Healing beyond medicine: The role of Physical & Rehabilitation Medicine

by Pauline Sosniok

Physical and Rehabilitation medicine is a speciality demanding a highly individualised and patient-centred approach, making it both challenging and unique. With medicine evolving fast, enabling treatments for life-threatening conditions, it becomes increasingly important for patients to return to a healthy and fulfilling life.

Introduction

In the Cambridge dictionary rehabilitation is defined as "the process of returning to a healthy or good way of life, or the process of helping someone to do this after they have been in prison, been very ill, etc" (1). Rehabilitation medicine, also called physiatry focuses on enhancing the overall functional recovery in patients with disability, aiming to improve quality of life within the constraints imposed by a disabling impairment or disease (2). Physiatry is not limited to a specific clinical setting but includes a huge variety of settings and patients.

While physical medicine and rehabilitation are considered "younger" specialities with a history only dating back to World War one and two respectively (3), the origins of rehabilitation can be traced back even to ancient Greece. Telesphoros, son of Hygeia, the Goddess of preventive medicine and health and daughter of Asclepius, God of medicine and health, is the God of convalescence and rehabilitation. The ancient Greeks have already emphasised the importance of rehabilitation, having recognised that effective healing in an acute setting must be complemented by the process of transitioning from illness back to a state of health (5). However, the necessity for thousands of injured soldiers being able to return to the battlefields accelerated the advancements in the development of the speciality significantly. Physical medicine and rehabilitation medicine developed separately as two unofficial specialities, both treated patients with disabling injuries (2). A long and challenging journey began to establish physical medicine and rehabilitation as a medical speciality. Important to mention in this context is Frank H. Krusen, a physician who introduced the term "physiatry" at Temple University in 1938 (6). In 1944, the Baruch Committee under the commission of Bernard Baruch, eventually combined both fields to the speciality of physical and rehabilitation medicine (6). It was Howard Rusk, another pioneer of rehabilitation medicine, who named rehabilitation medicine as the third field of medicine alongside preventive and therapeutic medicine (2). After the second World War, the primary focus in the field of physiatry was classical inpatient neurorehabilitation. After this period, the emphasis shifted towards musculoskeletal rehabilitation for outpatient care. Over the past decade the focus has been on interventional pain management. (7)

According to the US-American physiatrist Dr. Weinstein MD the most important qualities of physiatry are listening to understand a patient´s needs; translating medical information by responding to questions using understandable terms; managing care in a patient-centred approach with a team-based approach to ensure optimisation of care; innovating within the field of health maintenance; and most importantly tolerance for uncertainty, as chronic diseases often

have unpredictable progressions, which can leave patients to feeling anxious about this uncertainty. (8)

In accordance with this, patients' performance progress within a rehabilitation program should be evaluated as a whole, and not based on specific body functions (2). A frequently used scoring system for functioning and disability called the *International classification of functioning, disability and health* (ICF) was introduced by the European Union of Medical Specialists. It is a framework evaluating body functioning and structures, executing activities and lastly involvement in life situations (9).

Case presentation

As a Foundation Year 1 Doctor, I began my clinical career working on a Stroke Unit, where I quickly learned the importance of early intervention and rehabilitation for stroke patients. Individuals who experience a stroke often participate in early rehabilitation guided by a multidisciplinary team before being discharged to specialized rehabilitation clinics. I would like to present a case study that raises important considerations about neurological rehabilitation, particularly in more complex cases.

With regards to neurological rehabilitation, in 2021, stroke was the third leading cause of death worldwide and the fifth leading in the UK (10). Huge personal, societal and economic consequences are caused by the number of people surviving strokes. Neurological rehabilitation has improved significantly over the past decades and now includes physiotherapy, occupational therapy, speech and language therapy and neuropsychology (13). Treatments for strokes are improving and mortality is declining (11), however, many long-term consequences as disability, which includes poor functional, cognitive and psychological outcomes are still common. Despite advances in rehabilitation trials, disability rates following stroke remain high (12).

The case is about a 78-year-old woman who presented with a haemorrhagic stroke. Her condition was further complicated by the development of a hydrocephalus, which required the placement of an external ventricular drain (EVD) to lower the pressure in her ventricular system. Prior to her stroke, the patient had been healthy she was physically fit, lived independently, and had no cognitive impairments. Despite efforts to manage her condition, the medical team was unable to wean her off the EVD, which resulted in the requirement for a permanent shunt. Unfortunately, the patient's journey was far from straightforward. She developed ventriculitis, which was soon followed by sepsis due to pneumonia, delaying the planned shunt surgery. These complications, on top of her initial stroke, left her in a severely compromised clinical state. She became comatose and required maximum supportive care, including oxygen therapy, central lines, a urinary catheter, and a faecal management system. She remained on the Stroke Unit for nearly two months before we were able to initiate early rehabilitation efforts.

This case sparked significant discussion among our team about the role of rehabilitation in a palliative setting. Given her critical condition and the severity of her complications, her chances of surviving the complications of the stroke seemed slim, and the likelihood of her recovering without major disabilities was even smaller. However, in a remarkable turn of events, the patient

defied expectations. Against all odds, she began to recover and eventually was well enough to be discharged to a neurological rehabilitation program in a fairly good condition. This case highlights the unpredictable nature of neurological recovery and the importance of maintaining hope and perseverance in rehabilitation, even in cases where the outlook appears grim. It underpins the need for a personalised approach to care that considers both the potential for recovery and the quality of life in challenging medical situations. Fortunately, for this patient had an improved outcome, but the complications could have led into a severe disability or even death. This experience taught me that medical decisions concerning rehabilitation are often complex and must always be made with great caution.

The biopsychosocial model of health and disease can help us to understand how a patient´s rehabilitation is impacted by the latter three factors and how successful or failed rehabilitation impacts those areas of life.

Biological

In neurological rehabilitation important concepts facilitating behavioural recovery are decrease in functional limitation caused by the principle of neuroplasticity and the ability of compensation. Neuroplasticity refers to the brain's ability to reorganise itself by forming new neural connections. This mechanism allows patients to compensate for lost functions by strengthening remaining neural pathways or creating new ones. As a result, individuals can regain certain abilities and improve their overall function. To effectively boost neuroplasticity, it is essential to engage in targeted exercises that focus on specific areas, such as motor skills, language, and cognitive functions. These therapeutic exercises serve as inputs to the brain, stimulating it to rewire and adapt. The improvements that patients experience, such as enhanced movement, speech, or cognitive abilities, can be considered as outputs of their practice and rehabilitation process. Research has demonstrated a strong positive correlation between the amount of time spent in therapy and the level of improvement achieved. Essentially, the more extensive and focused the rehabilitation efforts, the greater the gains in functional recovery (15). Additionally, studies have highlighted the importance to start rehabilitation early in the post-ischaemic period—typically within the first few months following a stroke—when the brain is most responsive to neuroplastic changes. During this critical window, the potential for recovery is at its highest, making timely and intensive rehabilitation interventions crucial for maximising patient outcomes (16).

Psychological

Based on my experience on the Stroke Unit, I have observed a wide range of motivations among patients. Initially, many patients are in denial about their physical disabilities and may come up with various reasons to explain why they cannot perform certain tasks during a neurological examination. For instance, in the case study I presented, the woman often claimed she couldn’t lift her leg because the blood pressure cuff on her arm was too tight. Over time, however, most patients gradually begin to accept their impairments and become more engaged in their rehabilitation programs. As they start participating actively, they often become more motivated to work towards recovery. However, this renewed motivation can also bring new challenges, such as frustration when progress doesn’t meet their expectations or when improvements are

slower than hoped. Research has shown that social support from healthcare providers, family, and friends significantly enhances the effectiveness of rehabilitation. Encouragement and positive reinforcement can boost a patient's confidence and determination, leading to better outcomes. Additionally, fostering a sense of self-efficacy - patients' belief in their ability to succeed in their rehabilitation goals—is crucial for improving overall recovery (17). By understanding the emotional and psychological journey that patients undergo, healthcare professionals can better support them through the ups and downs of rehabilitation, ultimately helping them achieve more successful outcomes.

Social and economical

The World Health Organization (WHO) emphasises the importance of rehabilitation as it significantly reduces the burden of disease by helping individuals achieve the highest possible level of functioning (9). However, rehabilitation not only benefits the individual and their family, but it also plays a critical role in society by facilitating the reintegration of people with disabilities, enabling them to participate more in their communities, including their return as workforces (18). It also focuses on restoring abilities across various aspects of daily living, ensuring that people can live more independent and fulfilling lives.

While rehabilitation can be highly beneficial, it also comes with significant costs (19). Patients often require extended hospital stays to achieve the best possible outcomes, which can place a substantial financial strain on healthcare systems. Despite these costs, the long-term economic impact of rehabilitation is more challenging to quantify. Effective rehabilitation can potentially reduce the need for prolonged stays in acute care hospitals and minimise the likelihood of future hospital admissions, thereby indirectly decreasing healthcare costs (4). Understanding these dynamics is vital for making informed decisions about resource allocation in healthcare, ensuring that the benefits of rehabilitation are fully realised for both individuals and society (19). In conclusion, by helping individuals regain their functional capacity, rehabilitation can lessen the overall societal burden, especially when patients are able to return to work and contribute economically.

Conclusion

In conclusion, rehabilitation medicine is a complex, individualized process that requires time, effort, and support. It is essential to recognise that rehabilitation is a complex process that must consider the cognitive and communicative abilities of each patient. Involving patients in the decision-making process is crucial, as it ensures that their preferences and goals are taken into account, leading to more tailored and effective rehabilitation plans. The strong positive correlation between time spent in therapy and improvement highlights the importance of a sustained commitment to recovery, despite the unpredictability of neurological outcomes. Family and friends play a crucial role in supporting patients through the emotional phases of rehabilitation. While rehabilitation can reduce long-term healthcare costs, it is also inherently expensive. This experience has shown me that medical decisions regarding rehabilitation are intricate and must be approached with careful consideration, balancing hope with realistic expectations.

Rehabilitation medicine is an evolving specialty undergoing significant transformation. A major shift in the field is the growing emphasis on individualized and patient-centred care. This approach actively involves patients in goal setting and decision-making, which enhances their motivation, engagement, and adherence to treatment plans. As healthcare costs continue to rise, there is an increasing focus on cost-effective interventions. Tele-rehabilitation, for example, has emerged as a promising solution by making rehabilitation services more accessible and convenient, reducing both costs and time commitments for patients and providers. Advances in technology, such as artificial intelligence and robotics, are also expanding therapeutic options, allowing for more precise and personalized rehabilitation strategies. Moreover, there is a greater focus on holistic outcomes, prioritizing overall quality of life and well-being rather than solely concentrating on physical functioning. This comprehensive approach reflects the evolving understanding of rehabilitation as a multifaceted process that addresses not just the physical, but also the psychological, social, and emotional aspects of recovery.

Word count: 2092

Literature review:

1. Cambridge Dictionary. REHABILITATION | Meaning in the Cambridge English Dictionary [Internet]. dictionary.cambridge.org. Available from: https://dictionary.cambridge.org/dictionary/english/rehabilitation

2. Lee PKW, M.D. Defining Physiatry and Future Scope of Rehabilitation Medicine. Annals of Rehabilitation Medicine [Internet]. 2011;35(4):445. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3309231/

3. Dillingham TR MD. Physiatry, physical medicine, and rehabilitation: Historical development and military roles [Internet]. Volume 13, Issue 1. February 2002. Physical Medicine and Rehabilitation Clinics of North America. Available from: https://www.sciencedirect.com/science/article/abs/pii/S104796510300069X

4. Nair K, Lee M, Hobson E, Oliver D, Husbands E. End-of-life care of people with long-term neurological conditions. Practical Neurology [Internet]. 2022 Jul 14; practneurol-2022-003361. Available from: https://pn.bmj.com/content/practneurol/22/5/385.full.pdf

5. Dens Higano J MD; Newman J MD. Telesphoros: Ancient God of Rehabilitation. American Journal of Physical Medicine & Rehabilitation [Internet]. 103(9):p e129-e130, September 2024. Available from: https://journals.lww.com/ajpmr/fulltext/2024/09000/telesphoros__ancient_god_of_rehabilitation.17.aspx

6. The history of physical medicine and rehabilitation as recorded in the diary of Dr. Frank Krusen: Part 1. Gathering momentum (the years before 1942). Archives of Physical Medicine and Rehabilitation [Internet]. 1997 Apr 1 [cited 2021 Sep 16];78(4):442–5. Available from: https://www.sciencedirect.com/science/article/abs/pii/S0003999397902409

7. Weinstein SM. Maintaining Health, Wellness, and Fitness: A New Niche For Physiatry? [Internet]. PM&R. 2009 Sep;1(9):793–4. Available from: https://onlinelibrary.wiley.com/doi/full/10.1016/j.pmrj.2009.08.451?saml_referrer

8. Weinstein SM. Defining Physiatry: A Tolerance for Uncertainty [Internet]. PM&R. 2011 Jan;3(1):1–2. Available from: https://onlinelibrary.wiley.com/doi/10.1016/j.pmrj.2010.12.004

9. Stucki G MD, MS. International Classification of Functioning, Disability, and Health (ICF). American Journal of Physical Medicine & Rehabilitation [Internet]. 84(10):p 733-740, October 2005. Available from: https://journals.lww.com/ajpmr/pages/articleviewer.aspx?year=2005&issue=10000&article=00002&type=Fulltext

10. World Health Organization. The top 10 causes of death [Internet]. World Health Organization. 2020. Available from: https://www.who.int/news-room/fact-sheets/detail/the-top-10-causes-of-death

11. Lackland DT, Roccella EJ, Deutsch AF, Fornage M, George MG, Howard G, et al. Factors Influencing the Decline in Stroke Mortality. Stroke. 2014 Jan;45(1):315–53.

12. Crichton SL, Bray BD, McKevitt C, Rudd AG, Wolfe CDA. Patient outcomes up to 15 years after stroke: survival, disability, quality of life, cognition and mental health. Journal of Neurology, Neurosurgery & Psychiatry. 2016 Jul 22;87(10):1091–8.

13. Clinical Pathways in Stroke Rehabilitation https://www.bsprm.org.uk/mp-files/wfnr-clinical-pathways-in-stroke-rehabilitation.pdf/

14. Timm H, Thuesen J, Clark D. Rehabilitation and palliative care: histories, dialectics and challenges. Wellcome Open Research. 2021 Jul 2;6:171. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8790711/

15. Lohse KR, Lang CE, Boyd LA. Is More Better? Using Metadata to Explore Dose–Response Relationships in Stroke Rehabilitation. Stroke. 2014 Jul;45(7):2053–8. Available from: https://pubmed.ncbi.nlm.nih.gov/24867924/

16. Zeiler SR, Krakauer JW. The interaction between training and plasticity in the poststroke brain. Current Opinion in Neurology [Internet]. 2013 Dec [cited 2019 Mar 22];26(6):609–16. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4012223/

17. Cheong MJ, Kang Y, Kang HW. Psychosocial Factors Related to Stroke Patients' Rehabilitation Motivation: A Scoping Review and Meta-Analysis Focused on South Korea. Healthcare. [Internet] 2021 Sep 14;9(9):1211. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8471222/

18. W. Slesina. Soziologische Aspekte der medizinischen Rehabilitation. Das Gesundheitswesen [Internet]. 2008 Jun 1 [cited 2024 Sep 2];70(06):329–38. Available from: https://pubmed.ncbi.nlm.nih.gov/18661455/

19. McGinnis GE, Osberg JS, Seward ML, Campion EW, Branch LG, DeJong G. Total charges for inpatient medical rehabilitation. Health care financing review [Internet]. 1988;9(4):31–40. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4192880/