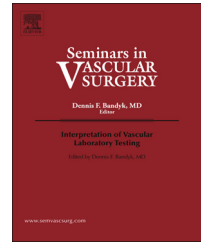


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Vascular surgery institutional-based quality and performance measures for the care of patients with critical limb ischemia



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ABSTRACT

The intensity and quality of medical care provided to patients with critical limb ischemia (CLI) varies by geography, ethnicity, and socioeconomic status. Although vascular surgery societal performance goals have been set forth, no consensus criteria exist by which to benchmark the quality of health care delivery specifically for CLI patients. We review existing broad performance measures for patients with peripheral vascular disease and suggest those with optimal care delivery suited for CLI (eg, ankle-brachial index, optimal medical therapy, smoking cessation, and duplex surveillance). Further, we propose that diabetic management, degree of wound healing, and quality of life measures be considered as additional quality measures for CLI management. In combination, these criteria provide a simple yet powerful metric that might allow for standardization of CLI care and comparisons across institutions, with the potential for diminishing the disparity that exists in current treatment practices.

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1. Introduction

Critical limb ischemia (CLI) is defined as ischemic rest pain or tissue loss among patients with peripheral arterial disease (PAD). Of the 12 million Americans affected by PAD, >1 million suffer from CLI, and the incidence appears to be rising in the setting of an aging population [1,2]. Furthermore, >70% of CLI patients will undergo revascularization and more than half will require multiple procedures [3]. Specifically, for most CLI patients, the threat of limb loss, impaired mobility, chronic wound care, and repeated inpatient hospitalizations, can have a significant negative impact on quality of life. Finally, in addition to the known physical burdens among patients, CLI accounts for >\$3.1 billion spent among Medicare

beneficiaries, signifying its role as a major health care cost burden in the United States [4].

Given the increasing prevalence and economic impact of CLI, objective performance goals (OPGs) were set forth by the Society for Vascular Surgery to assess the effectiveness of revascularization therapies in CLI and to assist with guiding research trials to improve care and outcomes [5]. These goals have been sequentially validated through successive analyses and have aided in standardizing reported outcome measures in CLI patient research studies, such as major adverse limb events and amputation-free survival [6]. However, despite their intended value, OPGs have not translated into established benchmarks for health care delivery that are measurable and applicable in routine clinical practice.

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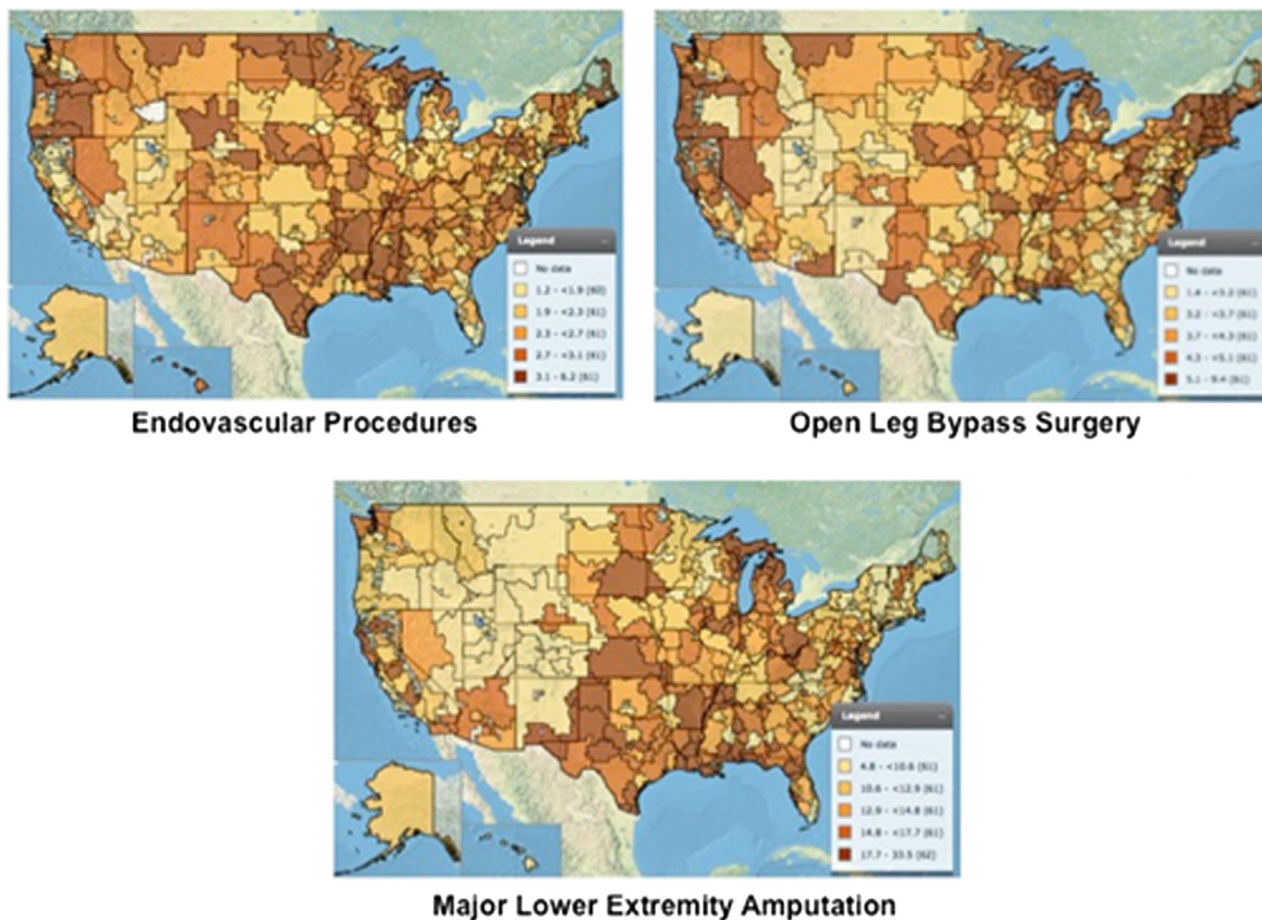


Fig. 1 – Variation in lower extremity vascular procedures. These maps demonstrate the rates of endovascular, open leg bypass, and major lower extremity amputation procedures per 1,000 Medicare beneficiaries by Hospital Referral Regions as defined in the Dartmouth Atlas.

More specifically, to date, no standardized quality and performance measures have been routinely adopted or endorsed for the specific care of CLI patients.

This lack of quality measure standardization is evidenced by the gross variation in the number of revascularization procedures and amputations performed in PAD patients across the United States, as depicted in Figure 1. Recent investigations demonstrate the heterogeneity in both type and intensity of care provided to CLI patients as the number of diagnostic endovascular, therapeutic endovascular, open surgical, and amputation procedures performed among CLI patients varies greatly by geography, race, and socioeconomic status [7-9]. Accordingly, it would appear that factors other than a CLI patient's health appear to be associated with the type and intensity of care provided. This fact highlights the need for standardized criteria to assist and assure health care delivery quality to CLI patients. Therefore, in this article, we propose objective, reliable, and reproducible variables that can assess and standardize CLI care quality.

2. Adoption of existing quality measures

In 2010, the American Heart Association published a consensus statement on performance measures for PAD patients [10].

The American Heart Association Task Force specifically identified a need for uniform quality measures in the treatment of this prevalent condition. The report advocated for measures that were useful in improving patient outcomes, comprised a clearly defined and validated unit measure, and was easy to implement and apply in practice. After an extensive review, performance measures for PAD were recommended to include the following: ankle-brachial index (ABI), cholesterol-lowering medication, smoking cessation, antiplatelet therapy, supervised exercise, lower extremity vein bypass graft surveillance, and monitoring for abdominal aortic aneurysms. In their discussion, the authors clarified that these measures were not intended for CLI patients and that they did not include measures specifically for CLI.

Similar to this approach, we believe that performance measures for CLI care should consist of ubiquitous, simple, objective criteria that can be assessed in all practice settings and are reliably obtained by most practitioners. Review of the literature demonstrates that several of the PAD quality measures set forth by the American Heart Association might also apply to CLI patients. First, ABI and toe pressures are easily obtainable, clear, and objective metrics. An ABI <0.4, an ankle pressure <50 mm Hg, and toe pressure <30 mm Hg are all metrics consistent with CLI [11]. ABIs are both sensitive and specific, as well as relatively low cost [2]. These

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