CLINICAL CONCEPTS OF NEUROLOGICAL DISORDERS

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Clinical Concepts of Neurological Disorders

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Clinical Concepts of Neurological Disorders

Clinical Concepts in Medicine Monograph Series

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and
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Series Editors

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Cluff & Johnson: **INFECTIOUS DISEASES**

FOREWORD

The modern practice of clinical medicine is founded firmly upon a base of medical science. Perhaps in no other branch of medicine is the clinical method—the interpretation of signs and symptoms—so clearly related to a knowledge of structure and function as is the case with neurology. Referring to neurology in the Silliman lectures at Yale in 1913, Sir William Osler observed that "...the combined results of the new anatomical, physiological, and experimental work have rendered clear and definite what was formerly the most obscure and complicated section of internal medicine."*

Nevertheless, students and practitioners of medicine today still too often view neurology as an obscure and difficult specialty and the neurologist as a collector of rare and exotic diseases. The central importance of neurology to general medicine can be illustrated by the consideration that virtually all diseases express themselves to the patient *and* the physician by means of the nervous system. Beyond this, a variety of neuromuscular disorders are, in fact, encountered frequently in the everyday practice of medicine.

Clinical Concepts in Diseases of the Neuromuscular System represents a companion volume to *Clinical Concepts of Infectious Diseases*. Collectively the series, of which they both are a part, *Clinical Concepts in Medicine*, is designed to make available to medical students, house officers, and practitioners a selective survey of clinical problems encountered throughout medical practice. Emphasized in this series are approaches to clinical problems, examples of major disease entities, principles of management—the conceptual framework on which the practice of general medicine is structured. Rather than the exhaustive treatment of the classical comprehensive textbook, this series attempts to present a perspective. By means of selective bibliographies, the reader is directed further to important sources in the literature. Future volumes in the *Clinical Concepts* series, now in preparation, will round out the framework for the remaining areas which collectively comprise the field of general medicine.

LEIGHTON E. CLUFF, M.D.
JOSEPH E. JOHNSON, III, M.D.

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*Osler, William. *The Evolution of Modern Medicine*. New Haven: Yale University Press, 1921, p. 206.

PREFACE

The contributors to this volume have geared their presentations to medical students and house officers training in general medicine.

The topics were chosen to provide a core of information concerning the nervous system which would be useful to the non-neurologist. As much as possible, we have emphasized ambulatory and outpatient evaluations and have approached each subject as a physician would; first considering the presenting complaints, then the examination of the patient followed by laboratory findings, management, and a short but up-to-date bibliography so that the interested reader can pursue each topic in greater depth.

The volume begins with interviewing and screening techniques for defining neurologic disorders and continues with consideration of common abnormalities such as headache, weakness, paresthesias, and gait disturbances. There are special considerations of episodic disturbances such as syncope, convulsions, and cerebral vascular disease. A section of special interest is a chapter on differentiation of neurologic disease from functional disorders.

The diagnosis and management of disorders of cortical function including amnesia, disorders of expression, stupor, and coma are particularly relevant for internists.

Cerebral vascular disorders are singled out for special attention and a final chapter on the use of computerized cranial tomography in medical and neurologic practice is included because of the enormous impact of this diagnostic innovation on the delivery of care to patients suffering with disorders of the head and brain.

I am especially pleased to have been able to assemble the work of such an outstanding group of neurologists who are above all, bedside clinicians, therapeutically oriented, and who have broad experience in internal medicine and neurology.

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Chapter

1

THE CLINICAL INTERVIEW AND THE SCREENING NEUROLOGICAL EXAMINATION

William E. DeMeyer, M.D.

This introductory chapter outlines the history taking and examination techniques that will screen the average adult patient for symptoms and signs of neurologic disease. I have limited the scope of the text to include only practical, high yield clinical procedures, stressing above all how to do them correctly. Consequently, I have not described all of the parlor tricks possible during the neurologic examination nor have I covered laboratory tests. What follows then is a detailed description of the basic clinical interview and neurologic examination.

Clinical Interview

Primary Complaint

Each interview should follow a fairly regular routine. Greet the patient by asking for his name and then state yours. Make direct eye-to-eye contact. Offer your hand to a male patient or accept the hand of a woman for a handshake if she offers it. A smile always helps. Then start a conversation about any general topic. Inquire about the patient's address, occupation, the weather, or how long he has waited to see you, but avoid comments about the patient's appearance or clothing. Do not, in the vain hope of saving time, bypass this general conversation. First, you gain valuable background information about the patient's attitudes and life style. Secondly, and most important, the patient will feel that you have tried to hustle him along if you push forward too quickly. Delay the start of the actual medical interview until your body language and that of the patient indicate the proper moment. At this time both of you will have relaxed your shoulder girdles, opened up your fingers, and settled back in your chairs.

When the patient and physician begin to feel comfortable with each other, the physician asks, "What did you come to see me about?" Notice how the phrasing of the question leaves the response entirely open. Avoid a question like, "What kind of trouble are you having?" which has sinister implications (you are in trouble) and almost invites the patient to come forth with a conclusion or diagnosis.

After a patient offers his primary complaint, encourage him to elaborate on it by open, neutral responses such as, "Yes, go on," "I see," or "Tell me more about that." Do not editorialize or sympathize at this point. You want the patient's responses to be spontaneous and free from any programming, prejudices, or medical jargon that you might inadvertently impose.

When the patient's spontaneous recital ends, try to recapitulate the illness in chronological sequence to understand its tempo and specificities. Now introduce the questions of *how*, *when*, and *where*. I often find it useful to ask, "When were you last well?" as a means of focusing on the first events of the illness.

If the patient has a periodic disorder manifested by attacks with symptom-free intervals, suggesting, for example, a disorder like migraine or epilepsy, ask him to describe one attack in great detail, including the time of day, the circumstances preceding the attack, and the recovery phase. Because the patient usually remembers his last attack vividly, ask him to describe that one. Always take a detailed history of the period preceding the attack, particularly if the patient has blackout spells, either syncope or epilepsy. The details of the beginning of the attack provide the most useful information for a probable diagnosis. A blackout spell that always occurs when the patient arises suggests orthostatic hypotension, while one that occurs after hyperventilation suggests hyperventilation syncope. The first manifestation of an epileptic seizure, such as tingling in a thumb, suggests that the patient has a focal lesion of his contralateral sensory cortex. The first manifestation localizes the lesion or gives insight into the mechanism of the blackout spell, whereas the loss of consciousness that may follow has no localizing value. It merely reflects the gross disturbance of cerebral function which can result from a variety of mechanisms.

Review of Systems

After eliciting the patient's primary complaint and its chronology, the physician asks a systematic series of questions designed to reveal any other neurologic symptoms or health complaints. He asks about (1) headaches, dizziness, and loss of consciousness; (2) difficulty with vision, hearing, smell, taste, speaking, and swallowing; (3) difficulty with movements, weakness or paralysis, involuntary movements, tremors, loss of balance, or incoordination; (4) bladder, bowel, and sexual functions; and (5) sensation in the face, hands, and feet. If the patient's

history does not suggest neurologic disease, a single, general question about each of these areas may suffice. Frequently, however, you will want to follow this open inquiry with more explicit questions. To localize a neurologic lesion or to exclude a disease, you need to know what is intact or has never been affected as well as what is involved.

To complete this part of the history, ask about previous illnesses, hospitalizations, allergies, and operations, and obtain a family history. Finally, inquire about any toxic exposure and the use of medications, alcohol, tobacco, and street drugs.

Mental Status Examination

Table 1.1 outlines the traditional mental status examination. I conduct this examination during the interview both because it saves time and because it is less obtrusive and disturbing to the patient. The inexperienced physician often tests the mental status of the patient by asking a series of direct but disconnected questions, fired machine gun style, about time, place, person, who the President is, interpreting an obvious proverb, doing serial 7's, and remembering a name, address, and color. He may even bluntly ask the patient whether he hears voices or sees visions. Although this pattern of questioning follows the textbook catechism for the mental status examination, it is annoying and insulting to the average, alert, intelligent patient. To describe the patient's mental status, you will ultimately want to have all the data outlined in Table 1.1; however, the outline serves as the goal of the interview, not the form by which you collect the data.

The subtler approach, which I utilize, spares the patient's feelings and, moreover, yields more information. Thus, you should determine the patient's orientation to time, person, and place during the initial interview, in particular by analyzing his description of his illness and its chronology. To discover his orientation to current events and his fund of information, lead by natural conversation into questions such as, "Have you been following the news? . . . What do you think about . . . ?" If the interview leads you to suspect a faulty memory, ask, "Do you have trouble remembering things?" Then give him a memory task. To test arithmetic ability, ask, "Have you noticed any trouble making change?" or, "Do you balance your checkbook?" Follow up by asking, "If you gave a cashier a dollar for a 7¢ item, how much change would you get?"

In essence you insult the perceptive patient by a barrage of disconnected questions that have simplistic answers. If the patient truly has organic defects and realizes this, the machine gun approach riddles his dignity as bullet after bullet strikes the target. He may feel obliged to apologize or may even break into tears.

Because depression so commonly accompanies either physical or mental disease, you should inquire specifically about it. Introduce a question such as, "How have your spirits been?" at some appropriate point after

TABLE 1.1. *Outline of Mental Status Examination**

A. General Behavior and Appearance:
Is the patient normal, hyperactive, agitated, quiet, immobile? Is he neat, slovenly? Is he dressed in accordance with his peers, background, and sex?

B. Stream of Talk:
Does he respond to conversation normally? Is he very slow and difficult to draw into spontaneous talk? Is he discursive, able to reach conversational goal?

C. Mood and Affective Responses:
Is the patient euphoric, agitated, inappropriately gay, giggling, or is he silent, weeping, angry? Does mood swing in a direction appropriate to the subject matter of conversation? Is he emotionally labile?

D. Thought Content:
Does the patient have illusions, hallucinations, delusions, or misinterpretations? Is he preoccupied with bodily complaints, with fears of cancer or heart disease, or with other phobias? Does he feel that society is maliciously plotting against him?

E. Intellectual Capacity:
Is he bright, average, dull, or obviously demented, mentally retarded?

F. Sensorium:
1. Consciousness
2. Attention span
3. Orientation to person, time, and place
4. Memory, both recent and remote, as disclosed during history taking
5. Fund of information
6. Insight, judgement, planning ability
7. Mathematical ability

* Adapted with permission from W. DeMyer: *Technique of the Neurologic Examination*, Ed. 2. New York: McGraw-Hill Book Co., 1974.

the interview has matured and the patient knows you will listen to him. Frequently this inquiry leads to a diagnostic response from the patient, such as a sad look, a sigh, or even tears.

End of Interview

I often end the interview with two questions. I ask the patient what he thinks may have caused his illness. The patient may disclose fears of cancer or heart disease, fears that can represent a hypochondriac preoccupation or stem from a magazine article or the illness of an acquaintance. Secondly, I ask, "Do you have anything else you want to tell me?" This question forestalls one of the commonest complaints patients make against the medical profession, i.e., that the doctor did not take time to listen to the patient. If the doctor asks this question, the patient himself feels that he has had an opportunity to discuss everything that was on his mind.

Neurologic Examination

Introduction

The information gained from the interview and the inspection of the patient at that time help you to decide upon the extent of the examina-

tion. The longer and more detailed the history, the more you can curtail the examination, unless the history suggests neurologic disease. In the latter case, you will have to do an exhaustive examination tailored to the specific problem. This text describes the *irreducible minimum examination for every patient* as a screening procedure to eliminate the presence of neurologic disease, even when none is suggested by the history, and as background testing for interpreting an exhaustive examination when it is indicated.

Although each step in the examination is in itself very simple, most physicians find it necessary to follow a fairly strict routine to avoid forgetting something. As an aid to an orderly exam, you should *lay your instruments out in order of use* before you begin any testing. This simple procedure has two very important virtues: the order of instruments reminds you of what to do next, and, when you have placed them all aside or all back in your bag, you know that you have completed the examination without overlooking anything. See Table 1.2.

Because the description of the neurologic examination that follows is so detailed and extensive, a summary is provided in Table 1.3.

Examination of the Head and Cranial Nerves

Inspection, Palpation, Percussion, Auscultation, and Transillumination. During the medical interview you can complete much of the neurologic examination. You can (1) inspect the patient's face for the quantity and symmetry of movements; (2) observe the spontaneous eye movements and the relation of the irises to the lids and the palpebral fissures; (3) appraise the adequacy of his speech and swallowing; (4) observe his posture and look for ataxia, tremors, or other abnormal movements; and (5) note the head shape.

Now you can proceed to the examination itself. If you suspect neurologic disease, record the occipitofrontal circumference of the patient's head. Palpate the skull for lumps, depressions, or tenderness and asymmetry. If the patient has headaches, percuss the sinuses and mastoid process for tenderness and attempt to transilluminate the frontal and maxillary sinuses.

The neurovascular examination becomes particularly important as a screening procedure in patients over 30 years of age and in any patient with unexplained neurologic signs or symptoms or an abnormal blood pressure. After inspecting and palpating the precordium, the physician looks at the suprasternal notch for pulsations indicative of disorders with high pulse pressure such as hypertension, aortic insufficiency, or hyperthyroidism. Look for tortuosity and prominence of the superficial temporal arteries in middle-aged and older patients. Inspect the jugular and scalp veins for distension which may indicate congestive heart failure, increased intracranial pressure, or shunting of blood through an arteriovenous (A-V) malformation.

TABLE 1.2. *Instruments for Screening Neurologic Examination: Order of Use and Purpose of Instrument*

Instrument	Purpose
1. Flexible steel measuring tape scored in metric system	Measurement of occipito-frontal and other body circumferences; size of skin lesions, length of extremities
2. Stethoscope	Auscultation of neck vessels, eyes, and cranium for bruits
3. Flashlight with rubber adaptor	Measurement of pupillary reflexes, inspection of pharynx, transillumination of head in infants
4. Transparent mm ruler	Measurement of pupillary size and diameter of skin lesions
5. Ophthalmoscope	Funduscopy
6. Tongue blades	Three per patient: one for depressing tongue, one for eliciting gag reflex, one broken for eliciting abdominal and plantar reflexes
7. Opaque vial of coffee*	Testing sense of smell
8. Opaque vials of salt and sugar*	Testing taste
9. Otoscope	Examination of auditory canal and drum
10. Tuning fork	Testing vibratory sensation and hearing (256 cps recommended)
11. 10-cc syringe*	Caloric irrigation of ear
12. Cotton wisp	Testing light touch
13. Two-stoppered plastic tubes	Testing hot and cold discrimination
14. Disposable straight pins	Testing pain sensation
15. Reflex hammer	Eliciting muscle stretch reflexes
16. Penny, nickle, dime, paper clip, and key	Testing stereognosis
17. Page of figure-stimuli*	Screening cerebral and intellectual functions
18. Blood pressure cuff	Testing BP and orthostatic hypotension

* For elective tests not required in routine screening examination. (See W. DeMyer: *Technique of the Neurologic Examination*, Ed. 2. New York: McGraw-Hll Book Co., 1974.)

Next the physician palpates above and below the claviles for thrills in the subclavian arteries in middle-aged or older patients. Palpate the carotid arteries, placing the fingers low in the neck and feeling distally along the vessel to the angle of the mandible, past the bifurcation of the common carotid artery into the internal and external branches. Palpate each carotid artery individually and with slight pressure. Rough or heavy palpation may dislodge an embolus or elicit a carotid sinus reflex resulting in asystole and hypotension. Do not do a carotid artery compression test or stimulate the carotid sinus in patients at risk for cerebrovascular disease. If these procedures are indicated at all, do them with electroencephalogram (EEG), electrocardiogram (EKG), pulse and blood pressure monitoring and with a resuscitation team available. Next the physician may proceed with palpation of the radial, femoral,

and dorsalis pedis pulses. Palpate both radial pulses simultaneously to detect any pulse lag between the two sides that may indicate a subclavian steal syndrome.

Next the physician auscultates along the subclavian, carotid, and vertebral arteries. He should pay special attention to auscultation along

TABLE 1.3. *Steps in Screening Neurologic Examination for Adult Patients*

I. Head and Face

A. Inspect the facial features during the interview, noting head shape, facial motility, spontaneous ocular movements, width of the palpebral fissures, speech production, and swallowing
B. Palpate the skull for lumps, swellings, depressions, tenderness, and asymmetry
C. Percuss sinuses and mastoid process for tenderness if the patient has had headaches
D. Auscultate for bruits over the great vessel, eyes, temples, and mastoid processes
E. Transilluminate the sinuses if the patient complains of headaches

II. Cranial Nerves

A. Optic Group (II, III, IV, VI)
1. Inspect width of palpebral fissures, relation of limbus to lid margins, and interorbital distance; look for en- or exophthalmos
2. Test visual acuity (central fields) by newsprint (each eye separately); test peripheral visual fields by confrontation
3. Test pupillary light reflexes and record size of pupils
4. Do ophthalmoscopy
5. Test ocular motility (See also Table 1.4)

B. Branchiomotor Group and Tongue (V, VII, IX, X, XII, XI)
1. V: Inspect masseter and temporalis muscle bulk; palpate masseter muscle when the patient bites
2. VII: Inspect forehead wrinkling, eyelid closure, mouth retraction. Check labial articulation and for Chvostek's sign in selected cases
3. IX and X: Note phonation, nasality of articulation, swallowing, gag reflex, and palatal elevation
4. XII: Inspect tongue for midline and lateral protrusion, atrophy, and fasciculations
5. XI: Inspect sternocleidomastoid and trapezius contours and test strength of head rotation and shoulder shrugging

C. Special Sensory Group (Smell, Taste, Hearing and Vestibular Function)
1. Olfaction and taste: test if the history indicates a possible disturbance
2. Hearing (VIII)
   a. Do otoscopy
   b. Test threshold and acuity by observing adequacy of hearing during conversation and the ability to hear tuning fork or ticking of watch
   c. If history or preceding tests suggest deficit, do air-bone conduction test of Rinne and vertex lateralizing test
   d. If the history suggests a cerebral lesion, test for auditory inattention to bilateral simultaneous stimuli, using finger-rustling technique
3. Vestibular function (VIII): Do caloric irrigation in selected patients and test for positional nystagmus

D. Somatic Sensation of the Face
1. Test the corneal reflex (V–VII arc)
2. By light touch, test the three divisions of the Vth nerve
3. Test pain or temperature perception of the three divisions of the fifth nerve