

BACKGROUND/PURPOSE

Throughout the country hospitals are becoming certified stroke centers to facilitate patients receiving efficient and coordinated care following initiation of stroke symptoms. Rehabilitation consults are part of this process with the goal of initiating services soon after patient arrival. The treatment for patients with ischemic stroke with less than 4.5 hours since onset often includes administration of tissue plasminogen activator (tPA).¹ Due to the risks of hemorrhage, angioedema, and GI bleed, patients receiving tPA are placed on bedrest for 24-48 hours based on hospital protocol.^{2,3,4,5} The purpose of this systematic review was to determine if current evidence supports the bedrest restriction or if early mobility may be safely initiated with patients following tPA administration for acute stroke.

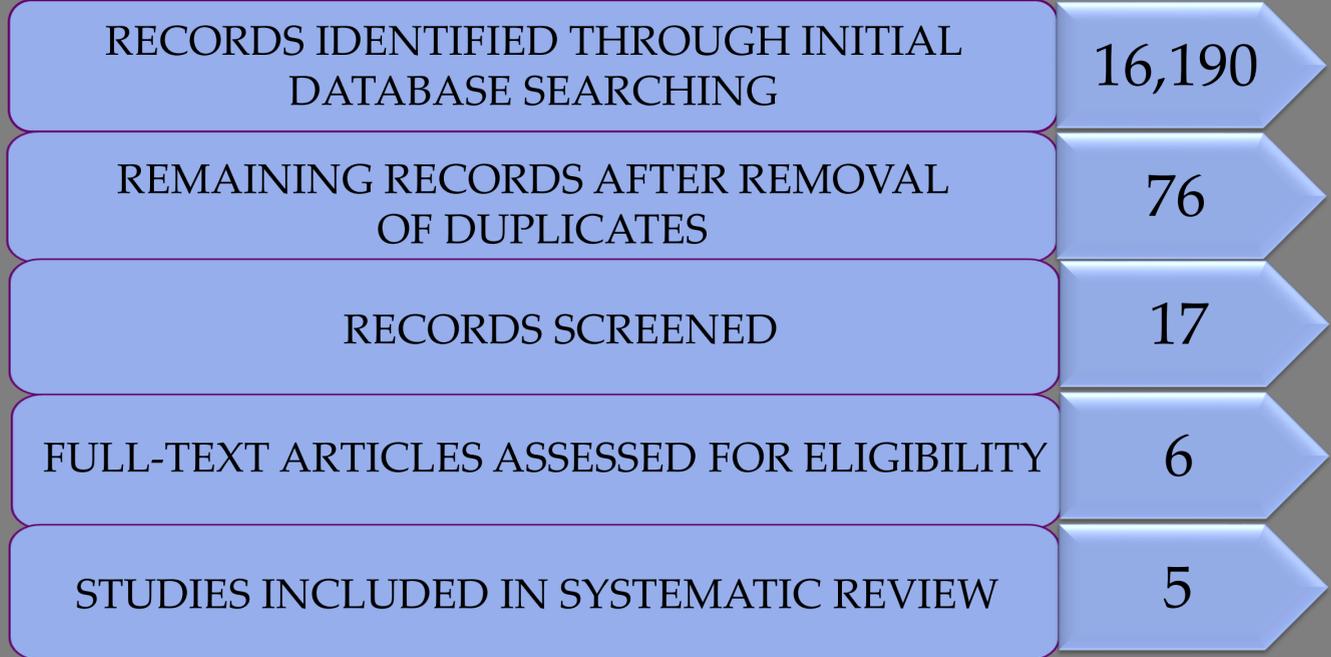
METHODS

A literature search of PubMed, Cinahl, Ebsco Host, Medline Plus, Pedro, and Google Scholar was performed using the terms: (tPA OR tissue plasminogen activator OR alteplase) AND (stroke OR CVA OR cerebrovascular accident) AND (early mobility). Search limits included: English, peer-reviewed, and published 2008-2019. Selection criteria included: persons with acute stroke who received tPA and were mobilized in < 48 hours. Two reviewers independently assessed each study for methodological quality and consensus based on Sackett Level criteria.

RESULTS

- Sample size ranged from 18-6153 subjects (n=8481), all > 35 years old.
- Interventions - Early mobility was inconsistently defined, but was initiated by either nursing or therapy.
 - 25% of patients were mobilized 0-12 hours post tPA (2 studies)^{2,5}
 - 75% were mobilized within 48 hours (5 studies)^{3,4}
- Functional Outcome Measures
 - Modified Rankin Scale (mRS)^{2,5}
 - The presence of adverse events^{3,4}
- Key Findings
 - Persons with severe stroke were unable to participate in early mobility^{2,3,4,6}
 - Early mobility was associated with achieving functional independence on the mRS^{2,3}
 - 1 study noted decline on the mRS 3 months post stroke⁵
 - Administration of tPA can increase risk of intracerebral hemorrhage, angioedema, and GI bleed⁴
 - Most hemorrhages occur within 12 hours post tPA²

PRISMA



ADVERSE RESPONSES DURING MOBILITY³

- Orthostasis
- “Dizziness” without orthostasis
- HR >100 BPM
- Neurologic signs (e.g. transient hemiparesis)
- Active bleeding
- Pallor
- Diaphoresis
- Intense anxiety
- Pain
- Syncope
- Hypotension (SBP <90 mmHg)
- Hypertension (SBP > 180 mmHg, DBP > 105 mmHg)

ARTICLE	SACKETT LEVEL
Momosaki R, Yasunaga H, Kakuda W, Matsui H, Fushimi K, Abo M ²	2B
Arnold SM, Dinkins M, Mooney LH, et al ³	2B
Ho E, Cheung SHC, Denton M, et al ⁴	2C
Bernhardt J et al ⁵	1B
Ha J, Churilov L, Linden T, Bernhardt J ⁶	3B

CONCLUSIONS

Moderate evidence exists on the safety of initiating early mobility in patients following tPA administration for acute stroke. Evidence does not support the current protocols restricting mobility, as long as adverse effects are monitored for and treatments are modified accordingly. Limitations of this review included small sample sizes and lack of clearly defined terms and comparison groups. Future research should focus on addressing these limitations and explicit reporting of adverse events.

CLINICAL RELEVANCE

Administration of tPA is the gold standard treatment for ischemic stroke, with known risks such as bleeding. Protocols often restrict mobility based on these risks in favor of bedrest, which may place the patient at risk for other complications. Based on this systematic review, mobility may be safely initiated within 24-48 hours of tPA administration with monitoring for adverse events. Healthcare providers should consider reviewing protocols to possibly eliminate restriction of mobility following tPA administration as a standard measure for all patients.

REFERENCES

1. StrokeAssociation.org <https://www.strokeassociation.org>. Accessed April 14, 2019.
2. Momosaki R, Yasunaga H, Kakuda W, Matsui H, Fushimi K, Abo M. Very early versus delayed rehabilitation for acute ischemic stroke patients with intravenous recombinant tissue plasminogen activator: a nationwide retrospective cohort study. *Cerebrovasc Dis.* 2016;42:41-48.
3. Arnold SM, Dinkins M, Mooney LH, et al. Very early mobilization in stroke patients treatment with intravenous recombinant tissue plasminogen activator. *J Stroke Cerebrovasc Dis.* 2015;24(6):1168-1173.
4. Ho E, Cheung SHC, Denton M, et al. The practice and predictors of early mobilization of patients post-acute admission to a specialized stroke center. *Top Stroke Rehabil.* 2018;25(8):541-547.
5. Bernhardt J et al. Efficacy and safety of very early mobilisation within 24h of stroke onset (AVERT): a randomized controlled trial. *Lancet.* 2015;386:46-55.
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