(PCORI) entitled, “Preventing Venous Thromboembolism: Empowering Patients and Enabling Patient-Centered Care via Health Information Technology.” Dr Streiff has received research funding from Portola and Bristol Myers Squibb, honoraria for CME lectures from Sanofi-Aventis, has consulted for Sanofi-Aventis, Eisai, Daiichi-Sankyo, Boehringer-Ingelheim, Pfizer, and Janssen HealthCare, and has given expert witness testimony in various medical malpractice cases. Dr Haut receives royalties from Lippincott, Williams & Wilkins for a book he coauthored (Avoiding Common ICU Errors). He has received honoraria for various speaking engagements regarding clinical and quality and safety topics and has given expert witness testimony in various medical malpractice cases.

Reducing Postoperative Venous Thromboembolism Complications
In Reply to Lau and colleagues

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We thank Mr Lau and his colleagues for their interest in our recent article, “Reducing postoperative venous thromboembolism complications with a standardized risk-stratified prophylaxis protocol and mobilization program.” We agree that venous thromboembolism (VTE) is a leading cause of preventable morbidity and mortality, and that the key to optimization of VTE prevention will be standardized, evidence-based prophylaxis practices.

In their letter, Mr Lau and coauthors express concern that we have overstated the benefit of postoperative mobilization for the prevention of VTE. Our article describes a mandatory electronic standardized risk stratification and pharmacologic prophylaxis protocol combined with a standardized postoperative mobilization program that achieved a significant reduction in VTE events among our patients. Mr Lau and colleagues’ letter states that we have attributed the reduction in VTE events to our ambulation program alone. A close reading of the manuscript reveals that this is not the case. The message of the article is that the mandatory VTE risk stratification and risk-based pharmacologic prophylaxis together with mobilization led to the dramatic reduction in VTE events. Although we noticed that VTE complications began to decline as the mobilization aspect of the program was introduced, even before the automated risk-stratified prophylaxis was fully integrated into the computerized physicians’ order sets, our article clearly states in the Discussion section that we cannot demonstrate the efficacy of either intervention alone, and that our intent was to analyze the effect of a standardized bundled program encompassing both interventions. The language in our article does not overstate the contribution of mobilization alone, nor do we claim that mobilization alone can account for the outcomes. It would be simple to attribute the sharp decline in postoperative VTE to the formal implementation of the Caprini system, as that had been its intent. However, the structured mobilization program had been introduced for pulmonary purposes just 6 months earlier. It is impossible to measure the relative contributions of these 2 elements of care, but it would be dishonest to disregard a major change in clinical practice that had been installed nearly simultaneously with the risk-based prophylaxis.

The authors of the letter recognized a downward trend in VTE events during the preimplementation phase of our study, and they are correct in that observation. However, they comment that we have provided no explanation for that trend. In fact, referring to page 1100 of our published article, we explained that our faculty were aware of the high incidence of VTE events at our institution and were involved in the deliberations as we planned and formalized VTE prevention efforts. As stated in the article, we believe that changes in practice naturally occurred as a result of these deliberations, even before full electronic implementation.

Mr Lau and his coauthors are correct that we did not attempt to strictly quantify ambulation in our experimental design. We performed observational audits of practice, and we demonstrated a significant change in the frequency of mobilization after the intervention. The optimal “quantity” of mobilization that may provide a benefit to postoperative patients is unknown and requires further study. The issue is complex and is influenced by a number of factors, including patient comorbidities, baseline functional status, the operation performed, and local resources. Although the question of how much ambulation will be beneficial is interesting, it was not a question we intended to answer with our study. Rather, our goal was to demonstrate the feasibility of a qualitative change in postoperative practice, while tracking outcomes over time.

The authors have also indicated that we did not provide quantitative analysis of our VTE process measures before implementation of our program. Although this fact contributed to the limitations of our study, we aimed to compare a system in which no standardized VTE prevention practices existed to a new system based on formal standardization. Our comparison should be interpreted
with an understanding that we set out to change the institutional culture and commitment to standardized postoperative practices.

Ultimately, we believe in the value of postoperative ambulation as an important component of patient care. In addition to our work in VTE prevention, we have demonstrated the benefit of mobilization as part of a standardized care bundle for the reduction of postoperative pulmonary complications in the paper, “I COUGH: Reducing postoperative pulmonary complications with a multidisciplinary patient care program.” In fact, our podium presentation at the 2013 NSQIP National Conference, entitled, “Challenges of sustaining momentum in quality improvement: lessons from a multidisciplinary postoperative pulmonary care program,” provided data from our institution that showed a direct correlation of pulmonary outcomes with adherence to a care bundle emphasizing postoperative mobilization. We observed an initial improvement in pulmonary outcomes with the introduction of the program, but as the novelty of the intervention waned, adherence to the guidelines declined and the incidence of adverse pulmonary outcomes rose. With rejuvenated efforts and improved compliance with the practice components, pulmonary outcomes improved once again. We believe that postoperative mobilization was an essential contributor to those outcomes. There is also evidence that early postoperative mobilization as a component of Enhanced Recovery After Surgery (ERAS) programs leads to shorter lengths of stay and decreased morbidity. Finally, we do not understand the correspondents’ concerns that ambulation may interfere with the administration of chemoprophylaxis, especially for low molecular weight heparin products that are administered once daily.

We agree that further work is needed to fully elucidate the role of ambulation in the prevention of postoperative problems, although we cannot conceive the development of a randomized controlled trial that would randomize patients to a minimal/no mobilization arm. Yet with our article and others, there seem to be sufficient data to suggest that ambulation as a component of standardized postoperative care programs can be a simple, inexpensive, low-risk intervention to reduce postoperative complications.

REFERENCES


Disclosure Information: Nothing to disclose.

Bariatric Surgery and Vitamin Deficiencies

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We read with great interest the article by Kruger and colleagues about the operative trends and long-term outcomes from a bariatric surgery Center of Excellence, as we have seen a particularly high number of gastric bypass surgery patients with vision loss from vitamin A deficiency (hypovitaminosis A). The article presented a prospective study of 3,460 patients undergoing various bariatric surgery procedures, including Roux-en-Y gastric bypass, adjustable band, and sleeve gastrectomy. Although the major complication rates for some of the more devastating complications of gastric bypass surgery, such as mortality, leak, bleed, pneumonia, thromboembolism, and reoperation, were low and impressive, we would like to inquire about the level of vitamin deficiencies as a potential long-term complication that can have significant and severe multi-organ effects over time. Slater and colleagues reported on outcomes of 170 patients undergoing gastric bypass surgery and found the prevalence of vitamin deficiencies to be quite high in their series. The incidence of vitamin A deficiency was 69%, vitamin K deficiency was 68%, and vitamin D deficiency was 63% by the 4th year after surgery. Although the biliopancreatic diversion and duodenal switch procedure carries a much higher risk of vitamin malabsorption compared with the techniques reviewed by Kruger and colleagues, rates of vitamin A deficiency have been reported to be >20% after Roux-en-Y gastric bypass procedure, regardless of vitamin A supplementation. It would be interesting to compare the various techniques of gastric bypass with regard to vitamin malabsorption, as this is a significant complication that can be underappreciated and under-reported and yet can have serious systemic complications.