

EDITORIAL

Geriatrics

It's time to mobilize: Moving mobility interventions for delirium from inpatient units to the emergency department

Delirium occurs in 10%–15% of all older emergency department (ED) patients and accounts for 1.5 million ED visits annually, yet emergency clinicians miss this diagnosis one third of the time.^{1–3} For this reason, ED-based delirium research has predominantly focused on improving delirium identification. However, delirium identification alone without a concerted effort to improve management is insufficient to ameliorate the detrimental effects of delirium. One third of hospitalized older adults and up to 80% of critically ill patients have delirium.^{4,5} Delirium is associated with higher mortality, future cognitive decline, greater institutionalization, longer hospital lengths of stay, and greater costs of care.^{5,6} Accordingly, it is critical that we implement evidence-based interventions to decrease incident delirium and delirium duration. Non-pharmacologic delirium prevention programs in inpatient wards, which include early mobility, have been shown to prevent approximately half of incident delirium and may decrease inpatient falls, hospital lengths of stay, and costs of care.^{7,8} Delirium prevention bundles in inpatient wards and ICUs, which also address mobility, have been demonstrated to reduce mortality and decrease delirium duration.^{9,10} However, there is limited research investigating delirium prevention and no research into delirium treatment initiated in the ED.¹¹

In this issue of *JACEP Open*, Jordano et al examined the impact of physical therapy (PT) and/or occupational therapy (OT) on delirium duration among ED patients admitted to the hospital. This was a secondary analysis of the prospective cohort study by Han et al funded by the National Institute on Aging, which enrolled a total of 228 patients, of which 105 had delirium, 47 had subsyndrome delirium, and 76 were not delirious in the ED.¹² This secondary analysis was restricted to 130 patients who received PT/OT during their hospitalization. The authors report that the time spent with PT/OT relative to hospital length of stay, termed “PT/OT intensity,” was associated with a significant reduction in delirium duration (adjusted odds ratio [OR] = 0.39; 95% confidence interval [CI]: 0.21, 0.73). However, time to initiation of PT/OT was not associated with delirium duration (adjusted OR = 1.02; 95% CI: 0.82, 1.27). What makes this study particularly noteworthy is the inclusion of patients diagnosed with delirium in the ED—to the best of our knowledge presently, this is the only study to examine the effect of PT/OT as a treatment for delirium in ED patients who were hospitalized.

Several key limitations of the Jordano et al study merit scrutiny. The first limitation is the observational nature of this study. PT/OT consul-

tation orders were at the discretion of the admitting team, and we do not know the factors that contributed to consultation. It is possible that patients who did not receive PT/OT may have had hyperactive delirium or were deemed too ill to participate. Hence the study may not sufficiently characterize the impact of PT/OT across the entire spectrum of delirious patients. It is notable, though, that this study sample includes a large number of patients who were critically ill (18.5% were admitted to the ICU) or had a prior dementia diagnosis (58.5%). The second limitation is that PT/OT often started after admission. Although the authors note that PT/OT consultation could have started in the ED for patients boarding in the ED, the median time to first PT/OT session was 2 days (interquartile range, 1–3 days). As such we do not know whether earlier initiation of PT/OT, for instance, in the ED or by orders initiated by ED staff, could improve delirium outcomes. The last limitation is the focus on PT/OT intensity, as opposed to intensity of mobilization or cognitive engagement, potentially limits the generalizability to facilities with either more or less availability of PT and OT services.

Given these and other limitations highlighted by Jordano et al in their article, the article alone will not drive widespread change in clinical practice. However, combined with existing literature in inpatient delirium programs and other studies demonstrating the benefits of inpatient PT and physical activity to preserve function among older persons, they provide ample evidence to advocate for ED-initiated research of the role of early mobility on delirium treatment and prevention. A recent randomized controlled trial (RCT) in Spain demonstrated that physical exercise could reverse new or worsening cognitive impairment associated with hospitalization in older persons.⁹ A 2022 systematic review found that exercise or early rehabilitation was safe for acutely hospitalized older persons and improved cognitive decline postdischarge; although their review concluded no significant benefit in preventing incident delirium overall during hospitalization over usual care, there was no assessment on the impact on prevalent delirium.¹³ ICU-based RCTs for PT¹⁰ and OT¹⁴ demonstrated that early initiation of either therapy reduced delirium duration.

Despite substantial research into mobility and cognitive interventions in the inpatient setting, no RCTs evaluating the impact of mobility interventions on delirium outcomes have been conducted in the ED. Why should we advocate for this? Several additional lines of evidence favor an intervention that can be initiated in the ED and continued in the inpatient setting.

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1. Any intervention performed earlier has the potential to increase its potency and effectiveness. This doctrine has been demonstrated in acute ST-segment elevation myocardial infarction,¹⁵ acute ischemic stroke,¹⁶ and early care for sepsis,¹⁷ where initiating these interventions in the ED has been proven to be highly feasible and enhanced the respective treatment benefits. In the case of out-of-hospital cardiac arrest, initiating target temperature management in the most proximal aspect of the hospital course (prehospital) results in earlier attainment of hypothermia.¹⁸
2. Intervening in the ED is feasible. More EDs are using PT for musculoskeletal injury, peripheral vertigo, gait assessment, and disposition planning.^{19,20} Moreover, ED physician view physical and occupational therapists very favorably.²¹
3. Acutely ill older adults who are hospitalized rapidly lose their functional abilities within the first 48 hours or hospitalization.²² Early PT and OT may not only improve functional status after delirium but also may improve cognition. It is well documented that physical exercise and COGNITION FUNCTION are closely intertwined.²³
4. The ED itself may be a culprit in precipitating delirium. ED lengths of stay exceeding 10 hours are associated with incident delirium among hospitalized older adults,²⁴ and patients with neurologic emergencies arriving to the ED on a day of high boarding are more likely to develop delirium.²⁵ Another observational study demonstrated that the absence of mobilization during the whole ED length of stay was independently associated with a 3-fold odds of incident delirium.²⁶

With ED boarding at crisis levels in this country and no indication of abatement,²⁷ we cannot continue pushing off delirium and mobility initiatives to the inpatient setting. To convince hospital administrators to invest in these programs, we will need more substantial evidence. Given the existing evidence base, further observational studies in the ED would contribute little. It is time to provide robust evidence with ED-initiated prospective interventional studies, such as RCTs or pragmatic trials. Research is needed into what interventions are most effective (eg, formal PT/OT consultation vs mobility using nursing aides), which patients benefit most from these interventions, optimal intensity and timing of these interventions, and impact on patient outcomes and healthcare use as well as program costs.

The projected rise in demand for ED care by the aging population and the expected resulting rise in the number of ED patients presenting with delirium, as well as the well-documented short-term and longer term adverse outcomes associated with delirium, beckon an urgent attention to this issue. We cannot ignore the opportunity to ameliorate this burden, and preventive or therapeutic interventions are needed urgently. The time for ED-initiated studies on delirium and mobility initiatives is now.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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REFERENCES

1. Carpenter CR, Hammouda N, Linton EA, et al. Delirium prevention, detection, and treatment in emergency medicine settings: a Geriatric Emergency Care Applied Research (GEAR) network scoping review and consensus statement. *Acad Emerg Med*. 2021;28(1):19-35.
2. Kinchin I, Mitchell E, Agar M, Trepel D. The economic cost of delirium: a systematic review and quality assessment. *Alzheimers Dement*. 2021;17(6):1026-1041.
3. Chen F, Liu L, Wang Y, Liu Y, Fan L, Chi J. Delirium prevalence in geriatric emergency department patients: a systematic review and meta-analysis. *Am J Emerg Med*. 2022;59:121-128.
4. Salluh JI, Wang H, Schneider EB, et al. Outcome of delirium in critically ill patients: systematic review and meta-analysis. *BMJ*. 2015;350:h2538.
5. Marcantonio ER. Delirium in hospitalized older adults. *N Engl J Med*. 2017;377(15):1456-1466.
6. Brummel NE, Girard TD. Preventing delirium in the intensive care unit. *Crit Care Clin*. 2013;29(1):51-65.
7. Hshieh TT, Yang T, Gartaganis SL, Yue J, Inouye SK. Hospital elder life program: systematic review and meta-analysis of effectiveness. *Am J Geriatr Psychiatry*. 2018;26(10):1015-1033.
8. Hshieh TT, Yue J, Oh E, et al. Effectiveness of multicomponent non-pharmacological delirium interventions: a meta-analysis. *JAMA Intern Med*. 2015;175(4):512-520.
9. Martinez-Velilla N, Casas-Herrero A, Zambom-Ferraresi F, et al. Effect of exercise intervention on functional decline in very elderly patients during acute hospitalization: a randomized clinical trial. *JAMA Intern Med*. 2019;179(1):28-36.
10. Schweickert WD, Pohlman MC, Pohlman AS, et al. Early physical and occupational therapy in mechanically ventilated, critically ill patients: a randomised controlled trial. *Lancet*. 2009;373(9678):1874-1882.

11. Lee S, Chen H, Hibino S, et al. Can we improve delirium prevention and treatment in the emergency department? A systematic review. *J Am Geriatr Soc.* 2022;70(6):1838-1849.
12. Han JH, Vasilevskis EE, Chandrasekhar R, et al. Delirium in the Emergency Department and Its Extension into Hospitalization (DELIN-EATE) Study: effect on 6-month Function and cognition. *J Am Geriatr Soc.* 2017;65(6):1333-1338.
13. Saez de Asteasu ML, Cuevas-Lara C, Garcia-Hermoso A, et al. Effects of physical exercise on the incidence of delirium and cognitive function in acutely hospitalized older adults: a systematic review with meta-analysis. *J Alzheimers Dis.* 2022;87(2):503-517.
14. Alvarez EA, Garrido MA, Tobar EA, et al. Occupational therapy for delirium management in elderly patients without mechanical ventilation in an intensive care unit: a pilot randomized clinical trial. *J Crit Care.* 2017;37:85-90.
15. Kurz MC, Babcock C, Sinha S, Tupesis JP, Allegretti J. The impact of emergency physician-initiated primary percutaneous coronary intervention on mean door-to-balloon time in patients with ST-segment-elevation myocardial infarction. *Ann Emerg Med.* 2007;50(5):527-534.
16. Jauch EC, Holmstedt C, Nolte J. Techniques for improving efficiency in the emergency department for patients with acute ischemic stroke. *Ann N Y Acad Sci.* 2012;1268:57-62.
17. Rivers E, Nguyen B, Havstad S, et al. Early goal-directed therapy in the treatment of severe sepsis and septic shock. *N Engl J Med.* 2001;345(19):1368-1377.
18. Hypothermia after Cardiac Arrest Study G. Mild therapeutic hypothermia to improve the neurologic outcome after cardiac arrest. *N Engl J Med.* 2002;346(8):549-556.
19. Kim HS, Strickland KJ, Mullen KA, Lebec MT. Physical therapy in the emergency department: a new opportunity for collaborative care. *Am J Emerg Med.* 2018;36(8):1492-1496.
20. Gurley KL, Blodgett MS, Burke R, Shapiro NI, Edlow JA, Grossman SA. The utility of emergency department physical therapy and case management consultation in reducing hospital admissions. *J Am Coll Emerg Physicians Open.* 2020;1(5):880-886.
21. Fruth SJ, Wiley S. Physician impressions of physical therapist practice in the Emergency Department: descriptive, comparative analysis over time. *Phys Ther.* 2016;96(9):1333-1341.
22. Hirsch CH, Sommers L, Olsen A, Mullen L, Winograd CH. The natural history of functional morbidity in hospitalized older patients. *J Am Geriatr Soc.* 1990;38(12):1296-1303.
23. Mandolesi L, Polverino A, Montuori S, et al. Effects of physical exercise on cognitive functioning and wellbeing: biological and psychological benefits. *Front Psychol.* 2018;9:509.
24. Bo M, Bonetto M, Bottignole G, et al. Length of stay in the Emergency Department and occurrence of delirium in older medical patients. *J Am Geriatr Soc.* 2016;64(5):1114-1119.
25. Moura Junior V, Westover MB, Li F, et al. Hospital complications among older adults: better processes could reduce the risk of delirium. *Health Serv Manage Res.* 2022;35(3):154-163.
26. Beland E, Nadeau A, Carmichael PH, et al. Predictors of delirium in older patients at the emergency department: a prospective multicentre derivation study. *CJEM.* 2021;23(3):330-336.
27. Peterson SM, Harbertson CA, Scheulen JJ, Kelen GD. Trends and characterization of academic emergency department patient visits: a five-year review. *Acad Emerg Med.* 2019;26(4):410-419.