
Preface

We all want to know this answer: How does our brain work?

“...I am conscious... but how?” is a question every person asks at some time...

“... I think, therefore I am” said Descartes in the seventeenth century—but how does the brain actually think?

How does a highly interconnected mass of nerve cells process information, and simultaneously is aware of itself and surroundings in the form of consciousness?

As neurologists, we unfortunately see patients slip away into a world of unconsciousness from which they may never return, despite our best efforts to save them. We can define what is lost and how—we know that the absence of higher cortical functions leaves patients in an irretrievable state of brain death with only the most primitive brain stem and/or spinal reflexes, but how exactly does a viable network of interconnected areas of cerebral cortex generate consciousness and meaningful human existence?

“... I think, therefore I am.” These seventeenth-century words of Descartes remind us how the brain defines who we are. Without proper functioning of the brain, our very sense of who we are can disappear—without a functioning brain, there is no quality of life, and we have come to measure life as just that. For the unfortunate ICU patient who has suffered a prolonged cardiac arrest and then revived, a pumping heart alone, without the brain being active and living as well, offers no life value.

This book examines all diseases of the nervous system and explores the central and peripheral nervous system in health and disease and the rapid diagnosis and treatment of an illness that affects the patient in profound ways and can make the difference between having a good long quality of life or being paralyzed and bedridden with diminished quality of life. In neurologic emergency cases, it is important to remember that the brain needs oxygen continuously and any deprivation of the circulation can lead to lifelong disability. Therefore, the astute physician must be aware of the clues to form a proper diagnosis and the subsequent need to find and implement therapy as soon as possible. The fundamentals of neuroscience are emphasized here as the root of knowledge for clinical neurology—once the basic science is grasped, the pathophysiology behind clinical neurology becomes readily apparent.

This book is also written to inspire the physician who wants to find new cures for untreatable illnesses—many illnesses in neurology are not treatable

at the current time, and an exciting field lies before the inspired neurologist to find cures to these devastating illnesses. In this regard, the inspired neurologist is invited to learn as much as possible about the molecular working of the nervous system, with the hopes that genetic therapies can intervene with the disease process.

Although this book is intended to train the next generation of physicians, it hopefully will also guide other established physicians in understanding the complexities of neurological disease as many may not be specialists in neurology. The book is written from the perspective of an initial inquiry into symptoms and goes forward from a simple set of symptoms into the actual possibilities and how a diagnosis is linked to a possible treatment plan that could be formed.

The approach to diagnosis is timeless and involves not only skills acquired by physicians through years of training but what could arguably be the most important skill of all, good, basic communication. The doctor and the patient must communicate effectively: the patient must clearly communicate their problem to the best of their ability, and the doctor must carefully listen and ask the right questions. Frequently patients with neurological disease may simply not be able to give any history. Consider the patient arriving in the emergency room with a sudden occlusion of the main artery leading to the left side of the brain where language takes place. In such a case, a left middle cerebral artery occlusion will leave the patient speechless and powerless on the right side of the body—history from another person who witnessed the event is critical in this case to know the time of onset—is this of great importance when considering intravenous medications to break up the clot (tPA must be used within 180 min of symptom onset). At the other end of the time spectrum, the patient may have incurred a slowly progressive aphasia—clues and details from others are essential in the classification of the problem as being likely of a degenerative nature. Without a clear and accurate history, the neurologist may only have a few clues to the underlying problem.

Although the approach to diagnosis in taking a careful history and physical examination may be timeless and involve skills doctors have employed for hundreds of years, the technology with which we explore these diseases has evolved in a dramatic way that is constantly being updated, as is the ever-expanding breadth of knowledge we have about neurological disease mechanisms.

Corning, NY

Michael Andrew Meyer, M.D.

Neurologic Disease

A Modern Pathophysiologic Approach to Diagnosis and
Treatment

Meyer, M.A.

2016, IX, 260 p. 322 illus., 303 illus. in color., Hardcover

ISBN: 978-3-319-39579-1