Vertigo Rehabilitation Protocols

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Foreword

In the last years, rehabilitation gained more and more interest in the medical field at least in the industrialized world. On one hand, clinical and epidemiological evidences highlight the importance of rehabilitation as a complimentary, but indispensable, part of the therapeutic pathway, on the other hand rehabilitation per se is the main therapeutic approach to chronic diseases.

Although drugs and surgery are first directed toward the resolution of a lesion or a dysfunction, they themselves may become source of lesion or dysfunction. Rehabilitation is not able to solve a lesion but it is always directed to restore a dysfunction and avoid a handicap.

Rehabilitation, per se or as a part of a wider therapeutic project, is aimed to return a patient to her/his own living and working environment. In other words, rehabilitation is mainly aimed to reduce the social impact, and thus at the end the social costs of a disease, an accident, a trauma, etc.

At the beginning, the goal of rehabilitation was the recovery of the motor functions but, progressively, it became a more and more complex medical discipline directed to restore every function of the human being, motor, psychological or cognitive.

Due to the complexity of the action field of rehabilitation and its "social" ultimate goal, sometimes rehabilitation resembles more a restoration art than a medical science. (About this argument see "don Carlo Gnocchi's *Restoration of the Human Person*, Milan, 1946.)

Furthermore, some diseases or disturbances may be not healed but only managed. Rehabilitation is frequently the most complete and less expensive approach to management of chronic disorders.

Equilibrium disturbances are becoming more and more frequent in the western industrialized countries, maybe due to particular aspects of the modern life with substantial changes in the life rhythm and feeding, or the modification of the epidemiology or the increase of degenerative diseases and viral infections, and last but not least, the increase in the average age of life.

Rarely equilibrium disturbances are dangerous to life but always they are annoying and expensive, both due to various investigations frequently employed to formulate a diagnosis and the loss of working days due to the resolution of the problem.

The authors of these book dedicated their last 25 years to study the vestibular system and to refine their approach to patient in order to optimize both the diagnostic pathway and, especially, the therapeutic approach. In their experience, the functional diagnosis and rehabilitation are the cornerstones of a daily cost-effective work.

The functional approach to equilibrium disturbances falls in the field of the so-called neuro-otology, a sort of super specialty which starts from otolaryngology to reach neurology passing through general medicine, ophthalmology, orthopedics, endocrinology, virology and physical medicine.

A valid rehabilitation is effective and efficient, that is to say that it is able to obtain the best and lasting functional result in the most time- and cost-saving way.

Along the chapters of this book the authors lead the reader to the management of the most frequent equilibrium disturbances, from the acute viral vestibular neuritis to elderly unsteadiness, through cervicogenic vertigo, quite a distinctive vertigo of the PC and tablet age, always keeping in mind the rehab key words, *effectiveness* and *efficiency*: simple life style advices and complex exercises are blended to obtain the best and lasting therapeutic result.

We can state that the authors approach vertigo dizziness and unsteadiness more along the pathway of the fuzzy logic than the evidence based guidelines, but always leaning on solid neurophysiological basis.

We are grateful to the authors that decided to share their experience, due to successes and failures, including tradition and innovation, guidelines and common sense, always directed to *restore* the unbalanced human being.

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Preface

Vertigo is one of the most frequently experienced physical disturbances and is probably also the most interdisciplinary symptom. As Thomas Brandt highlighted in his book "*Vertigo. Its Multisensory Syndromes*" [1], understanding vertigo may be approached through taking into account how vision, hearing, and proprioception interact with vestibular cues and result in the distinct dynamic balance of human beings. As detailed in chapter 1, human balance is unique along the evolutionary scale. Human bipedalism-based balance is a continuous challenge against gravity. Life, in general, is a challenge for every kind of living being. However, bipedalism-based balance presents both a challenge and opportunities for humans to change their habitat, their interaction with the environment, and their interaction with other humans. Humans have the possibility of changing the rules of gravity, changing the rules of life; they are able to walk, run, jump, and swim, and they may also become able to skate, fly, and more. Modern life demonstrates how humans are able to change the rules of the game of life, combining challenges and opportunities. The problem of vertigo arises from how the vestibular system adapts to the opportunities of modern life.

Inner ear vestibular organs and the subcortical vestibular system developed to control the balance of the dinosaurs approximately 400 million years ago. With similar vestibular systems, *Homo sapiens* had a span of only 150,000 years to adapt to managing the balance of a complex multisegmental body that was continuously moving and continuously close to falling. In only the past 100 years, modern *Homo sapiens*, who often live in a high-velocity world, have had to adapt to managing the balancing required by modern life while still using the same vestibular system. Vertigo reminds *Homo sapiens* that gravity exists, that the body has structural limits, and that sometimes we overwhelm the rules of life, exceeding the rules of our biology and overpowering our natural limits. It seems that vertigo says to us, "Hey, you are on the Earth, you can't fly, you can't live so fast, you need rest, you can't change more quickly than your vestibular system can adapt to your lifestyle!"

Thus, vertigo is a part of the experience of modern human life for the majority of our lives. Children enjoy playing in vertigo-provoking manners, such as playing ring-around-the-rosy or on the seesaw; many adults enjoy carousels and rollercoasters and many adults enjoy challenging gravity, experiencing an exciting adrenergic vertigo. Vertigo as pleasure or vertigo as suffering is always with us, reminding us that we are dino-sapiens, living here and now. Because of this role, vertigo may

deeply impact a patient's life. Vertigo patients deeply suffer because they have become a restricted *Homo sapiens*, frequently no longer *erectus* and sometimes a bit less *sapiens*.

The purpose of vestibular rehabilitation is to restore an adequate relationship between the patient and the Earth, even if it is through a damaged vestibular system. Since the 1940s, when Cawthorne and Cooksey first proposed vestibular rehabilitation, the recommended physical exercises have not changed significantly, whereas the scientific approach to vertigo has changed and is a "work in progress." For this reason, the foreword is devoted to a virologist and the first chapter to the adaptation of the vestibular system to bipedalism-based human balance, the subsequent chapters on vestibular disorders begin with considering the patient as a complex biomechanical and biological system interacting with a specific disease, and each rehabilitation protocol ends with specific suggestions regarding the mutual impact of disease and lifestyle.

Reference

1. Brandt T. Vertigo: its multisensory syndromes. Springer, London (1991 first edition, 1999, second edition)

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Part I

Human Balance and Rehab