Discussion of 2021-1748

SURGICAL OUTCOMES IMPROVEMENT AND HEALTH INEQUITY IN A REGIONAL QUALITY COLLABORATIVE

**DR ALLAN D KIRK** (Durham, NC): A great study like this has depth. It is informative on multiple layers, or planes, to draw from complexity theory. This manuscript has that character, and I enjoyed reading it greatly. It characterizes the patients studied, the system, and the society in which those patients reside. It might also characterize us as well. On the surface, it comes from polished investigators using methodologies that meet the conventions of scientific rigor, applied to a unique and robust infrastructure–South Carolina's Surgical Quality Collaborative.

You find that Black patients do worse than White patients after operation. Black patients suffer a 42% increase in risk of complication, and it is worse for older Black patients, where a 57% increase in complications is evident. That is sobering. On a more optimistic note, you also show a decrease in complication over time, with a rate of improvement better in Black patients than in White patients. This is a great accomplishment, producing one of the few studies on disparity to show real positive change. You shine the light on the needs of vulnerable patients and, in doing so, you have improved their outcomes.

On another plane, this study shows that race is associated with numerous comorbidities known to worsen outcomes: diabetes, COPD, cirrhosis, renal failure. To assess these relationships, risk adjustment was performed, specifically, multicollinearity was assessed by assessing the variants' inflation factor, with a VIF greater than 5 considered multicollinear. Of note, this excludes only highly collinear variables and leaves variables with more nuanced relationships in the risk assessment model.

This methodology leads us to the conclusion that a Black person is innately a higher risk patient than a White person. It is interesting to note, though, that the comorbidities that are most discrepant all relate to either poor access to healthcare or known compensation mechanisms for misery: sugar, tobacco, and alcohol.

This takes us to a more interesting plane, that of how we interpret this study. For example, we accept the need to declare variables as dichotomous: age is segregated at 65 years in this study, though we know that age is a continuous variable. This works, because our inherent bias is that we know that age is a continuous risk. We would never draw a conclusion that age becomes lethal at a particular age. A residual risk would be assumed to be a limitation of the study, not a quality of age. But when we study poverty in dichotomous terms, as in this study, with either a 1 or 0 based on zip code, we do not have the same innate reaction. We allow ourselves to believe that the study controlled for poverty. Similarly, the rate of trauma, the accumulation of renal failure, and the presence of cirrhosis are all dichotomized. The danger is not in the method ‑ it is an accepted method ‑ but in how we interpret the convention. Reader bias allows us to accept the conclusion that all these things were controlled for, and therefore, that there was a residual risk of being Black.

This structural assumption that we make is the essence of structural racism in science. How much of your unaccounted-for risk is due to race–a biological construct–vs an inability to control for racism–a social construct? The distinction is critically important, in that the former is a fixed parameter over which we have little control; it kind of gives us a pass. Whereas the latter is a mitigable parameter, for which we have great responsibility.

Might we be seeing primordial defects in our accepted scientific methodology and training that allow us to propagate myths of race as risk?

**DR KEITH A DELMAN** (Atlanta, GA): I will read verbatim the comments from Dr Sweeney, as he sends his sincere apologies for his inability to attend and discuss this paper due to a personal matter.

The current manuscript by Dr Lockett and colleagues from the Medical University of South Carolina details the analysis of surgical morbidity by race and age over time within the South Carolina Surgical Quality Collaborative. They demonstrated that Black patients had a higher morbidity rate than non‑Black patients, when controlling for confounders. They also showed that perioperative morbidity in the South Carolina Surgical Quality Collaborative improved over time for all patients, with older Black patients seeing a larger overall improvement in morbidity. The authors conclude that a regional Surgical Quality Collaborative can improve outcomes and may impact healthcare disparity.

There are tremendous opportunities for quality collaboration across health systems, states, and regions. Collaboratives provide the opportunity to exchange ideas and problem-solve with members of different institutions that may share similar patient populations. There is also the ability to understand complex quality issues through enhanced data sharing, which might not be recognized from a small subset of data about a patient population at the single hospital level. State level quality collaboration can also foster key relationships between institutions, which can not only drive surgical quality improvement, but also serve as a platform for regional interventions designed to improve health disparity and remove barriers to health equity.

The authors mention that member hospitals of the South Carolina Quality Surgical Collaborative range from small facilities to large academic referral centers and represent all major geographic regions of South Carolina. Considering this, did the authors break down their data and analyze it at the institutional and/or regional level? Were there significant differences in the patient populations (race or comorbidity) between institutions or regions? Were there significant differences in the perioperative morbidity rate between institutions or regions? Furthermore, was the degree of improvement over time similar across all institutions in the collaborative?

Do the authors have any information regarding perioperative outcomes based on ethnicity across the South Carolina Surgical Quality Collaborative?

The manuscript states that the collaborative requires each member institution to select at least 1 surgery‑related quality improvement (QI) initiative on an annual basis, but this is left up to each institution. If that is the case, what was in the "secret sauce" responsible for the improvements seen in this study? Do the authors have any data as to which QI initiatives were most frequently implemented across the collaborative? Were there different effects of these initiatives across the member institutions in the collaborative?

To me, health equity means that everyone has a fair and just opportunity to be as healthy as possible. Health inequity arises when there are barriers to health, such as poverty, discrimination, lack of access to quality education and housing, safe environment, and lack of access to healthcare across patient populations. Although the authors are careful to point out in the manuscript that the results of this study are associative and not causal, I would like to use the privilege of the podium to challenge the authors regarding what they will do next. Considering what you have learned, what intervention or interventions might you implement in a coordinated fashion across the collaborative that will remove barriers to health equity and improve perioperative outcomes and health further in South Carolina.

**DR HENRY A PITT** (Philadelphia, PA): Having personally worked on the NSQIP platform for 2 decades, I would appreciate you educating us on how your platform is similar or different from NSQIP. For example, outcomes like surgical site infection and deep venous thrombosis frequently occur after the patient is discharged. In NSQIP, the surgical clinical reviewer is tasked with obtaining the outcomes at 30 days postoperatively. Does your system report outcomes at 30 days?  
 Also in NSQIP, one possible outcome is death and serious morbidity, not overall morbidity. Some complications are more impactful than others. Do you separate the degree of morbidity? Do you use the Clavien-Dindo system to grade the morbidity?  
 Finally, NSQIP is very highly risk-adjusted. Would you please educate us on how risk‑adjustment is performed on your platform?

**DR JONATHAN LARYEA** (Little Rock, AK): You have grouped the patients in a dichotomous way, Black vs non‑Black. I am wondering if the differences would have been even starker if you had 3 groups. If you combine all other races into non‑Black, some of the other racial minorities will pull down the average. Did you look at that, and would you like to comment on that?

**DR MARK LOCKETT** (Charleston, SC): First, to Dr Pitts' question, our platform is very similar to NSQIP. The definitions are similar. The abstraction methodology is similar. These are 30‑day outcomes, which are not in‑patient outcomes. So, you can somewhat equate this to a NSQIP-type system. It is a different vendor that also has data from other systems that feed in to give us national comparators. Additionally, we have enough data within our own set now that have South Carolina risk-adjustment. I, as a surgeon, can log in and see my own data, and can see that within my own institution, vs a baseline within South Carolina, vs a national baseline, established from what is in that dataset.

We did not grade morbidity in this study. That is a very relevant point. We could, but for this purpose we just said morbidity, yes or no. The dichotomous nature of this is one of the major limitations.

Relative to the reason that we analyzed Black vs non‑Black, we did have data on other races, but they were low. About 2% overall fell into another race category; either we did not have data on race, it was not in the system, or was not self‑identified. Asian race, Native American, or Pacific Islanders were not a large portion of the population.

Dr Sweeney had asked whether we looked at ethnicity. We did not, in this particular study. We also did not look at regions of the state in this study, but we do know that there are some differences in regions, primarily in South Carolina, that can be broken into anywhere from 3 to about 5 or 6 regions. We usually look at upstate, the midlands, and the low country. There are some differences from hospital to hospital. At each meeting, we provide quality reports to the hospital, while also showing the whole collaborative's data. We have not done that based on race or ethnicity, but only based on outcomes. So, if I were the surgeon lead at a hospital upstate, I would be looking at a report in hand as we are showing the reports for the collaborative as a whole, so I can make some comparisons as those reports are being done. Then again, surgeons can log in themselves. We have not found that they often do to see their own outcomes. We have shown decreases in morbidity through all these groups, and then we started looking at it, both from a racial and an age perspective. We are frequently asked what is making the difference. I cannot honestly tell you. I believe it is a combination of many things; a thousand little things as opposed to 1 magic bullet. I think that is what we must work towards.

I think the Hawthorn effect is a component of this. I do not think that is the only component. The competition between hospitals and providers is actually very useful in this setting. These are competing hospital systems, and they work to get better. They will ask each other how to improve, and the entire group, even though we are in competition with each other, come together and use one another to improve outcomes.

We do provide some education, which is very helpful, especially for some of the smaller sites that may not have the resources of the larger sites. I have learned a ton from some of the smaller sites, relative to what I would call implementation science.

At my institution, if we did find the magic bullet, and determined it would decrease surgical site infection by 20%, it would likely take us 8 months to route that through 7 committees, and back through, then rewrite it, before getting it in an Epic order set. Whereas our smaller hospitals can meet with a group of 4 or 5 surgeons, an anesthesiologist, and a perioperative nurse on a Friday for example, and by Monday, have an entirely new enhanced recovery after surgery (ERAS) protocol. It is very impressive.

I think reliable data is important. NSQIP and this system, I believe, are better than some of the large coding‑based datasets, although I do think there is some value in trying to obtain real‑time, actionable data, and we are working towards that. Learning from others also shortens the quality improvement cycle. ERAS protocols at one location can be developed and moved quickly into another hospital, so there is not the lag time in getting projects up and running. I honestly think there are homework due date factors involved. We ask facilities to present how they are doing at our quarterly meetings. It is easy to put QI projects on the back burner, but when you get close to that deadline, I think Thomas Jefferson on July 3, 1776, said, “That is due tomorrow?” Setting a due date helps people drive the quality improvement efforts.

Some of the efforts were transfusion reduction, return to the emergency department, enhanced recovery, and opioid stewardship. None of these specifically addressed disparity or looked at a particular patient population, but they spill across all efforts within an institution.

So, where do we go next? There are 2 areas: first, what role does race play vs all other matters that are inseparable from race; to Dr Kirk's point, race vs racism. I do not think we can pull all those things apart; they are linked together. None of this is linear. It is a very complex system, but I think awareness of some of these issues, shedding light on them, and then trying to adjust and attack things we know that we can is where we need to start.

We know that diabetes is a major issue, as well as poverty, especially in the Black population in our state. We have partnered with a group in South Carolina c,where we are planning to use the surgical event to try and improve diabetes management, hopefully for the entire family. As part of this, we are going to survey patients on the social determinants, to try and tease out some of these differences. For example, do you have food insecurity? Can someone help you change a dressing? Were you able to afford your medication? We have a pilot that will start soon where 4 of our institutions are going to set up a pre‑rehabilitation clinic, especially for diabetes patients. That will be the target, but it will spill into other patient care as well, to try and dig deeper into these variables that are so heavily intertwined. I honestly do not think we will ever be able to pull those pieces apart to say this is the 1 or the 2 things we should target. We must target everything that contributes to these outcomes and look at ourselves to make sure that we and our implicit biases are not contributing, and that we become part of the positive aspects of improving care.