



# Frailty as a Predictor of Colonoscopic Procedural Risk: Robust Associations from Fragile Patients

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Colonoscopy, the current “gold standard” for colorectal cancer and precancer detection and removal, is generally recommended for the screening of adults aged 50–75. Through recommendations and guidelines such as the 80% screening rate by 2018 set by the National Colorectal Cancer Roundtable [1], its use has nearly doubled over the past two decades [2]. Colonoscopy also carries the risk of major complications such as hemorrhage, perforation, and cardiopulmonary events [3], for which the incidence remains low, although its growing use will increase the number of patients experiencing adverse events. Moreover, it may be of limited benefit in a subset of older patients. A method for determining the patients in which the risk of colonoscopy outweighs its benefit has the potential to help clinicians improve the procedural risk/benefit.

This issue of *Digestive Diseases and Sciences* features a study by Taleban and colleagues which addresses the problem of risk stratification by using frailty as a predictor of complications associated with colonoscopy [4]. Frailty is a state of decreased physiologic capacity and reserve in which patients are more vulnerable to acute stressors such as surgery. This is often associated with sarcopenia. As the authors point out, it can be used to predict outcomes following a variety of procedures. In patients undergoing elective surgery, for example, frailty is an independent predictor of postoperative complications, length of hospital stay, and discharge to a nursing facility [5]. While frailty has now been

successfully used to risk-stratify patient risk across a wide range of surgeries, to our knowledge the current study is the first time it has been used as a screening instrument for colonoscopy risk.

This prospective cohort study divided the patients into two groups—prefrail/frail and non-frail—using an easily administered upper-extremity frailty test. In this test, participants wear motion sensors and flex and extend their dominant elbow as many times as possible in 20s. The authors then recorded adverse events associated with colonoscopy, reporting that frailty and American Society of Anesthesiologists (ASA) status were significantly associated with colonoscopy-associated adverse events, with 70% of patients in the prefrail/frail group experiencing an adverse event compared to 41% of non-frail patients.

We commend the authors on their novel application of frailty as a screening tool for colonoscopy risk. Not only are frail patients at increased risk of colonoscopy complications, they are also less likely to derive any real benefit given the association of frailty with shorter life expectancy [6]. Therefore, determining a patient’s frailty index could significantly inform the decision to pursue colonoscopy to screen for colorectal cancer.

Another strength of this study is the practicality of its application. There are several methods by which to determine a patient’s frailty index. Although there is no “gold standard” for diagnosing frailty, several methods rely on determining factors such as weight loss, exhaustion with activity, level of physical activity, and physical weakness and slowness. This often involves a lengthy evaluation and interview process. Such a robust evaluation process may have strengthened the conclusions of this paper, but readers would be left wondering how best to implement this. By using a validated strength test that takes under a minute to administer, the authors greatly enhance the ease of test application and the scalability of their results.

Frailty diagnosis may also be useful given the ongoing debate that often surrounds the use of screening

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colonoscopy. Guideline-setting groups in Canada and the European Union do not endorse its use as strongly as those in the United States of America (USA). Even within the USA, there are other, noninvasive screening methods available, such as guaiac-based fecal occult blood and fecal immunochemical testing [7, 8]. Therefore, determining that a patient is at increased risk due to a state of frailty may help influence a clinician's decision about which test is most appropriate. At the very least, knowing a patient's frailty status would help clinicians and patients make a decision based on individualized patient risk factors, as endorsed by the American Society for Gastrointestinal Endoscopy [9].

Whether the association between frailty and adverse colonoscopy outcomes has clinically meaningful impact is yet to be determined. This study includes a number of "adverse events" that likely would not impact a patient's overall outcome, including changes in blood pressure and heart rate that, while beyond the normal range, did not require any intervention. These physiologic changes may not ultimately impact an individual patient's clinical outcome. What's more, the major adverse events seen in this study occurred in only one patient in the frail group. Long-term follow-up is needed to further investigate whether frailty affects a patient's overall outcome of screening colonoscopy.

Importantly, introducing the idea of frailty screening to determine colonoscopy risk opens the door to risk mitigation. Improving a patient's functional status through engagement in a prehabilitation program could potentially reduce the risks associated with the procedure. In the surgical literature, prehabilitation improves outcomes, reduces hospital length of stay, and decreases procedural costs [10]. Many of these programs are as simple as giving a patient a pedometer and encouraging them to walk more for 2 weeks prior to surgery, or utilizing an incentive spirometer. Many health systems already have formalized surgical prehabilitation programs in place, making enrollment of frail colonoscopy patients convenient and practical.

As clinicians continue to balance the numerous screening tests available, to choose the most appropriate test for an individual patient's specific risk factors, comorbidities, and life expectancy, frailty provides another useful tool by which

to choose a test that conveys the most benefit for an acceptable level of risk. Clearly, frailty is an important consideration when determining a patient's risk of undergoing screening colonoscopy. Nonetheless, it remains equally important to have an open and candid discussion with each patient regarding his or her individual risk factors and potential benefits. Incorporating frailty into this discussion provides an additional piece of data to inform that decision.

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