

# The Need for Dedicated Brain Injury Rehabilitation Units in Pakistan

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## ABSTRACT

Brain injuries are an increasing healthcare problem in Pakistan. Despite the growing burden of head injuries, few specialised brain injury rehabilitation services are available in the country. This results in poor functional and cognitive outcomes for patients. This article examines the need for dedicated brain injury rehabilitation units in Pakistan and how these might enhance patient care through multidisciplinary team working and individualised rehabilitation plans. It also identifies gaps in the healthcare system, workforce, and public awareness regarding brain injury rehabilitation. This study provides recommendations to implement best-practice guidelines from across the globe to improve lifetime care and support head-injured individuals and their families in a resource-limited environment.

**Key Words:** Traumatic brain injury, Rehabilitation, Pakistan.

**How to cite this article:** Khalil MT, Razaq S, Noor MB, Anwar F. The Need for Dedicated Brain Injury Rehabilitation Units in Pakistan. *J Coll Physicians Surg Pak* 2026; **36(03)**:410-413.

Acquired brain injuries are broadly classified into traumatic and non-traumatic brain injuries, based on the history of head trauma, which can range from mild concussion to diffuse axonal injury, leading to remarkable variability in severity and resultant impairments. The most common causes of traumatic brain injury (TBI) include vehicular accidents, fall injuries, sports injuries, and violent injuries, whereas stroke, neoplasm, infection, and anoxia remain the common causes of non-traumatic brain injury.<sup>1</sup> Regardless of the cause, consequences are multifaceted and complex, including motor, cognitive, behavioural, and emotional aspects, along with dependence in activities of daily living, difficulties in inter-personal interactions, and challenges in acquiring or retaining employment.<sup>2</sup> The presence of pain, musculoskeletal problems, neurological complications, and a lack of guidance for caregivers further exacerbate the problem.

Hence, there is a strong need for comprehensive patient rehabilitation, along with a transition to long-term home care, preferably led by a brain injury specialist and/or a physical medicine and rehabilitation (PM&R) physician who possesses in-depth knowledge of the consequences of brain injury, to support individuals in achieving full participation in various aspects of life.<sup>3</sup> This viewpoint aims to provide a framework for establishing dedicated brain injury rehabilitation units in Pakistan, to learn from international models and evidence-based best practices, and to tailor them according to the Pakistani healthcare system and local legislation.

Brain injury rehabilitation units are specifically designed to provide rehabilitation services and facilitate the recovery and reintegration of patients with brain injury. The core components of such units include multidisciplinary team management, comprehensive assessment and treatment planning, followed by treatment delivery. The multidisciplinary team includes a PM&R physician or brain injury specialist, rehabilitation nurses, clinical psychologists, physical and occupational therapists, speech-language pathologists, prosthetists and orthotists, as well as social workers and vocational rehabilitation officers.<sup>4</sup> At the heart of this system is a comprehensive assessment of patients by each team, aimed at establishing realistic and individualised goals. The assessments include physical examination, spasticity evaluation, functional assessment, swallowing assessment, neuropsychiatric evaluation, and prog-

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Received: May 26, 2025; Revised: August 03, 2025;

Accepted: August 16, 2025

DOI: <https://doi.org/10.29271/jcpsp.2026.03.410>

nostic outcome scoring. The aim is to identify problem areas and develop individualised treatment plans.<sup>4</sup>

Once the problem areas are defined and goals are established, various therapeutic interventions are introduced to achieve the agreed objectives within a designated timeframe. The interventions depend on the impairment types. Spasticity is managed through medications, therapeutic modalities, and interventional procedures, such as botulinum toxin injections, motor point blocks, and phenol neurolysis. Disorders of consciousness (DoC) are addressed with psychostimulants and environmental modifications. Specific cognitive impairments are managed through compensatory or restorative techniques. Swallowing disorders are treated with compensatory manoeuvres and dietary modifications. Physical impairments are addressed through strengthening programmes and task-specific training.<sup>4</sup> Training in activities of daily living is also provided, and assistive devices are recommended according to individual patient needs.

There are limited data from Pakistan on the prevalence rates of disability following TBI, hospital readmission rates, and the economic costs of untreated brain injury. A recent study reported an incidence of 81 TBI brain injury cases per 100,000 population, with a fatality rate up to 15%.<sup>5</sup> Despite these alarming statistics, brain injury rehabilitation services remain limited and are primarily concentrated in metro-politan cities, such as Rawalpindi, Islamabad, and Karachi. The healthcare system for brain injury rehabilitation in Pakistan is fragmented. Most tertiary care hospitals lack a dedicated brain injury rehabilitation team.

Key challenges to brain injury rehabilitation in Pakistan include inadequacy of infrastructure and trained staff, as well as a lack of awareness amongst healthcare providers and patients. Dedicated brain injury rehabilitation units are scarce, particularly in suburban and rural areas. In addition, there is a shortage of PM&R physicians/brain injury specialists, along with allied healthcare staff, such as rehabilitation nurses, speech and language pathologists, occupational therapists, clinical neuropsychologists, and prosthetists / orthotists. Neurosurgeons and neurologists seldom refer patients to PM&R physicians, often working solely with physical therapists and thereby lacking the goal-directed, multidisciplinary rehabilitation approach essential for effective brain injury rehabilitation.

The Rights of Persons with Disabilities Act 2020 mandates the provision of rehabilitation facilities by the government.<sup>6</sup> However, there remains a significant lack of financial resources allocated for rehabilitation services, especially for brain injury rehabilitation. The Council on the Rights of Persons with Disabilities does not include any PM&R physicians among its members.<sup>7</sup> The absence of representation at the policy-making level poses a major challenge, as it impedes advocacy for PM&R-led rehabilitation services, particularly in

the domain of brain injury rehabilitation. Representation is essential for policy development and resource allocation.

Rehabilitation is often treated as an afterthought in Pakistan. There is a critical need at the national level to allocate dedicated funding and resources for brain injury rehabilitation. PM&R physicians, the Pakistan Society of Physical Medicine and Rehabilitation (PSPMR), and other national societies representing allied health professionals must advocate to policymakers about unmet needs and push for sufficient budget allocation. Currently, Individual Financial Assistance (IFA) is available to individuals with disabilities who earn less than Rs. 30,000 per month. This support covers items such as wheelchairs, assistive devices, hearing aids, and prosthetic devices. However, most rehabilitation services still require patients to pay out of pocket.

Global practices in countries with well-developed brain injury rehabilitation services can offer guidance for developing a similar service in Pakistan. In the United States, several rehabilitation frameworks are used, with the bio-psycho-socio-ecological framework being the one chiefly followed.<sup>8</sup> This framework emphasises a system that coordinates care, anticipates patient needs, and regularly reassesses care plans, focusing on equity and comprehensive support. Rehabilitation care is structured into five phases: assessment, goal setting, intervention, monitoring, and discharge.<sup>9</sup> A multidisciplinary, team-based approach led by a PM&R physician and brain injury specialist addresses the needs of patients in the acute, sub-acute, and chronic phases.<sup>10</sup> This holistic approach leads to improved functional outcomes, community reintegration, enhanced independence, productivity, and psychosocial well-being.<sup>10</sup> The interdisciplinary rehabilitation framework ensures interdisciplinary coordination of care among various stakeholders, including brain injury specialists, PM&R physicians, allied healthcare staff, neurosurgeons, and neurologists. This framework discourages isolated care under a single clinician and promotes coordinated, interdisciplinary care, preferably under one roof. The vocational rehabilitation framework focuses on integrating neuropsychological evaluations with standard care and ongoing job support to ensure community integration.

The first step in developing dedicated brain injury rehabilitation services in Pakistan is the establishment of a dedicated brain injury registry, which does not exist in Pakistan. The Pakistan Trauma Registry was officially launched in January 2022, which also included patients who sustain traumatic brain injuries.<sup>11</sup> However, its widespread implementation across the country is still pending. Following the development of a brain injury registry, the Ministry of Health in Pakistan should develop a national brain injury rehabilitation framework, initially to be implemented at the university hospital level. All stakeholders, including PM&R physicians, allied healthcare staff, and policymakers, must collaborate to create an inclusive framework that addresses both the acute

and chronic consequences of acquired brain injury while considering local resource limitations. At the local level, the formation of brain injury rehabilitation networks would facilitate the transfer of patients from district hospitals to specialised centres. The Rehabilitation Competency Framework (RCF), developed by the WHO, can serve as a tool to align workforce development with population needs.<sup>12</sup> The RCF enables government or institutions to establish competency-based education, training, and standards of regulation.<sup>13</sup> It can be easily adopted or adapted to local contexts. Additionally, the Guideline for Rehabilitation Workforce Evaluation (GROWE) can help identify workforce structure, gaps, and opportunities.<sup>14</sup> The GROWE also offers guidance for initiating and planning capacity-building efforts.<sup>13</sup>

To give TBI survivors a real chance at recovery, Pakistan needs a national brain injury rehabilitation framework—one that ensures every patient has access to a multidisciplinary team of specialists, including rehabilitation physicians, therapists, and mental health professionals, who can support them in rebuilding their lives. More investment is needed to train healthcare workers, expand rehabilitation facilities, and integrate new technologies that can improve access to care, especially in rural and underserved areas. By learning from global models and adapting them to fit the country's health-care system, Pakistan can ensure that TBI survivors receive the best possible support.

Raising awareness is just as important as expanding services. Many people, including healthcare providers, still underestimate the impact of brain injuries and the role rehabilitation plays in recovery. National campaigns, educational programmes, and advocacy efforts must bring this issue to the forefront and prioritise funding and resources for rehabilitation. Importantly, PM&R physicians must have a seat at the table in policy discussions, ensuring that rehabilitation is not treated as an afterthought but as a core part of brain injury management. March is observed as Brain Injury Awareness Month, providing an excellent opportunity to raise awareness among the general public and healthcare professionals.<sup>15</sup>

Without urgent attention, TBI survivors in Pakistan will continue to struggle in silence, facing unnecessary hardship when rehabilitation could help them regain their independence and quality of life. Now is the time to make meaningful changes to ensure that every person affected by a brain injury can heal, recover, and re-engage with their families and communities.

#### COMPETING INTEREST:

The authors declared no conflict of interest.

#### AUTHORS' CONTRIBUTION:

MTK, MBN, FA: Selection of study topic, drafting, cross-checking of the references, and proofreading.

SR: Preparation of the abstract, conclusion, and final draft.

All authors approved the final version of the manuscript to be published.

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