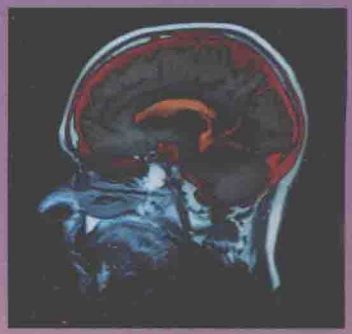
Primary NEUROLOGIC Care



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Mosby

Primary NEUROLOGIC Care

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With 80 illustrations

Mosby
A Harcourt Health Sciences Company
St. Louis London Philadelphia Sydney Toronto

Mosby
A Harcourt Health Sciences Company

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Mosby, Inc.
A Harcourt Health Sciences Company
11830 Westline Industrial Drive
St. Louis, Missouri 63146

Printed in the U.S.A.

Library of Congress Cataloging-in-Publication Data

Petit, Jeannine Millette.
Primary neurologic care / Jeannine Millette Petit.
p. ; cm.
Includes bibliographical references and index.
ISBN 0-8151-5304-X (alk. Paper)
1. Neurology—Handbooks, manuals, etc. 2. Nervous system—Diseases—Handbooks, manuals, etc. 3. Primary care (Medicine)—Handbooks, manuals, etc. I. Title.
[DNLM: 1. Nervous System Diseases—Handbooks. 2. Neurologic Examination—Handbooks. 3. Primary Health Care—Handbooks. WL 39 P489p 2001]
RC355 .P48 2001
616.8—dc21 00-041137

00 01 02 03 04 CL/FF 9 8 7 6 5 4 3 2 1

Primary Neurologic Care

In loving memory of my grandmother

NOTICE

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THE PUBLISHER

Preface

This quick-reference handbook condenses a body of knowledge into a concise and convenient framework for use by primary care providers such as family practitioners, advanced practice nurses, and physician's assistants. Because primary care practitioners are often the first to examine the client, a thorough knowledge is needed of the commonly encountered neurologic conditions. Each chapter of this book uses an organized clinical approach, providing an overview of

- background and etiology of the disorder
- differential diagnosis
- laboratory and scanning tests
- indications for consultation
- appropriate treatment

Useful information is summarized in easily understandable tables and diagrams. The initial chapters deal with the basic neurologic examination and a review of neurologic tests. Subsequent chapters guide the reader through the frequently encountered neurologic entities. A glossary of terminology is included to ease communication with specialists in the neurosciences. At the end of the book is a list of organizations that provide valuable assistance and information for clients and families.

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"But life is short and information endless; nobody has time for everything. In practice we are generally forced to choose between an unduly brief exposition and no exposition at all. Abbreviation is a necessary evaluation, and the abbreviator business is to make the best of a job, which, though intrinsically bad, is still better than nothing. He must learn to simplify, but not to the point of falsification. He must learn to concentrate upon the essentials of a situation, but without ignoring too many of reality's qualifying side-issues."

ALDOUS HUXLEY

Acknowledgments

Many thanks are extended to the colleagues who reviewed and critiqued the chapters of this book and to the editors at Mosby. I offer my appreciation to the many professionals who granted permission for the reproduction of their illustrations.

I am grateful to my nursing colleague Elizabeth Wywialowski for her persistent, inspiring, and contagious enthusiasm from the beginning of this project. I thank my family and friends for their interest and support and most particularly Susan Diamantopoulos for her generosity. Finally, I have saved a special recognition for my husband, Pete, not only for his endurance in providing timely editorial and computer expertise in the preparation of this book but also for his steadfast love and encouragement as I navigated each chapter.

Contents

Chapter 1

Neurologic Examination

Symptoms, then, are in reality nothing but
the cry from suffering organs.
Jean-Martin Charcot, MD

Background

The clinician performs the neurologic examination as a part of the routine physical examination to screen for neurologic diseases or in response to the client's complaints. Although the neurologic examination is presented in this chapter in its entirety, parts of the examination rather than the whole are more typically used depending on the presenting problem. A complete neurologic assessment includes:

Vital signs
Mental status
Cranial nerves
Motor function
Sensory function
Muscle stretch reflexes
Cerebellar function (coordination, balance, and gait)

The focus of the examination is shifted in response to the chief complaint and history. A complaint of loss of sensation indicates a need to assess the peripheral nervous system. Higher cortical functioning is evaluated when the client has lost the ability to concentrate. In-depth knowledge of the neurologic examination saves time by more clearly focusing one's attention on the salient points.

Additionally the clinician's role includes determining the influence of the defects on the activities of daily living as well as on the client's and family's life-style. The focus of care shifts to the environmental assessment and formulation of a care plan with interventions.

History

The history is the most important part of the examination and normally requires more time than the physical. Listening attentively is essential because the client frequently uses words, such as "weakness," "fatigue," or even "numbness," interchangeably. Encourage the client who has difficulty describing his or her symptoms to discuss how the symptoms affect his or her activities of daily living.

A diary is especially useful for neurologic problems with periodic symptoms, such as seizures and headaches, because it provides quantifiable data that are more accurate than memory alone. Clients should be taught to keep a log or diary of symptoms describing events, their frequency, severity, duration, provocative or palliative factors, and preceding activities. This serves as a valuable tool for assessment and also engages the client as an active participant in the diagnostic pathway and subsequent plan of care. Parkinson's disease is another condition in which a diary provides a wealth of supplemental information beyond the presentation of the client in the office setting. Fig. 1-1 is an example of a symptom diary. The client or family member records episodes of loss of balance and movement hesitation in relationship to meals, medications, and so on. Hesitation, or "freezing," often occurs at the start of an activity or when the client enters a room or crosses a threshold.

In some situations, the history must be obtained from family members. An example of this is when seizure activity is suspected. The patient has no memory of events surrounding the seizure. Family members are the only source of reliable information concerning events during a seizure. Feelings of control are frequently lost with a progressive, deteriorating neurologic disease. Including the client and family in the management of the condition provides a sense of control and active participation.

Mental Status Examination

The mental status examination is divided into two parts: level of consciousness and cognitive functions. Consciousness has two components: arousal (the ability to respond to stimuli) and awareness (orientation to person, place, time, and situation). Levels of arousal can be further divided. *Lethargy* is the inability to stay awake or sustain attention without stimulation. The client appears to lack interest in the conversation. **Stupor** is a state during which the client responds to aggressive stimulation with no meaningful recognition or cooperation. In *coma* the client is unable to be aroused with vigorous stimulation.

The higher functions are orientation, attention/concentration, speech/language/vocabulary, memory, object recognition, and knowledge of current

Figure 1-1 PARKINSON'S SYMPTOM DIARY

Part I. *For each time period please indicate the number of different symptoms you experienced.*

SYMPTOM	BEFORE BREAKFAST	BEFORE LUNCH	BEFORE DINNER	BEFORE BED
Loss of balance				
Movement hesitation (freezing)				

Part II. *Using the following scale, write the number that indicates the severity of your symptoms for that time period.*

None — *Moderately severe* — *Entirely disabling*

0 1 2 3 4 5 6 7 8 9

SYMPTOM	BEFORE BREAKFAST	BEFORE LUNCH	BEFORE DINNER	BEFORE BED
Tremor				
Difficulties with walking				
Difficulties using hands or arms				
Comments:				

(From Montgomery G, Reynolds N: *J Nerv Ment Dis* 178:637,1990.)

events. Other cognitive functions considered more advanced are insight/reasoning/judgment/problem-solving, abstraction, and affect/mood. The accuracy of evaluating higher cerebral functioning is also dependent on the client's physical status, level of fatigue, and cultural and language background. Physical illness may produce inconsistent results. Cultural factors and the use of English as a second language need to be accounted for in the interpretation of results involving speech, vocabulary, and comprehension.

A thorough mental status examination done by a psychologist or neuropsychologist takes hours to complete. This section includes those tests that are convenient for the clinician. Poor performance in such tests may indicate a need for further in-depth evaluation.

Arousal and Orientation

In the hospital or ICU setting, the Glasgow Coma Scale (Fig. 1-2) is the commonly used standardized method of assessing *level of consciousness.* The scale is divided into three parts: eye opening, best verbal response, and best motor response. The highest level is 15, and the lowest 3. In general, a score of 8 or less indicates coma. The coma scale is most often used to provide serial data over a time period, for example, after a head injury. This scale, however, does not allow for those clients who cannot open their eyes or cannot speak because of aphasia or intubation. Technically such a client would score inaccurately low.

The Mini–Mental Status Examination (Fig. 1-3) is a test of *orientation, attention, concentration,* and *recent memory.* It is short and easy to use in an office setting. The practitioner needs to feel comfortable

Figure 1-2 GLASGOW COMA SCALE

Scoring for Eye Opening	
4	Opens eyes spontaneously when someone approaches
3	Opens eyes in response to speech, either normal or loud
2	Opens eyes only to pain
1	No response at all
Scoring for Best Motor Response	
6	Obeys simple one-step commands
5	Localizes and pushes away from painful stimuli
4	Purposeless movements or cowering from painful stimuli
3	Abnormal flexion, i.e., flexes elbows and wrists while extending legs in response to pain
2	Abnormal extension, i.e., extends upper and lower extremities in response to pain
1	Flaccid or no motor response to pain on any limb
Scoring for Best Verbal Response	
5	Oriented to time, place, and person
4	Converses but is confused
3	Inappropriate words or phrases
2	Incomprehensible sounds, e.g., groans
1	No verbal responses

(From Teasdale G, Jennett B: *Lancet* 2:81, 1974.)

with whatever instrument is used to enhance the free flow of information. Those clients with preserved language skills and higher education will perform better than expected as this test is biased toward language and education.

Memory

Evaluating short-term and long-term memory is important in differentiating memory loss. **Remote,** or *long-term*, **memory** is evaluated when one asks for the client's mother's maiden name or significant dates such as V-J Day (victory in Japan) for a World War II veteran (Sept. 2, 1945). The information requested should have significance for the client for the results to be useful. Foreign elderly clients and those who have outlived their peers present a significant challenge for the clinician to elicit familiar events.

Recent, or **short-term, memory** is often tested when one asks the client to recall three items mentioned 5 minutes earlier. It is important that the person repeat the names of the objects after they are spoken to ensure correct auditory perception.

Language Skills

During the interview the clinician listens closely to the speech flow, speed, cadence, syntax, word output, effort, and paraphasias (use of wrong words or senseless combinations of words). **Fluency** is both the ability to understand others and to express oneself in comprehensible words and phrases. Impairments of speech may indicate aphasia, which can be either fluent or nonfluent. In fluent, or receptive, aphasia, the client is able to articulate the words correctly but does not understand what is said. The client may have difficulty understanding written as well as verbal instructions. In nonfluent, or expressive, aphasia, the client knows what he or she wants to say but is unable to articulate it.

Object Recognition

Testing for the ability to name objects is done when one asks for the names of common objects such as a pen, eyeglasses, or necktie. The inability to name these objects after the client looks at them may be evidence of anomia, a form of aphasia (inability to name objects) or a more unusual condition called "visual agnosia" (inability to recognize objects). Evaluating right-left disorientation by giving the client the following instructions "Put your left thumb on your nose and your right thumb on your left ear" may be further evidence. **Agnosia,** or the failure to interpret sensory information despite primary sensory modalities being intact, is a complex phenomenon requiring a more thorough examination. However, these are accurate tests only if the client has adequate vision, dexterity, and speech for the task.

Because many activities of daily living consist in multiple-step tasks, it is important to evaluate the client's ability to understand and perform one-step to three-step oral instructions such as being asked to

Figure 1-3 SIX-ITEM ORIENTATION-MEMORY-CONCENTRATION TEST (MINI–MENTAL STATUS TEST)

This simple test, easily administered by a nonphysician, discriminates between mild, moderate, and severe cognitive defects. The results correlate with Alzheimer neuritic plaque counts at autopsy and accurately predict scores on a more comprehensive mental status questionnaire. Normal subjects have a weighted score of 6 or less; scores greater than 10 are consistent with a dementing process; and a completely demented patient would have a score of 28.

ITEM	INSTRUCTION	MAXIMUM ERROR	RAW ERROR SCALE		WEIGHTING FACTOR		WEIGHTED ERROR SCORE
1	What year is it now?	1	–	×	4	=	–
2	What month is it now?	1	–	×	3	=	–
3 (memory phrase)	Repeat this phrase after me: John Brown, 42 Market Street, Chicago	1	–	×	3	=	–
4	Count backward from 20 to 1	2	–	×	2	=	–
5	Say the months in reverse order	2	–	×	2	=	–
6	Repeat the memory phrase	5	–	×	2	=	–

Score 1 for each incorrect response; maximum weighted error score = 28.

(From Olson WH, Brumback RA, Gascon G, et al: *Handbook of symptom-oriented neurology*, ed 2, St. Louis, 1994, Mosby.)

"stand up," "take paper and fold it in half," and "take the glass and fill it with water and place it on the corner table."

Serial 7s, that is, asking the client to subtract 7 from 100, 7 from 93, and so on for five calculations, is a technique used to identify the client's mathematical ability. It tests the client's ability to concentrate. This can be difficult if the client is under stress. Another method to assess calculation ability is the use of simple common problems, such as, "If four bananas cost one dollar how much does one banana cost?" Education, language, and cultural background are important factors to consider for the reliability of this test.

Asking the client to repeat "no ifs, ands, or buts" will test for the ability to repeat the spoken word and to articulate. Asking for an interpretation of the phrase tests for abstract thinking, or abstraction. *Abstraction* is a higher cerebral function requiring both comprehension and judgment. Proverbs are also used to test abstraction, such as, "A stitch in time saves nine." Clients who understand the words but not the meaning, might answer in concrete terms, such as, "It has something to do with sewing."

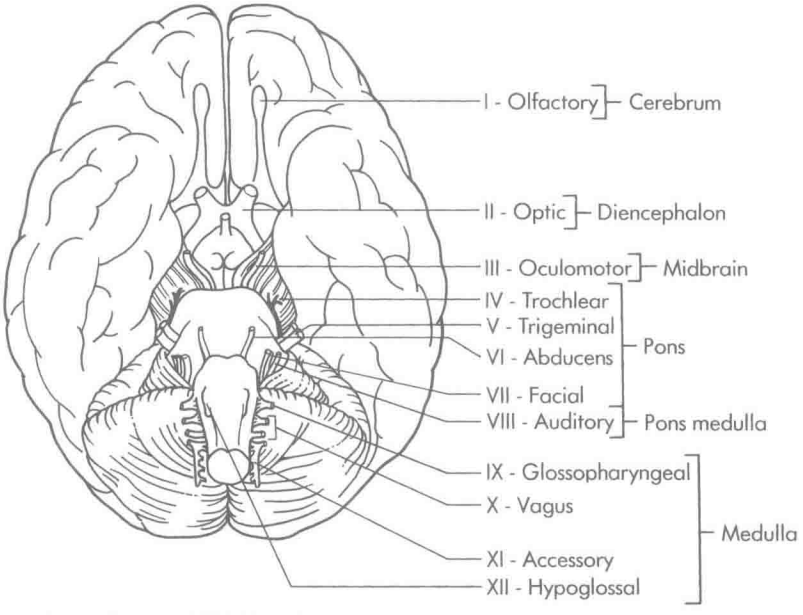
Insight and Reasoning

Judgment and reasoning are difficult to assess. Presenting the client with a problem is an excellent method for testing *judgment*. Examples include, "What would you do if you had a flat tire?" or "What would you do if someone yelled 'fire!' in a crowded theater?" Another useful test involves similarities and differences: "What do a fork and a spoon have in common?" Reviewing the client's activities of daily living and driving and occupational records may also reveal evidence of poor judgment.

Current Events

Current events testing is performed when one asks the client to name the last four presidents of the United

Figure 1-4 INFERIOR VIEW OF THE BRAIN SHOWING THE CRANIAL NERVES



(From Barker E: *Neuroscience Nursing*, St. Louis, 1994, Mosby.)

States or the mayor or the governor. Asking about a particularly prominent news item can also be used. Accurate answers to such questions require an interest in the environment, intact orientation, and recent memory as well as the ability to think abstractly. However, failure to perform is nonspecific and can be attributable to any of several physical and mental illnesses.

Affect and Mood

Affect and *mood* are assessed by observation of facial expressions during the history and examination. Notice any unusual configuration of the face, color changes, flushing, sweating, tics, tremors, and grimacing. Facial expression may reveal a wide range of emotions such as distress, anxiety, and distrust. Immobility of facial movements is characteristic of Parkinson's disease, whereas ptosis (eyelid drooping) and weakness of facial muscles are indicators of myasthenia gravis.

Cranial Nerves (Fig. 1-4)

The cranial nerves are actually part of the peripheral nervous system. However, the second cranial nerve, the optic nerve, is anatomically part of the brain, whereas the others are similar in structure and function to the spinal nerves. Cranial nerves may be sensory, motor, or both.

Cranial Nerve I: Olfactory Nerve

The olfactory nerve is generally not tested in a routine neurologic examination unless the history indicates **anosmia,** or loss of smell, or *hyposmia*, a decrease in the sense of smell. A nonirritating volatile substance, such as coffee or toothpaste is used.

Table 1-1 FUNDUSCOPIC EXAMINATION—HELPFUL HINTS

PROBLEM	SOLUTION	AVOID
Difficulty holding ophthalmoscope steady	Brace fourth and fifth fingers of the hand holding the ophthalmoscope against the client's face. Try to be at the same level comfortably as the client.	Avoid using two hands to hold the ophthalmoscope.
Client moves his or her head or eyes	Steady the client's head with your free hand. Have the client focus on a distant object over your shoulder.	Avoid emphasizing this focusing by the client. Poor vision may cause the client to shift gaze.
Pupils are too small	Dilate the pupils by darkening the room.	Avoid use of mydriatic agent: • Risk of narrow-angle glaucoma • Cause of blurred vision • In neurologic emergency pupil signs unobtainable
Difficulty finding the disk	Approach from temporal side and follow vessels in toward the disk. The disk is about 15 degrees nasally.	Avoid a straight approach because the client may blink and withdraw.
Cannot see enough of the disk	Try to move closer to the eye.	Avoid touching the eyelashes.
You are unable to use one eye	Approach the client from above with the client lying down.	Do not examine the client's right eye with your left in the facing position because you will bump noses.

Sweet, bitter, cool, or irritating substances stimulate the olfactory endings of the trigeminal nerve. Loss of smell is associated with such neurologic conditions as head trauma, upper respiratory or sinus infections, toxins, and neoplasms. Increase in olfactory acuity, or **hyperosmia,** is found in hysteria, psychotic states, and substance abuse (Haerer 1992).

Cranial Nerve II: Optic Nerve

The optic nerve is a sensory nerve responsible for visual acuity and visual fields. For adults, near visual acuity is tested more frequently than far visual acuity in the general office practice. A pocket Snellen Chart or newspaper is held at a fixed distance of 14 inches. The client with corrected near vision will need his or her glasses for testing accuracy. An ophthalmoscopic examination is also conducted to detect **papilledema** or *optic atrophy* (Table 1-1). Papilledema may be attributable to increased intracranial pressure or retinal edema. Optic atrophy indicates decreased blood supply and may be a sign of a degenerative neuropathy.

Screening for visual field defects can be easily accomplished by having the client describe the examiner's face for blurred or missing parts. Visual fields testing by confrontation uses the provider vision as the standard. Face the client, about 1 foot away, covering one eye at a time. Ask the client to focus on the examiner's nose or open eye. The examiner then brings into the peripheral vision a stimulus such as a wiggly finger or a small object such as a pen. The client is then asked to say when the object comes into view. All six quadrants are tested. Remind the client

Table 1-2 EXAMINATION OF THE PUPIL

TEST	OBSERVATION	HINTS
Size and shape	Size is measured in millimeters. If shape is changed as a result of cataract surgery, observe postsurgical pupil.	If deep brown irises make it difficult to see the pupil, darken the room, shine the light from the side; observe size before constriction.
Reactivity	Observe direct reaction and indirect reaction or consensual one at a time by covering one of the eyes.	Observe the reaction at an angle to avoid glare; open eyelid just as you shine the light.

to stare at the examiner's nose or eye throughout the examination because it is difficult to focus because the eye tends to follow the moving finger. Lesions such as cerebral infarctions or tumors of the optic nerve, chiasm, or tracts or radiations can cause visual field cuts or defects. For example, a lesion of the optic tract interrupts fibers innervating the same side of both eyes. The visual deficit in the field of vision on the same side is called **homonymous** and, when it impairs half of each field, is called **hemianopia.**

Cranial Nerves III , IV, and VI: Oculomotor, Trochlear, and Abducens

These are motor nerves whose function include elevation of the eyelid, movements of the eye, and constriction of the pupil. The degree of eyelid opening is assessed in relationship to the position of the iris. A drooping eyelid, or ptosis, is seen when the lid drops or is closer to the iris relative to the other eyelid. Common errors occur when the opposite lid is abnormally wide, giving the impression that the lid is drooping when in fact the problem is facial weakness and false ptosis or blepharospasms. **Blepharospasm** is the series of spasmodic contractions of the orbicularis oculi and the levator causing forced closure. Bilateral ptosis, or inability to sustain lid opening for an upward gaze, may be a sign of myasthenia gravis or muscular dystrophy.

Although neurologists are often able to localize brain lesions by extraocular eye movements (EOM), the primary provider's focus is the accurate description of eye movements. During history taking and on examination, close observation is made for *conjugate gaze*, that is, the eyes moving together as if yoked. If one eye is turned outward while the other faces forward, the condition is called *exotropia;* if one eye is turned inward, *esotropia.* Testing for EOM is done when the client is asked to focus on an object an arm's length away from his or her face as the object is moved in different directions. For an office screening test, horizontal and vertical planes are used unless the client's history indicates vision problems requiring a more in-depth assessment.

Watch for **nystagmus,** involuntary oscillation or trembling of the eyeball, at rest or in any field of gaze. There are many types of nystagmus—horizontal, vertical, rotatory, coarse, fine, or a combination. End-point nystagmus is regular oscillation at the extreme fields of vision. It is a reflex response termed *oculocerebral reflex.* This reflex is an attempt to increase vision; therefore, testing for EOM should be done with adequate illumination.

Examination of the pupils includes shape, size in millimeters, and comparison (Table 1-2). If the pupils are of different sizes, this finding needs to be correlated with other clinical findings. About 20% of the population have nonpathologic unequal pupil size, or *anisocoria.* Abnormal findings are summarized in Table 1-3.

Cranial Nerve V: Trigeminal Nerve

The trigeminal, the largest and most complex of the cranial nerves, is both a sensory and a motor nerve. It has three segments of cutaneous distribution: the ophthalmic, the maxillary, and the mandibular. All three areas are tested for sensitivity to light touch