The Bedside Mobility Assessment Tool 2.0

Advancing patient mobility

By Teresa Boynton, MS, OTR, CSPHP;
Dee Kumpar, BSN, RN, MBA; and
Catherine VanGilder, MBA, BS, MT, CCRA

IMMOBILITY compromises almost every system in the body. Studies show that adults who were ambulatory before hospital admission spend up to 83% of their time lying down while in the hospital, and more than a third of hospitalized adults 70 years and older are discharged with a major new disability that wasn't present on admission.

Mobilizing patients safely and consistently is challenging. Accurately assessing mobility status allows healthcare providers to monitor improvements and deterioration and apply interventions to mobilize patients, even when deficits are present. The result can be progress toward physical independence; at a minimum, it maintains patients' strength and decreases risks associated with bedrest.

This article introduces the Bedside Mobility Assessment Tool 2.0 (BMAT 2.0), revised from BMAT 1.0, which was created to identify patient mobility function deficits and guide the healthcare team in selecting equipment to safely handle and mobilize patients. BMAT 2.0 is most effective when documented in the electronic health record (EHR) and clearly communicated with all staff.

BMAT aligns with the American Nurses Association's (ANA's) *Safe Patient Handling and Mobility: Interprofessional National Standards Across the Care Continuum* by promoting mobilization techniques. The tool promotes healthcare worker safety and early and frequent mobilization, which improves patient safety.

BMAT origin

In 2003, Boynton (lead author of this article) saw the need for a mobility assessment tool and began searching for one nurses could use to determine patients' current mobility status and would help standardize safe patient handling and mobility (SPHM) equipment (especially patient lifts) use. Development included networking with nurses from different hospitals and piloting the tool to assess its feasibility and utility.

Validation

In 2012-2013, BMAT 1.0 was validated for content and construct, and for inter-rater reliability by a healthcare team at Banner Baywood Medical Center in Mesa, AZ. The tool was created in the Banner Health system EHR and linked to the fall risk assessment (Morse Fall Scale) on the Adult Mobility and Fall Risk Assessment screen and to the skin assessment (Braden Scale).

Nurses who completed an early BMAT 1.0 pilot study on a 60-bed medical telemetry unit found that the tool took the guesswork out of determining a patient's mobility status and choosing SPHM equipment. Findings included decreased nurse injuries and patient falls. Nurses reported increased awareness of changes in patients' status during a shift and improved confidence using SPHM lifts and getting patients out of bed more frequently because they no longer relied on physical and occupational therapists.

BMAT 1.0 has been implemented at many hospitals throughout the United States and internationally. Nursing implications include timely referrals to rehabilitation services; improved communication among nurses, aides, physical and occupational therapists, and ancillary services (radiologists, transporters) regarding SPHM practices and safe patient transfer methods; and better implementation of ANA SPHM Standard 6 (integrate patient-centered SPHM assessment, plan of care, and use of SPHM technology).

BMAT 2.0

BMAT 2.0 incorporates new knowledge developed over 5 years of BMAT 1.0 use. It clarifies how to perform assessments and determine pass or fail; the nurse's role in assessing, strengthening, and progressing patients; progression from Level 3 to Level 4; and the use of walkers, canes, crutches, and prosthetic legs and progressing patients who use these aids. BMAT 2.0 also addresses bilateral nonweight-bearing patients and bed rest orders and focuses on previous level of function (PLOF), discharge planning, and goals for ambulating patients who pass all four assessments.

BMAT 2.0, which takes about 2 minutes to complete, typically is performed by nurses on patient admission, once per shift, and with any significant change in a patient's status. It empowers caregivers to ACT:

- **A**ssess for mobility level in "safe mode."
- **C**oordinate strategies for strengthening.
- **T**arget the right piece of equipment to advance mobility.

The tool defines four levels of mobility. Each level has a physical task aimed at assessing a patient's strength, coordination, balance, tolerance, and ability to follow directions. When patients can perform the task, they advance to the next level; if they can't, they stay at the current level. If the patient is responsive, the assessment can be completed as part of routine physical and cognitive screenings. (Download the full BMAT 2.0 at myamerican-nurse.com/?p=66915.)

Level 1 assessment

Level 1 evaluates core strength, sitting tolerance, balance, and hemodynamic stability in response to sitting upright.

Sit and shake: Ask the patient to pivot from a semireclined position (head of bed ≥ 30 degrees) to the edge of the bed and maintain an unsupported seated balance for up to 1 minute (to allow fluid shifts and other compensatory changes to occur). Then ask the patient to reach across the midline with one hand and shake your hand; have the patient repeat with the other hand.

Assess: Can the patient maneuver to an upright seated position and maintain unsupported seated balance while reaching across the midline?

- Unsupported sitting engages core muscles and back extensors.
- Sitting upright assists with fluid shifts (with bedrest, about 1 L of fluid moves from the legs to the chest).
- Sitting upright aids ribcage expansion and breathing.

Patients who sit without getting tachycardic, diaphoretic, or light-headed, and can

reach across and shake your hand can proceed to Level 2 assessment.

Note: Patients who are nonresponsive or have a strict bedrest order are automatically Level 1 and should be mobilized following progressive mobility protocols. A provider's "strict bedrest" or "bedrest" order may require clarification if the order is inconsistent with nursing responsibility expectations. Patient mobilization is within the scope of nursing practice, and nurses are expected to evaluate patients' needs and advance mobility to avoid immobility risks and complications.

Safe mode: Consider safe mode for patients who can't perform Sit and Shake (for example, a patient with a large abdominal incision), for patients you're not sure can independently maneuver to a seated position at the edge of bed and sit unsupported, and for patients who may slide off the bed. (See *Safe mode.*)

How do I mobilize and progress patients who can't perform Sit and Shake? Level 1 patients require appropriate SPHM equipment for tasks such as repositioning/boosting, turning, limb holding, and bed-to-chair transfers. Consider calf pump exercises to help progress these patients, prepare them for the Level 2 assessment, assist with circulation, and prevent contractures.

Level 2 assessment

Level 2 evaluates a patient's ability to engage leg and foot muscles. It assesses leg strength and foot-drop contracture deformity and is a precursor to weight-bearing.

Stretch: While the patient is sitting upright and unsupported on the side of the bed or in a chair, instruct the patient to extend one leg, straighten the knee (knee remains below hip level), pump the ankle (dorsiflexion/plantar flexion) at least three times, and repeat with the other leg and ankle.

Assess: Can the patient straighten the knees and pump the ankles?

- This maneuver evaluates patient control and leg muscle (quadriceps and calf muscles) strength.
- Pumping the ankles engages the calf muscles, which assists with venous blood return (leg muscles, especially calf muscles when they contract, play an important role in compressing major leg veins and ensuring adequate blood return to the heart). When

done before the patient stands, calf pump exercises can decrease the risk of orthostatic hypotension and falls.
- Achilles tendon shortening is one of the most common contractures that occurs with bedrest. Pumping the ankle assesses for this contracture and ability to move the ankles.
- Extensor muscles (for example, quadriceps, which have a primary postural role) are one of the first groups of muscles compromised by bedrest. These muscles are necessary for both standing and walking. Patients who can't perform Stretch won't be able to safely stand or walk. Assessing can prevent a possible fall.

Patients who sit without getting tachycardic, diaphoretic, or light-headed, and can extend their leg/straighten their knee and pump their ankle three times (one leg/ankle and then the other) can proceed to Level 3 assessment.

Safe mode: Consider performing Stretch with the bed in chair position or by supporting the patient in a walking/ambulation vest or pants and a lift at the edge of the bed.

How do I mobilize and progress patients who can't perform Stretch? Level 2 patients typically require the same type of SPHM equipment as Level 1 patients; however, because they have adequate seated balance, Level 2 patients can participate to a greater extent than Level 1 patients. When working to progress Level 2 patients, a powered sit-to-stand lift, which allows the patient to safely assume an upright position and bear weight through one or both legs, may be appropriate. Other leg-strengthening exercises can be incorporated into the patient's care plan, along with increased calf pump exercise repetition.

Level 3 assessment

Level 3 evaluates the patient's ability to stand, tolerate standing, and maintain standing balance, which are precursors to ambulation.

Stand: While the patient is sitting upright unsupported on the side of the bed or in a chair, with feet positioned about shoulder-width apart, instruct the patient to move from a seated position to standing upright. Patients should shift their weight forward while raising the buttocks from the surface and rising.

Assess: Can the patient shift forward, rise, and maintain standing balance for up to 1 minute?

- Stand evaluates the patient's leg muscle control, dynamic balance, and strength to rise.
- Standing upright for up to 1 minute allows fluid to shift and other compensatory changes to occur. Most patients who exhibit orthostatic hypotension do so in the first minute of standing, which is the rationale for standing for up to 1 minute for this assessment.
- Guide patients who become light-headed or can't tolerate standing to sit down.

Patients who can stand without becoming tachycardic, diaphoretic, or light-headed, and who have the cognitive ability to stand can proceed to Level 4 assessment.

Safe mode: To assess Stand in safe mode and progress the patient, consider using a sit-to-stand lift to determine how the patient tolerates moving from sitting to standing and weight-bearing.

- If the patient tolerates standing with the use of a sit-to-stand lift, consider repeating Level 3 assessment without the lift or consider further strengthening exercises and referral to physical therapy (PT).
- Consider use of the patient's walker, cane, crutches, or prosthetic leg(s) consistent with best practice and safe use guidelines during the standing assessment.

How do I mobilize and progress patients who can't perform Stand? Level 3 patients may require the same type of SPHM equipment as Level 2 patients for tasks such as quick transfers from bed to toilet. Consistent with best practice guidelines, use the patient's walker, cane, crutches, and prosthetic leg(s) to complete stand. If the patient passes Stand, continue to Level 4 Assessment using aides as needed.

Level 4 assessment
Level 4 evaluates the patient's ability to step in two parts: march in place and advance step and return with one foot then the other. This is a precursor to ambulation.

Step: While the patient is standing at the side of the bed or by a chair, ask the patient to march in place using small steps (not lifting knees up high) for three repetitions. If the patient successfully completes marching in place, ask the patient to step forward with the right foot then return to the starting position; repeat with the left foot.

Assess: Can the patient shift weight from one foot to the other and maintain balance side-to-side and forward and back?

- Step assesses patient leg muscle control and dynamic balance.
- Step allows fluid to shift and other compensatory changes to occur.
- Guide patients who become light-headed or can't tolerate the Step maneuvers to sit.
- Patients who can pass marching in place but can't perform advance step and return with one or both feet should be guided to sit; request a PT consult. To avoid potential falls, keep the patient close to the bed or chair; patients shouldn't independently leave the side of the bed or chair until they demonstrate the ability to back up.

Patients who can Step without becoming tachycardic, diaphoretic, or light-headed, and who have the cognitive ability to Step can proceed to activities to improve endurance and ambulation confidence.

Safe mode: To assess Step in safe mode and progress the patient, consider positioning the bed in chair position and use end-of-bed egress after fitting the patient with a walking vest or pants with a mobile lift. Another option is having the patient sit at the side of the bed and using a walking/ambulation vest or pants and ceiling lift. Using either technique, instruct the patient to complete Step.

How do I mobilize and progress patients who can't perform Step? Level 4 patients may require the same type of SPHM equipment (for example, a stand aid) as those used with Level 3 patients for tasks such as quick transfers from bed to toilet during the night. Following good practice guidelines, initially complete Step in safe mode using a walking/ambulation vest or pants and a lift; consistent with best practice, use the patient's walker, cane, crutches, or prosthetic leg(s) to complete the maneuver.

Patients who perform and pass both portions of Step, with or without an aid, can progress through discharge planning.

How do I mobilize and progress patients who have passed all four assessment levels? To meet discharge goals, patients who have passed all four assessment levels may still need to use a lift with a walking/ambulation vest or pants to increase endurance and distance walked and to reduce fall risk. In addition:
- Continue to address medical issues and stability as needed while improving or main-

Safe mode

Depending on the patient's current condition, consider safe mode for each assessment level. Below are examples of safe mode options for each level for a patient who's had abdominal surgery. To view other patient scenarios, visit myamericannurse.com/?p=66915.

Patient scenario	Level 1 assessment Sit and Shake	Level 2 assessment Stretch	Level 3 assessment Stand	Level 4 assessment Step
Post abdominal surgery	• Patient is unable to move to side of bed without assistance • Nurse raises head of bed and monitors patient • Patient tolerates well and nurse slides sling behind patient • Nurse attaches sling to lift and uses it to move patient to edge of bed • Nurse instructs patient to sit upright unsupported by sling and complete Sit and Shake • Patient passes/demonstrates Sit and Shake and progresses to Assessment 2	• Patient remains in sling attached to lift • Nurse instructs patient to extend one knee and complete ankle pumps three times and repeat with other leg • Patient passes/demonstrates Stretch and progresses to Assessment 3	• Nurse detaches sling from lift and moves lift out of the way • Nurse brings in powered sit-to-stand lift, fits sling/vest to patient, and attaches sling/vest to lift • Nurse uses lift to bring patient to upright standing position • Patient tolerates upright standing position for 2 minutes while nurse takes standing blood pressure and heart rate • Patient passes Stand with use of lift and progresses to Assessment 4	• Nurse uses sit-to-stand lift to move patient back to bed or chair, detaches sling/vest, and moves lift out of the way • Nurse positions ambulation pants and attaches them to mobile lift • Patient is instructed to stand as nurse coordinates raising lift hanger bar and positioning lift armrests/handholds • Patient completes Step (march in place and advance step and return) • Patient demonstrates/passes Step while attached to lift and progresses to walking independently in room without lift • Patient continues to walk in hallway using ambulation pants and lift, increasing distance, strength, tolerance, and confidence; consider discharge goals

taining mobility; evaluate other medical conditions and treatment plans before discharge.

- Coordinate with PT and the care coordination team when considering discharge planning goals, destination, and equipment needs. (Remember, discharge planning begins on the day of admission.)
- Compare preadmission/prior status, including ability to perform activities of daily living, to discharge status; i.e., PLOF compared to post-acute functional status.
- Use a multidisciplinary approach to review rehabilitation goals and ensure they've been met.
- Continue to complete BMAT 2.0 assessments per protocol. With any change in the patient's ability to complete an assessment level, adjust mobility level and goals as needed.

Vital indicator

Mobility is a vital indicator of patient deterioration or improvement. Proper assessment using BMAT 2.0 can help predict mobility changes early so they can be addressed. In addition, it encourages evaluating patients' pre-admission status and setting functional mobility goals, as well as promoting discharge planning that begins on the day of admission.

Standardizing nursing practice, processes, and procedures for SPHM equipment use promotes caregiver safety, reduces nursing care variability, results in better patient outcomes, and aligns with ANA's standards. **AN**

Teresa Boynton is a clinical consultant at Mobility Consulting and Presentations, LLC, based in Loveland, Colorado. Dee Kumpar is the clinical marketing manager for patient support systems at Hill-Rom. Catherine VanGilder is a senior manager of medical affairs for patient support systems at Hill-Rom.

Mobility assessments and screenings summary

Many therapy-focused mobility assessments are designed to determine mobility limitations, establish baselines, assist with care planning and rehabilitation goals, and enhance discharge planning. Compared to BMAT 1.0 and 2.0, these other tools include more components and are more akin to functional assessments. They may be part of a comprehensive assessment, but unlike BMAT, they aren't:

- validated
- quick (BMAT typically takes less than 2 minutes to complete using objective findings)
- a bedside (or chairside) assessment
- nurse-driven
- linked to safe patient handling and mobility interventions and technology based on real-time status and safety needs.

The table below provides an overview of several assessment tools.

Name	Description

PULSES Profile [Moskowitz 1957][1]	**Six components**
	 1. Physical condition (cardiovascular, pulmonary, and other visceral disorders)
	 2. Upper extremities (shoulder girdle, cervical and upper spine)
	 3. Lower extremities (pelvis, lower dorsal and lumbosacral spine)
	 4. Sensory function (vision, hearing, speech)
	 5. Excretory function (bowel and bladder)
	 6. Social and mental status (emotional and psychiatric disorders)
	    ○ **Purpose:** Evaluate functional independence in ADLs with elderly institutionalized population
	    ○ **Scoring:** Each component scored from 1 to 4 (1 = Normal, 2 = Mild, 3 = Moderately severe, 4 = Severe) with descriptors for each level
	    ○ **Administered by:** Clinical staff
	    ○ **Validated:** Unable to determine from available literature

Barthel Index of Activities of Daily Living (BI) [Mahoney 1965][2]	**Functional independence using the following components**
	 • Transfers: 0 (unable to transfer, no sitting balance) to 10 (independent)
	 • Mobility on level surfaces: 0 (immobile < 50 yards) to 10 (independent but may use any aid > 50 yards)
	 • Stairs: 0 (unable to climb stairs) to 10 (independent)
	    ○ **Purpose**: Assess mobility in acute care and with rehabilitation patients to predict length of stay and amount of nursing care needed
	    ○ **Scoring**: 10-item ordinal scale
	    ○ **Administered by**: Clinical staff
	    ○ **Validated:** Unable to determine from available literature

Timed Up and Go Test (TUG) [Mathias 1986][3]	**One timed sequence**
	 • On "Go," clinician begins timing patient, who stands up from the chair, walks at a normal pace to the line on the floor 10 feet away, turns, walks back to the chair at a normal pace, sits down
	 • Clinician stops timing after patient sits down
	 • Clinician records time (in seconds), observes and documents patient's postural stability, gait, stride length, and sway
	    ○ **Purpose**: Assess mobility in acute care; inadequate scale width for people whose limitations are either too severe or relatively modest
	    ○ **Scoring:** Timed (older adults who take ≥ 12 seconds to complete are at risk of falling)
	    ○ **Administered by:** Clinical staff
	    ○ **Validated**: Yes

Uniform Data System for Medical Rehabilitation: Functional Independence Measure Instrument (FIM™) [Keith 1987[4]; version 5.1 1997][5, 6]	**18 items divided into motor and cognitive categories; also classified based on the type of task involved**
	 Motor category:
	 • Self-care tasks (1. eating, 2. grooming, 3. bathing, 4. upper body dressing, 5. lower body dressing, 6. toileting)
	 • Sphincter control tasks (7. bladder management, 8. bowel management)
	 • Transfer tasks (9. bed-to-chair transfer, 10. toilet transfer, 11. tub or shower transfer)
	 • Locomotion tasks (12. walk or use a wheelchair, 13. stairs)
	 Cognitive category:
	 • Communication tasks (14. comprehension, 15. expression)
	 • Social cognition tasks (16. social interaction, 17. problem-solving, 18. memory)
	    ○ **Purpose**: Classify patient's function; gauges and tracks the amount of assistance required to carry out everyday activities; criterion-referenced and administered by trained and tested clinicians for assessments of functioning to be uniform across different certified raters
	    ○ **Scoring**: Rated from 7 (independent: complete independence) to 1 (complete dependence: total assistance)
	    ○ **Administered by:** Nurses, PT, OT, trained and tested clinicians/certified raters
	    ○ **Validated**: Yes

Physical Performance Mobility Examination (PPME) [Winograd 1994][7]	**Six mobility tasks**
	 1. Bed mobility – ability to move from lying to sitting
	 2. Transfer skills – transferring from sitting on edge of bed to sitting in a chair
	 3. Multiple stands from chair – sit-to-stand-to-sit five times from a 45-cm seat height
	 4. Standing balance – full tandem; postural sway meter attached to waist measures body displacement
	 5. Step up – step up one step without the use of a bed handrail; number of times can step onto a 5-cm block in 15 seconds
	 6. Ambulation – timed 6-meter walk
	    ○ **Purpose**: Performance-based instrument measuring physical functioning and mobility in hospitalized and frail elderly
	    ○ **Scoring:** Pass/fail option (Pass scores 1; Fail scores 0) or three-level scoring system option (High Pass scores 2, Low Pass scores 1, Fail scores 0; e.g., for #1. Bed mobility, score 2 if performed in 10 seconds or less; score 1 if performed but takes over 10 seconds)
	    ○ **Administered by**: Clinical staff
	    ○ **Validated**: Yes

Elderly Mobility Scale (EMS) 1994; updated in 2012 [Elderly Mobility Scale. Ver 2 2012][8]	**Seven components**
	1. Lying to sitting
	2. Sitting to lying
	3. Sitting to standing
	4. Standing
	5. Gait
	6. Timed walk (6 meters)
	7. Functional reach
	    ○ **Purpose:** Assess mobility in elderly patients in hospital settings
	    ○ **Scoring:** Each item scored from 0-2, 0-3, or 0-4 with a possible total of 20:
	        ▪ < 10 = dependent in mobility; requires help with basic ADLs
	        ▪ 10 to 13 = borderline; requires some help
	        ▪ > 14 = independent; can perform mobility maneuvers alone and independent in basic ADLs
	    ○ **Administered by:** Nurses, clinical staff, PT, OT, aides
	    ○ **Validated:** Yes

Four-Stage Balance Test [Rossiter-Fornoff 1995][9]	**One timed sequence of four positions**
	Instruct patient to:
	1. Stand with feet side by side
	2. Place the instep of one foot so it's touching the big toe of the other foot
	3. Tandem stand
	4. Stand on one foot
	    ○ **Purpose:** Assess mobility and falls risk
	    ○ **Scoring:** For each position say, "Ready, begin" and start timing; after 10 seconds, say, "Stop." Assessment based on the patient's ability to hold four progressively challenging positions
	    ○ **Administered by:** Clinical staff
	    ○ **Validated:** Unable to determine from available literature

30-Second Chair-Stand Test [Jones 1999][10]	**One timed sequence**
	Instruct patient to:
	• Sit in the middle of the chair
	• Place hands on opposite shoulder crossed, at the wrists
	• Keep feet flat on the floor
	• Keep back straight and arms against chest
	• On "Go," rise to a full standing position, then sit down again
	• Repeat for 30 seconds
	    ○ **Purpose:** Designed for use with community-dwelling older adults
	    ○ **Scoring:** On the word "Go," begin timing. If patient uses arms to stand, stop the test. Count and record how many times patient comes to full standing position in 30 seconds. Use chart based on age and gender to score; below average score indicates falls risk
	    ○ **Administered by:** Clinical staff
	    ○ **Validated:** Unable to determine from available literature

Hierarchical Assessment of Balance and Mobility (HABAM) [MacKnight 2000][11]	**Three domains**
	1. Balance: 0 = impaired static sitting up to 21 = stable ambulation
	2. Transfers: 0 = total lift; 3 = two-person assist up to 18 = independent
	3. Mobility: 0 = needs positioning in bed; 4 = positions self in bed up to 25 = limited > 50-meter distance; 26 = unlimited
	    ○ **Purpose:** Designed for use with hospitalized patients; studies have noted an inability to discriminate among higher-performing participants
	    ○ **Scoring:** 0-21 scale for balance, 0-18 for transfers, 0-26 for mobility
	    ○ **Administered by:** Nurses, PT, OT
	    ○ **Validated:** Yes (against the BI)

Liko Quick 5 Bedside Guide [Wright 2005][12]	**Five tests**
	Ask patient to:
	1. Roll – logroll to side without assistance
	2. Bridge – while supine, bend knees and lift buttocks off bed toward ceiling
	3. Sit and shake – from semi-reclined position, sit upright at side of bed, reach out crossing midline and grab nurse's hand
	4. March – sit at side of bed, place both feet on floor, then raise one knee and straighten leg and point toes
	5. Stand – elevate off the bed or chair (seated to standing) using an assistive device
	    ○ **Purpose:** Evaluate functional competence and help choose safe patient handling device based on demonstrated functional competence and limitations; revised to the Liko Quick 3
	    ○ **Scoring:** Pass/fail
	    ○ **Administered by:** Nurses, PT, OT
	    ○ **Validated:** No

Egress Test [Dionne 2005][13]	**Three phases/components**
	• Three reps of sit-to-stand
	• Three steps of marching in place (each leg)
	• Advance step and return (each foot)
	    ○ **Purpose:** Safe progression; patient is required to demonstrate sufficient strength and endurance at the bedside prior to leaving the edge of the bed
	    ○ **Scoring:** If patient requires more than cues and guarding techniques for assistance, use a mechanical lift until he or she demonstrates consistent performance
	    ○ **Administered by:** PT
	    ○ **Validated:** Unable to determine from available literature

Boston University Activity Measure for Post Acute Care (AM-PAC™) [Haley 2004][14]	**A set of 269 functional activities with items organized into three functional domains**
	1. Basic mobility (bend/stand/carry, ambulation, transfers, wheelchair skills; total of 131 items)
	2. Daily activity (grooming and hygiene, feeding and meal preparation, personal care; total of 88 items)
	3. Applied cognitive (communication, print information, new learning and applying knowledge; total of 50 items)
	    o **Purpose**: Guide post acute care; assess multiple aspects (difficulty, assistance required, limitations); licensed from Mediware.com
	    o **Scoring**: 1-to-4 scale: 1 = Unable (Total assist); 2 = A lot (Mod/Max assist); 3 = A little (Min assist/Supervision); 4= None (Independent/No difficulty) in response to questioning and/or based on observation
	    o **Administered by:** Nurses, PT, OT
	    o **Validated:** Yes

Liko Quick 3 [Polakow 2007][15]	**Three tests/assessment levels**
	Ask patient to:
	1. Sit and shake – from a semi-reclined position, sit upright and rotate to a seated position; then reach out crossing midline and grab the nurse's hand
	2. Kick and point – extend knee, then dorsiflex/plantarflex the ankle; repeat with other leg
	3. Stand – elevate off the bed or chair (seated to standing); raise buttocks off bed and hold for count of five
	    o **Purpose:** Evaluate functional competence and assist with choosing appropriate Liko lift and sling/safe patient handling device(s) based on demonstrated functional competence and limitations
	    o **Scoring:** Pass/fail
	    o **Administered by:** Nurses, PT, OT
	    o **Validated**: No

de Morton Mobility Index (DEMMI) [de Morton 2008][16]	**Five main categories/15 items**
	• Bed: 1. Bridge, 2. Roll onto side, 3. Move from lying to sitting
	• Chair: 4. Sit unsupported in chair, 5. Sit-to-stand from chair, 6. Sit-to-stand without using arms
	• Static balance (no gait aid): 7. Stand unsupported, 8. Stand feet together, 9. Stand on toes, 10. Tandem stand with eyes closed
	• Walking: 11. Walking distance +/- gait aid, 12. Walking independence
	• Dynamic balance: 13. Pick up pen from floor, 14. Walk four steps backwards, 15. Jump
	    o **Purpose:** Measure mobility across the spectrum from bedbound to independent mobility in hospitalized older adults; can identify meaningful changes in mobility between admission and discharge
	    o **Scoring:** Raw score from 0 to 19 and DEMMI score from 0 to 100
	    o **Administered by:** Clinical staff
	    o **Validated:** Yes

Independent Mobility Validation Examination (I-MOVE) [Manning 2009][17]	**12-point scale**
	1. Turns in bed with assistance
	2. Turns in bed independently
	3. Sits on bed with assistance
	4. Sits on bed independently
	5. Stands with assistance
	6. Stands independently
	7. Sits in chair with assistance
	8. Sits in chair independently
	9. Walks in room with assistance
	10. Walks in room independently
	11. Walks in hallway with assistance
	12. Walks in hallway independently
	    o **Purpose:** Early identification of patients for therapy and to measure functional outcome; help hospitalists assess their patients' mobility
	    o **Scoring:** Start with patient in bed; continue actions until patient completes test (i.e., completes 12. Walks in hallway independently) or needs assistance; circle highest number patient achieves
	    o **Administered by:** Clinical staff
	    o **Validated:** Unable to determine from available literature

Perme Intensive Care Unit Mobility Score [Perme 2014][18]	**Seven components/15 items**
	• Mental status: 1. Alertness on arrival, 2. Able to follow two out of three commands
	• Potential mobility barriers: 3. On mechanical ventilator or noninvasive ventilation, 4. Pain, 5. Two or more lines, tubes, catheters or connected devices, 6. On any drips
	• Functional strength: 7. Legs, 8. Arms
	• Bed mobility: 9. Supine to sit, 10. Static sitting balance
	• Transfers: 11. Sit to stand, 12. Static standing balance once position established, 13. Transfers from bed to chair/chair to bed
	• Gait: 14. Gait activity
	• Endurance: 15. Distance walked in 2 minutes
	    o **Purpose:** ICU-specific tool to measure mobility status of patients with limited independent activities; indicative of functional performance, particularly patient's walking capability
	    o **Scoring:** Ranges from 0 to 1, 0 to 2, 0 to 3 (e.g., Alertness on arrival: Unresponsive = 0, Lethargic = 1, Awake and alert = 2; Able to follow two out of three commands: No = 0, Yes = 1)
	    o **Administered by:** Clinical staff
	    o **Validated:** Yes

Boston University Activity Measure for Post-Acute Care Inpatient Mobility Short Form (AM-PAC™ IMSF) – also called Activity Measure for Post-Acute Care "6-Clicks" (AM-PAC™ "6-Clicks") [Jette 2014][19, 20]	**AM-PAC™ IMSF or "6-Clicks"**
	Includes items selected from the AM-PAC™; two forms used to assess:
	1. Basic mobility function (turning over in bed, moving from supine to sitting, transferring from bed to chair, moving from sitting to standing, walking in room, taking three to five steps holding on to a rail)
	2. Daily activity function (dressing lower body, bathing, toileting, dressing upper body, personal grooming such as brushing teeth, eating meals)
	   o **Purpose**: Improve mobility, guide discharge recommendations and therapist utilization; therapists seeing the right patient at the right time for the right reason; licensed from Mediware.com
	   o **Scoring:** 1-to-4 scale: 1 = Unable (Total assist); 2 = A lot (Mod/Max assist); 3 = A little (Min Assist/supervision); 4 = None (Independent/no difficulty) in response to questioning (e.g., "How much help from another person does the patient currently need putting on and taking off regular lower body clothing?")
	   o **Administered by:** PT (basic mobility function), OT (daily activity function), clinical staff
	   o **Validated:** Yes (in a single-center study)

Banner Mobility Assessment Tool (BMAT) [Boynton 2014][21, 22]
In 2015 name changed to Bedside Mobility Assessment Tool (BMAT) by Banner Health; also called Bedside Mobility Assessment Tool 1.0 (BMAT 1.0)
	Four assessments
	Ask patient to:
	1. Sit and shake (from semi-reclined position, sit upright and rotate to side of bed, then reach across midline and shake nurse's hand)
	2. Stretch and point (in seated position at edge of bed, place both feet on the floor, then stretch one leg, straighten the knee, and bend the ankle/flex and point the toes; repeat with other leg)
	3. Stand (elevate off the bed or chair [seated to standing] using assistive device; patient should be able to raise buttocks off bed and hold for a count of five)
	4. Walk (march in place at bedside, then advance step and return each foot)
	   o **Purpose:** Determine mobility status, assign mobility level, and choose appropriate SPHM equipment to safely complete tasks (e.g., bed-to-chair transfer, hallway ambulation) based on real-time, objective findings; licensed by Banner Health/Liko, a Hill-Rom company
	   o **Scoring:** Pass/fail
	   o **Administered by:** Nurses as part of comprehensive nursing assessment on admission, at least once per shift, and with any significant change in status; per hospital/system protocol, also administered by PT, OT, and other clinical staff/aides as a screening
	   o **Validated:** Yes

Johns Hopkins Highest Level of Mobility (JH-HLM) [Hoyer 2016][23]	**Four main categories**
	• Bed: Lying = 1; Turn self/activity = 2; Sit at edge of bed = 3
	• Chair: Transfer = 4
	• Stand: 1 minute = 5
	• Walk: 10+ steps = 6; 25+ feet = 7; 250+ feet = 8
	   o **Purpose:** In-hospital use to track patient function longitudinally through acute-care and post-acute care services; fulfill CMS regulatory requirements and address core measure that requires inclusion of functional status; CMS meaningful use and conditions of participation
	   o **Scoring:** 1-to-18 scale
	   o **Administered by:** Clinical staff
	   o **Validated:** Yes

Bedside Mobility Assessment Tool 2.0 (BMAT 2.0) [Boynton 2020][24]	**Four assessments**
	Ask patient to:
	1. Sit and shake (from a semi-reclined position or at edge of bed, sit upright for up to 1 minute, then reach across midline and shake the nurse's hand' repeat with other hand. Use safe mode to assist with assessment if needed)
	2. Stretch (while sitting upright unsupported, extend one leg and straighten knee [knee remains below hip level] and point toes/pump ankle between dorsiflexion/plantar flexion; feet may be flat on floor or dangling. Use safe mode to assist with assessment if needed)
	3. Stand (with feet flat on floor about shoulder-width apart, shift forward, raise buttocks/rise and stand upright for up to 1 minute. Use safe mode to assist with assessment if needed)
	4. Step (march in place taking small steps x 3 repetitions; if able to pass, step forward with one foot, weight-bear/shift weight onto foot, and return foot to starting position; repeat with other foot. Use safe mode to assist with assessment if needed)
	   o **Purpose:** Assess for mobility level in safe mode; coordinate strategies for strengthening; target the right piece of equipment to advance mobility; determine mobility status, assign mobility level, and choose appropriate SPHM equipment to safely complete tasks (e.g., bed-to-chair transfer, hallway ambulation) based on real-time, objective findings; licensed by Hill-Rom
	   o **Scoring:** Pass/fail
	   o **Administered by:** Nurses as part of comprehensive nursing assessment on admission, at least once per shift, and with any significant change in status; per hospital/system protocol, also administered by PT, OT, and other clinical staff/aides as a screening
	   o **Validated:** Yes

CMS = Centers for Medicare & Medicaid Services; ICU = intensive care unit; OT = occupational therapist; PT = physical therapist; SPHM = safe patient handling and mobility

Other tools, such as the AM-PAC™ Generic Outpatient Basic Mobility Short Form, Rivermead Mobility Index, the Canadian Neurological Scale, the Expanded Disability Status Scale, the Hauser Ambulation Index, the Functional Mobility Assessment tool, the Mobility Scale, the Physiotherapy Functional Mobility Profile, Katz Index of Independence in Activities of Daily Living scale, Minimum Data Set, the ICU Mobility Scale, the Functional Status Score for the Intensive Care Unit, the Short Physical Performance Battery, and mobility screenings found in fall risk tools are not included in this review.

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BMAT 2.0 SAFE MODE EXAMPLES – Patient Scenarios

	Level 1 assessment Sit and Shake	Level 2 assessment Stretch	Level 3 assessment Stand	Level 4 assessment Step
Example #1: Post abdominal surgery	-Patient is unable to move to side of bed without assistance -Nurse raises HOB and monitors patient -Patient tolerates well and nurse slides sling behind patient -Nurse attaches sling to lift and uses it to move patient to edge of bed -Nurse instructs patient to sit upright unsupported by sling and complete Sit and Shake -Patient passes/demonstrates Sit and Shake = progress to Assessment 2	-With patient still in sling attached to lift, nurse instructs patient to extend one knee and complete ankle pumps x3; repeat with other leg -Patient passes/demonstrates Stretch = progress to Assessment 3	-Nurse detaches sling from lift and moves lift out of the way -Nurse brings in powered sit-to-stand lift, fits sling/vest to patient, and attaches sling/vest to lift; uses lift to raise patient to upright standing position -Patient tolerates upright standing position for 2 minutes while nurse takes standing BP and HR/passes Stand with use of lift = progress to Assessment 4	-Nurse uses sit-to-stand lift to move patient back to bed or to chair, and detaches sling/vest and moves lift out of the way -Nurse positions ambulation pants and attaches to mobile lift -Patient instructed to stand as nurse coordinates raising lift hanger bar and positioning of lift armrests/handholds -Patient completes Step (march in place and advance step and return) -Patient demonstrates/passes Step while attached to lift = progress to walking independently in room without lift -Patient continues to walk in hallway using ambulation pants and lift = increase distance, strength, tolerance, and confidence; consider discharge goals
Example #2: Post hip surgery	-Nurse raises HOB and lowers bed so patient's feet will be flat on the floor -Patient instructed to move/pivot to side of bed and complete Sit and Shake -Patient passes/demonstrates Sit and Shake = progress to Assessment 2	-Nurse fits ambulation vest on patient and attaches vest to lift hanger bar -Nurse instructs patient to complete Stretch while seated at side of bed -Patient demonstrates Stretch = progress to Assessment 3	-With ambulation vest still attached to lift, nurse instructs patient to stand while nurse coordinates raising the lift hanger bar and hands patient his or her walker -Patient demonstrates ability to stand upright while nurse takes standing BP and HR/passes Stand with use of lift = progress to Assessment 4	-With ambulation vest still attached to lift and while patient holds on to walker, nurse instructs and demonstrates Step -Patient demonstrates/passes Step while attached to lift and using walker = progress to walking independently with walker in room without lift -Patient continues to walk in hallway using ambulation vest, lift, and walker = increase distance, strength, tolerance using walker with and then without lift; consider discharge goals
Example #3: Post trauma	-After patient has progressed following ICU progressive mobility program criteria, nurse raises HOB and positions bed in chair position -Nurse instructs patient to sit upright unsupported by mattress and complete Sit and Shake -Patient passes/demonstrates Sit and Shake = progress to Assessment 2	-With bed still in chair position, nurse instructs patient to complete Stretch -Patient demonstrates with one leg and then the other -Nurse then instructs patient to complete additional repetitions of ankle pumps to progress strengthening and venous return -Patient demonstrates Stretch with additional repetitions = progress to Assessment 3	-Nurse brings in powered sit-to-stand lift, fits sling/vest to patient, brings in lift to end of bed, and attaches sling/vest to lift; uses lift to bring patient to upright standing position -Patient tolerates upright standing position for 2 minutes while nurse takes standing BP and HR/passes Stand with use of lift = progress to Assessment 4	-Nurse moves the sit-to-stand lift out of the way, positions and attaches ambulation pants to ceiling lift hanger bar -With bed still in chair position and using end of bed egress, nurse instructs patient to raise buttocks and stand as nurse coordinates raising lift hanger bar -Patient completes Step (march in place and advance step and return) -Patient demonstrates/passes Step while wearing ambulation pants attached to lift = progress to walking independently in room without lift -Patient moved to stepdown unit and continues to walk in hallway using ambulation pants and lift = increase distance, strength, tolerance, and confidence with walking; consider discharge goals
Example #4: Post trauma	-Nurse raises HOB and lowers bed so patient's feet will be flat on the floor -Patient instructed to move/pivot to side of bed and complete Sit and Shake -Patient passes/demonstrates Sit and Shake = progress to Assessment 2	-While still seated on edge of bed, nurse demonstrates and instructs patient to complete Stretch -Patient demonstrates/passes with both legs = progress to Assessment 3	-Nurse brings in powered sit-to-stand lift, fits sling/vest to patient, and attaches sling/vest to lift; uses lift to bring patient to upright standing position -Nurse moves patient to toilet; after toileting, nurse takes standing BP and HR -Patient tolerates upright standing well with use of lift/passes = progress to Assessment 4	-Nurse moves patient back to the edge of the bed using sit-to-stand lift and detaches sling/vest and moves lift out of the way -Nurse then instructs patient to raise buttocks and stand upright at side of bed and complete Step -Patient holds on to bedrail, begins march in place but then reports feeling light-headed -Nurse guides patient to sit back down on bed
				-Patient sits for a minute, then reports feeling better -Nurse fits an ambulation vest on patient and brings in a mobile lift -Nurse attaches vest to lift and coordinates raising lift hanger bar as patient stands upright -Patient demonstrates/passes Step while attached to lift -While still attached to lift, patient walks for short distance in room before returning to bed

BMAT = Bedside Mobility Assessment Tool, BP = blood pressure; HOB = head of bed; HR = heart rate; ICU = intensive care unit