Study finds patient messages help predict medication adherence

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Around two-thirds of patients treated for breast cancer will have had hormone-sensitive tumors and, after their initial treatment, will be advised to undergo hormone therapy for five to 10 years to prevent recurrence.

But around half of these patients will for various reasons decide to discontinue these drugs early and face increased risk of recurrence.

Looking for a means to predict which patients will enter this risky terrain, Zhijun Yin, Ph.D., and colleagues at Vanderbilt University Medical Center turned to electronic health records, and specifically to electronic messages sent by these patients to the health care team via the online patient portal My Health at Vanderbilt.

Their study appears in the *Journal of the American Medical Informatics Association*.

While this study happens to focus on hormone therapy, Yin and colleagues are motivated by the broader question of how patient-generated messages can be used in biomedical research and in the search for methods to automatically stratify the electronic health record population according to risk.

"To our knowledge, there are no previous studies linking the content of these patient messages to health outcomes or patient behaviors," said Yin, assistant professor of Biomedical Informatics at VUMC.

"This study is notable because it suggests a method for automatically calculating this risk for each patient, as a matter of day-to-day clinical practice. We believe methods like these will further streamline and personalize our system of care," he said.

Using de-identified data, the team analyzed messages sent over 12 years by 1,106 breast cancer patients prescribed hormone therapy at VUMC. The applicable guidelines call for at least five years of hormone therapy and the study was limited to this initial period. Thirty-five percent of patients failed to complete their therapy.

Using unsupervised machine learning methods, within these messages the researchers computationally inferred the presence of hundreds of so-called message topics. Patients were represented by lists of these topics found in their messages.

Ten topics were found to be associated with increased risk of discontinuing hormone therapy, and another 13 topics were found to be associated with decreased risk.

For example, patients who mentioned surgery-related topics or side effects caused by hormone therapy were somewhat more likely to discontinue the medication.

By contrast, patients who sought professional suggestions, expressed gratitude to the health care team, or mentioned drugs to cope with side effects

or symptoms were somewhat less likely to
discontinue the [therapy](#).

   More information: Zhijun Yin et al. The therapy is
making me sick: how online portal communications
between breast cancer patients and physicians
indicate medication discontinuation, *Journal of the
American Medical Informatics Association* (2018).
[DOI: 10.1093/jamia/ocy118](#)