

In Clinical Practice

Ondrej Dolezal

Clinical Cases in Neurology

Second Edition

 Springer

In Clinical Practice

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*To my parents Karel
and Zuzana.*

Introduction to the Second Edition (2024)

This book serves as the second volume of case scenarios I have gathered over the years. The feedback and reactions received in the last 5 years since publishing the first edition have been generally positive. Similar to the first edition, this volume is designed for non-neurologists, junior doctors, and nurses.

While some experienced neurologists have criticized the oversimplification of the neurological exam and, to some extent, the diagnostic path, and the absence of therapeutic considerations, these features were well-received by the original target group of readers, which includes medical students, doctors from other specialties, and nurses. Consequently, I have chosen to maintain the same format for the second edition.

In this book, I present an additional 25 clinical scenarios, each featuring notable and, to some extent, typical neurological symptoms, followed by a diagnostic conclusion.

The diagnostic process invariably relies on the triad of “symptom-sign-syndrome”—rooted in the clinical story (history), clinical examination, and test results. In a teaching and educational role, it is not uncommon to encounter junior colleagues who possess excellent academic and theoretical knowledge but find it challenging to connect all the loose ends in this logical “chain of thought.”

How to Use This Book

In this book, the reader will be provided with a very short history description and brief neurological examination with stick figure diagram. At that point, readers can think what can

be responsible for symptoms and confront her/his ideas with “Thoughts” section which follows. The most appropriate test(s) will be chosen. Afterwards, readers can look at the scan or other test results and try to interpret it themselves. Imaging is deliberately left without a legend. After that the section called “Answers” follows, and each case is concluded by definite diagnosis and short summary of outcome and treatment. In the section “Hallmarks,” you can go again through learning points, interesting twists, and even mistakes made. “Further reading” section provides articles which describe similar clinical situation and also pregraduate/post-graduate texts where readers can refresh their knowledge of general principles, epidemiology, and therapy.

At the end of the book, there is a “Key Images” chapter showing key scan or scans (if the scan was relevant) for each case which reader can use for confrontation.

The majority of readers used the previous book for self-study, wherein they learned about the patient’s presentation and objective examination. They formulated their own differential diagnoses and then compared them with the “Thoughts” section. Subsequently, they analyzed the provided scans to identify pathology and formulated a final diagnosis, which they then compared with the “Answers” section.

Many readers also utilized the electronic version of this book for educational purposes. They presented clinical stories to students alongside examination, leading to clinical discussions within the group. Students were encouraged to formulate their own diagnostic thoughts and were challenged through the evaluation of scans. This format allowed teachers to share their experiences with similar conditions or introduce similar cases for comparison. This option was particularly appreciated, especially when there were not suitable patients on the ward, or when logistical challenges hindered bedside teaching, especially in the Covid and post-Covid era.

Picture below shows ideal diagnostic process put into the context of this book with one clinical example (stroke patient).

First section introducing the case & Neurological examination	Personal medical history Clinical story	Sudden onset of right sided weakness, speech disturbance
	Neurological examination	right hemiparesis, global aphasia, (UMN) right VII palsy
Thoughts	Differential diagnosis	Stroke (ischaemic vs. hemorrhagic), postictal paresis less likely
	Diagnostic plan Indication of tests	CT brain – urgent Blood tests,
Answers	Analysing results in the clinical context	Normal, but history less then 90 minutes
	Formulating diagnosis, Treatment	Ischaemic stroke likely, thrombolysis
Hallmarks	Recording interesting aspect of the case/further research	Patient recovered well, good response to treatment
Further reading		
Notes		

Picture: How to approach cases; using this book (left column), in general (middle column) with clinical example (right column)?

Before you start reading this book, I would like to mention one important issue I mentioned in previous book as well. It would be very tragic if the main conclusion of the reader/you would be that imaging is always the answer. In fact, it is rather the opposite. Emphasis is mainly on history and clinical examination (in its simplified form), but I deliberately chose cases which were “cracked” by imaging. From didactic point of view, conclusive scan (as “jewel in the crown”) seemed to provide prompt answer. I believe that it also allows cases to be remembered better. This book is not trying to cover theoretical, academic, or research neurology and should be used as purely a tool helping with bed-side diagnostic process.

This book with all simplification mentioned above and below (e.g., stick figure diagram) would be of limited value to neurologists and neurosurgeons. With one exemption: as mentioned above, when there was lack of suitable patients on wards I used this book with success in practical teaching sessions.

“Notes” section you can use for remarks, comments, and hallmarks. You can record similar cases you have seen in your practice or add some other comments which would make future use or particular scenario simpler (e.g., mentioning where junior doctors misjudged the case, or what students found surprising or difficult to understand, interpret)

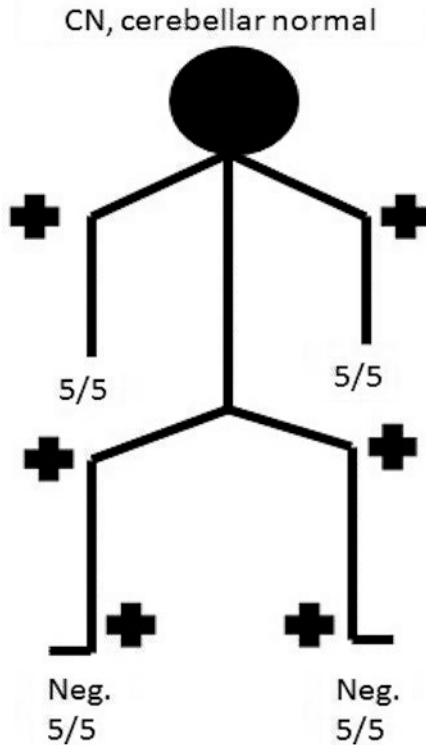
Following cases do not necessarily reflect individual patients and they have to be interpreted rather as scenarios; saying that, no symptoms were added or removed and cases showed here were inspired by real patients.

Stick Figure Diagram

Stick figure diagram represents simplified version of neurological examination, however agreeing with level of emergency department and general practice templates. Table below summarizes abbreviations.

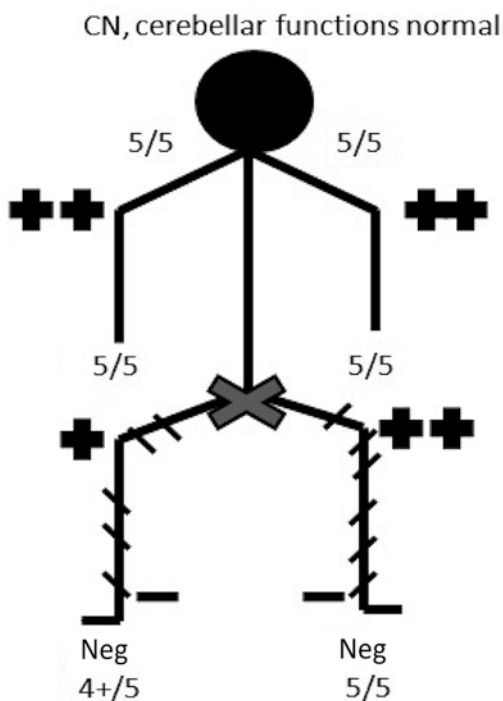
Reflexes	Not distinguishing biceps, triceps, brachioradialis in upper extremities
–	Absent
+	Present
++	Increased
+++	Clonus
Muscle strength	
1/5-5/5	Muscle strength using range from no contraction to normal
Plantars	
Negative (Neg.)/ positive (Pos.)	Down-going/flexor, up-going/extensor
CN	Cranial nerves

Normal examination would look like this diagram on the left. Reflexes are present (+) in upper extremities (if one of the reflexes (biceps, triceps, brachioradialis) is outstanding, it would be mentioned in the text). Muscle strength in upper limbs is normal (5/5). Patellar reflex/quadriceps/knee jerk and Achilles tendon reflex/ankle jerk are present and normal (+), plantars are flexor (negative), and leg strength is normal (5/5). There is no sensory deficit and sphincter functions are normal as well. If there was any particular muscle group weakness (innervated by peroneal, tibial, radial nerve, etc.), it would be described in the text.



Another example you can see on the left. Sensory deficit (marked as dash lines across extremities) in our diagram is not discriminating between negative and positive sensory

symptoms. The same is valid for sphincter symptoms as diagram just shows (using X symbol) their presence; irrespective of retention, incontinence, overflow incontinence or urgency, etc. Details are again mentioned in the text if needed. Example shows patient with bilateral leg paresthesias or hypoesthesia/numbness and incontinence or urgency or retention. There are also brisk/increased reflexes in arms ($++$), right leg is weaker ($4+/5$), and patellar reflex is increased on the left ($++$), with bilateral absent ankle reflex ($-$).



For teaching purposes, I encourage teachers/lecturers to modify these cases according to their needs. Depending on specific educational requirements, they can emphasize history taking, examination, radiology aspects, or treatment options as needed.

Acknowledgments

I would like to express my gratitude to all the colleagues with whom I have had the pleasure of working over the last 25 years. The cases that inspired the scenarios presented in this book involved large teams of neurologists, radiologists, junior doctors, and colleagues from various other specialties. Their support, constructive criticism, and guidance have played a crucial role in my journey in the field of medicine and without them I would not be able to write this book.

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About the Author

Ondrej Dolezal studied medicine at Charles University in Prague, where he also completed his medical training. He focuses on multiple sclerosis, autoimmunity, epilepsy, neuroimaging, and medical education. Additionally, he has been actively involved in charitable work, serving as a medical volunteer in Zambia. Dr. Dolezal was awarded the Dr. Lawrence D. Jacob Fellowship in Buffalo, US.

After completing his Ph.D. in neuroscience with a thesis titled “Grey Matter Pathology in Multiple Sclerosis,” he transitioned from a tertiary university hospital to work in secondary care as a neurology consultant in Dumfries and Galloway, NHS Scotland. He is a Fellow of the Royal College of Physicians in Edinburgh. In 2019, he published a successful book titled *Clinical Cases in Neurology*.

Abbreviations

A&E	Accident and emergency
ADEM	Acute disseminated encephalomyelitis
AED	Anti-epileptic drug
ALT	Alanine transaminase
anti-MOG	Antibodies against myelin oligodendrocyte glycoprotein
AVM	Arteriovenous malformations
CAA	Cerebral amyloid angiopathy
CIDP	Chronic inflammatory demyelinating polyneuropathy
CK	Creatine kinase
CMV	Cytomegalovirus
CN	Cranial nerves
CRP	C-reactive protein
CSF	Cerebrospinal fluid
CT	Computerized tomography
CTS	Carpal tunnel syndrome
DLRSN	Diabetic lumbosacral radiculoplexus neuropathy
DMT	Disease-modifying treatments
EBV	Epstein-Barr virus
ECG	Electrocardiogram
EEG	Electroencephalogram
EOM	Extra ocular muscles
FBC	Full blood count
FLAIR	Fluid attenuated inversion recovery /MRI sequence
FS	Fat saturation/MRI sequence
FSH	Follicle-stimulating hormone