Study questions strategy of asking patients to self-report their physical fitness before surgery

October 10 2019

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Physicians ask patients two universal questions to determine whether they are healthy enough to undergo and recover from a major non-

cardiac surgical procedure: whether or not they can climb a set of stairs, and if they can walk two blocks on level ground. The idea is to gain insight into patients' common physical activities and their cardiovascular fitness.

Now, a recent study in the journal *Anesthesiology* by University of Chicago Medicine anesthesiologist Daniel Rubin, MD, MS, and his colleagues calls into question whether those queries and the answers they elicit accurately reflect patients' fitness levels.

"These questions are used literally with every patient, day after day. They're a cornerstone of the preoperative evaluation," Rubin said. "Yet the evidence suggesting the accuracy of using them is quite limited. We know that patients can both overestimate their physical abilities and underestimate their physical abilities."

Specifically, physicians want to know whether patients can withstand an activity requiring four or more metabolic equivalents (MET). One MET is the amount of oxygen consumed while sitting. Studies have shown that patients who cannot perform such activity are at increased risk of major adverse cardiac events.

If patients report they can achieve the equivalent of four METs—climbing a set of stairs, walking two blocks—then they are classified as having an adequate functional capacity for surgery. If they report that they cannot achieve four METs, they may then be referred for a stress test so physicians better understand their cardiovascular health before surgery.

'It's basically a coin flip'

Rubin and his colleagues looked at data from two separate years—2003-2004 and 2005-2006—from the National Health and Nutrition

Examination Survey, NHANES. The survey, which includes physical activity questions such as, "Do you have difficulty walking for a quarter mile/2-3 blocks?" or "Do you have difficulty walking up 10 stairs?" is administered to participants of all ages and oversamples understudied groups such as adults over age 70 and non-Hispanic black Americans. A subset of the participants also wore accelerometers on their hips, which recorded their physical activity for one week.

Rubin's analysis looked only at patients who took the survey and wore the accelerometers. If their device measured at least one 2-minute bout of moderate exercise during the week, they were classified as having an adequate functional capacity.

Rubin found the questions worked well for seeing which patients had functional capacity and knew it. In other words, if a patient answered "yes" to being able to climb a set of stairs or walk two blocks, most of the time their accelerometers recorded that they had engaged in at least 2 minutes of moderate physical activity. About 80 percent of patients who answered yes to those questions also had at least a 2-minute bout of moderate exercise.

If, however, the patients answered "no" to being able to climb a set of stairs or walk two blocks, the data was mixed. Of those patients, for example, 54.6 percent were able to sustain at least 2 minutes of moderate physical activity, according to their accelerometers.

"The questions are pretty good at identifying patients who answer in the affirmative to whether they can climb stairs or walk two to three books and who actually have adequate functional capacity," Rubin said. "Where it gets a little messy is classifying patients who don't respond yes. It's basically a coin flip as to whether they are functionally capable."

With this in mind, Rubin wants physicians to adapt more robust

strategies for assessing functional capacity. He and several colleagues are in the process of developing a smart phone application that will allow physicians to give patients The Duke Activity Status Index (DASI) survey and conduct the 6-minute walk test, both of which have been demonstrated to evaluate functional capacity and predict perioperative outcomes. The patient's steps are counted by the phone when it is worn in the front pocket or the hip/belt location.

During a recent pilot study, they found the app worked moderately well in a perioperative patient population, though they need to conduct further studies to adjust the app's step-counting accuracy and distance-estimation algorithm.

When the app is finished, the next challenge will be to get physicians to use it.

"It's very hard to change physician practices," he said. "You have to give them something that's just as easy but better. That's really the challenge."

The study is titled "Accuracy of Physical Function Questions to Predict Moderate-Vigorous Physical Activity as Measured by Hip Accelerometry."

More information: Daniel S. Rubin et al. Accuracy of Physical Function Questions to Predict Moderate-Vigorous Physical Activity as Measured by Hip Accelerometry, *Anesthesiology* (2019). DOI: 10.1097/ALN.0000000000002911

Provided by University of Chicago Medical Center

surgery (2019, October 10) retrieved 25 April 2024 from https://medicalxpress.com/news/2019-10-strategy-patients-self-report-physical-surgery.html