- My name is Eric Secemsky. I'm the Director of Vascular Intervention, at Beth Israel Deaconess Medical Centre, in Boston, Massachusetts. I'm also the section head of Interventional Cardiology and Vascular Research at the Smith Centre for Outcomes, Research and Cardiology. And I'm honoured to discuss our study today called The Real-world Evaluation of Disparities in Critical Limb Ischemia Management, Associated with Major Limb Amputation.

Reasoning Behind this Study:

So we all know the established disparities that exist in the care of patients with critical limb ischemia. Critical limb ischemia affects more than 2 million of our patients in the United States alone. And 25% require an amputation a year after diagnosis with up to 50% requiring, or suffering mortality at five years. But we really haven't teased out all the factors associated with disparities in care and in particular, what care looks like prior to a major amputation. And so the purpose of this study was really to understand if there are disparities in patients who received different intensities of vascular care preceding the necessity of a major lower extremity amputation.

Study Design and Patient Cohort:

So this analysis was a retrospective study of Medicare fee-for service beneficiaries. Medicare insurance is the largest insurance body in the United States and ensures the majority of adults aged 65 years and older. And how we perform this analysis is we identify patients enrolled in Medicare in the year 2017, and we evaluated everyone who underwent a major lower extremity amputation. We then did a look back period a year prior to their amputation to understand what type of vascular care they received preceding that amputation. We then looked forward two years to see what happened after their lower extremity amputation. And to try to understand if the intensity of care they received prior to amputation influenced their eventual outcomes. We also use the same design to understand if disparities exist in regards to how people were treated prior to amputation. For this study, we kind of binned, or quantified the intensity of vascular care into three different categories, low, meaning that the patient received no angiography and no attempt at revascularization prior to amputation. Medium, meaning that the patients received an angiogram prior to amputation, but no build intervention, whether surgical or endovascular. And then high meaning that patients had an attempt at revascularization prior to their amputation. And really the key variables we were interested in for this analysis included age, gender, and race, as well as people who are enrolled in both Medicare and what we call Medicaid, which is a public insurance programme for people who have lower income. And also where they were treated, in particular hospitals that were lower resourced in regions of the country that have known disparities and care for treating patients with peripheral artery disease. We looked at, in addition to the intensive care leading up to amputation, but we also looked at other limb salvage care, including wound care, minor amputations, and then also mortality following the amputation itself.

Key Findings:

So for this analysis, we identified 7,900 patients who had undergone a major amputation during the year of 2017. And these patients really reflect who we take care of in clinical practice. The average age was 76. The majority of these patients were men and also had diabetes 75%, hypertension 96% and hyperlipidemia 78%. A third of these patients came from low-income areas. So 35% were of low resource areas. And about 32% of patients were non-white. And we found that intensity of care really varied. About 31% of patients received high intensity care, which means they at least had a revascularization attempt prior to major amputation. 6% received medium intensive care, meaning they had an angiogram, but no attempt at revascularization. And a really remarkable 63% of patients received low intensity care as defined by no angiogram or revascularization attempt in the year prior to the major amputation. And if we really kind of put these key findings in four bins, I'll say that 69% received no revascularization in the one year prior to amputation, 92% of those that were not re vascularized also did not receive an angiogram. 26% received a minor amputation in the year prior to amputation and otherwise no care. And 46% of all these major amputations were above the knee, which is a very dramatic amputation that is associated with incredible morbidity. Now we then teased out the factors associated with receiving high, medium, and low intensity care. And really the resounding factors that were associated with receiving low intensity care include being male, low income and receiving care at a safety-net hospital, so an under-resourced hospital. All those factors drove the intensive care, tended to be low prior to amputation. So why does that matter? Well, in follow up after amputation, we found that outcomes varied depending on the type of intensive care you received going into the amputation. So for instance, low intensity patients had worse survival overall in followup compared to their counterparts who got a higher or medium intensity care. And that was a difference of more than 10%. So out through more than two and a half years, we found that patients who had low intensity care were more likely to die and more likely to be readmitted. So that intensive care really had an influence, not only going into that amputation, but also what your outcomes look like afterwards.

Impact on Practice and Further Research:

So we've been dealing with disparities and the management of patients with critical limb ischemia in the United States for decades. We've recognised it, we understand it, but we haven't made any great strides to really reduce these disparities and improve our amputation rates. We recently saw a call from our American Heart Association's group for a reduction in non-traumatic amputations by the year 2030. And I think we need to live up to that delivery. We need to do a better job of intervening on these high risk patients earlier in their disease course, hopefully preventing them from progressing into critical limb ischemia and understanding when patients have high risk ulcers, wounds, symptoms or pain, that require a multidisciplinary approach to prevent them from moving onto amputation. And we need to better resource our hospital systems and healthcare regions to be able to deliver the level of care that some patients in the United States are receiving and others are not. This all sounds easy. It's easy for me to stand here and talk about what is needed to be done, but I think hopefully this research will again, point us in the right direction, give us some targets to work on and really move forward reducing those risks of amputation for all our patients in the near future.