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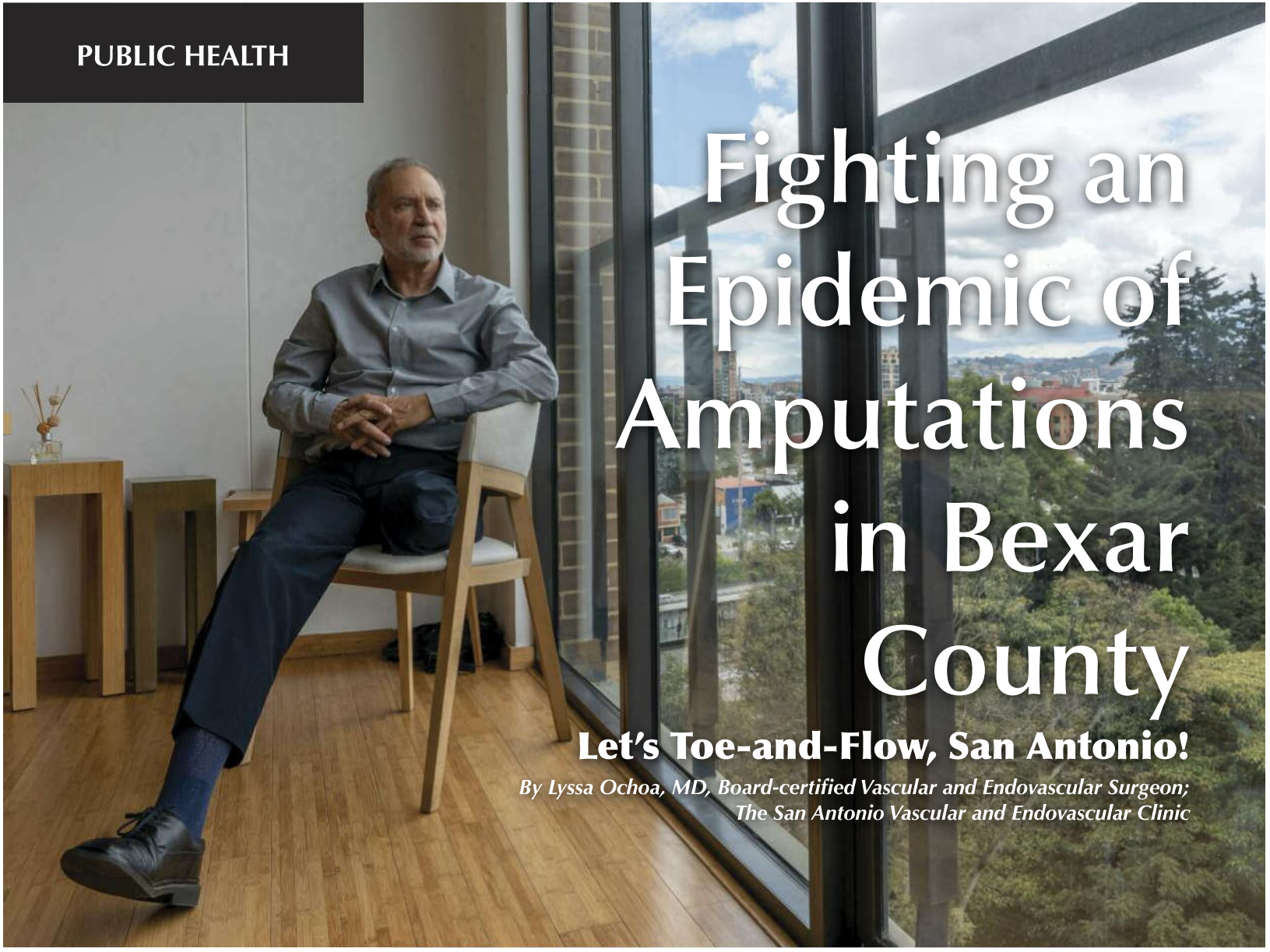


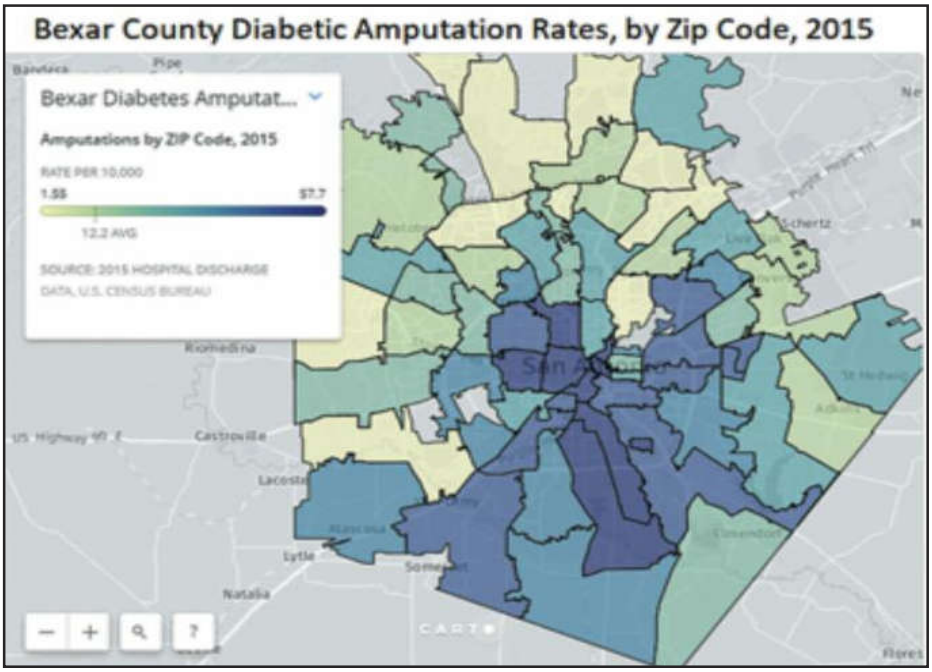
Fighting an Epidemic of Amputations in Bexar County

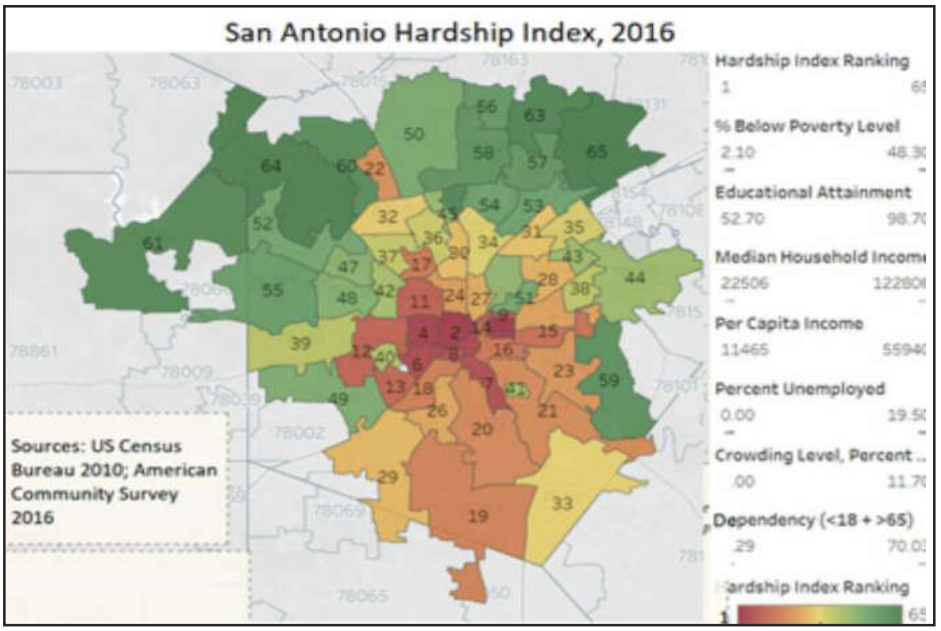
Let's Toe-and-Flow, San Antonio!

By Lyssa Ochoa, MD, Board-certified Vascular and Endovascular Surgeon; The San Antonio Vascular and Endovascular Clinic

Over 2,000 Bexar County residents will lose a limb to amputation due to diabetes and peripheral arterial disease this year alone. San Antonio has nationally-high rates of diabetes (13.3% of adults) and obesity (38.4% of adults) which are major contributors to this problem[1].

Furthermore, San Antonio's economics creates uniquely challenging barriers to preventing amputations related to diabetes and obesity. In fact, data from the Texas Department of State Health Services shows that the diabetic amputation rates are highest in zip codes that also rank highest in the Hardship Index, which aggregates six socioeconomic factors to identify relative difficulty in daily living.





These circumstances indicate that we need a wide-reaching amputation prevention program that specifically targets areas with both the highest clinical need and strongest socioeconomic barriers. Thankfully, much of the groundwork for the clinical component has already been established. In a 2010 edition of the Journal of Vascular Surgery, the "Toe-and-Flow" model of collaborative amputation prevention was born[3]. The article stipulated that the amputation prevention team should include foot specialists and vascular surgeons at a minimum, along with infectious disease, general surgery, plastic surgery, diabetology, and primary care, to essentially wrap each at-risk patient in a proactive bubble of resources. Of course, this combination of resources and requisite collaboration is more practical in a major academic center than a lower-socioeconomic area encompassing over 200 square miles, but modifications can tackle both the logistics and the socioeconomics.

Diagnosis and Availability of Care

Diagnosis of the at-risk patient may occur in any practitioner's office, ranging from ischemic changes of a toe to obviously infected, non-healing foot wounds. Upon such suspicion, the practitioner can use a free HIPAA-compliant smartphone app to alert all other specialists on the team to the presentation, pictures and all. This simple action launches immediate collaboration toward amputation prevention. With a few descriptive texts, an entire plan of care arises. One benefit of community-based practices is autonomy over clinical schedules. It is not unfathomable that a committed team of practitioners could perform the necessary consultations and diagnostics on a same-day to next-day basis.

Transportation

Patients that face the combined dilemma of clinical amputation risk and socioeconomic barriers frequently cite transportation as a primary barrier to care. However, many private insurance plans and Medicare Advantage plans offer transportation as a benefit. Medicaid will soon provide transportation for all beneficiaries through all managed and traditional carriers. A little energy from office staff can go a long way to help patients acquire the "free" transportation included in their plan. Many of the transportation arrangements will include multiple stops if multiple offices must be visited in a single day. Furthermore, non-profit organizations, such as Ride Connect Texas, offer transportation to those in need at no cost. Eliminating the transportation barrier is a major step toward a community-based amputation prevention program.

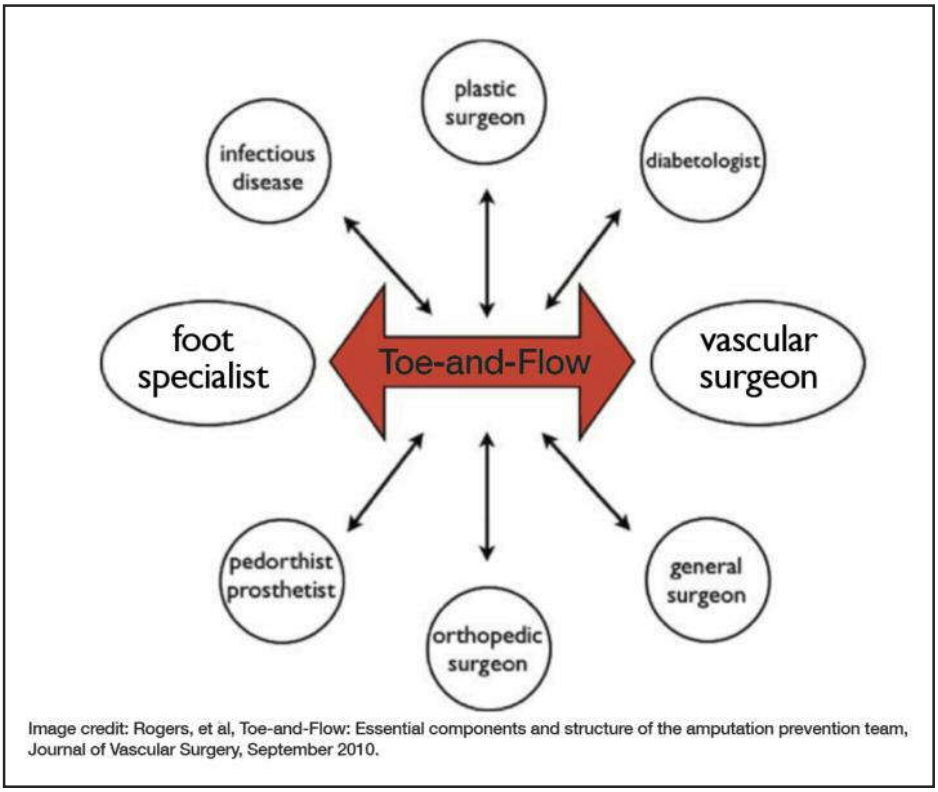


Image credit: Rogers, et al, Toe-and-Flow: Essential components and structure of the amputation prevention team, Journal of Vascular Surgery, September 2010.

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Intervention

Designing the appropriate clinical intervention strategy for amputation prevention is truly a patient-by-patient endeavor. The breadth of the available toolbox is determined by the combined skill sets of the team taking care of each patient. Primary infection control is commonly obtained through surgical intervention by incision and drainage, debridement, or digital amputation. Diabetic foot infections may harbor treatment-resistant bacteria, requiring the infectious disease specialist to initiate appropriate infection control therapy and guide long-term, culture-specific antibiotic therapy. In many cases, arterial insufficiency is an underlying factor which could require revascularization ranging from distal arterial bypass to pedal artery angioplasty. Optimal wound healing may also require the wound specialist to administer hyperbaric oxygen therapy, requiring 5-day-per-week treatment for up to two months. A significant proportion of patients will have comorbidities involving any mix of heart disease, kidney disease, hyperlipidemia, and hypertension, adding additional layers of specialists that need to be consulted and informed along with a major juggling act by primary care physicians.

The interventional mix described above would be daunting to most people facing such issues, but even more so to those with limited resources of finances, time, transportation, and health education. How can a single, stay-at-home grandmother with an 8th grade education raising two grandchildren on a fixed income without a vehicle be expected to make all of the appointments requisite to amputation prevention, let alone understand each step of the way? This is where an emphasis on Social Determinants of Health by all members of the amputation prevention team can make the most significant impact. Coordinating resources in today's smartphone-connected world is not as challenging as it may seem. Vascular and foot specialists, for example, can be scheduled to see patients inside a hyperbaric oxygen facility in conjunction with the wound specialist. An alternative could be that the patient's transportation for the day be coordinated to visit multiple specialists at their independent facilities on a single day.

The Dream: Upstream Prevention

All of us healthcare professionals understand that diabetic amputation prevention cannot begin at the presentation of a diabetic foot ulcer. Amputation prevention begins in childhood, with the establishment of healthy nutritional and exercise habits. Amputation prevention continues at every step through life, regardless of whether one is rich or poor, white or Hispanic, more educated or less educated. We cannot ignore, however, that risk factors for diabetic amputations have a tendency to creep into our lives with varying degrees of disproportionality. This opens a complicated Pandora's box. What are the roles of government, educational systems, parenting, community resources, housing, transportation infrastructure, and safe environments? All of these and more undoubtedly have an impact on health outcomes, as described by countless studies of Social Determinants of Health. As a community of healthcare providers, we must optimize the care we provide to our patients, but we must also challenge ourselves to help our patients in ways that extend beyond the four walls of the exam room. Only then will we begin to see diabetic amputation rates fall, along with improved health outcomes at every turn.

Together, We Can Make a Difference

The collective challenges we face in San Antonio which lead to diabetic amputations may be unique to our city, but a wide range of possible solutions can be found by applying a little creativity to adapt existing models to our community. Collaborative amputation prevention can be the future of San Antonio by leveraging the well-established Toe-and-Flow model, and trading a bricks-and-mortar medical tower for a technology-enabled, passionate pool of community-oriented resources who are willing to tackle Social Determinants of Health with our patients. Achieving this vision would undoubtedly create a new model that may benefit cities throughout the United States, but it has to start somewhere. Let's Toe-and-Flow, San Antonio!

Resources

1. Centers for Disease Control, 500 Cities: Local Data for Better Health, 2018; https://chronicdata.cdc.gov/500-Cities.
2. Economic Innovation Group, Distressed Communities Index Report, 2016; https://eig.org/wp-content/uploads/2016/02/2016-Distressed-Communities-Index-Report.pdf.
3. Rogers, et al, Toe-and-Flow: Essential components and structure of the amputation prevention team, Journal of Vascular Surgery, September 2010; 3www.jvascsurg.org/article/S0741-5214(10)01325-X/pdf.