

# **Low Hospital Mobility – resurgence of an old epidemic within a new pandemic and future solutions**

Daniel E. Pereira BA<sup>1</sup>, Sarah A. Welch, DO, MA<sup>2</sup> Chandler D. Montgomery BS<sup>1</sup>, Jeremy B. Hatcher BA<sup>1</sup>, Mariu C. Duggan MD MPH<sup>3</sup>, S. Ryan Greysen MD, MHS, MA<sup>4</sup>

1 Vanderbilt University Medical Center, 1211 Medical Center Dr. Nashville, TN 37232, USA

2 Department of Physical Medicine & Rehabilitation, Vanderbilt University Medical Center, Nashville, Tennessee, USA

3 Division of Geriatric Medicine, Department of Medicine, Vanderbilt University School of Medicine, Nashville, Tennessee, USA

4 Section of Hospital Medicine, Division of General Internal Medicine, Perelman School of Medicine at the University of Pennsylvania, Philadelphia, PA

**Corresponding Author:**

S. Ryan Greysen, MD, MHS, MA

Section of Hospital Medicine, Division of General Internal Medicine

Perelman School of Medicine at the University of Pennsylvania

3400 Civic Center Blvd

Philadelphia, PA 19104

Email: [Ryan.Greysen@penmedicine.upenn.edu](mailto:Ryan.Greysen@penmedicine.upenn.edu)

**Abstract:**

Low mobility during hospitalization poses risks of functional decline and other poor outcomes for older adults. Given the pervasiveness of this problem, low mobility during hospitalization was first described

as “dangerous” in 1947 and later described as an epidemic. Hospitals have made considerable progress over the last half-century and the last two decades in particular, however, the COVID-19 pandemic presents serious new challenges that threaten to undermine recent efforts and progress towards a culture of mobility. In this special article, we address the question of how to confront an epidemic of immobility within a pandemic. We identify 4 specific problems for creating and advancing a culture of mobility posed by COVID-19: social distancing and policies restricting patient movement, personnel constraints, PPE shortages, and increased patient hesitancy to ambulate. We also propose 4 specific solutions to address these problems. These approaches will help support a culture of healthy mobility during and after hospitalization and help patients to keep moving during the pandemic and beyond.

### **Key points:**

- Low mobility during hospitalization was described 70 years ago but persists.
- COVID-19 has added new challenges to low mobility in the hospital.
- New approaches are needed to combat challenges of social distancing, PPE, and increased patient hesitancy.

**Keywords:** frailty, hospitalization, mobility, functional decline, COVID-19, transitions of care, older people

The problem of excessive bedrest or low mobility during hospitalization leading to loss of independence, repeat hospitalization, nursing home placement, and early mortality has been recognized for decades.<sup>1,2</sup> At the turn of the 21<sup>st</sup> century, efforts to reduce falls unintentionally reinforced a culture of bedrest which inspired broad action to confront an “epidemic” of low mobility.<sup>3,4</sup> Over the last 2 decades, recognition that excessive bedrest is toxic<sup>5</sup> has increased and programs to improve mobility during hospitalization have been spreading.<sup>6</sup>

Unfortunately, the coronavirus pandemic has augmented many age-old challenges with hospital mobility and added new ones which threaten to undermine or even undo recent progress.<sup>7</sup> Below we highlight 4 new problems and specific solutions for low hospital mobility associated with the COVID-19 pandemic. Importantly, while these strategies are critical to implement during the pandemic, they are also important to continue beyond the pandemic to develop a lasting culture of mobility in the hospital.

### **New Problem #1 = Adoption of Restrictive Hospital Measures**

Strict social distancing measures within the hospital have inadvertently created barriers to walking outside the room by reducing access to the hospital halls.

### **New Problem #2 = Personnel Constraints**

Reallocation of personnel to high-need areas such as the emergency department or intensive care units may limit the number of bedside providers and staff (including nurses and aides) who are trained in mobilizing patients across the spectrum of activity.

### **New Problem #3 = Equipment Shortages**

Measures to economize personal protective equipment (PPE) have led to a reduction in bedside providers interacting with patients for the purpose of mobilization. While other providers (such as consultants) may use PPE when treating patients on a regular basis, they may not be appropriately trained in mobility.

### **New Problem #4 = Patient Hesitancy Towards Mobility**

Out of concern for exposure, patients may be fearful of interacting with providers in order to get out of bed or walk in the halls leading to limited engagement across the spectrum of physical activity. This phenomenon begins pre-admission with limited movement due to COVID-19 which reduces a patient's ability to walk once they are admitted.<sup>8</sup>

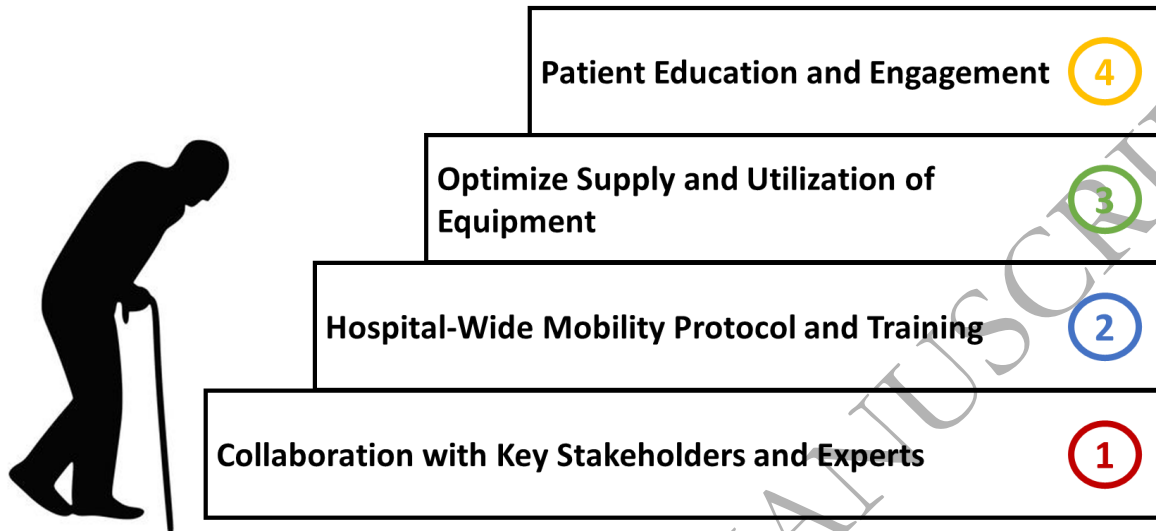
### **Steps to Promote a Culture of Hospital Mobility**

Often, hospital mobility is equated with walking in hospital hallways, but it is important to define mobility as a spectrum that encompasses a spectrum of physical activity that includes sitting, standing, and limited walking or activities in the patient's room. In recognition of this spectrum, the first step towards a culture of mobility is to create a specific daily mobilization plan for each patient which engages them at the level they can participate, whether this be basic movement at bedside, moving about the room, or walking outside the room. Crucial to this aim, units and care teams should partner with physical and occupational therapists as mobility experts to establish unit-specific plans including simple activities that can be practiced within a patient room (e.g. strength exercises such as sit-to-stand, endurance exercises such as stationary walking, and balance exercises such as tandem stand or single leg stance). These exercises are low-cost and feasible to implement in the context of physical distancing and have been shown to reduce falls in at-risk patients.<sup>9</sup> Further, schedules may be drafted to reduce the volume of patients walking in the halls at one time to reduce potential exposure.

### **Figure 1: Steps to Promote a Culture of Mobility During COVID-19 and Beyond**

Problems	
①	Adoption of Restrictive Hospital Measures
②	Personnel Constraints
③	Equipment Shortages
④	Patient Hesitancy Towards Mobility

### Steps to promote a culture of hospital mobility



Second, beyond unit-based approaches, hospital leaders can champion hospital-wide mobility training hosted virtually by physical/occupational therapists to expand the number of providers that can safely mobilize patients. This can also help preserve direct patient engagement of therapists for the most physically-impaired patients.<sup>10</sup> Ideally, providers including nurses and physicians will habitually mobilize patients regularly during routine care, thus reducing PPE usage. Importantly, protocols should also promote the routine use of mobility assessment tools to provide a common language across the spectrum of physical activity and identify patients with skilled therapist needs.<sup>11,12</sup>

Third, hospitals can optimize the procurement and utilization of appropriate equipment to assist with mobilization. In addition to standard equipment used for ambulation (gait belts, walkers, etc.), unit managers can expand the capacity to provide in-room equipment to facilitate other kinds of physical activity at bedside. For example, resistance bands, pedal exercisers, and blocks for stair stepping can all provide a high impact at low cost and are easily sanitized. Importantly, increased patient mobility including in-room activity has been shown to significantly reduce hospital cost through reduced length of stay, readmission rates, and mortality rates, which may provide return on investment in these tools.<sup>10</sup>

Fourth, better patient engagement in mobilization efforts is needed, both during hospitalization and after discharge. Hospitals can create formalized educational materials and curricula on mobility that can empower patients to develop their own mobility goals that will be useful well beyond the COVID-19 pandemic. Additionally, inpatient use of telehealth for physical therapy has been shown to increase communication between patients and their providers and to yield cost-savings.<sup>13</sup> Telehealth mobility after discharge can augment hospital mobility protocols and increase patient engagement both during and after hospital discharge.<sup>14</sup> Ideally, patients should receive access to classes and education even after their discharge, extending their level of potential through virtual platforms. Finally, families, friends, and caregivers should be engaged in supporting and encouraging patients to be active before and after

discharge. As one example, a recent study demonstrated that patients with high levels of social engagement walked more (over 1,000 steps/day greater than control) when enrolled in a mobility game with a support partner after discharge.<sup>15</sup>

### **Conclusion:**

The COVID-19 pandemic has upended recent progress towards creating a culture of mobility in hospitals and has led to low levels of patient activity not seen in decades. These changes pose significant risk of negative long-term consequences for patients and hospital operations. While efforts to reduce spread of COVID in hospitals are necessary, the medical community must take steps to prevent these same efforts from depriving patients of the benefits of mobilization. The setbacks caused by this pandemic need not be permanent; the approaches detailed above will help patients to keep moving during the pandemic and beyond and speed progress towards a lasting culture of healthy mobility during and after hospitalization into the future.

**Declaration of Conflicts of Interest:** Dr. Welch is supported by the US Veterans Administration through the VA Quality Scholars program. No sponsor (VA Quality Scholars program) had any role in design, drafting or decision to submit this manuscript.

**Declaration of Sources of Funding:** None

### **References**

---

<sup>1</sup> Asher RAJ. The dangers of going to bed. *Br Med J.* 1947;2(4536):967. doi:10.1136/bmj.2.4536.967

<sup>2</sup> Covinsky KE, Pierluissi E, Johnston CB. Hospitalization-associated disability: “she was probably able to ambulate, but I’m not sure”. *JAMA.* 2011;306(16):1782-1793.

<sup>3</sup> Brown CJ, Redden DT, Flood KL, Allman RM. The underrecognized epidemic of low mobility during hospitalization of older adults. *J Am Geriatr Soc.* 2009 Sep;57(9):1660-5. doi: 10.1111/j.1532-5415.2009.02393.x. Epub 2009 Aug 4. PMID: 19682121.

<sup>4</sup> Greysen SR. Activating Hospitalized Older Patients to Confront the Epidemic of Low Mobility. *JAMA Intern Med.* 2016 Jul 1;176(7):928-9. doi: 10.1001/jamainternmed.2016.1874. PMID: 27243416.

<sup>5</sup> Greysen SR, Patel MS. Bedrest is Toxic: Why Mobility Matters in the Hospital. *Ann Intern Med.* 2019;170(6):429-430.

<sup>6</sup> Hastings SN, Zullig LL. Mobilizing Hospitals to Mobilize Patients. *J Am Geriatr Soc.* 2020 Aug 5. doi: 10.1111/jgs.16698. Epub ahead of print. PMID: 32757213.

<sup>7</sup> Kalisch BJ, Lee S, Dabney BW. Outcomes of inpatient mobilization: a literature review. *J Clin Nurs.* 2014 Jun;23(11-12):1486-501.

<sup>8</sup> Roschel H, Artioli GG, Gualano B. Risk of Increased Physical Inactivity During COVID-19 Outbreak in Older People: A Call for Actions. *J Am Geriatr Soc.* 2020;68(6):1126-1128. doi:10.1111/jgs.16550

---

<sup>9</sup> Cadore EL, Rodríguez-Mañas L, Sinclair A, Izquierdo M. Effects of different exercise interventions on risk of falls, gait ability, and balance in physically frail older adults: a systematic review. *Rejuvenation Res.* 2013;16(2):105-114.

<sup>10</sup> Lorgunpai, S.J., Finke, B., Burrows, I., Brown, C.J., Rubin, F.H., Wierman, H.R., Heisey, S.J., Gartaganis, S., Ling, S.M., Press, M. and Inouye, S.K. (2020), Mobility Action Group: Using Quality Improvement Methods to Create a Culture of Hospital Mobility. *J Am Geriatr Soc*, 68: 2373-2381. <https://doi.org/10.1111/jgs.16699>

<sup>11</sup> Hoyer EH, Young DL, Klein LM, Kreif J, Shumock K, Hiser S, Friedman M, Lavezza A, Jette A, Chan KS, Needham DM. Toward a Common Language for Measuring Patient Mobility in the Hospital: Reliability and Construct Validity of Interprofessional Mobility Measures. *Phys Ther.* 2018 Feb 1;98(2):133-142

<sup>12</sup> Zisberg A, Shadmi E, Gur-Yaish N, Tonkikh O, Sinoff G. Hospital-associated functional decline: the role of hospitalization processes beyond individual risk factors. *J Am Geriatr Soc.* 2015;63(1):55-62.

<sup>13</sup> Tenforde AS, Hefner JE, Kodish-Wachs JE, Iaccarino MA, Paganoni S. Telehealth in Physical Medicine and Rehabilitation: A Narrative Review. *PM R.* 2017 May;9(5S):S51-S58.

<sup>14</sup> Grona SL, Bath B, Busch A, Rotter T, Trask C, Harrison E. Use of videoconferencing for physical therapy in people with musculoskeletal conditions: A systematic review. *J Telemed Telecare.* 2018 Jun;24(5):341-355.

<sup>15</sup> Greysen SR, Changolkar S, Small DS, Reale C, Rareshide CAL, Mercede A, Snider CK, Greysen HM, Trotta R, Halpern SD, Patel MS. Effect of Behaviorally Designed Gamification With a Social Support Partner to Increase Mobility After Hospital Discharge: A Randomized Clinical Trial. *JAMA Netw Open.* 2021 Mar 1;4(3):e210952. doi: 10.1001/jamanetworkopen.2021.0952.