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APPLICATION OF A PROGRESSIVE INDIVIDUALIZED REHABILITATION PROGRAM TO IMPROVE MOBILITY IN A PATIENT WITH GUILLAIN–BARRÉ SYNDROME: A CASE REPORT

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ABSTRACT

Guillain–Barré syndrome (GBS) is an acute immune-mediated peripheral neuropathy that can cause rapidly progressive muscle weakness, sensory disturbance, respiratory dysfunction, and substantial functional limitation. Recovery of motor function may continue after the acute phase and requires rehabilitation tailored to clinical stability and functional capacity. Objective to describe the implementation and clinical outcomes of a progressive individualized rehabilitation program for impaired mobility in a hospitalized patient with GBS. A descriptive case study was conducted in one 27-year-old woman with GBS who was hospitalized from 1 to 10 July 2026. The rehabilitation program consisted of readiness assessment, passive and active-assisted range-of-motion (ROM) exercises, rolling, sitting training, monitoring of muscle strength using the Medical Research Council (MRC) scale, activity tolerance monitoring, and patient/family education. Rehabilitation was progressed according to clinical status and functional readiness. During nine days of implementation, the patient demonstrated gradual improvement in motor and functional performance. Shoulder strength increased to MRC grade 5, toe and hip strength improved to grade 3 during the progression of bed mobility, and knee and hip strength subsequently improved. The patient progressed from requiring assistance for repositioning to rolling right and left with minimal assistance and sitting for 10, 20, and finally 30 minutes. The program was temporarily withheld when the patient developed melena and severe anemia (hemoglobin 6.9 g/dL) requiring packed red blood cell transfusion. Dangling, standing, and walking were not achieved during hospitalization because lower-extremity strength and postural control remained insufficient and the inpatient rehabilitation period was limited. A progressive individualized rehabilitation program supported gradual improvement in muscle strength, bed mobility, and sitting tolerance while maintaining patient safety.

Keywords: early mobilization; guillain–barré syndrome; individualized rehabilitation; physical mobility; rehabilitation nursing

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INTRODUCTION

Guillain–Barré syndrome (GBS) is an acute immune-mediated polyradiculoneuropathy characterized by progressive weakness, sensory symptoms, reduced or absent reflexes, and variable involvement of the cranial, autonomic, and respiratory systems. The condition can evolve rapidly and may result in respiratory failure and substantial disability, making early recognition and supportive management essential (Leonhard et al., 2019; Shahrizaila et al., 2021; van Doorn et al., 2023). The European Academy of Neurology/Peripheral Nerve Society guideline emphasizes individualized assessment because the clinical presentation and severity of GBS vary considerably among patients (van Doorn et al., 2023).

Although acute medical management is essential, recovery does not end when the acute neurological crisis has stabilized. Residual weakness, fatigue, pain, sensory symptoms, impaired balance, and limitations in activities of daily living may persist and interfere with independence and quality of life (Bellanti et al., 2024; Jacobs, 2025; Laparidou et al., 2021). Rehabilitation therefore represents an important component of comprehensive GBS care. Evidence from systematic reviews

indicates that multidisciplinary rehabilitation and physical exercise can improve functional mobility, strength, fatigue, and participation, although the available evidence remains heterogeneous and additional high-quality studies are needed (Arsenault et al., 2016; Khan & Amatya, 2012; Sulli et al., 2021).

The rehabilitation approach should be progressive rather than uniform. Exercise selection and intensity need to reflect the patient's neurological status, cardiopulmonary stability, fatigue, pain, postural control, and functional goals. Contemporary evidence supports combinations of strengthening, functional training, balance work, endurance training, and other individualized activities, with supervised exercise appearing particularly useful in patients with persistent disability (Kiper et al., 2025; Shah et al., 2022). A structured rehabilitation program may also incorporate prevention of complications related to immobility, adaptation of activities, and restoration of function (Higgins, 2024; Medwave, 2026).

Nurses have a strategic role in this process because they continuously assess patients, provide positioning and basic mobility interventions, monitor tolerance, reinforce exercise, and coordinate care with rehabilitation professionals. Recent evidence concerning nurse-involved early mobilization supports staged progression from bed mobility and ROM toward sitting, standing, and ambulation when clinically appropriate (Lee et al., 2025). For patients with marked weakness, beginning with lower-level functional tasks is important because progression to more complex activities requires adequate strength and postural control.

The source case involved a 27-year-old woman with GBS who had passed through the acute phase and intensive care but continued to experience marked weakness, predominantly in the lower extremities, persistent paresthesia, impaired postural control, dependence for mobility, and limitations in activities of daily living. The case report therefore aimed to describe the application of a progressive individualized rehabilitation program and its observed effect on mobility during hospitalization. The original nursing report identified impaired physical mobility as the primary nursing problem and used the rehabilitation program as the central intervention (Universitas Muhammadiyah Jakarta case report, 2026). This case report aimed to describe the implementation of a progressive, individualized rehabilitation nursing program and its observed effects on physical mobility in a hospitalized patient with Guillain–Barré syndrome (GBS).

Method

Design and setting

This report used a descriptive single-case design to document the implementation of a progressive individualized rehabilitation program in a hospitalized patient with GBS. The case was conducted during inpatient care from 1 to 10 July 2026, with active rehabilitation implementation from 2 to 10 July 2026. The design follows the logic of case study reporting, in which a clinical phenomenon is examined in its real-world context and described longitudinally (Yin, 2018).

Patient characteristics and clinical problem

The patient was a 27-year-old woman diagnosed with GBS. Before the neurological symptoms developed, she had experienced diarrhea, vomiting, and fever and had previously required hospitalization. During the disease course, she experienced severe weakness and respiratory failure requiring intensive care, mechanical ventilation, and tracheostomy. After the acute condition improved, substantial residual weakness remained, particularly in the lower extremities. At the beginning of the rehabilitation program, she was unable to reposition herself independently, had difficulty maintaining sitting, required assistance for mobility, and reported persistent paresthesia. These findings supported the nursing diagnosis of impaired physical mobility. The original case report documented patient consent for the case study (Universitas Muhammadiyah Jakarta case report, 2026).

Rehabilitation program

The intervention was individualized according to clinical readiness, muscle strength, functional capacity, and activity tolerance. The program followed a staged sequence: (1) education and readiness assessment; (2) passive and active-assisted ROM; (3) rolling and bed mobility; (4) sitting and postural control; and, when criteria were met, progression toward dangling, standing, and walking. In this case, implementation reached the sitting stage. ROM exercises were delivered for approximately 10–30 repetitions, twice daily, according to tolerance. Muscle strength was monitored using the MRC muscle strength scale, while vital signs, activity tolerance, fall risk, pressure-injury risk, and clinical symptoms were monitored throughout the intervention. This structure was consistent with evidence supporting progressive, supervised, individualized rehabilitation in GBS (Kiper et al., 2025; Lee et al., 2025; Shah et al., 2022).

Outcome assessment

The principal outcomes were changes in MRC muscle strength, bed mobility, sitting tolerance, and symptoms associated with neurological recovery. Functional progression was interpreted clinically rather than statistically because only one patient was observed. Safety and readiness were prioritized; rehabilitation was reduced or withheld when the patient's medical condition made exercise inappropriate. This principle is consistent with contemporary recommendations that rehabilitation intensity should be adapted to the patient's clinical stage and tolerance (Higgins, 2024; van Doorn et al., 2023).

RESULT

Table 1.
Progressive rehabilitation and clinical response

Day	Rehabilitation	Clinical response	Functional milestone
1 (2 Jul)	Education, readiness assessment, passive and active-assisted ROM	Initial weakness; generalized paresthesia	No functional mobility milestone
2 (3 Jul)	Passive and active-assisted ROM	No clear change in strength	Continued bed-based exercise
3 (4 Jul)	ROM	Shoulder strength increased to MRC 5; exercise limited by hematochezia	Bed-based exercise maintained
4 (5 Jul)	Rehabilitation withheld	Melena; Hb 6.9 g/dL; packed RBC transfusion	Safety prioritized
5 (6 Jul)	ROM and rolling	Hb improved to 7.5 g/dL; left toe strength reached MRC 3	Rolling initiated
6 (7 Jul)	ROM and rolling	Hip strength reached MRC 3	Right/left rolling with minimal assistance
7 (8 Jul)	ROM, rolling, sitting	Knee strength increased to MRC 3	Sitting for 10 minutes
8 (9 Jul)	ROM, rolling, sitting	Hip strength MRC 4; left knee MRC 3; Braden score 15	Sitting for 20 minutes
9 (10 Jul)	ROM, sitting, home-exercise education	Elbow strength increased to MRC 4; paresthesia decreased	Sitting for 30 minutes

The rehabilitation trajectory showed a gradual rather than linear improvement. During the first two days, ROM was tolerated but measurable strength did not substantially change. On day 3, shoulder strength improved, although the exercise session was limited by hematochezia. On day 4, rehabilitation was appropriately withheld because the patient developed melena, had a hemoglobin concentration of 6.9 g/dL, and required packed red blood cell transfusion. Following medical stabilization, rehabilitation resumed with ROM and rolling. By day 6, the patient could roll to both sides with minimal assistance. Sitting training was introduced on day 7 and progressed from 10 to

20 and then 30 minutes by day 9. Paresthesia also decreased during the final evaluation (Universitas Muhammadiyah Jakarta case report, 2026).

Achievement of rehabilitation stages

The planned program included ROM, rolling, sitting, dangling, standing, and walking. During the nine days of implementation, the patient progressed through ROM, rolling, and sitting but did not reach dangling, standing, or walking. The main barriers were persistent lower-extremity weakness, inadequate postural control, and the limited duration of inpatient rehabilitation. The patient was discharged after the medical condition was considered stable and was given education for continued rehabilitation at home. Thus, the observed outcome represents early inpatient functional improvement rather than complete neurological recovery.

DISCUSSION

Rationale for individualized rehabilitation

The clinical pattern in this case is consistent with the variable recovery trajectory of GBS. GBS can produce severe motor impairment even after the acute inflammatory phase has stabilized, and recovery depends on the extent of peripheral nerve dysfunction and subsequent remyelination or axonal recovery (Leonhard et al., 2019; Shahrizaila et al., 2021). The patient's persistent lower-extremity weakness after intensive care illustrates why rehabilitation should not be considered merely an adjunct to acute treatment but an ongoing component of recovery.

The individualized design of the program was particularly important because the patient's readiness changed during hospitalization. The temporary interruption on day 4 demonstrates that progression cannot be based solely on a predetermined schedule. Rehabilitation must be responsive to concurrent medical events. Current GBS guidance emphasizes monitoring of respiratory, autonomic, neurological, and general clinical status, while rehabilitation literature supports adjustment of exercise to the patient's stage and tolerance (van Doorn et al., 2023; Higgins, 2024). In this case, withholding exercise during severe anemia and gastrointestinal bleeding was therefore an important safety decision rather than a failure of the rehabilitation plan.

The progression from ROM to rolling and then sitting reflects a functional hierarchy. ROM is useful for maintaining joint mobility and limiting complications of immobility, whereas rolling requires greater active trunk and limb control. Sitting requires additional postural control and the ability to tolerate a change in body position. Contemporary rehabilitation literature describes similar progression from basic bed mobility toward sitting, standing, and gait training according to readiness (Lee et al., 2025; Kiper et al., 2025; Yousef et al., 2025).

Changes in strength and mobility

The case demonstrated clinically meaningful functional progression over a short inpatient period. The patient moved from substantial dependence for repositioning to rolling with minimal assistance and subsequently sustained sitting for 30 minutes. These changes occurred alongside improvements in selected muscle groups measured using the MRC scale. Although the magnitude of change cannot be interpreted as treatment efficacy from a single case, the temporal pattern is compatible with the expected benefits of repeated, supervised, task-oriented exercise described in previous rehabilitation studies (Arsenault et al., 2016; Shah et al., 2022; Kiper et al., 2025).

The findings also align with the systematic review by Sulli et al. (2021), which concluded that rehabilitation interventions in GBS are associated with improvements in well-being but that the evidence base is still insufficient to establish a definitive treatment effect. Earlier evidence similarly supports multidisciplinary rehabilitation and physical therapy for functional recovery, while emphasizing heterogeneity in intervention intensity and outcome measurement (Khan & Amatya,

2012). Consequently, the present case should be interpreted as supportive clinical evidence of feasibility and observed improvement rather than proof of causality.

The supervised nature of the program may have been advantageous. In a randomized trial involving people with chronic GBS, individualized supervised exercise involving strengthening, endurance, breathing exercises, gait training, and pain management produced better outcomes than an unsupervised home program for several domains (Shah et al., 2022). Although the current patient was in the inpatient recovery phase rather than the chronic phase, the principle of supervision is relevant because the patient had substantial weakness and required assistance to perform mobility tasks safely.

Why higher-level mobility was not achieved

Failure to reach dangling, standing, and walking within nine days should not be interpreted as unsuccessful rehabilitation. These activities require greater antigravity strength, postural control, balance, and tolerance than the earlier stages. The patient had more severe weakness in the lower extremities and had also experienced prolonged critical illness, mechanical ventilation, and tracheostomy. Prolonged critical illness may contribute to additional weakness and reduced functional reserve, which can compound neurological impairment. Therefore, advancing prematurely to standing or walking could have increased the risk of falls, intolerance, or injury. The limited duration of inpatient treatment is another important explanation. Rehabilitation after GBS commonly extends beyond the acute hospitalization. Contemporary evidence supports continued exercise and functional training over longer periods, particularly when residual weakness and fatigue remain (Forsberg et al., 2012; Kiper et al., 2025; Mudge et al., 2025). The patient was therefore appropriately transitioned to home-based continuation after medical stabilization, with education provided to the patient and family.

Nursing implications

This case highlights several practical roles for nurses. First, nurses can identify mobility readiness through repeated assessment of muscle strength, postural control, vital signs, symptoms, and activity tolerance. Second, nurses can deliver and reinforce low-level mobility interventions such as positioning, ROM, bed mobility, and sitting. Third, nurses can identify conditions that require modification or temporary interruption of rehabilitation. Fourth, nurses can provide education to patients and families so that safe exercise continues after discharge. These responsibilities are consistent with the concept of nurse-involved early mobilization and with the need for multidisciplinary coordination among nurses, physicians, physiotherapists, and rehabilitation specialists (Lee et al., 2025; Matos et al., 2025).

Strengths and limitations

The main strength of this case is the longitudinal documentation of a staged rehabilitation process, including both functional gains and a clinically necessary interruption. The program was individualized and linked to observable changes in strength and mobility. However, several limitations should be acknowledged. The study involved only one patient, had no control or comparison condition, and was observed for only nine days of active rehabilitation. MRC scores were available for selected muscle groups rather than a comprehensive standardized functional outcome battery. The inability to observe longer-term outcomes also prevents conclusions about sustained independence, walking recovery, fatigue, or quality of life. Accordingly, larger prospective studies using standardized functional outcomes and longer follow-up are required.

Conclusion

A progressive individualized rehabilitation program consisting of readiness assessment, ROM, rolling, sitting training, continuous safety monitoring, and education was feasible during inpatient recovery from GBS. Over nine days, the patient demonstrated gradual improvements in selected muscle strength, progressed to rolling with minimal assistance, and increased sitting tolerance from

10 to 30 minutes. Rehabilitation was appropriately paused during an episode of gastrointestinal bleeding and severe anemia, illustrating the importance of clinical readiness and safety. Dangling, standing, and walking were not achieved during hospitalization because lower-extremity strength and postural control remained insufficient and the rehabilitation period was limited.

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