



BRIEF ANSWERS
TO SPECIFIC
CLINICAL
QUESTIONS

Q: When can patients with acute deep vein thrombosis be allowed to get up and walk?

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A: As soon as possible. In 1944, Dock¹ wrote, “The physician must always consider complete bed rest as a highly unphysiologic and definitely hazardous form of therapy, to be ordered only for specific indications and discontinued as early as possible.” But despite this decades-old admonition, physicians fear that ambulation may dislodge thrombi in the legs, precipitating pulmonary embolism.

Although rational at face value, prescribing bed rest is not evidence-based and runs counter to the well-established fact that immobility promotes stasis and is an important risk factor for formation and propagation of deep vein thrombosis. Some trusted textbooks still recommend bed rest for patients with acute deep vein thrombosis,² but newer disease-specific guidelines do not.

The seventh American College of Chest Physicians Conference on Antithrombotic and Thrombolytic Therapy³ soundly recommends that patients with deep vein thrombosis should get up and walk as tolerated. Patients who are not expected to tolerate early ambulation, such as those who are hemodynamically unstable or are experiencing significant respiratory compromise, should be stabilized first.

■ EVIDENCE THAT WALKING IS NOT HARMFUL

Observational studies

Recent observational studies suggest that patients with acute venous thromboembolism

do not fare worse if they get up and walk sooner.

Trujillo-Santos et al⁴ prospectively evaluated 2,650 patients with acute symptomatic deep vein thrombosis or pulmonary embolism, including submassive pulmonary emboli. All patients received low-molecular-weight heparin, and 1,435 (54%) were also prescribed bed rest at the provider’s discretion.

Over 15 days, new cases of pulmonary embolism (that were clinically apparent and radiographically confirmed) occurred in 15 patients, including 9 (0.6%) of the 1,435 patients who were on bed rest and 6 (0.5%) of those who were not, for an odds ratio of 0.8 (95% confidence interval 0.3–2.2). Only 5 patients (0.2%) were deemed to have died of new pulmonary embolism, of whom 3 were in the bed rest group. Overall death rates also favored early ambulation.

An important limitation of this study was that patients prescribed bed rest tended to be sicker at baseline. More of them had cancer, had recently undergone surgery, or had proximal deep vein thrombosis, and they received a lower mean dose of low-molecular-weight heparin initially. This imbalance in baseline characteristics notwithstanding, there was no apparent association between early ambulation and new symptomatic pulmonary embolism, and very few patients who were not on bed rest developed new, clinically apparent pulmonary embolism.

Similar reassuringly low rates of pulmonary embolism have been observed in other cohorts of patients with deep vein thrombosis who were encouraged to get up and walk.

Partsch⁵ followed 1,289 consecutive patients admitted with acute deep vein

Patients with deep vein thrombosis should walk as tolerated

*Dr. Feldman has indicated that he has received consulting fees from Quintiles Education, a supplier of evidence-based continuing medical education.

thrombosis. Ventilation-perfusion lung scans were performed at baseline and again 10 days later. Patients were encouraged to ambulate, they received heparin or low-molecular-weight heparin, and their affected limbs were wrapped in compression bandages from forefoot to groin. The baseline ventilation-perfusion scans revealed concurrent pulmonary embolism (which in two thirds of cases was asymptomatic) in 49% of the patients.

New perfusion defects developed in 77 patients (6%), but only 6 of these patients (0.5% of the cohort) developed new pulmonary symptoms. Autopsy was performed in all 17 patients who died, and pulmonary embolism was deemed to have been the cause of death in only 3 (0.2%).

In all, the results of early ambulation in these observational studies compare favorably with those in historical cohorts in which bed rest was the standard of care.

Martin,⁶ for example, in a study of more than 1,600 patients treated with unfractionated heparin and bed rest, found that fatal pulmonary embolism developed in 2.3%.

Randomized trials

Three randomized trials compared early ambulation and bed rest.⁷⁻⁹ The trials were small and used ventilation-perfusion scanning of all patients to detect new events, rather than clinical signs or symptoms. All three trials excluded patients who would be unable to walk for any reason, including hemodynamic instability or significant respiratory compromise.

Schellong et al⁷ randomized 122 patients with symptomatic proximal deep vein thrombosis to stay in bed for 8 days or to stay in bed for only 2 days and then get up and walk. All patients wore compression stockings and received enoxaparin in a dosage based on weight. Baseline ventilation-perfusion scans suggested subclinical pulmonary embolism in more than 65% of patients.

Eight to 10 days later, 10 (17%) of the bed-rest patients and 14 (22%) of the early-ambulation group had a new perfusion defect (difference not statistically significant), and only 1 patient (who was assigned to bed rest) had a symptomatic pulmonary embolus in the follow-up period.

Aschwanden et al⁸ observed similar

results in patients with acute proximal deep vein thrombosis without clinically apparent pulmonary embolism. All patients received low-molecular-weight heparin in a dosage based on weight. They were randomized to completely stay in bed for 4 days or to walk for at least 4 hours per day while wearing compression stockings. The primary end point was a perfusion defect on a follow-up ventilation-perfusion scan on the 4th day of the study.

Six (10%) of the patients in the bed rest group and 10 (14.4%) in the ambulation group had perfusion defects on the 4th day (difference not statistically significant).

Blattler and Partsch,⁹ in the smallest of the three studies, also found no significant difference in the rates of new perfusion defects between patients assigned to bed rest vs ambulation. In this study, patients who were encouraged to walk also had more rapid relief of pain and swelling, but they were also prescribed compression stockings, whereas those assigned to bed rest were not.

In all, these randomized trials demonstrate nonsignificant trends towards increased rates of new pulmonary perfusion defects in patients who get up and walk, but clinically apparent pulmonary embolism is uncommon and no more frequent with ambulation.

MECHANICAL MEASURES ARE IMPORTANT

In all three randomized trials, the ambulatory patients received compression therapy. Only Schellong et al⁷ provided compression therapy for all the patients, while the other two trials^{8,9} used them in just the ambulatory patients. Since compression devices were used regularly in these trials, their therapeutic role should not be overlooked when making decisions.

Moreover, only one of the trials encouraged the patients on bed rest to elevate their legs.⁷ While this therapy makes intuitive sense for those who are not well enough to walk and for ambulatory patients while they are in bed, it was not specifically evaluated in these trials.

RECOMMENDATIONS

- In aggregate, randomized controlled trials and the larger observational studies do not

We advocate compression stockings to minimize symptoms and prevent postthrombotic syndrome



show that bed rest is beneficial, and the known hazards of bed rest should take precedence over the dubious risks of ambulation with deep vein thrombosis.

- Given that most studies of early mobilization employed compression stockings in addition to ambulation, we advocate the use of compression stockings, not only to minimize

symptoms but also to prevent the post-thrombotic syndrome.¹⁰

- Elevating the legs while the patient is in bed is reasonable.

As physicians, our job is to return patients to health, and in patients with acute deep vein thrombosis, one step we should take is to encourage our patients to take steps early. ■

REFERENCES

- Dock W.** The evil sequelae of complete bed rest. *JAMA* 1944; 125:1083–1085.
- Creager MA, Dzau JV.** Vascular diseases of the extremities. In: Kaspar DL, Braunwald E, Fauci AS, Hauser SL, Longo DL, Jameson JL, editors. *Harrison's Principles of Internal Medicine*, 16th ed. New York: McGraw-Hill, 2005:1486–1494.
- Buller HR, Agnelli G, Hull RD, Hyers TM, Prins MH, Raskob GE.** Antithrombotic therapy for venous thromboembolic disease: the Seventh ACCP Conference on Antithrombotic and Thrombolytic Therapy. *Chest* 2004; 126(suppl):401S–428S.
- Trujillo-Santos J, Perea-Milla E, Jimenez-Puente A, et al.** Bed rest or ambulation in the initial treatment of patients with acute deep vein thrombosis or pulmonary embolism: findings from the RIETE registry. *Chest* 2005; 127:1631–1636.
- Partsch H.** Therapy of deep vein thrombosis with low molecular weight heparin, leg compression and immediate ambulation. *Vasa* 2001; 30:195–204.
- Martin M.** PHLECO: a multicenter study of the fate of 1647 hospital patients treated conservatively without fibrinolysis and surgery. *Clin Invest* 1993; 71:471–477.
- Schellong SM, Schwarz T, Kropp J, Prescher Y, Beuthien-Baumann B, Daniel WG.** Bed rest in deep vein thrombosis and the incidence of scintigraphic pulmonary embolism. *Thromb Haemost* 1999; 82(suppl 1):127–129.
- Aschwanden M, Labs KH, Engel H, et al.** Acute deep vein thrombosis: early mobilization does not increase the frequency of pulmonary embolism. *Thromb Haemost* 2001; 85:42–46.
- Blattler W, Partsch H.** Leg compression and ambulation is better than bed rest for the treatment of acute deep venous thrombosis. *Int Angiol* 2003; 22:393–400.
- Prandoni P, Lensing AW, Prins MH, et al.** Below-knee elastic compression stockings to prevent the post-thrombotic syndrome: a randomized, controlled trial. *Ann Intern Med* 2004; 141:249–256.

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