

Part 1

The Neurological Approach

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Chapter 1

Neurological history-taking

The diagnosis and management of diseases of the nervous system have been revolutionized in recent years by new techniques of investigation and new treatments. But neurology continues to rely as much as any other branch of medicine on the fundamental clinical skills of history-taking and physical examination.

Neurological diagnosis

The neurological diagnosis is generally separable into two parts:

- Anatomical: What is the site of the lesion in the nervous system?
- Pathological: What disease process has occurred at that site?

This division is helpful as it can reduce possible confusion caused by the many available sites for neurological disorder (Table 1.1).

The history is of paramount importance in determining both the anatomical and pathological diagnoses. Indeed, many neurological patients have no abnormal signs, or simply have physical features that confirm clinical suspicions based on the history.

Sometimes, however, particularly with complex problems, the history can only yield a 'shortlist' of potential sites of the lesion(s) and final local-

Table 1.1 Potential sites of neurological disease.

Cerebral cortex
Cerebral white matter
Basal ganglia
Cerebellum
Brainstem
Cranial nerves
Spinal cord
Spinal roots
Peripheral nerves
Neuromuscular junction
Muscle

ization must await the formal examination. This is because disease at one site in the nervous system may produce symptoms mimicking a lesion at another.

History of presenting complaint

How can the history best be taken to provide the maximum diagnostic information? An important rule is first to allow the patient sufficient uninterrupted time to speak. Most patients can give a reasonable account of their symptoms within 2 or 3 minutes and time spent listening at this stage is not wasted.

The nature of the main complaint and its duration will usually have been established in this early part of the interview, along with three further essential pieces of information about the patient:

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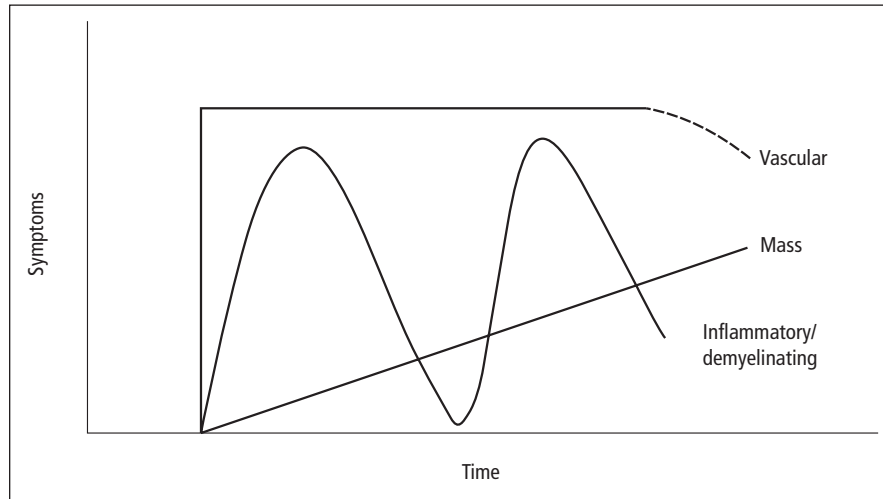


Figure 1.1 Temporal patterns associated with specific neuropathological causes. Using the example of a cerebral hemisphere lesion presenting with contralateral weakness, a rapid onset (seconds, minutes or at most hours) and static subsequent course, ultimately possibly with some improvement, suggest a vascular event (**stroke**), i.e. haemorrhage or infarction. A slowly progressive course (days, weeks or months) is more indicative of a **mass** lesion, i.e. a tumour. A relapsing and remitting pattern (with symptoms typically developing and resolving over days or weeks, then perhaps recurring with a similar time course) generally implies a **chronic inflammatory** or **demyelinating** process, of which multiple sclerosis is the prime example in the central nervous system.

- Age
 - Certain neurological disorders are associated with specific age groups.
- Occupation
 - A patient may have experienced occupational exposure to a toxin or other potential causative agent of disease.
 - Some neurological symptoms may limit the patient's ability to perform certain occupations.
- Handedness
 - To obtain information about cerebral hemisphere dominance.
 - To establish the extent to which a patient is disabled if the presenting complaint concerns the upper limbs.

Having heard the patient's description of the symptoms, it is usually necessary to probe the history of the presenting complaint in specific areas.

Timing of symptoms

Determining the temporal features of a patient's symptoms is essential to reach a pathological diagnosis:

- onset,
- progression,
- duration,
- recovery,
- frequency.

For example, a patient may present with weakness of one side of the body, suggesting a lesion in the contralateral cerebral hemisphere. Detailed further questioning on the timing of the symptoms may clarify the pathological nature of this lesion (Fig. 1.1).

'Discriminant' questions

If the initial history only partially solves the anatomical diagnosis, the 'shortlist' of potential sites may be reduced by asking the patient direct questions (Table 1.2).

For example, a patient presenting with numbness in both hands and both feet is likely to have a diffuse disorder of all the peripheral sensory nerves of the extremities (**sensory polyneuropathy**). But a similar '**glove-and-stockings**' sensory loss may occasionally be produced by

Table 1.2 Neurological systematic review questions:
Has the patient suffered any of the following?

<i>Pain</i>
Headache
Facial, neck, back or limb pain
<i>Disturbance of consciousness</i>
Blackouts, faints, fits*
Altered sleep pattern
<i>Cognitive and affective dysfunction</i>
Memory, language
Depression, irritability
<i>Cranial nerve symptoms</i>
Loss of vision, blurred or double vision*
Hearing, sense of taste and smell
Vertigo, dizziness, giddiness*
'Bulbar' problems (swallowing, articulation of speech)
<i>Limb symptoms</i>
Difficulty in lifting, gripping, fine finger movements; clumsiness
Gait disorder, leg weakness or stiffness, balance problems
Loss of sensation, altered sensation, numbness*
Involuntary movements, incoordination
<i>Sphincter disturbance</i>
Bladder, bowel, sexual dysfunction

*If the patient uses terms like blackouts, fainting, dizziness, giddiness, double vision or numbness, it is worthwhile establishing their exact meaning, as the standard medical usage of the term may not correspond to the patient's intended meaning.

a **cervical spinal cord lesion**, mimicking a polyneuropathy.

In this instance, selecting questions from Table 1.2 likely to *discriminate* between these two anatomical diagnoses, a history of neck pain or injury will strongly favour the diagnosis of cervical cord lesion, as will the presence of sphincter dysfunction. Bladder disturbance is an early feature of spinal cord disease but only occurs in patients with a sensory polyneuropathy if there is a coexistent **autonomic** neuropathy.

Upper limit of symptoms

A useful further refinement in neurological history-taking is to check the '**upper anatomi-**

cal limit' of the symptoms. Thus, in a patient presenting with weakness of one leg the anatomical diagnostic range is wide. But specifically asking whether there are equivalent symptoms in the ipsilateral arm immediately narrows this range, the patient then being far more likely to have a **hemiparesis** caused by a lesion on the opposite side of the brain than anything else.

Negative and positive symptoms

A valid distinction may be made between 'negative' and 'positive' neurological symptoms.

Negative symptoms, or loss of particular functions, signify destructive lesions of the nervous system. Thus, a vascular event in one cerebral hemisphere will generally lead to loss of function as indicated, for example, by paralysis of the opposite side of the body.

Conversely, **positive symptoms** are those that suggest an irritative lesion, i.e. an area of abnormal excessive electrical activity in the nervous system. An irritative lesion in one cerebral hemisphere may produce repetitive involuntary (**clonic**) movements of groups of muscles on the opposite side of the body (**partial epilepsy**) rather than paralysis.

Remainder of the history

In neurology, as in other branches of medicine, valuable information, particularly about the pathological diagnosis, can be obtained by asking directly about:

- previous medical history,
- family history,
- social history,
- therapeutic history.

Considering again the patient who presents with glove-and-stocking sensory loss caused by a sensory polyneuropathy:

- **Previous medical history:** A history of diabetes mellitus would be especially relevant, this being a common cause of a sensory polyneuropathy.
- **Family history:** Some causes of a polyneuropathy are inherited.

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- **Social history:** Excessive alcohol intake may lead to a sensory polyneuropathy, as may accompanying vitamin deficiencies.
- **Therapeutic history:** Many drugs may cause a polyneuropathy.

Witnesses

Many neurological patients are unable to give a complete account of their symptoms, and information must be sought from family members and other witnesses.

A witness account is especially valuable for patients reporting transient alterations in their state of consciousness. By their very nature, such attacks may prevent the patient from recalling the details of all that occurred. In the acute setting of an unconscious patient in the hospital casualty department, obtaining a history from anyone accompanying the patient is essential.

The need for witnesses also applies to those presenting with progressive **cognitive** impairment in adult life (**dementia**). Indeed, corroboration of such symptoms by a close family member lends weight to this diagnosis. A patient who reports problems of memory and intellect unnoticed by family or colleagues at work may be experiencing the consequences of anxiety or depression (**'pseudodementia'**) rather than 'organic' dementia, i.e. associated with a recognized macroscopic or microscopic change in brain structure.

History and examination

In neurology, separating the history and examination is artificial in practice, in the sense that the examination really begins before and during the formal history-taking. Much may be learnt from initial impressions of a patient's:

- gait,
- facial expression,
- handshake,
- speech.

The neurological examination must also be performed in the context of the general physical examination. This applies particularly to the

cardiovascular and musculoskeletal systems. The following features are important in assessing vascular disease of the nervous system:

- pulse – rate and rhythm,
- blood pressure,
- murmurs and bruits – cardiac, carotid, cranial or spinal.

In the musculoskeletal system, it is important to examine for skull, spine and joint deformity.

The various components of the neurological examination should be 'screened' in each patient:

- level of consciousness,
- cognitive function,
- speech,
- cranial nerves,
- neck and trunk,
- limbs – motor and sensory examination,
- gait.

The detail required for each part will be dictated by the history. Thus, in many standard outpatient consultations, level of consciousness and cognitive function are screened merely by assessing the patient's ability to give a coherent history. However, in the emergency setting of an unconscious patient in the casualty department, or a confused patient on a general medical ward, these aspects require much more detailed assessment. The remaining chapters of this section outline these parts of the neurological examination in the context of relevant anatomy and physiology.

Key points

- Neurological diagnosis is best divided into two steps: site of lesion (anatomical diagnosis) and disease process (pathological diagnosis).
- The time course of a patient's symptoms provides clues to the pathological diagnosis.
- Neurological symptoms may be negative (loss of function) or positive.
- History from witnesses is essential for patients presenting with disturbances of consciousness, or with cognitive impairment.
- A full neurological examination is time-consuming and potentially exhausting for patient and doctor; selection of the components requiring detailed assessment is determined by the history.