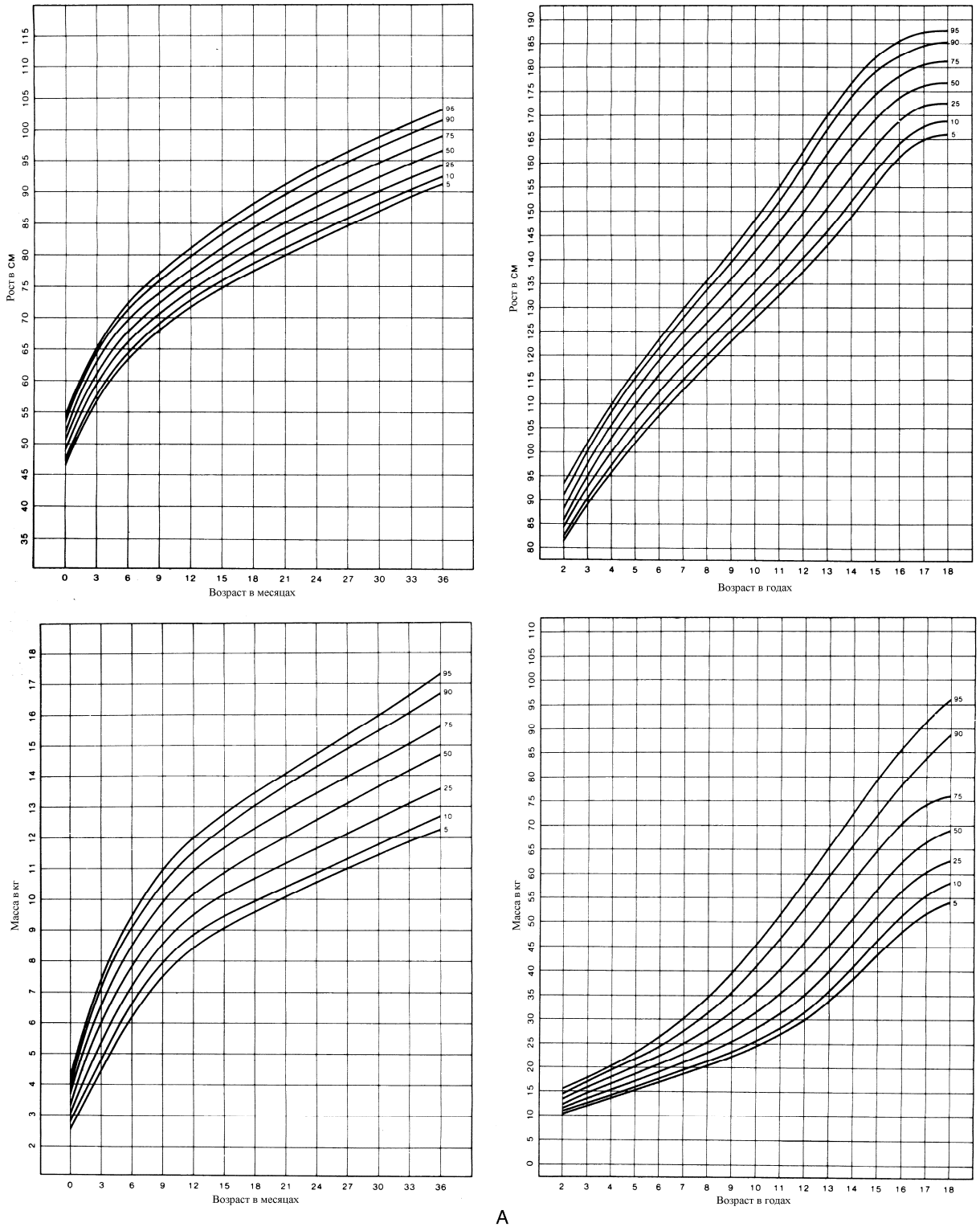
Height

1. Average length: 50 cm at birth, 75 cm at 1 yr.
2. At age 3 yr, the average child is 3 ft tall.
3. At 4 yr, the average child is 100 cm tall (double birth length).
4. Average annual height increase: 5 cm between age 4 yr and puberty.

Head Circumference

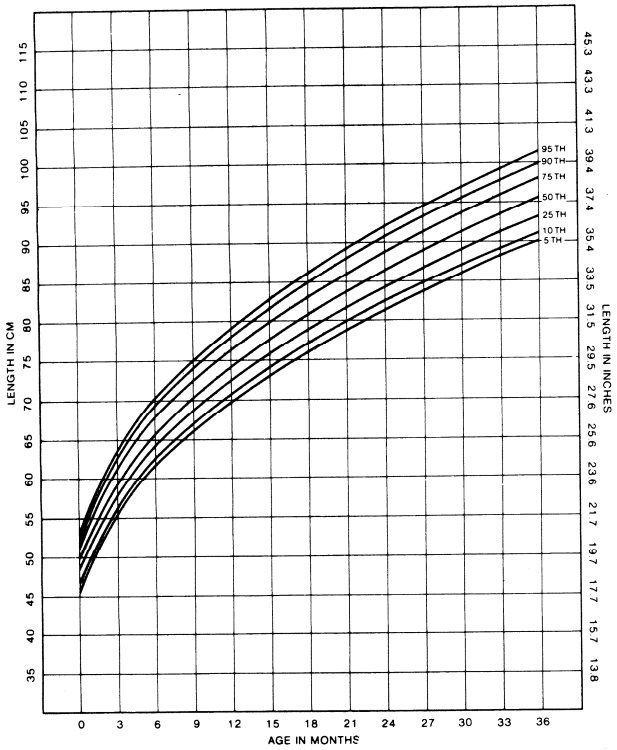
1. Average head circumference at birth: 35 cm

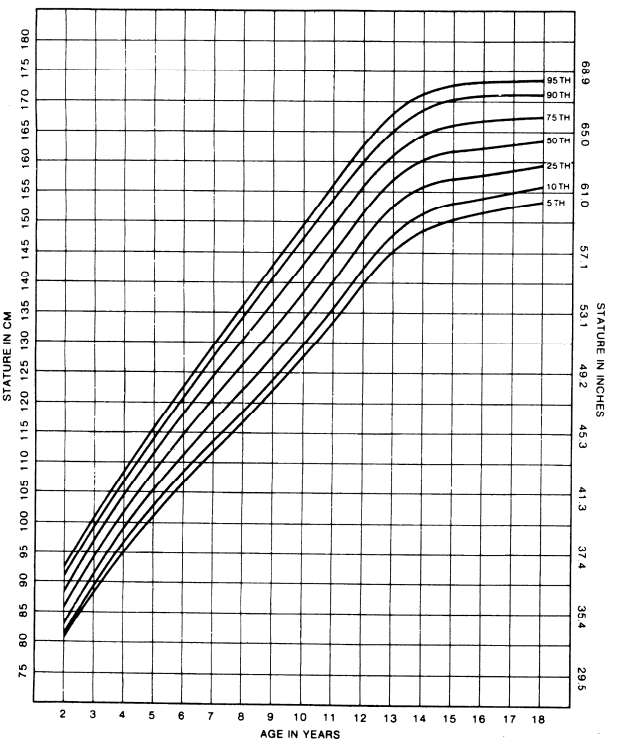
2. Head circumference increases: 12 cm for first yr and 10 cm for rest of life.

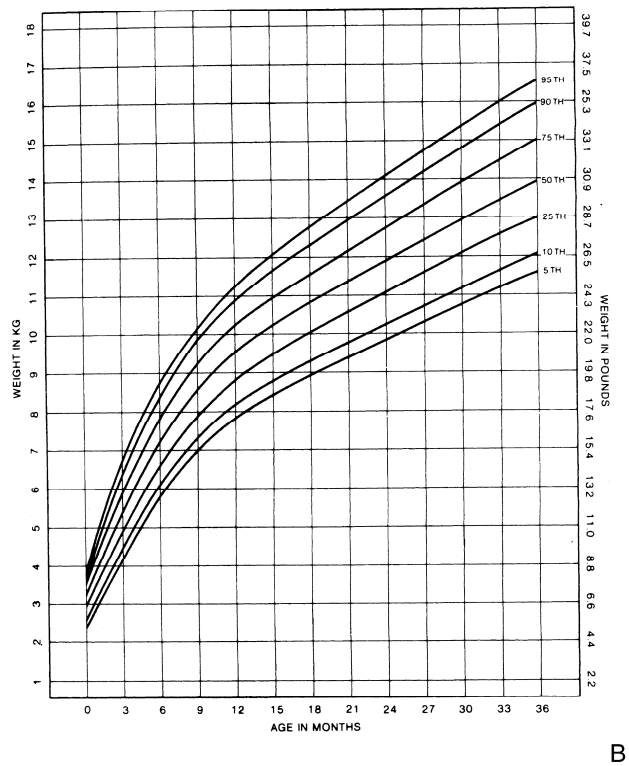


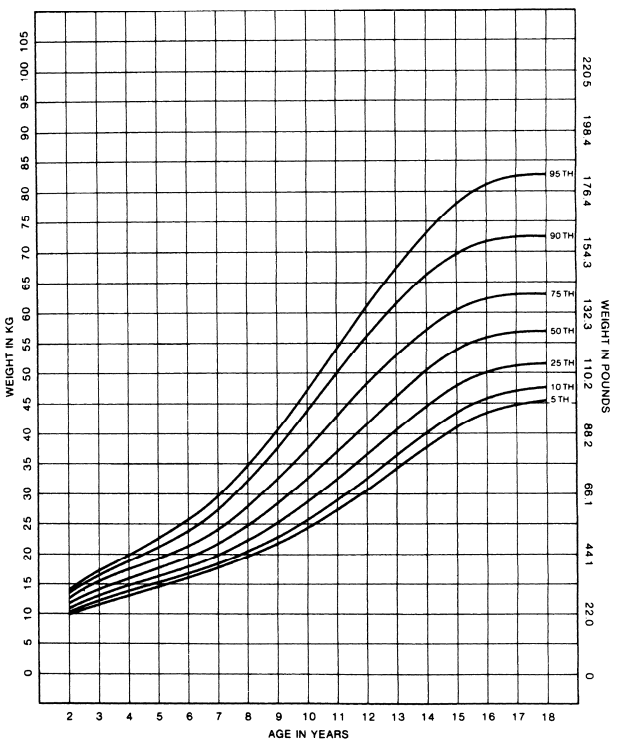
A

Charts for BOYS (A) of length (or stature) by age (upper curves) and weight by age (lower curves), each curve corresponding to the indicated percentile level.


LENGTH IN CM
LENGTH IN INCHES
AGE IN MONTHS
95 TH
90 TH
75 TH
50 TH
25 TH
10 TH
5 TH


STATURE IN CM
STATURE IN INCHES
AGE IN YEARS
95 TH
90 TH
75 TH
50 TH
25 TH
10 TH
5 TH


WEIGHT IN KG
WEIGHT IN POUNDS
AGE IN MONTHS
95 TH
90 TH
75 TH
50 TH
25 TH
10 TH
5 TH


WEIGHT IN KG
WEIGHT IN POUNDS
AGE IN YEARS
95 TH
90 TH
75 TH
50 TH
25 TH
10 TH
5 TH

B

Charts for GIRLS (B) of length (or stature) by age (upper curves) and weight by age (lower curves), each curve corresponding to the indicated percentile level.

Percentile table for boy's weight (kg) by age

Age	Percentile (interval)					
	3	10	25	75	90	97
	1	2	3	4	5	6
24 month	9,6	10,9	11,8	13,5	14,6	15,4
30 month	10,6	11,6	12,6	14,5	16,0	16,5
36 month	12,1	12,7	13,6	16,0	17,0	18,0
4 years	13,3	14,2	15,0	18,0	19,0	20,0
5 years	14,8	16,0	17,1	10,0	22,0	23,1
6 years	16,5	17,9	19,0	22,7	25,0	27,7
7 years	18,4	20,1	21,3	25,6	28,1	31,6
8 years	20,3	22,1	23,6	28,4	31,4	35,3
9 years	22,3	24,2	25,8	31,6	35,2	39,3
10 years	24,2	26,3	28,4	35,1	39,5	45,2
11 years	26,3	28,6	31,1	39,2	44,5	51,3
12 years	28,6	31,4	34,4	44,0	50,3	58,2
13 years	31,3	34,8	38,2	49,5	56,2	65,0
14 years	34,5	39,0	43,2	55,9	62,4	72,1
15 years	38,2	43,4	48,3	60,5	67,1	76,4
16 years	41,0	48,2	55,0	67,0	74,0	82,4
17 years	47,2	53,1	57,3	68,1	75,0	86,0

Percentile table for girl's weight (kg) by age

Age	Percentile (interval)					
	3	10	25	75	90	97
	1	2	3	4	5	6
24 month	10,0	10,6	11,5	13,1	14,0	15,1
30 month	11,2	11,8	12,8	14,5	16,0	17,0
36 month	11,7	12,5	13,1	15,0	16,5	17,5
4 years	13,1	14,1	14,9	17,2	19,0	20,1
5 years	15,1	16,1	17,2	20,1	22,0	24,0
6 years	16,4	17,5	19,0	22,7	25,1	27,9
7 years	18,2	19,4	21,1	25,4	28,4	31,8

8 years	20,1	21,4	23,2	28,5	32,3	36,5
9 years	22,1	23,5	25,5	32,1	36,5	41,2
10 years	24,0	26,0	28,3	36,1	41,3	47,1
11 years	26,0	28,5	31,5	40,6	46,0	53,6
12 years	28,7	31,8	35,5	45,6	51,4	58,8
13 years	32,1	35,7	40,0	58,8	56,7	65,3
14 years	36,2	40,2	44,2	55,0	60,9	70,1
15 years	39,6	43,8	47,7	58,0	63,8	74,5
16 years	42,2	47,1	51,1	61,0	66,0	76,3
17 years	45,0	48,4	52,3	62,0	68,0	79,0

Percentile table for boy's height (cm) by age

Age	Percentile (interval)					
	3	10	25	75	90	97
	1	2	3	4	5	6
24 month	78,6	80,9	83,0	89,2	91,1	94,2
30 month	80,6	84,7	88,2	94,1	96,1	100,0
36 month	88,1	90,4	92,2	98,2	100,2	104,2
4 years	94,1	96,4	98,9	106,1	108,2	110,0
5 years	100,5	102,8	102,2	112,2	116,0	118,4
6 years	106,5	109,0	112,0	119,5	122,1	123,5
7 years	112,4	115,3	118,1	125,7	128,5	130,0
8 years	117,2	120,8	123,6	131,6	134,9	136,7
9 years	122,9	126,1	129,7	136,8	140,5	143,2
10 years	128,0	130,9	134,3	142,2	146,3	149,4
11 years	132,0	135,6	138,9	147,8	154,3	155,5
12 years	136,0	140,2	143,5	153,5	158,8	162,5
13 years	142,0	144,8	149,0	160,1	165,8	169,8
14 years	145,6	149,9	155,3	166,7	172,4	176,6
15 years	149,9	155,0	161,0	172,1	177,4	181,0
16 years	154,0	160,4	167,1	178,1	172,1	185,0
17 years	160,3	166,5	170,4	180,1	184,0	187,5

Percentile table for girl's height (cm) by age

Age	Percentile (interval)					
	3	10	25	75	90	97
	1	2	3	4	5	6
24 month	75,6	80,5	82,3	87,6	90,8	92,6
30 month	80,2	84,0	87,2	92,1	96,0	97,5
36 month	86,4	88,7	92,0	96,4	100,0	102,0
4 years	94,0	96,0	98,4	104,4	108,0	109,1
5 years	100,5	102,7	106,0	112,2	116,0	117,0
6 years	105,3	108,5	112,1	119,1	121,9	123,2
7 years	111,1	114,5	118,2	125,3	128,1	134,1

8 years	116,6	120,2	124,0	130,8	134,3	138,2
9 years	122,0	125,7	130,0	136,4	140,7	144,6
10 years	126,6	130,7	134,7	142,4	147,5	150,5
11 years	131,1	136,4	140,1	148,7	153,6	156,9
12 years	135,9	140,8	146,4	155,1	159,3	163,5
13 years	141,2	146,1	151,0	160,3	163,7	168,1
14 years	144,9	150,1	155,2	163,5	167,1	170,7
15 years	149,6	154,5	158,0	165,6	169,3	172,8
16 years	152,5	158,0	160,6	166,3	170,1	174,0
17 years	155,2	158,9	161,6	168,0	172,0	176,4

Developmental Milestones in child

Age	Milestones
1 month	Raises head slightly when prone; alerts to sound; regards face, moves extremities equally.
2-3 months	Smiles, holds head up, coos, reaches for familiar objects, recognizes parent.
4-5 months	Rolls front to back and back to front; sits well when propped; laughs, orients to voice; enjoys looking around; grasps rattle, bears some weight on legs.
6 months	Sits unsupported; passes cube hand to hand; babbles; uses raking grasp; feeds self crackers.
8-9 months	Crawls, cruises; pulls to stand; pincer grasp; plays pat-a- cake; feeds self with bottle; sits without support; explores environment.
12 months	Walking, talking a few words; understands no; says mama/dada discriminantly; throws objects; imitates actions, marks with crayon, drinks from a cup.
15-18	Comes when called; scribbles; walks

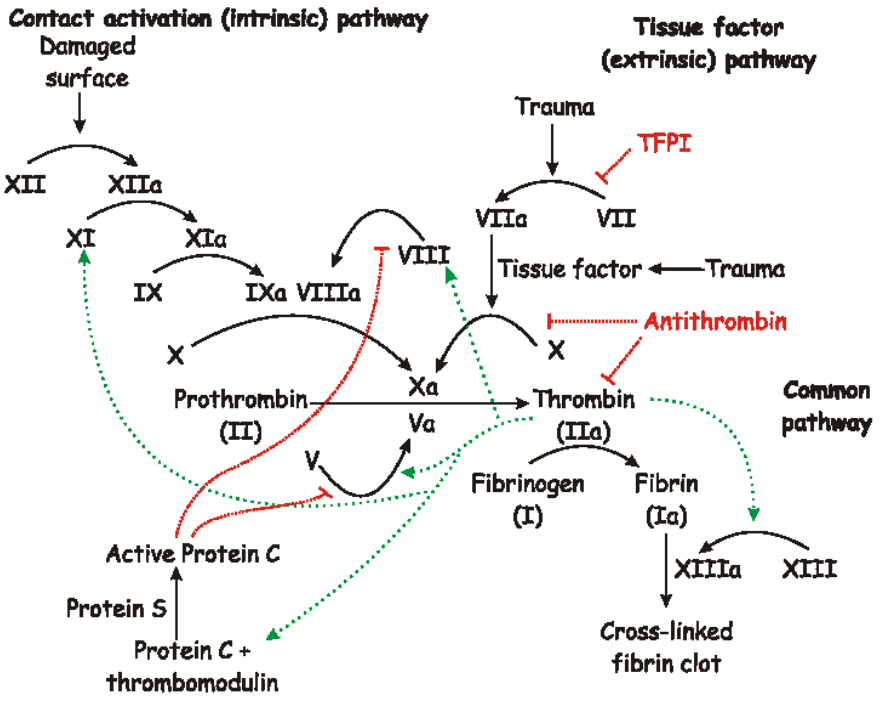
months	backward; uses 4-20 words; builds tower of 2 blocks.
24-30 months	Removes shoes; follows 2 step command; jumps with both feet; holds pencil, knows first and last name; knows pronouns. Parallel play; points to body parts, runs, spoon feeds self, copies parents.
3 years	Dresses and undresses; walks up and down steps; draws a circle; knows more than 250 words; takes turns; shares. Group play.
4 years	Hops, skips, catches ball; memorizes songs; plays cooperatively; knows colors; uses plurals.
5 years	Jumps over objects; prints first name; knows address and mother's name; follows game rules; draws three part man; hops on one foot.

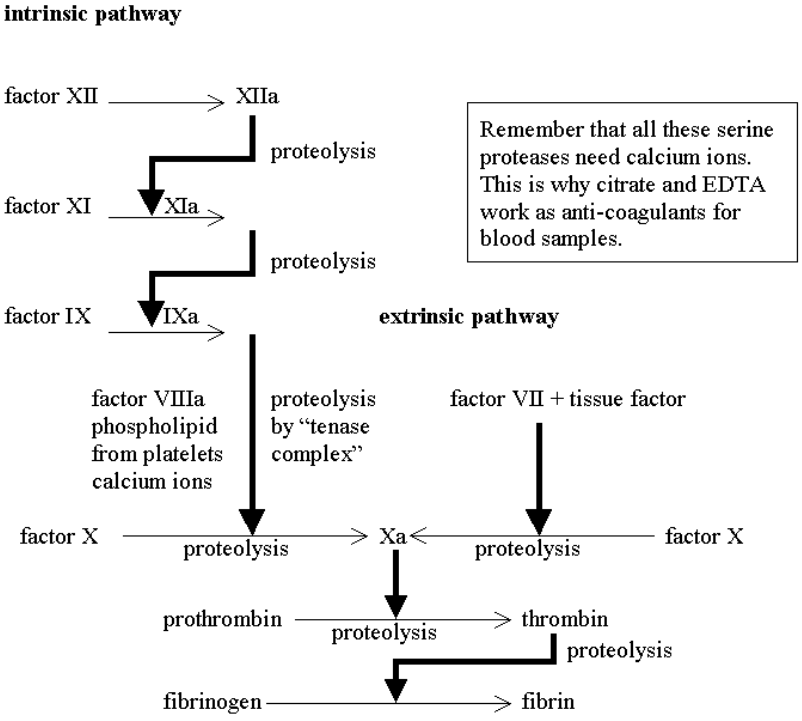
LABORATORY EXAMINATION

Hematology

Determination	Age/sex	Normal value				
Hematocrit (Ht)	Newborn (1-7 days)	45-56%				
	Neonate	31-43%				
	Infant	28-36%				
	Child	31-43%				
	Thereafter: Male Female	 42-52% 37-47%				
Hemoglobin (Hb)	Newborn	145-200 g/l				
	Neonate	100-140 g/l				
	Infant	110-135 g/l				
	Child	115-155 g/l				
	Thereafter:	120-160 g/l				
Osmotic fragility (fresh specimen) 50% hemolysis		0,42-0,46% NaCl				
Platelet count		150-350 $\times 10^9$/l				
Red blood cell count (RBC)	Newborn	4,5-7,5$\times 10^{12}$/l				
	Neonate	3,5-4,0$\times 10^{12}$/l				
	Infant /Child	3,2-4,5$\times 10^{12}$/l				
	Thereafter:	3,5-4,5$\times 10^{12}$/l				
Reticulocyte count	Newborn	1-3%				
	Infant	0,5-1%				
	Thereafter	1-3%				
Sedimentation rate (ESR)	Newborn	1-2 mm/hour				
	Neonate/ Child	3-15 mm/hour				
	Thereafter: Male	3-15 mm/hour				
	Female	3-15 mm/hour				
White blood cell count (WBC)		Total,$\times 10^9$/L	% eosinophils	% neutrophils		% lymphocytes
				bands	segmented granulocyte	
	Newborn	5-21,0	1-4	4	51	25
	Neonate	6-18	1-4	4	36	45
	Infant	10,0	1-4	4	**28-36↓**	**45↑**
	5-6 years	10,0	1-4	4	**41**	**45**
	Thereafter	4,5-13,5	1-4	4	**40-61↑**	**25-35↓**

Hemostasis





Initial step is formation of platelet plug to stop bleeding from damaged vessel

Then, platelet plug is reinforced by fibrin clot

Then, fibrin clot is stabilized by activated factor XIII, which cross-links fibrin strands

Fibrin clot may occur via either intrinsic or extrinsic pathway (or both), though in vivo it occurs via a hybrid model

Coagulation factors in intrinsic or extrinsic pathway assemble on surface of activated platelets, which are usually at site of vascular injury

Many coagulation reactions also require calcium as a cofactor

Note: "a" after factor number indicates "activated"

Factor I: fibrinogen

Factor II: prothrombin

Factor III: tissue thromboplastin (tissue factor and phospholipid)

Factor IV: ionized calcium

Factor V: occasionally called labile factor or proaccelerin

Factor VI: unassigned

Factor VII: occasionally called stable factor or proconvertin

Factor VIII: antihemophilic factor

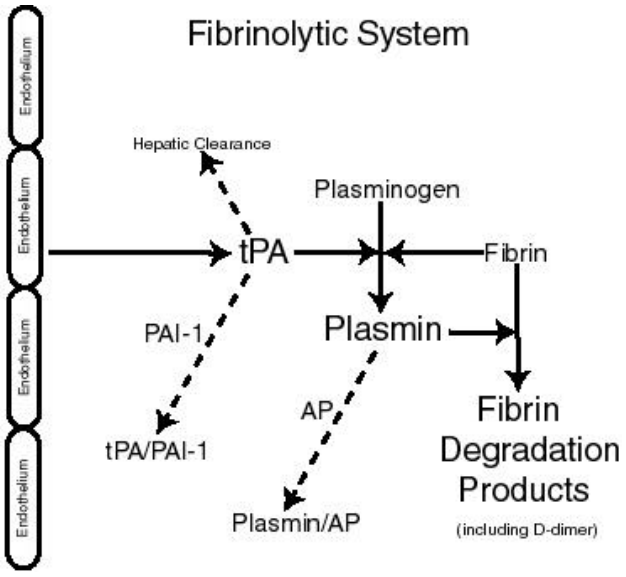
Factor IX: plasma thromboplastin component, Christmas factor

Factor X: occasionally called Stuart-Prower factor

Factor XI: occasionally called plasma thromboplastin antecedent

Factor XII: Hageman factor

Factor XIII: fibrin-stabilizing factor



Primary hemostasis:

Pinch test – skin does not change

Cuff test – less than 10 petechias

Trombocytes – 150-300 $\times 10^9$/l

Duration of capillary bleeding by Duce – 2-4 min

Clot retraction – 20-24 hours

Coagulation

Determination	Age/sex	Normal value
Activated clotting time (ACT)		1 minute 50”- 2 minute 30”
Bleeding time	Newborn	1-8 minutes
	Thereafter	1-6 minutes
Clot retraction (whole blood)		40%-94% at 2 hours
Clotting time (whole blood)	by Burcer	start 2,5 min; finish 5 min
	by Lee-White	5-10 min
Fibrinogen (plasma)		4,0-10,0 mkmol/l
Prothrombin consumption (serum)		> 25”
Prothrombin time (plasma)	Newborn	<17”
	Thereafter	11-14”
Trombin time (plasma)		<17”
Fibrinogen B (plasma)		absent

Serology

Determination	Age/sex	Normal value
Antistreptolysin O titer (ASO)	0-13 years	< 150 U/ml
	14 and older	< 200 U/ml
C-reactive protein (CRP)		Negative
Reumatoid factor, titer		Less than 1:80
Seromucoid		0,13-0,29 units

Chemistry

Determination	Age/sex	Normal value
ALT		0,1-0,78 mmol/l
ά-Amylase (serum)		3,3-8,9 mg(sek*l)
ά-Amylase (urine)		Less than 44 mg(sek*l)
Alkaline phosphatase		1,2-6,3 unit
Bilirubin, total (serum)	Newborn	8,55-60,0 mkM/l
	Thereafter	8,0-20,0 mkM/l
Bilirubin (direct “conjugated”) (serum)	Newborn	8,7-15 mkM/l
	Thereafter	2,0-5,0 mkM/l
Calcium (serum)	Newborn	2,25-2,55 mmol/l
	Thereafter	2,25-3,0 mmol/l
Carbon dioxid (P CO2) partial pressure in blood		35 - 45 mm Hg
Cholesterin (serum)		1,8-7,0 g/l
Chloride (serum)		100-108 mmol/l
Chloride (sweet)		0-30 mmol/L

Determination	Age/sex	Normal value
Creatinine (serum)		0,053-0,106 mmol/l
Creatinine (urine)		4,42-17,6 mmol/l
Iron-binding capacity (serum)		44,8-73,4 mkM/l
Iron, total (serum)	Newborn	9,0-26,9 mkM/l
	Thereafter: Male	10,7-21,5 mkM/l
	Female	13,4-24,4 mkM/l
Lipids, total (serum)		2,4-7,0 g/l
Protein, total (serum):	Newborn	47-65 g/l
	Child	54-79 g/l
	Thereafter	62-82 g/l
- albumin (serum)		57-70 %
- globulin, gamma (serum)		8-20 %
Fat, fecal (feces)	0-6 years	Less than 2 g/day
	Thereafter	2-6 g/day
Glucose (serum)	Neonate	1,6-4,0 mmol/l
	Infant	2,8-4,4 mmol/l
	Thereafter	3,9-5,6 mmol/l
Glucose (urine)		negative
Oxygen (P O2) partial pressure in blood		83 - 108 mm Hg
pH of blood		7,35-7,4
Potassium (serum)	Newborn	3,7-5,0 mmol/l
	Infant	4,1-5,3 mmol/l
	Child	3,4-4,7 mmol/l
	Thereafter	3,5-5,3 mmol/l
Sodium (serum)	Newborn	134-144 mmol/l
	Infant	139-146 mmol/l
	Child	138-145 mmol/l
	Thereafter	135-148 mmol/l
Triglycerides		0,2-0,8 g/l

Urinalysis

Determination	Age/sex	Normal value
Appearance (morning urine taken for the routine analysis)		Clear pale yellow to deep gold
Specific gravity (morning urine taken for the routine analysis) with normal fluid intake	Newborn	1.001-1.020
	Thereafter	1.016-1.020
pH	Newborn	5-7
	Thereafter	4.8-7.8
Glucose (morning urine taken for the routine analysis)		Absent
Protein (morning urine taken for the routine analysis)		Absent up to 0,033 g/L
Protein excretion in day (daily urine)		Less than 100 mg/ day

Aceton(ketone) (urine taken for the routine analysis)		Absent
Microscopic (morning urine taken for the routine analysis):		
- leukocytes		Less than 2 in microscopic view
- erythrocytes		Less than 2 in microscopic view
- casts		Occasional
Present of bacteria		Absent to a few

Urinalysis by Nechiporenko

In 1 ml urine (average portion of first urination in the morning):

- erythrocytes - 1000 in 1 ml of urine
- leukocytes - 2 thousand (2000 un.) leukocytes in 1 ml of urine
- casts – 100 in 1 ml of urine

Tests of renal function

In newborns the normal value of blood endogenous creatinine clearance is about 10 ml/mines. In infants aged 6 months it is 50 ml/mines. In children aged 1 year it reaches 100 ml/mines and due to be in adult level of 100 – 120 ml/minute.

Determination	Age/sex	Normal value
Blood urea nitrogen (BUN)	Newborn	4-18 mg/dl
	Thereafter	5-18 mg/dl
Urea (serum)		2,5 – 6,5 mmol/l
Creatinine (serum)		0,053-0,106 mmol/l
Urea (urine 24 h)		3,33- 8,33 mmol/l
Creatinine (urine)		4,42-17,6 mmol/l
Glomerular filtration rate		80-120 ml/min
Tubular reabsorption		97-99%
Specific gravity (morning urine taken for the routine analysis) with normal fluid intake (concentration)	Newborn	1.001-1.020
	Thereafter	1.016-1.020

The diuresis is everyday (daily diuresis) **or** hourly (hourly diuresis) urinary excretion.

The daily (or hourly) diuresis is not a constant parameter and can change in a wide range depending on the drunken water and sodium chloride consumption of. It is about **25-50ml/kg of body weight per day** or **1-2ml/kg of body weight per hour.** In late children and adults a normal diuresis is at list 500 ml/day and more.

Microbiological investigation of urine

In physiological conditions the urine is sterile.

In condition of the urine tract infection (including processes without clear clinical presentations) in the urine taken from the mean portion of stream the 10^3 (1000) and more microorganisms in 1 ml can be found out (***bacteriuria***).

The most important parameters of homeostasis are:

pH of arterial blood – 7,35-7,4

Bicarbonate – 20 – 24 мEq/ litre

Sodium ion – 135-140 мEq/ litre

Potassium ion – 4,0 – 5,5 мEq/ litre

Cloride ion – 100-105 мEq/ litre

Urea – 10 -30 мg/%, или 2,5 – 6,5 mM/l

Creatinine – 0,5 – 1,0 мg/% or 50 – 100 мkM/l

CEREBRAL SPINAL FLUID ANALYSIS				
Disease	**Color**	**Protein**	**Cells**	**Glucose**
Normal CSF Fluid	Clear	<50 mg/100 mL	<5 lymphs /mm^3	>40 mg/100 mL, .-2/3 of blood glucose level
Bacterial meningitis or tuberculous meningitis	Cloudy	Elevated 50-1500	>100 WBC/mm^3 predominantly neutrophils. Bacteria present on Gram's stain.	Low, <. of blood glucose
Tuberculous, fungal, partially treated bacterial, syphilitic meningitis, meningeal	Clear opalescent	Elevated usually <500	10-500 WBC with predominant lymphs	20-40, low

metastases				
Viral meningitis, partially treated bacterial meningitis, encephalitis, toxoplasmosis	Clear opalescent	Slightly elevated or normal	10-500 WBC with predominant lymphs	Normal to low

Average respiratory rates at rest (breaths/minute):

- Newborn - 35-40;
- 1-11 months - 30;
- 2-6 years – 21-25;
- 10-14 years -18-20.

The usual ratio of breaths to heartbeats is 1:4.

Gas exchange

In health arterial po2 is approximately 95 to 100 mm hg and arterial pco2 is 40 mm hg.
arterial blood gas and ph measurements at sea level (21% OXYGEN)*:
pH: Normal range 7.35-7.45
Acidosis Mild: 7.300-7,350
Mod.: 7.250-7.300
Severe: <7.250
Alkalosis Mild: 7.450-7.500
Mod.: 7.500-7.550
Severe: >7.550
PCO2: Normal range - 35 - 45 mm Hg
Hypercapnia Mild: 45-50
Mod.: 50-60
Severe: >60
Hypocapnia Mild: 30-45
Mod.: 25-30
Severe: < 25
P O2 : Normal range = 83 - 108 mm Hg
Hypoxemia Mild: 55-85
Mod.: 40-55
Severe: < 40
Bicarbonate: Normal values = 21- 28 mEq/liter
Depression Mild: 19-22
Mod.: 1749
Severe: < 17
Elevation Mild: 28-31

Mod.: 31-35
Severe: >35
Base excess: Normal values = - 3 to + 3
Depression Mild: -3 to - 7
Mod.: -7 thru -10
Severe: < -10
Elevation Mild: + 4 to +8
Mod.: +8 thru +12
Severe > + 12
*Ranges are for children and infants beyond the newborn period

The normal frequency of pulse

Age	Normal data
Newborns	120-140 per minute (immediately after the birth it is 100-160 per min)
Infants and late infants (1-2 years)	110-100 at minute
Toddlers (3-7 years)	100-90 at minute
Senior children and teens	80 per minute and less

Location of Lymph Node (s)

Location of Node(s)	Etiology of Infection or Process
Posterior auricular, posterior/ suboccipital, occipital	Measles, scalp infections (eg, tinea capitis)
Submandibular, anterior cervical	Oropharyngeal or facial infections (unilateral, "cold" submandibular nodes without infection indicates atypical mycobacteria)
Preauricular	Sinusitis, tularemia
Posterior cervical	Adjacent skin infection
Bilateral cervical of marked degree	Kawasaki's disease, mononucleosis, toxoplasmosis, secondary syphilis

Supraclavicular or scalene, lower cervical	Infiltrative process (malignancy)
Axillary	Cat scratch disease, sporotrichosis
Generalized adenopathy, including axillary, epitrochlear, inguinal	Generalized infection (mononucleosis, hepatitis), immunodeficiency (HIV), sarcoidosis
Recurrent episodes of adenitis	Chronic granulomatous disease, immunodeficiency

Normal data of arterial blood systolic pressure
Boys 1-17 years old

AGE	Height percentile / Pressure percentile	5	10	25	50	75	90	95
1	90	94	95	97	98	100	102	102
	95	98	99	100	102	104	105	106
2	90	98	99	100	102	104	105	106
	95	101	102	104	106	108	109	110
3	90	100	101	103	105	107	108	109
	95	104	105	107	109	111	112	113
4	90	102	103	105	107	109	110	111
	95	106	107	109	111	113	114	115
5	90	104	105	106	108	110	112	112
	95	108	109	110	112	114	115	116
6	90	105	106	108	110	111	113	114
	95	109	110	112	114	115	117	117
7	90	106	107	109	111	113	114	115
	95	110	111	113	115	116	118	119
8	90	107	108	110	112	114	115	116
	95	111	112	114	116	118	119	120
9	90	109	110	112	113	115	117	117
	95	113	114	116	117	119	121	121
10	90	110	112	113	115	117	118	119
	95	114	115	117	119	121	122	123
11	90	112	113	115	117	119	120	121
	95	116	117	119	121	123	124	125
12	90	115	116	117	119	121	123	123
	95	119	120	121	123	125	126	127
13	90	117	118	120	122	124	125	126
	95	121	122	124	126	128	129	130
14	90	120	121	123	125	126	128	128
	95	124	125	127	128	130	132	132
15	90	123	124	125	127	129	131	131
	95	127	128	129	131	133	134	135
16	90	125	126	128	130	132	133	134
	95	129	130	132	134	136	137	138
17	90	128	129	131	133	134	136	136
	95	132	133	135	136	138	140	140

Normal data of arterial blood diastolic pressure
Boys 1-17 years old

AGE	Height percentile / Pressure percentile	5	10	25	50	75	90	95
1	90	50	51	52	53	54	54	55
	95	55	55	56	57	58	59	59
2	90	55	55	56	57	58	59	59
	95	59	59	60	61	62	63	63
3	90	59	59	60	61	62	63	63
	95	63	63	64	65	66	67	67
4	90	62	62	63	64	85	66	66
	95	66	67	67	68	69	70	71
5	90	65	65	66	67	69	69	69
	95	69	70	70	71	72	73	74
6	90	67	68	69	70	70	71	72
	95	72	72	73	74	75	76	76
7	90	69	70	71	72	72	73	74
	95	74	74	75	76	77	78	78
8	90	71	71	72	73	74	75	75
	95	75	76	76	77	78	79	80
9	90	72	73	73	74	75	76	77
	95	76	77	78	79	80	80	81
10	90	73	74	74	75	76	77	78
	95	77	78	79	80	80	81	82
11	90	74	74	75	76	77	78	78
	95	78	79	79	80	81	82	83
12	90	75	75	76	77	78	78	79
	95	79	79	80	81	82	83	83
13	90	75	76	76	77	78	79	80
	95	79	80	81	82	83	83	84
14	90	76	76	77	78	79	80	80
	95	80	81	81	82	83	84	85
15	90	77	77	78	79	80	81	81
	95	81	82	83	83	84	85	86
16	90	79	79	80	81	82	82	83
	95	83	83	84	85	86	87	87
17	90	81	81	82	83	84	85	85
	95	85	85	86	87	88	89	89

Normal data of arterial blood systolic pressure
Girls 1-17 years old

AGE	Height percentile / Pressure percentile	5	10	25	50	75	90	95
1	90	97	98	99	100	102	103	104
	95	101	102	103	104	105	107	107
2	90	99	99	100	102	103	104	105
	95	102	103	104	105	107	108	109
3	90	100	100	102	103	104	105	106
	95	104	104	105	107	108	109	110
4	90	101	102	103	104	106	107	108
	95	105	106	107	108	109	111	111
5	90	103	103	104	106	107	108	109
	95	107	107	108	110	111	112	113
6	90	104	105	106	107	109	110	111
	95	108	109	110	111	112	114	114
7	90	106	107	108	109	110	112	112
	95	110	110	112	113	114	115	116
8	90	108	109	110	111	112	113	114
	95	112	112	113	115	116	117	118
9	90	110	110	112	113	114	115	116
	95	114	114	115	117	118	119	120
10	90	112	112	114	115	116	117	118
	95	116	116	117	119	120	121	122
11	90	114	114	116	117	118	119	120
	95	118	118	119	121	122	123	124
12	90	116	116	118	119	120	121	122
	95	120	120	121	123	124	125	126
13	90	118	118	119	121	122	123	124
	95	121	122	123	125	126	127	128
14	90	119	120	121	122	124	125	126
	95	123	124	125	126	128	129	130
15	90	121	121	122	124	125	126	127
	95	124	125	126	128	129	130	131
16	90	122	122	123	125	126	127	128
	95	125	126	127	128	130	131	132
17	90	122	123	124	125	126	128	128
	95	126	126	127	129	130	131	132

Normal data of arterial blood diastolic pressure
Girls 1-17 years old

AGE	Height percentile / Pressure percentile	5	10	25	50	75	90	95
1	90	53	53	53	54	55	56	56
	95	57	57	57	58	59	60	60
2	90	57	57	58	58	59	60	61
	95	61	61	62	62	63	64	65
3	90	61	61	61	62	63	63	64
	95	65	65	65	66	67	67	68
4	90	63	63	64	65	65	66	67
	95	67	67	68	69	69	70	71
5	90	65	66	66	67	68	68	69
	95	69	70	70	71	72	72	73
6	90	67	67	68	69	69	70	71
	95	71	71	72	73	73	74	75
7	90	69	69	69	70	71	72	72
	95	73	73	73	74	75	76	76
8	90	70	70	71	71	72	73	74
	95	74	74	75	75	76	77	78
9	90	71	72	72	73	74	74	75
	95	75	76	76	77	78	78	79
10	90	73	73	73	74	75	76	76
	95	77	77	77	78	79	80	80
11	90	74	74	75	75	76	77	77
	95	78	78	79	79	80	81	81
12	90	75	75	76	76	77	78	78
	95	79	79	80	80	81	82	82
13	90	79	76	77	78	78	79	80
	95	80	80	81	82	82	83	84
14	90	77	77	78	79	79	80	81
	95	81	81	82	83	83	84	85
15	90	78	78	79	79	80	81	82
	95	82	82	83	83	84	85	86
16	90	79	79	79	80	81	82	82
	95	83	83	83	84	85	86	86
17	90	79	79	79	80	81	82	82
	95	83	83	83	84	85	86	86

LITERATURE

1. GHAI Essential Pediatrics by O.P. Ghai M.D., FIAP, FAAP; Vinod K Paul M.D., PhD, FAMS, FIAP; Arvind Bagga M.D., FIAP, FAMS. Published by Satish Kumar Jain. India. Printed at: Thomson Press (India) LTD, 2009.

2. Nelson textbook 18th Edition by Robert M. Kliegman, MD, Richard E. Behrman, MD, Hal B. Jenson, MD and Bonita F. Stanton, MD. Published: SAUNDERS.

3. Pediatric History And Physical Examination by Elizabeth K. Albright, MD 4-th edition Copyright 2002-2003 Current Clinical Strategies Publishing.

4. Pediatrics by Paul H. Dworkin, M.D. B.I. Waverly Pvt Ltd New Delhi. Reprint authorised 3rd edition by Waverly Internatioonal 1996.

5. Physical Examination and History Taking by Barbara Bates, M.D. Lynn S. Bickley, M.D. Robert A. Hoekelman, M.D. 6 th Edition Copyright 1995, by J.B. Lippincott company.

6. Зразки медичних облікових форм та інструкції до них. Форма № 003-210 «Історія хвороби», затверджена Наказом МОЗ України 27.12.99р. №302. - Київ МНІАЦ медичної статистики VDW «Медінформ», 2008.

7. Клінічні протоколи надання медичної допомоги «Педіатрія». Збірник нормативних документів у 2-х частинах. - Київ МНІАЦ медичної статистики VDW «Медінформ», 2008.

8. Лекції з пропедевтики дитячих хвороб ЗГМУ.

9. Наказ МОЗ України № 149 від 20.03.2008 р. Про затвердження Клінічного протоколу медичного догляду за здоровою дитиною віком до 3 років.

Підписано до друку 19.09.2013 р.
Папір офсетний. Друк - ризограф.
Умов. друк. арк. 5,83
Наклад 75 прим. Зам. № 5913
Оригінал-макет виконаний в ЦВЗ ЗДМУ
69035, г. Запоріжжя, пр-т Маяковського 26,
тел. (0612) 34-97-82