

1 in 5 are discharged from hospital with unstable vital signs

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Dr. Oanh Nguyen (left), Dr. Anil Makam (center), and Dr. Ethan A. Halm (right) of UT Southwestern's Center for Patient-Centered Outcomes Research. Credit: UT Southwestern Medical Center

Twenty percent of people hospitalized are released before all vital signs

are stable, a pattern that is associated with an increased risk of death and hospital readmission, a new study by UT Southwestern Medical Center researchers shows.

As hospital stays have shortened dramatically over the past 30 years, there is increasing concern that patients are being discharged before all [vital signs](#) have stabilized, putting them at risk of adverse events after discharge. However, no studies to date have examined the extent to which patients are discharged with unstable vital signs, and whether this practice is actually associated with higher post-discharge mortality and readmission rates, the researchers said.

"We found that nearly 1 in 5 hospitalized adults is discharged with one or more vital sign instabilities such as an elevated heart rate or low blood pressure," said lead author, Dr. Oanh Nguyen, Assistant Professor of Internal Medicine and Clinical Sciences. "This finding is an important [patient safety](#) issue because patients who had vital sign abnormalities on the day of discharge had higher rates of [hospital readmission](#) and death within 30 days even after adjusting for many other risk factors."

The researchers assessed electronic medical records (EMR) of 32,835 unique individuals from six Dallas-Fort Worth area hospitals, and noted abnormalities in temperature, heart rate, blood pressure, respiratory rate, and oxygen saturation within 24 hours of discharge. Nearly 20 percent had one or more abnormalities, with elevated heart rate being the most common vital sign instability (affecting about 10 percent). About 13 percent were readmitted or died, and individuals with three or more instabilities had a nearly four-fold increase in the odds of death.

"Our findings, that 'vital signs are still vital' have important implications for the development of national discharge guidelines to improve patient safety for the 35 million individuals being discharged from hospitals in the U.S. annually," said co-lead author, Dr. Anil Makam, Assistant

Professor of Internal Medicine and Clinical Sciences.

"At a time when people are developing complicated, black box computerized algorithms to identify patients at high risk of readmission, our study highlights that the stability of vital signs, something doctors review with their own eyes every day, is a simple, clinically objective means of assessing readiness and safety for discharge. There's a good reason we call them vital signs," said senior author Dr. Ethan A. Halm, Chief of the William T. and Gay F. Solomon Division of General Internal Medicine, Chief of the Division of Outcomes and Health Services Research in the Department of Clinical Sciences at UT Southwestern, and Director of UT Southwestern's Center for Patient-Centered Outcomes Research. "It is important for clinicians to look at all of the vital signs in the 24 hours prior to discharge and not just the last set or the best ones in judging a patient's readiness for discharge."

Researchers concluded that:

- Discharge guidelines should include objective vital sign criteria for judging stability on discharge to improve disposition planning and post-discharge patient safety.
- At a minimum, patients with one instability on discharge should be discharged with caution.
- Close outpatient follow-up and appropriate patient education about warning signs and symptoms that merit urgent medical attention may be warranted.
- Individuals with two or more instabilities should likely remain in the hospital for continued treatment and observation in the absence of extenuating circumstances.
- Though post-acute care facilities are frequent sites of post-discharge care for those discharged with vital sign instabilities, patients sent to these facilities had still higher rates of readmission and death, suggesting that an alternate site of

discharge may have been more appropriate for a significant subset of these individuals.

Other researchers included Dr. Song Zhang, Associate Professor of Clinical Sciences; and researchers from Parkland Health & Hospital System, the Parkland Center for Clinical Innovation (PCCI), and Texas Health Resources.

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The UT Southwestern Center for Patient-Centered Outcomes Research, led by Dr. Halm, Professor of Internal Medicine and Clinical Sciences, who holds the Walter Family Distinguished Chair in Internal Medicine in Honor of Albert D. Roberts, M.D., is supported by a \$5 million grant from the federal Agency for Healthcare Research and Quality and seeks to assess the benefits and harms of different preventive, diagnostic, therapeutic, and health delivery system interventions to inform decision-making, highlighting comparisons and outcomes that matter to people.

The Center works in conjunction with UT Southwestern's Center for Translational Medicine, part of a \$28.6 million grant from the NIH to promote rapid translation of basic laboratory findings into patient care. The Center is a member of a national Clinical and Translational Science Award Consortium that includes more than 60 medical research institutions.

Provided by UT Southwestern Medical Center

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