Barthel Index: Assessing Functionality

What We Know

› Neurologic disease (e.g., multiple sclerosis [MS]), stroke, and traumatic brain injury (TBI) often lead to functional disability or the inability to independently perform ADLs; (for more information on stroke, MS, and traumatic brain injury, see the series of related Quick Lessons and Evidence-Based Care Sheet)\(^1,8,12\)

› The Barthel Index (BI; also known as the Barthel Index of ADLs) is a 10-item tool that is commonly used to measure functional disability in adolescents and adults who are inpatients in a rehabilitation program or who have significant activity limitations but live in the community; the BI is frequently used to measure functional disability in individuals diagnosed with stroke. The BI assesses an individual’s functioning performance at baseline and is used to serially monitor for improvement in performance of ADLs during the course of rehabilitation. The 10 activities assessed in the BI are as follows:\(^1,2,11,12\)

• Feeding
• Bathing
• Grooming
• Dressing
• Bowels
• Bladder
• Toilet use
• Transfers from bed to chair and back
• Mobility
• Stairs

› Typically, the clinician observes and rates an individual’s performance for each activity using the BI; it is important that the clinician rates the individual on actual functioning performance and not on potential ability to function\(^1,2\).

• Direct activity assessment is not necessary, and the clinician can choose to interview the individual or a trusted family member and clinical staff to rate the individual’s functional ability for each BI activity\(^2\).

› The goal of rehabilitation of functional ability is to establish independence in performing ADLs, and the patient is considered dependent if verbal cues or physical assistance is provided from the clinician, staff members, or family members during the BI assessment\(^1,2\).

› The individual is permitted to use assistive devices (e.g., a walker or cane) during the BI assessment. Total time to complete the BI is approximately 30 minutes, depending on the individual’s level of functional disability. The BI activities are variably scored in five-point increments of 0, 5, 10, or 15, depending on the activity\(^1,2,12\).

• Feeding, dressing, bowels, bladder, toilet use, and stair use activities are scored 0, 5, or 10. Middle categories, or a score of 5, implies that the individual is exerting over 50% of his or her effort to complete the activity. For example, assessment of the dressing activity is scored as follows:

–0 indicates complete dependence
–5 indicates that some assistance is required, but the individual completes approximately 50% of the task without help; the individual can require assistance with buttons, zippers, and laces
–10 indicates full independence, including the individual’s ability to use zippers, buttons, and laces

• Grooming and bathing activities are scored as 0 or 5. For example, assessment of grooming activity is scored as follows:
  –0 indicates complete dependence with personal care
  –5 indicates full independence with personal hygiene, including hair care, face washing, oral hygiene, and shaving
• Transfers and mobility activities are scored 0, 5, 10, or 15. For example, assessment of transfers from bed to chair and back is scored as follows:
  –0 indicates inability to transfer and absence of balance when sitting
  –5 indicates that the individual is able to maintain balance when sitting, but requires major physical assistance from 1 or 2 persons to complete transfers
  –10 indicates that the individual requires minor verbal or physical assistance or supervision to transfer
  –15 indicates complete independence

Each of the 10-item scores are added together for a total BI score of 0–100 points. An unconscious individual is scored at a level 0 for all activities, even if the patient is not yet incontinent of bowel and bladder functions. Lower scores correlate with more severe functional disability; a score of 0 indicates total dependence, and a score of 100 indicates total independence

Investigators report that changes in the total BI score of > 2 points for the serial assessment of functional ability during participation in rehabilitation correlates with “probable genuine change.” An individual’s ability to transition from fully dependent to independent in any one activity is “likely to be reliably” measured by the BI

Ceiling effects (i.e., the percentage of subjects with the maximum possible score) and floor effects (i.e., the percentage of subjects with the minimum possible score) are limitations of the BI, and predicting factors (e.g., type of illness, age, length of stay) in individuals with the lowest or highest possible scores cannot be distinguished from one another

Investigators report that:

• the functional disability of 55 patients with TBI, cerebral palsy, MS, and spinal cord injury who were treated by injection of botulinum toxin type A for spasticity was not strongly correlated with improved functional outcomes in ADLs according to retrospective analysis of BI scores before and after injection; additional research using other measurement methods is required to determine the efficacy of botulinum toxin type A treatment for spasticity to improve functional ability
• The performance evaluation tool modified Barthel index (PET-MBI) was compared to BI. PET-MBI measured patient ADL while BI measured ADL capacity. Researchers found both measurement tools to be effective for stroke patients
• The World Health Organization Disability Assessment Schedule (WHODAS) on a 2.0 scale and the modified Barthel index (MBI) were compared. Researchers found WHODAS 2.0 scale to be 12.1% higher than the MBI before surgical intervention, which conveyed the limitations of MBI
• BI-based Supplementary Scales (BI-SS) was evaluated for its efficacy for stroke patient’s rehabilitation by testing the ability scale and self-perceived difficulty scale. The ability scale of the BI-SS was effective, but the self-perceived difficulty scale gave incorrect results
• the Nottingham Extended Activities of Daily Living (NEADL) scale was more effective in determining predictors of functional disability (e.g., age, ethnicity) in 238 patients 3 months after a first stroke compared with the BI and the Frenchay Activities Index (FAI); because the NEADL did not demonstrate floor or ceiling effects compared with the ceiling effect of the BI and the floor effect of the FAI, it can be a more appropriate tool to determine functional status in patients after stroke
• scores of the BI on admission correlated with the length of stay for 161 patients admitted to neurologic rehabilitation; diagnosis, age, and gender also significantly influenced length of stay
• An assessment of how well the patient is able to dress and bathe himself is a solid indicator on how well he will do with ADLs in five years. This can be used as an early indicator on how intensive the follow-up needs to be. The more dependent the patient is at discharge, the closer the follow up needs to be

What We Can Do

• Learn about the BI so you can accurately assess your patient’s functional performance of ADLs; share this information with your colleagues
• Assess and document your patient’s functional disability at baseline and each time the patient is reevaluated with the BI to track functional progress or changes during rehabilitation
References


