and a desire to improve perioperative outcomes. Large variability is also seen in U.S. perioperative screening. Katz *et al.* showed that anesthesiologists and surgeons cannot agree on the number of appropriate preoperative tests.[2] This variability, as Wijeysundera *et al.* point out, exists at a local, regional, and national level, despite the proliferation of clinical testing algorithms and consensus guidelines. Even anesthesiologists within the same group cannot agree; this results in canceled surgeries because the preoperative anesthesiologist is not the anesthesiologist on the day of surgery.

The goal of reducing variability in the delivery of health care is a worthy goal in itself, even if outcome data are not initially available. In 1989, Laffel and Blumenthal pointed out that modern industrial quality science (*e.g.*, statistical process control) "may well make important advances in the quality of care and service through the application of rigorous principles and techniques."[3] Inherent in statistical process control is that every complex system, which health care most certainly is, has a certain level of variability. Continuous process improvement must involve the reduction of system variability. Reducing variability in the system has numerous advantages. Less variable systems are easier to study and need smaller sample sizes to prove a hypothesis. It is easier to introduce new guidelines in less variable systems. Although it is true that it will be difficult to produce "objective research" that includes "risk-adjustment and outcome measures," such as "clinical results, financial costs, and process efficiency," it should not deter us from improving the system or missing clinical opportunities.[4]

There will always be a level of variability in preoperative consultations, not only in Ontario, but also in the rest of the world. Some disagreement is inevitable because guidelines are not rules, and medicine is as much craft as science. This leads to different decisions when an anesthesiologist evaluates a moderate-risk patient for a moderate-risk surgery even with the publication of guidelines. Moreover, most guidelines are based on expert opinion and extrapolation, and we still do not know if many of these guidelines are "correct." However, we should recognize that many unnecessary tests and consults could be reduced by simply using clinical decision support programs that reduce variability. For instance, anesthetists in Europe have used web-based preoperative systems to minimize variability in preoperative testing patterns for years.[5] These programs, or other tools that reduce variability, may allow us to direct our ever-shrinking healthcare resources to where they are most needed.

Although additional research is needed, we believe that Wijeysundera *et al.* present a unique opportunity to improve the preoperative evaluation system in Ontario without further research. The data clearly show that the government has the opportunity to refine preoperative consultations simply by reducing variability in the patient population that had the most preoperative testing and examining the testing patterns at institutions where the percentages of consults is greater than the average for all the institutions. The majority of the preoperative consults were ordered for total knee and hip replacement surgeries and for patients with hypertension and diabetes. We believe that the government of Ontario should develop new processes to reduce these preoperative consults and drive the percentage down to the average. U.S. anesthesiologists should do the same. More importantly, these steps should be done in parallel with a prospective database that tracks patients' perioperative outcomes from the beginning to end. Ultimately, reduced systemic variability allows us to study these questions in a more focused, cost-effective, rational manner. Simply put, improving the system and additional research need not be mutually exclusive.

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In Reply:

We thank Tsai and Black for their insightful comments. As previously stated,[1] we agree that our data sources did not describe several important clinical details, which may have further explained the substantial interhospital variation in rates of preoperative medical consultation. Given that the only previous characterization of preoperative evaluation practices in Ontario occurred in 1997,[2] our future research plans include an updated cross-sectional survey to better understand contemporary practices in the province.

We further agree that decreasing the current variability in preoperative consultation practice is an important goal for perioperative care. However, the initial emphasis should be on better understanding which specific patients benefit from preoperative medical consultations. Previous research has demonstrated that some perioperative interventions (*e.g.*, β-blockers)[3] and tests (*e.g.*, cardiac stress tests)[4] are beneficial when applied to some individuals, yet potentially harmful when applied to others. A similar pattern is likely to apply to preoperative medical consultation. Consequently, initiatives that narrowly focus on reducing overall consultation rates may not improve clinical outcomes if the result is a reduced use of consultations among patients who most need them.

The goal should instead be to improve the appropriateness of preoperative medical consultations; hence, reducing unnecessary consultations among low-risk patients while potentially increasing consultations among high-risk individuals.

Notably, the existing variability in preoperative consultation practice may actually be helpful in designing initiatives to improve the appropriateness of preoperative medical consultations. Specifically, in characterizing preoperative consultation practices at centers with superior postoperative outcomes, we may be able to identify specific practices that can be implemented more widely at other centers. As suggested in the accompanying editorial,[5] improved prospective databases will be critical for any such effort to use existing practice variation for identifying "optimal" perioperative practices. Once there is better understanding of which patients should be appropriately referred for preoperative medical consultation, anesthesiologists must take a leadership role in developing preoperative evaluation processes that better target appropriate patients for such specialized preoperative care. The goal for these improved processes should be to simultaneously improve clinical outcomes and patient satisfaction, while reducing healthcare system costs and practice variability.

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Predictors of Analgesic Response to Sympathetic Blockade in Complex Regional Syndrome Type 1: No Conclusive Answers but Best to Get Standard Medical Therapy Right First

To the Editor:

Van Eijs *et al.* must be commended for conducting a clinically useful and informative study on the use of sympathetic blockade in the management of complex regional pain syndrome (CRPS) type 1.[1] Despite many advances in our understanding of the pathophysiology of this condition, CRPS remains a challenging clinical problem. This study informs our practice thanks to a good methodologic process that captures a homogenous group of patients at an early stage of the condition and a thorough assessment of their clinical response to sympathetic blockade.

However, despite the merits of the study, I would not be satisfied that what was defined as "standard treatment" was sufficient before undertaking an interventional procedure. Physiotherapy and active mobilization are, of course, fundamental to treatment at all stages of CRPS but should first be supported and made possible by adequate medical therapy. Standard treatment in this study is detailed as comprising 50% dimethyl sulfoxide cream with acetaminophen and tramadol (erroneously termed nonsteroidal antiinflammatory medication in the article) supplemented to aide with physiotherapy. Gabapentin was then added after 3 weeks if analgesia was not satisfactory with this initial combination. Gabapentin is then described as being titrated to a maximum dose of only 1,800 mg/day, with 3 weeks given to assess response. Medical treatment was then considered to have failed if analgesia was insufficient at this point.

Although there is no internationally accepted standard of treatment for CRPS, there are a number of therapies that have a good supporting evidence base that should be considered before reverting to an interventional procedure. The use of acetaminophen and tramadol are reasonable first-line choices, but the use of gabapentin as described in this study is inadequate. Gabapentin can be safely titrated to a maximum dose of 3,600 mg and in practice often needs this higher dose for maximum efficacy. In addition, the 3-week limit used in this study probably is too short a time to adequately assess success or failure of gabapentin therapy, which often takes a minimum of 4 weeks to deliver maximum analgesic effect. The protocol used in this study defining standard treatment was, I believe, undertreating with medical therapy in terms of duration and dose of drug administered.

Furthermore, a number of other important therapeutic options were not considered as part of initial therapy. The use of oral steroids (*e.g.*, prednisolone) in early CRPS consistently has been shown to provide a lasting analgesic effect in CRPS,[2–5] yet as demonstrated in this study, it is seldom used in clinical practice and is not included. In addition, tricyclic antidepressants are widely regarded as being fundamental in both the first- and second-line management of many neuropathic pain problems, including CRPS, either alone or in combination with anticonvulsants. Again, this important component of medical management is not included as part of standard treatment in this study.

Medical therapy is not free from side effects; however, because of the potential for significant excess morbidity with a relatively low success rate for sympathetic blockade, far