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Editor's Spotlight/Take 5

Editor's Spotlight/Take 5: Is Changing Hospitals for Revision Total Joint Arthroplasty Associated With More Complications?

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Patients commonly change hospitals when undergoing revision surgery. The reasons for the switch range from the mundane (food, distance to home) to the profoundly personal and potentially important (trust in the care team whose surgery may have failed, or failed to meet expectations). But while we appropriately consider implants, anesthetics, and preoperative testing as key elements of care, there is precious little information out there describing the influence of the setting of care on the efficacy of our interventions.

Dr. Stephen Lyman's (Fig. 1) Healthcare Research Institute at the Hospital for Special Surgery (HSS), in partnership with other colleagues at HSS, along with Dr. Kevin Bozic from the University of California at San Francisco, seek to fill this gap. In this issue of *CORR*®, they present a paper evaluating the act of changing hospitals for revision total joint arthroplasty (TJA) as we might evaluate any other intervention. Lyman and colleagues use large administrative databases from California and New York to determine the frequency with which patients change hospitals for their revisions, what factors might be associated with the act of changing hospitals, and most importantly, whether changing hospitals is associated with a higher risk of postoperative complications

We learn that many patients change hospitals for revision TJA; 30% of patients in this report made a switch (5102 of 17,018 revisions they surveyed). Older patients and patients who had the index arthroplasty performed at a high-volume hospital were less likely to change hospitals, while increasing time since the index procedure was associated with a larger likelihood of patients having the revision done elsewhere; the authors identified no obvious race- or gender-related effects. Perhaps most importantly, patients who changed hospitals were more likely to experience complications at revision surgery, and maybe not surprisingly, this effect was stronger in the small group of patients (about 6% of the overall cohort) that changed from a higher- to a lower-volume hospital for the second procedure.

This important work is part of a larger reality in our specialty that previously has been explored in this space [2]. To get the answers to some really important questions, we will

Note from the Editor-In-Chief: In "Editor's Spotlight," *one of our editors provides brief commentary on a paper we believe is especially important and worthy of general interest. Following the explanation of our choice, we present* "Take Five," *in which the editor goes behind the discovery with a one-on-one interview with an author of the article featured in* "Editor's Spotlight."

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need to become more familiar with what big databases can (and cannot) deliver. Earlier work by Dr. Lyman's group demonstrated that the great numbers of patients, and the many comorbidities and demographic elements these databases capture, allow us access to questions we would not otherwise be able to answer [1]. The downside, of course, is that the associations they observe with these methods are just that — associations. Causation cannot be determined, and the reader sometimes is left hungering for answers to many questions that start with the word "why."

Even so, this study has profound implications in terms of the "what." When almost one-third of patients change venue for an expensive and potentially risky intervention, this has major economic and medical implications. Join me as we explore both the "what" and the "why" in greater depth with the senior author of this fascinating study, Dr. Stephen Lyman, in the interview that follows.

Take Five Interview with Stephen Lyman PhD, senior author of "Is Changing Hospitals for Revision Total Joint Arthroplasty Associated With More Complications?"

Seth S. Leopold MD: *Congratulations on some excellent work, and thank you for publishing it in* CORR®. *Before getting to the medicine, let's discuss some economics: What do you see as the most immediate economic implication of the fact that nearly one-third of the patients you surveyed changed hospitals for major revision joint surgery?*

Stephen Lyman PhD: Obviously, revision joint replacement is a costly procedure that is risky for patients, more complicated for surgeons, and resource intensive for hospitals. Therefore, hospitals that perform high rates of revision surgeries bear a disproportionate clinical and economic burden in managing these complex patients.

Dr. Leopold: *How might we best deal with this mass migration? Speak to this question, if you can, in terms of the burdens to physicians and hospitals that are on the receiving end, and in terms of interventions our specialty societies and government might do to support them.*

Dr. Lyman: We are moving toward value-based incentive systems in healthcare, and orthopaedics cannot expect to escape this change. Given the enormous numbers of joint replacements being performed annually, the revision burden is also growing rapidly. Specialty societies can contribute by coordinating multicenter studies to identify appropriate clinical protocols and care pathways for revision joint replacement. As far as the government, since I prefer carrots to sticks, I could imagine an incentive program in which providers are preferentially reimbursed for achieving better clinical outcomes (eg, lower readmission rates) at a lower cost to care for these patients in need of revision.

Dr. Leopold: *Sometimes what we do not find is as interesting as what we do. For example, it surprised me that you found no association between insurance type or increasing levels of patient infirmity (measured by the Charlson Comorbidity Index) and changing hospitals for revision. The widespread perception is that sicker, less-well-insured patients get shifted to teaching centers for complex revisions. Why do you suppose the perception and reality as ascertained by your study are so different?*

Dr. Lyman: That is a very interesting observation. We should note that not all teaching hospitals are the same. Some are highly specialized referral centers with a diverse payer mix, while others are safety net hospitals. I suspect that while these underserved or at-risk patients are often shunted off to teaching hospitals, they may have also had their primaries at those facilities. Our analysis detected no significant movement. Since teaching hospitals are more likely to take poorly insured patients to begin with, they may have no choice but to stay where they are.

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At the population level, these factors may have overwhelmed any effect that may have been seen if reasons for individual referrals were explored. This could be an interesting study for a qualitative researcher.

Dr. Leopold: *What related trends in other orthopaedic specialties, other areas of medicine, and even other countries' healthcare systems can inform a reader's understanding of the issue you studied here?*

Dr. Lyman: Great question. One key example is that American cardiothoracic surgeons have established large patient registries to measure outcomes of innovative surgical techniques in order to assess safety and effectiveness of these novel therapies in near real-time. While other countries have been successful in establishing national joint replacement registries, we have lagged behind in large part thanks to our fractured payment system and the wide variety of practice models that exist in the United States. Our size also is, no doubt, part of the issue, as Kaiser Permanente covers more lives than the entire population of Norway (one of the longest established joint replacement registries). If the American Joint Replacement Registry is ultimately successful, we will go a long way toward fully understanding patient referral patterns and the ways to make the system work more efficiently.

Fig. 1 Dr. Lyman (above) and colleagues used large administrative databases from California and New York to determine how often patients change hospitals for their revisions, what factors might be associated with changing hospitals, and whether changing hospitals is associated with a higher risk of postoperative complications.

Many of our current institutional or regional registries miss revisions that occur elsewhere, losing the very patients we would be most interested in for this kind of evaluation.

Dr. Leopold: *In one of your secondary analyses involving a relatively small slice of the population studied, you suggested that patients switching to lower-volume hospitals for revision surgery are at increased risk for complications. Imagine this finding holds up in future studies designed specifically to answer it, and you are in a position to advise our elected representatives about how to respond to a finding like this. What do you say?*

Dr. Lyman: I think the Leapfrog Group has the right idea with preferential referral to high volume centers for procedures with clear volume-outcome relationships, though it appears their market-based approach has been insufficient to change the game. I would like to see incentives created for hospitals to specialize in high priority areas and move away from areas in which they do not excel, at least when it comes to elective surgery. I can imagine regional revision centers where patients are preferentially shifted. Travel subsidies for low-income Medicare and Medicaid

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beneficiaries could also help move patients to more appropriate care locations. Since lower volume hospitals will still be access points for many patients, development of appropriate clinical care pathways and referral networks will be required as well.

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