

Innovation: Health Equity Perspective

Suzanne Shirley, LCSW

Director of Partnerships &
community Engagement

VHA: Innovation Ecosystem
(10X3)

VHA Innovation Ecosystem-10X3

VHA Innovation Ecosystem - Office of Discovery Education and Academic Networks (DEAN)

Through a variety of programs and initiatives, we work to accelerate innovation throughout the organization:

- ▶ Invest in the design/development, testing and scaling of solutions invented by frontline staff
- ▶ Leverage partnerships with academia and industry to collaborate in the design, testing and scaling of external solutions
- ▶ Serve VA program offices and deliver repeatable innovation processes to help them achieve their goals
 - ▶ Road Maps, Playbooks, Design Challenges, Human Centered Design Education

VHAIE operationalizes innovation through the methodology of Human Centered Design

Innovation in Health Equity

Reducing Disparities through Innovation

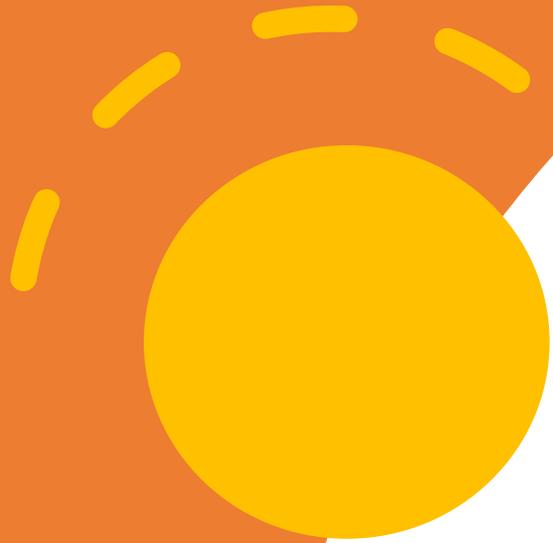
- ▶ Ride Share Program
- ▶ Mobile Prosthetics Program
- ▶ Personalized Assistive Technology
- ▶ 3D Printed Medical Models for Patient Education in Presurgical Planning
- ▶ PRIDE Program
- ▶ Race-Based Trauma Program
- ▶ Home Telehealth for Diabetes Management
- ▶ National Initiative to Eliminate Diabetic Amputation Across VA

Preventing Amputations through Remote Temperature Monitoring

“A massive challenge, impacting thousands of Veteran lives...

A DFU can very easily lead to an amputation or even death for a diabetic Veteran. The most at-risk Veterans face a 5-year mortality rate of 43 percent after developing their first DFU. With 25 percent of Veterans suffering from diabetes, DFUs are a major concern for VA. Last year, VA treated 75,000 DFUs, which accounted for more than 80 percent of non-traumatic amputations in VA, resulting in a cost of more than \$3.2 billion.

Catching these foot ulcers early, before they are even visible, can save limbs and lives. It is why VA has worked aggressively to spread remote temperature monitoring as a standard practice. This task force completed exhaustive quality assurance (QA) chart reviews, research investigations, and educational sessions. The team also streamlined the purchasing guidelines and redesign of preventative care models.”



PAVE and VA's Response to Disparities in Health Care

Jeffrey M. Robbins, DPM

Director Podiatry Service VACO

Why is this
still
necessary in
2020?

- Op/Ed: **The Moral Determinants of Health** by Don Berwick, MD
- *“ In the US at the moment, 40 million people are hungry, almost 600 000 are homeless, 2.3 million are in prisons and jails with minimal health services (70% of whom experience mental illness or substance abuse), 40 million live in poverty, 40% of elders live in loneliness, and public transport in cities is decaying.”*
- “Except for a few clinical preventive services, most hospitals and physician offices are repair shops, trying to correct the damage of causes collectively denoted “social determinants of health.” “

Why is this
still
necessary in
2020?

- Marmot¹ has summarized these in 6 categories:
 - conditions of birth and early childhood,
 - education,
 - work,
 - the social circumstances of elders,
 - a collection of elements of community resilience (such as transportation, housing, security, and a sense of community self-efficacy),
 - and, cross-cutting all, what he calls “fairness,” which generally amounts to a sufficient redistribution of wealth and income to ensure social and economic security and basic equity

VA's Response to Disparities in Amputation Prevention

- VA is by no means a perfect system.
- It does however continually strive to improve health care as it does not financially benefit from disease.
- It benefits from health allowing the system to fund many of the social determinates of health such as:
 - Homelessness
 - Travel
 - Income disparities (means testing)
 - Suicide prevention
 - Amputation prevention

“Every system is perfectly designed to get the results it gets.” Bataldan et al



Veterans Medical Programs Amendments of 1992 (PL102-405)

- Emphasized importance of **highest quality amputee care**
- Identified veterans with amputation as a **special disability group**
- Chartered the **Advisory Committee** on Prosthetics and Special Disabilities Programs-reported to Secretary of VA annually

1993 PACT Program Launched

- Established a **model of care** to prevent or delay amputations
- Developed to meet the **changing needs** of veterans
 - more neuropathy, PVD and diabetes
 - fewer traumatic amputations
 - **New issues in 2006 with returning OEF/OIF Vets**
- Proactive early **identification of “at risk”** populations
 - Especially veterans with diabetes
- **Track** from date of entry to discharge back to the community (Amputee Cube)

Directives

- 1. 1993 VHA Directive 10-93-092**
 - Preservation Amputation Care and Treatment (PACT) – Initial Directive establishing the program
- 2. 1995 VHA Directive 10-95-092 (PACT)**
 - Tied to performance measures
- 3. 2001 VHA Directive 2001-030 (PACT)**
 - Added High Risk Foot Registry
- 4. 2006 VHA Directive 2006-050 (PACT)**
 - Added mandatory mental health consultation
- 5. 2012 VHA Directive 2012-020**
 - Changed name to Prevention of Amputation in Veterans Everywhere (PAVE)
 - Requires coordination with Amputation System of Care
- 6. 2017 VHA Directive 1410**
 - Added sensory neuropathy of any cause as risk condition
 - Added mental health representative to the PAVE oversight committee

Policy

It is VHA policy that the PAVE program be **established at all VA medical centers**. The program will at a minimum provide for:

- *Brief foot check for at-risk populations (DM, PVD, ESRD, prior amputation)*
- *Identify high-risk individuals and determine appropriate care and timely referral*
- *Provide mental health support*
- *Identify and track amputees through all appropriate levels of care*

VA's Tele- health Amputation Initiatives

- Tele-podiatry: VA Video Connect Tele-supervision
- No Wound Left Behind
- Wound Tele-Health: Silhouette Star System
- Remote Temperature Monitoring High-Risk Patients



Types of Remote supervision

- Synchronous Tele-Supervision of basic preventive foot care or wound care.
- Asynchronous Tele-Supervision of basic preventive foot care or wound care.
- Can be adapted to other forms of tele-health

Synchronous Tele- Supervision of basic preventive foot care or wound care.

- Entails an initial assessment face to face by video examination by the podiatrist to determine suitability for basic foot care by the basic foot care provider.
- The podiatrist then directs what care is to be provided.
- Once completed the basic foot care provider contacts the remote provider for inspection of result and discharge by CVT.

Tele-podiatry session



Tele-podiatry session



Asynchronous
Tele-
Supervision of
basic
preventive foot
care or stable
wound care.

- When the supervising podiatrist is not readily available.
- When the patient presents to the basic foot care provider an examination is done to determine that there are **no new issues** and the ordered basic foot care or wound care is provided. Once completed the basic foot care provider records the result of the care via video web cam using the CVT system.
- The basic foot care provider completes the note and identifies the podiatrist as the primary caregiver.

Asynchronous
Tele-
Supervision of
basic
preventive foot
care or stable
wound care.

- The supervising podiatrist reviews the note (e.g. end of day, or other convenient time), reviews the video and signs off on the care with an addendum. If they pick something up missed by the remote provider they can **arrange for follow-up** with the patient.
- If there is a new problem discovered by the remote provider, they **immediately contact the available podiatrist** and do a live consult using CVT system for instructions for care and disposition.

Wound TeleHealth: Silhouette Star System

- A system that provides an accurate area evaluation in 3D and wound image capture
- Use
 - Wound progress for decision making
 - Failure to close by 50% in four weeks, with proper basic wound care is required before requesting and using advanced wound care products. Both quality and cost savings implications
 - Possible to remotely monitor wounds and provide in home dressing changes by visiting nurse or home based primary care.

USB Connection



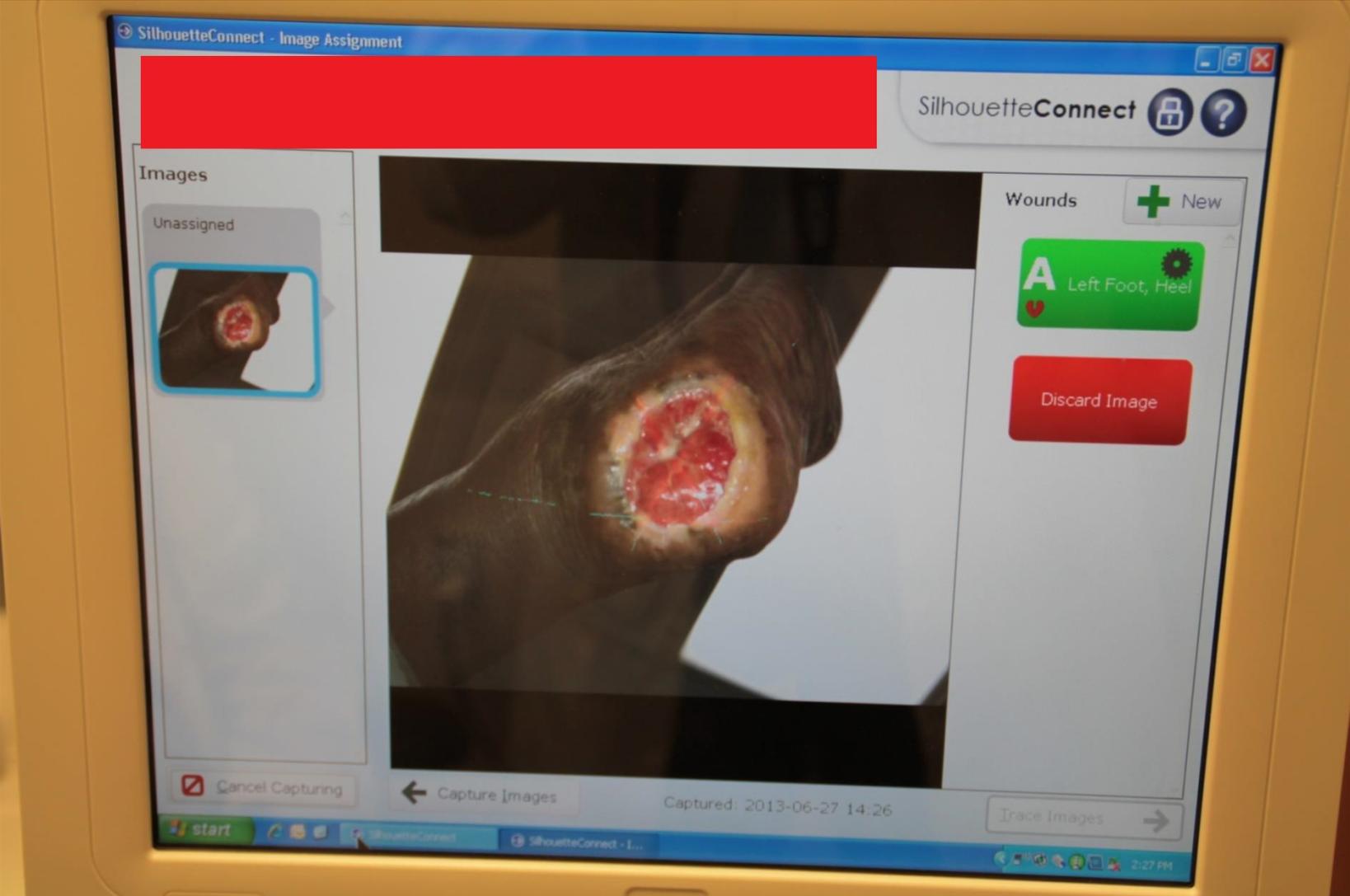
Align the laser over the wound (three lines converge at a central point within the wound)

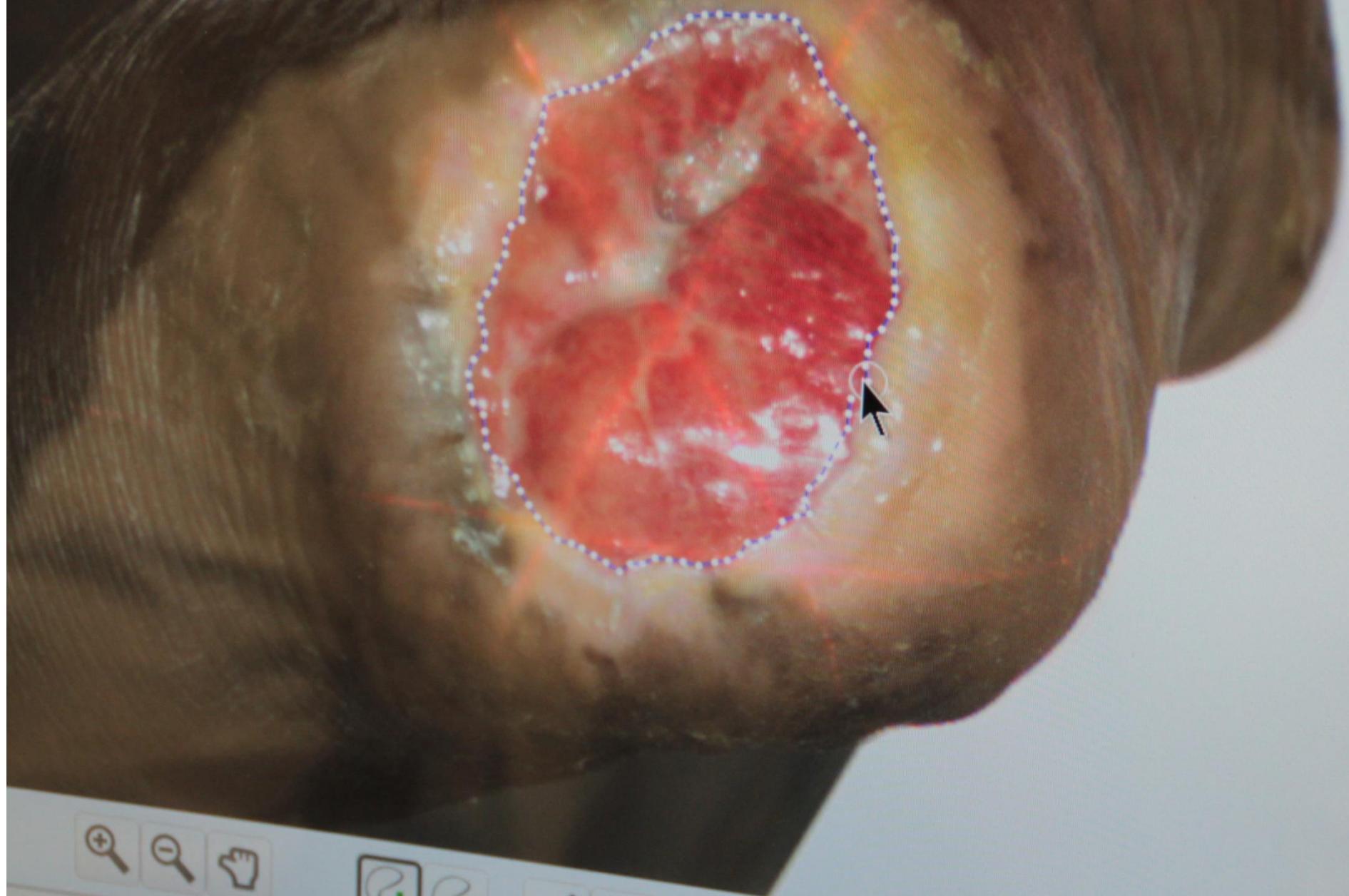


Once the laser is aligned simply push the button



The photo appears instantly





Assign Images

teConnect

A software interface overlay at the bottom of the image. It contains several icons: a magnifying glass with a plus sign for zooming in, a magnifying glass with a minus sign for zooming out, a hand icon for panning, a square with a plus sign and a curved arrow for a specific tool, a square with a minus sign and a curved arrow for another tool, a square with a plus sign and a diagonal line for a third tool, a square with a minus sign and a diagonal line for a fourth tool, a square with a curved arrow for a fifth tool, a square with an 'X' for a sixth tool, a square with a diagonal line and a green dot for a seventh tool, a square with a curved arrow and a green dot for an eighth tool, a square with a diagonal line for a ninth tool, and a square with a plus sign for a tenth tool.

Wound Assessment Report

Single Assessment, Single Wound



Assessment 2013-06-27

Left Foot, Heel: Wound A

Status: Open

Image taken
2013-06-27
14:26:48

Area
8.8cm²

Perimeter
115mm

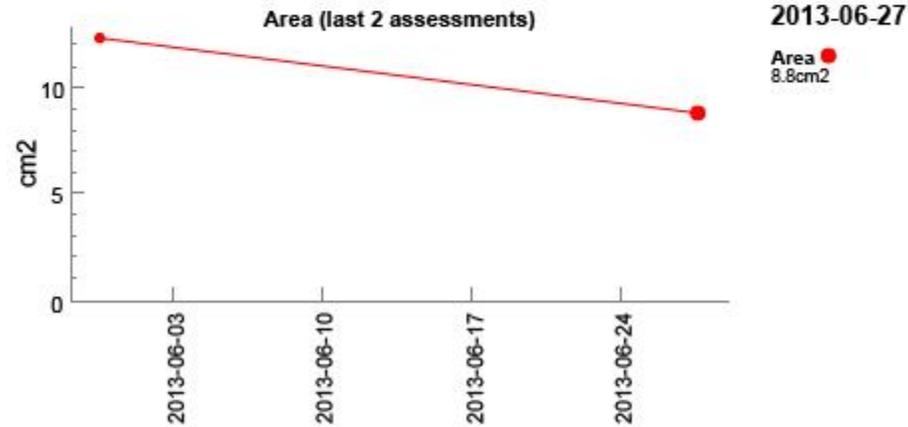
Max. Depth
2mm

Mean Depth
0mm

Volume
0.4cm³



Length/Width
L: 41mm
W: 28mm





Remote Monitoring High-Risk Patients

Remote Temperature Monitoring Devices - VA Clinical Guidance Document

- Developed by National PSAS and National Podiatry Program Office
- Titled: **TMD SOP 12.19.19** (last updated 12/19/19)
- Temperature Monitoring Devices (TMD) for Feet
- Approved for PAVE 3

Risk Category	Characteristics	Guidance
0	No peripheral neuropathy	No
1	Foot deformity or minor foot infection	No
2	Peripheral neuropathy with peripheral artery disease and/or a foot deformity	No
3	Peripheral neuropathy and a history of foot ulcer or lower-extremity amputation/ or Charcot foot	Yes

National PSAS and National Podiatry Guidance Document

Topic: Temperature Monitoring Devices (TMD) for Feet

Purpose: This document details circumstances for appropriate provision of Temperature Monitoring Devices (TMD) for feet in the management of patients at risk of inflammatory foot conditions such as diabetic foot ulcers (DFU) for Veterans, with guidance for clinical and Prosthetic and Sensory Aids Service (PSAS) personnel.

Background: Use of once-daily thermometry as a modality for the prevention of DFU has been referred to as Temperature-Guided Avoidance Therapy. The practice may be summarized as the temporary use of off-loading strategies (e.g. decreased ambulation or removable cast walker placement) during periods of persistent, localized elevations in plantar skin temperature.

Once-daily temperature-Guided Avoidance Therapy has been investigated in three NIH-funded randomized controlled trials,¹⁻³ one of which additionally supported by VA HSR&D Merit Award 20-059.³ Enrolled participants have been pooled from patients in either Category 2 (neuropathy and structural foot deformity) or Category 3 (history of foot ulcer or partial foot amputation) of the International Diabetic Foot Risk Classification System.³ Across the three trials, use of thermometry coupled with early offloading resulted in a 70.0% reduction in occurrence of ulceration in this high risk group.¹⁻³ As a result, daily measurement of foot temperatures in high risk groups has been incorporated into three clinical practice guidelines: the American College of Foot and Ankle Surgeons,⁴ the International Working Group on the Diabetic Foot,⁵ and the Wound Healing Society.⁵

Remote Temperature Monitoring with Podometrics

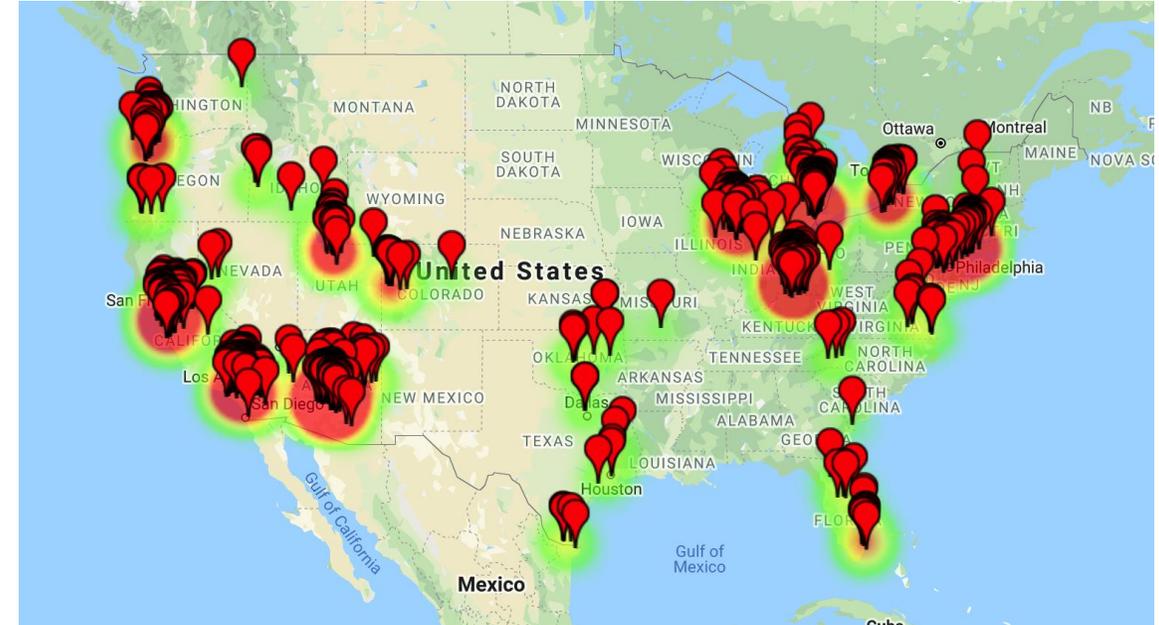
- Podometrics SmartMat remotely monitors temperature on plantar surface of the foot for early signs of inflammation
- In-home device that veterans step on once-daily
- Data is automatically sent to Podometrics
- Uses cell signal and HIPAA compliant
- Clinical trial on efficacy of device published in Diabetes Care in 2017
 - Detected 97% of ulcers on average 5 weeks before clinical presentation



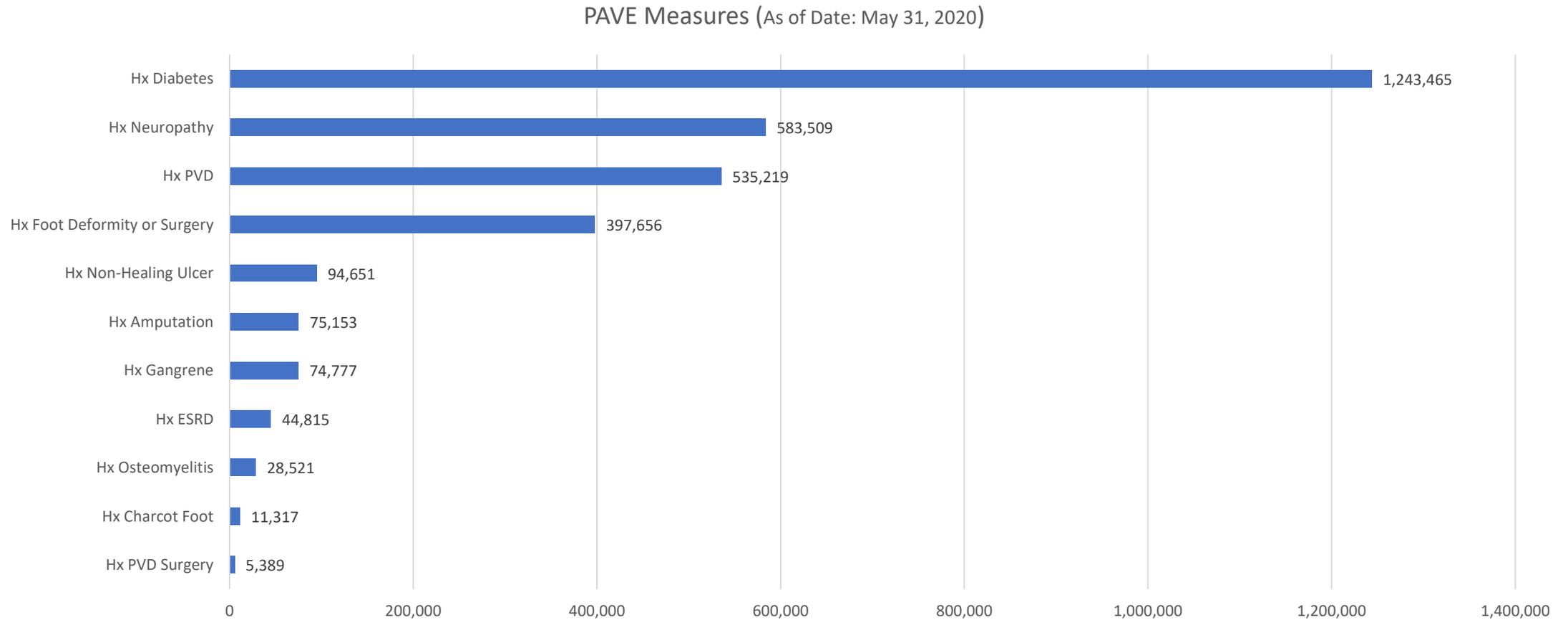
VHA Clinical Evidence

Federal Practitioner March 2020

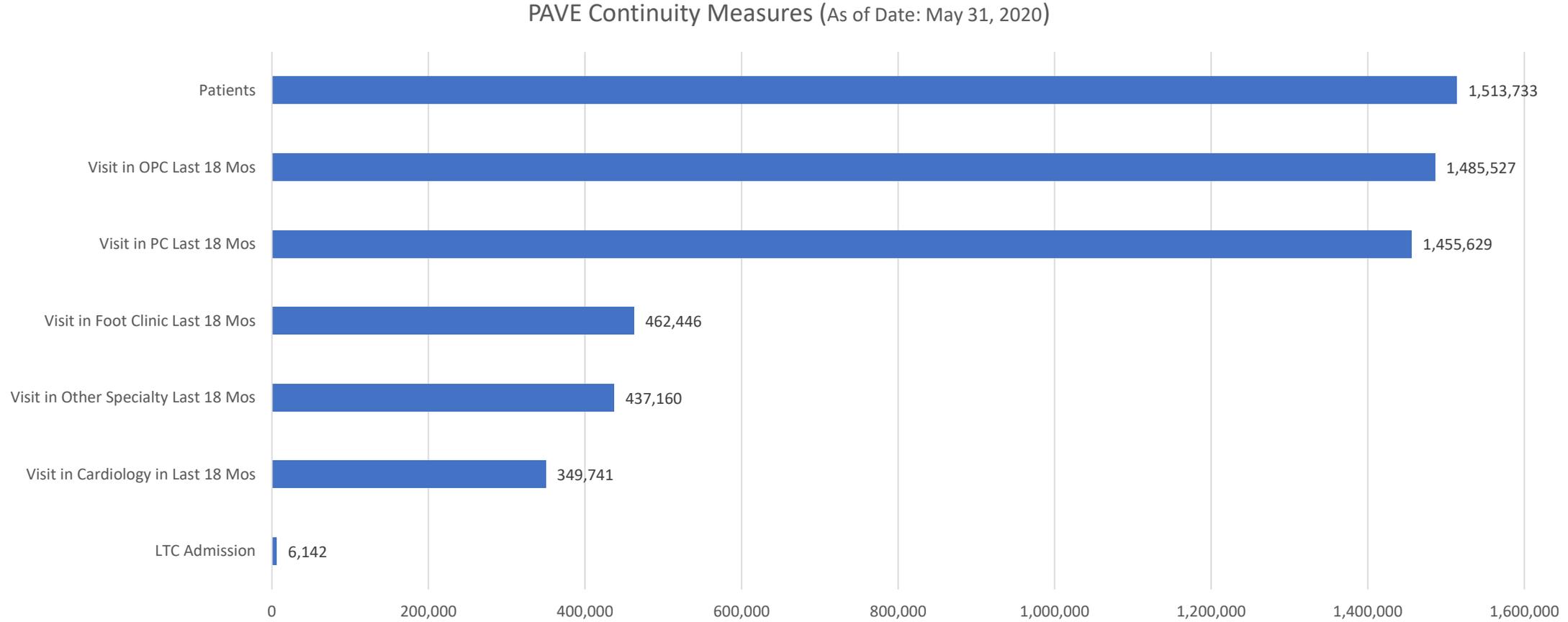
- 600+ veterans
- 70% engaged after 1 year of monitoring
- 68% of detected inflammation resolved from patients offloading
- For cases that were escalated to clinical team, 76% patients reported clinically meaningful preventative care (preulcerative callus was debrided, etc)



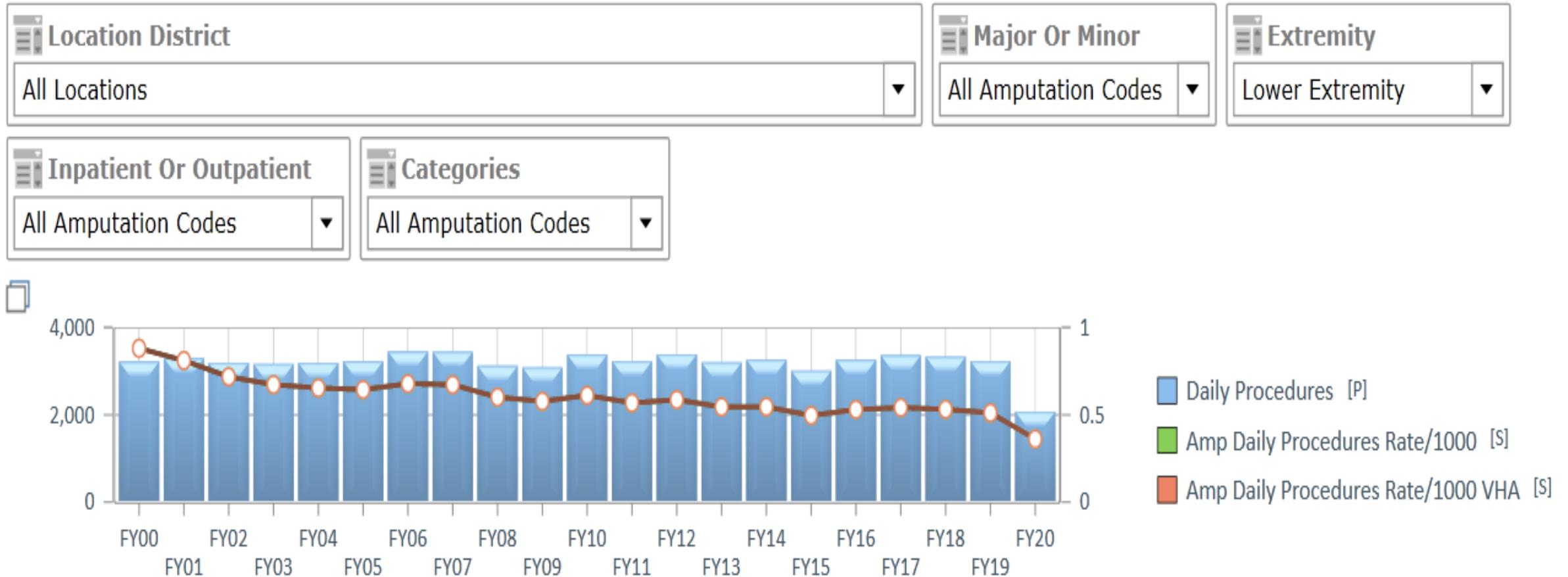
Who are our vulnerable populations?



How are we sure we are following them?



Rates and numbers do not tell the whole story

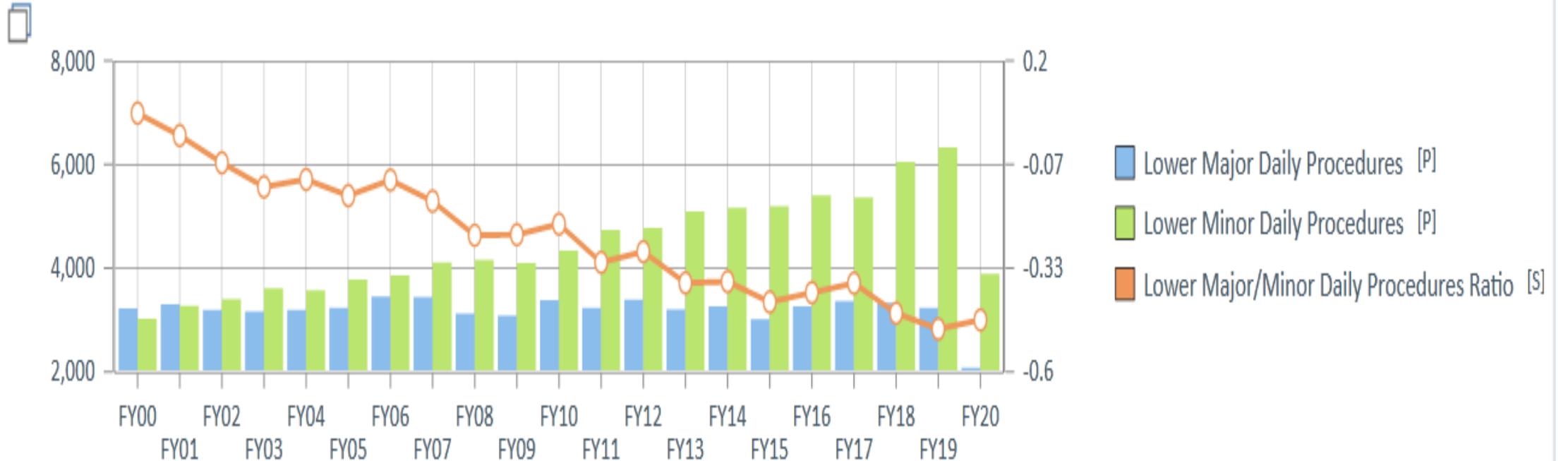


Major/Minor Ratios

Lower Major Daily Procedures, Lower Minor Daily Procedures and Lower Major/Minor Daily Procedures Ratio by Dates (Date) on columns sub-setted by All Locations and All

Location District
All Locations

Category
All

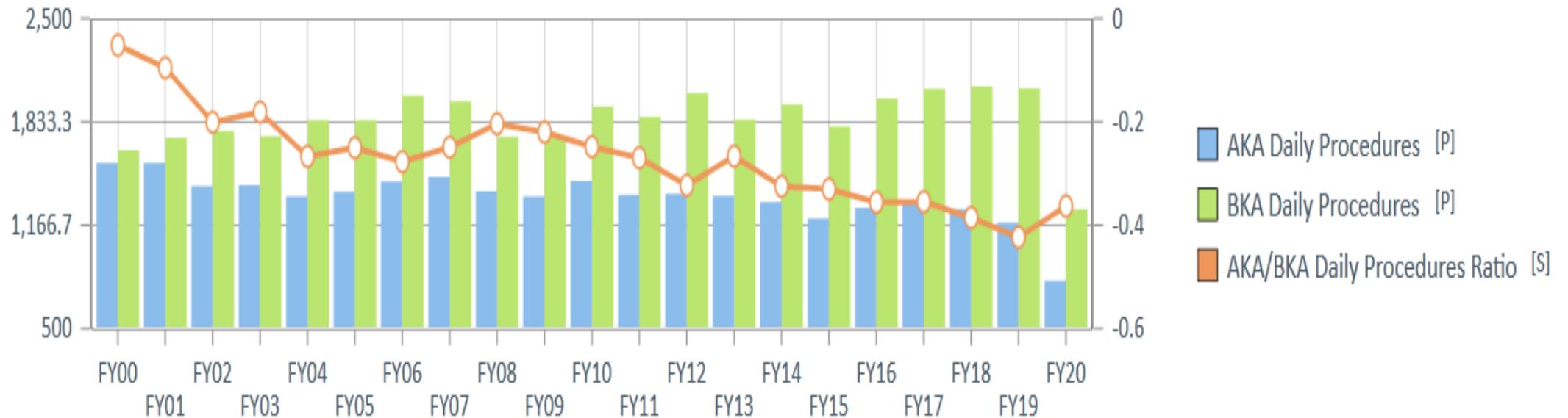


AKA/BKA Ratio's

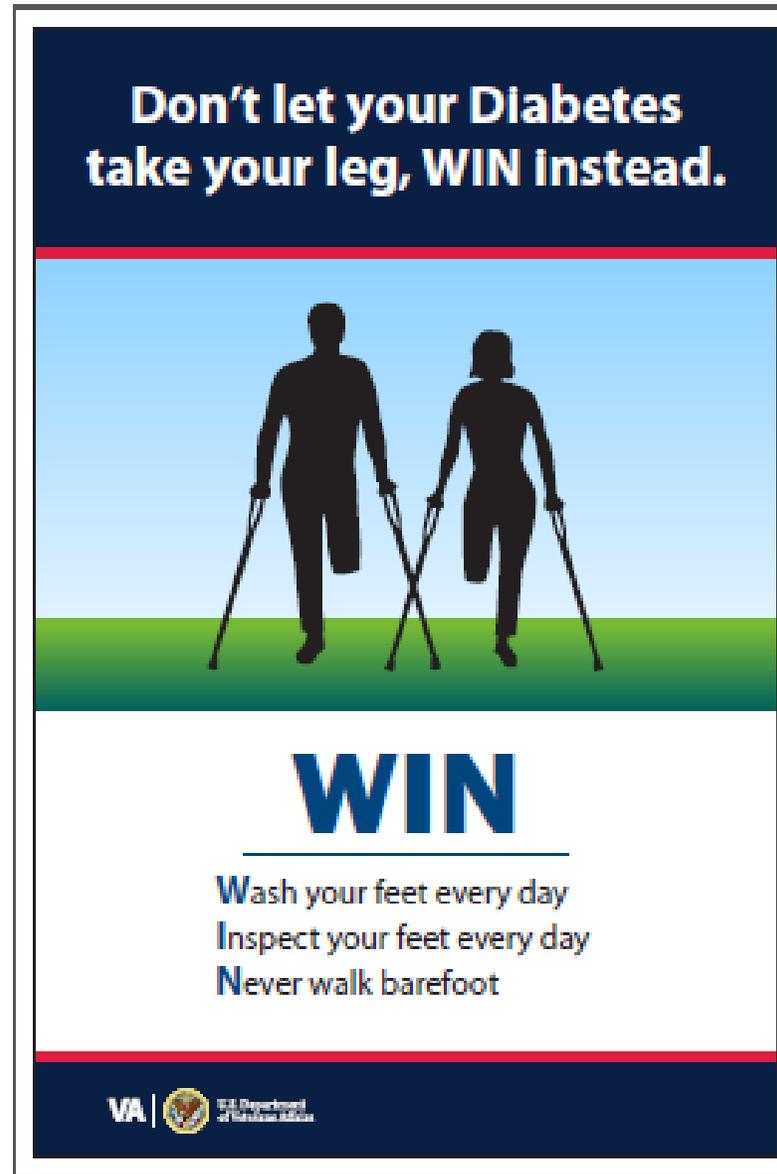
☰ AKA Daily Procedures, BKA Daily Procedures and AKA/BKA Daily Procedures Ratio by Dates (Date) on columns sub-setted by All Locations, All, Procedure and Lower Extremity

Location District
All Locations ▼

Category
All ▼



Amputation Prevention Poster



The effort continues!!!

- Questions?



Reducing the risk of lower limb amputation

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VA Health Services
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IIR 15-372



Poll: What do you think is the most common cause of lower extremity amputation in Veterans?

Trauma

Dysvascular disease (vascular disease, diabetes)

Cancer



55% of amputations are due to dysvascular disease and the toe is the most common level of amputation

At least 50% of amputations are thought to be preventable



Impacts of amputation

Physical functioning

Social functioning

Mental health

Participation

Pain

Future amputation risk

Some of the questions our study sought to answer

How frequently do people with a toe amputation undergo a subsequent ipsilateral amputation in the first year?

How does the risk of subsequent amputation vary over time and by individual factors (e.g., race)

What do patients and providers understand about risks for subsequent amputation following a toe amputation?

Methods

QUALITATIVE AIM

Semi-structured interviews with patients (n=61) and providers (n=24)

Patient interviews conducted within ~10 months of their initial toe amputation

Purposive sampling of patients to include those who underwent a subsequent amputation

QUANTITATIVE AIMS

Veterans with diabetes who had a toe amputation performed in VA or paid for by VA between FY2005 and FY2016

Follow-up (via medical records) for one year after toe amputation

Not seeking care quickly after problems developed

- Not knowing what to look for
- Not understanding the seriousness of the wound
- Having competing priorities

Not having direct and prompt access to a provider knowledgeable about diabetes foot complications

Key patient themes related to risk of amputation

Not knowing what to look for

“I wish I would’ve known more about what to watch for in line with an infection. Because I didn’t know what was going on with my toe, I never thought of there being an infection because there was no wound. It just started turning bruised like, and red. And turning sore.”

Not understanding the seriousness of the wound

“I didn’t realize ... I didn’t feel it, and I may not have noticed it for a few days. Like I said, I tried treating it myself with triple antibiotic, I thought it was nothing. I didn’t take it seriously. I’ve never had any problems with my feet before.”

Competing priorities

“A bigger reason why I thought I lost my toe, is because I had started working and it was under Voc-Rehab. They found me this training thing to do. I only had a couple months of entitlements left, and my counselor was just a majorly, mean and negative person. She was convinced that I was just trying to get money from the government and not complete the program that I was doing. She said that if I didn’t miss any days, she’d give me a 2-month extension on my entitlements. But, she said, ‘I don’t think you can do it. I don’t think you’re ready to work. You’re not motivated’... I proved her wrong, but I lost my toe doing it; I didn’t miss any days, I missed a lot of appointments...”

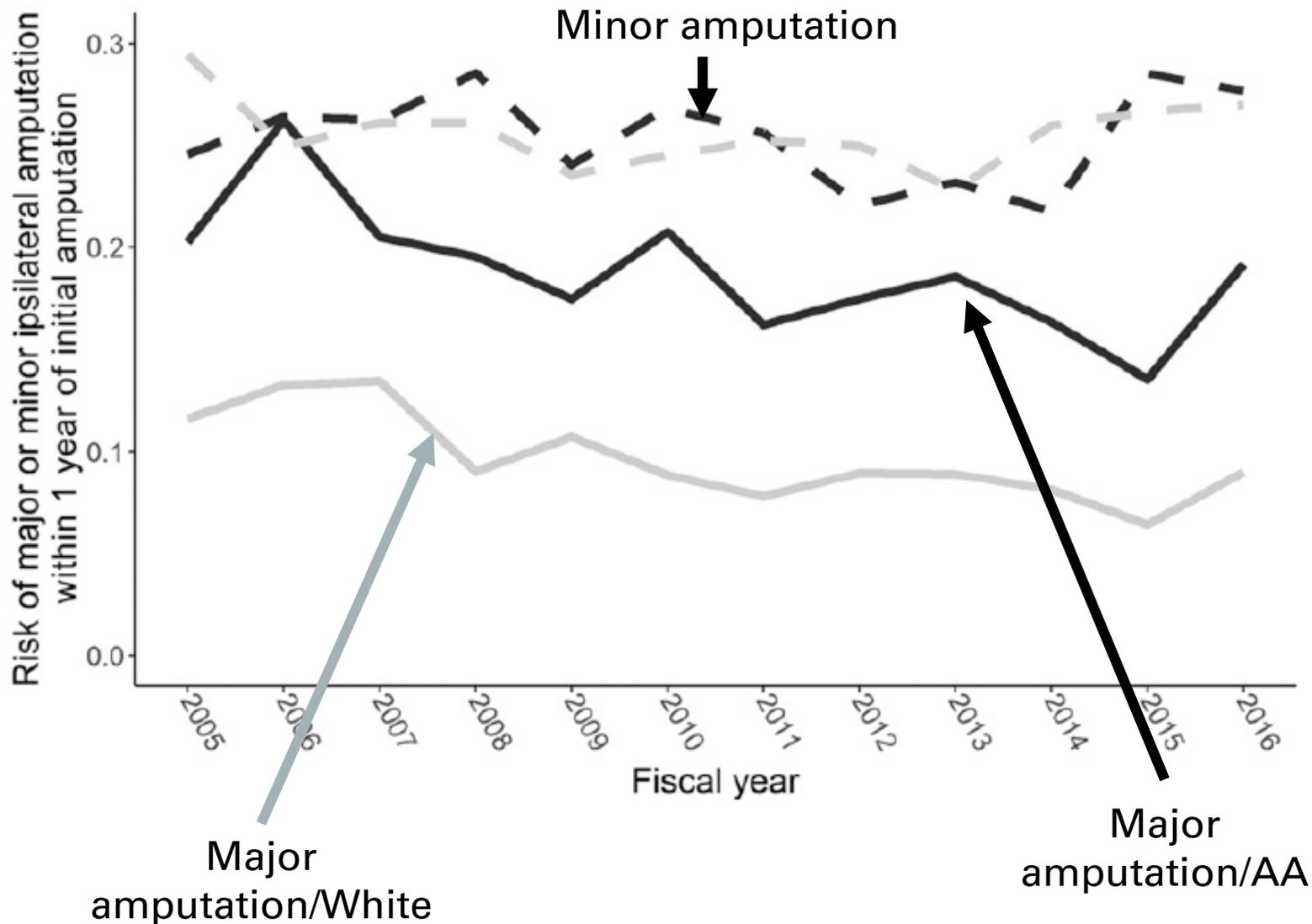
Not having direct and prompt access to a provider knowledgeable about diabetes foot complications

“What they need is being able to see somebody when you need to see them ... If I’ve got a sore on my foot or something, and it starts getting infected, I can’t wait 3 weeks to get it seen ... But you can’t get an appointment unless you go to the ER. That’s all you can do.”

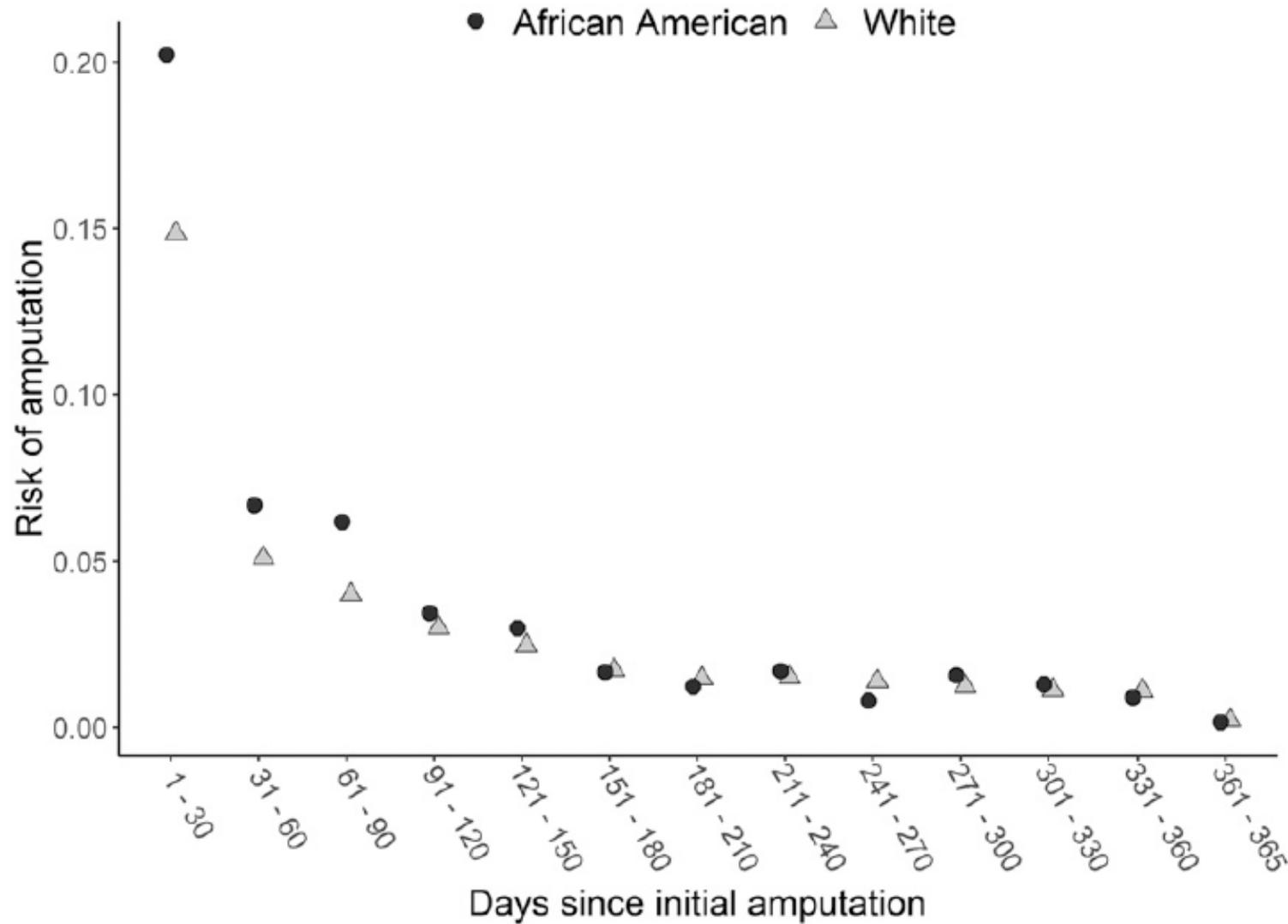
Results – quantitative aims

17,786 Veterans met inclusion criteria

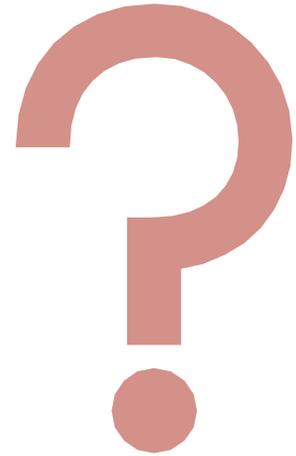
- 10% had a subsequent “major” amputation
- 24% had a subsequent “minor” amputation (without having a major amputation)
- 8% died in the first year (prior to having an amputation)



Risk of a major amputation following a toe amputation declined over time, but racial disparities remain



African American Veterans have a higher risk of subsequent amputation compared with whites in the first 90 days after a toe amputation



What might be the reasons for the racial disparities?

Factors/barriers to preventing diabetes and complications and obtaining care when needed may differ by race

Differential knowledge/understanding, possibly a function of whether diabetes education materials/delivery were ..

- Culturally appropriate
- Tailored based on health literacy
- Feasible given social/physical environment

Access to care

- Structural racism
- Temporal/geographic access

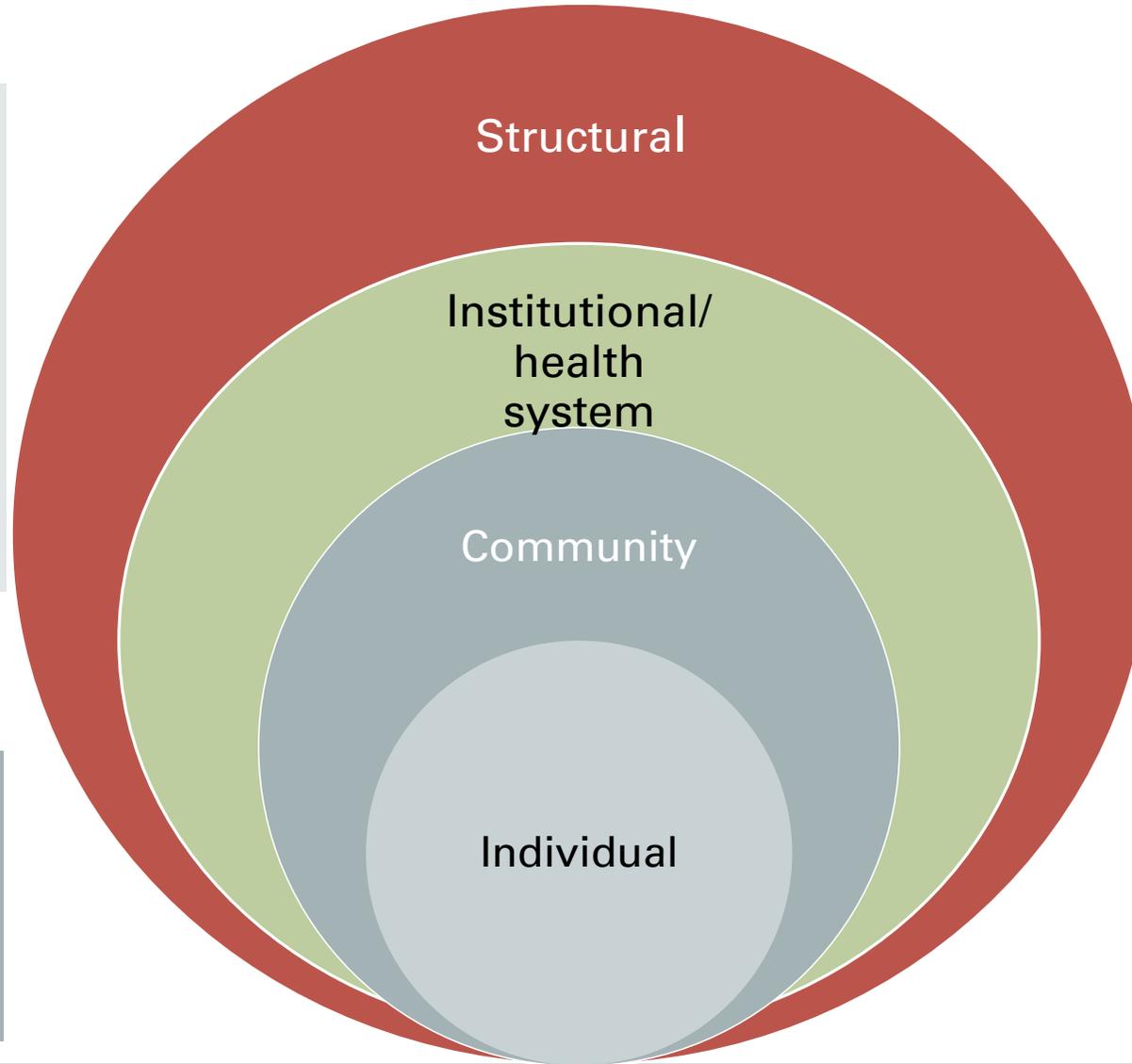
Risk of diabetes complications may differ by race/racism

Individual

- Knowledge
- Risk perception
- Skills
- Motivation
- Physical health
- Mental health status
- Readiness to change
- Etc.

Community

- Stigma
- Norms
- Social support
- Social networks/capital

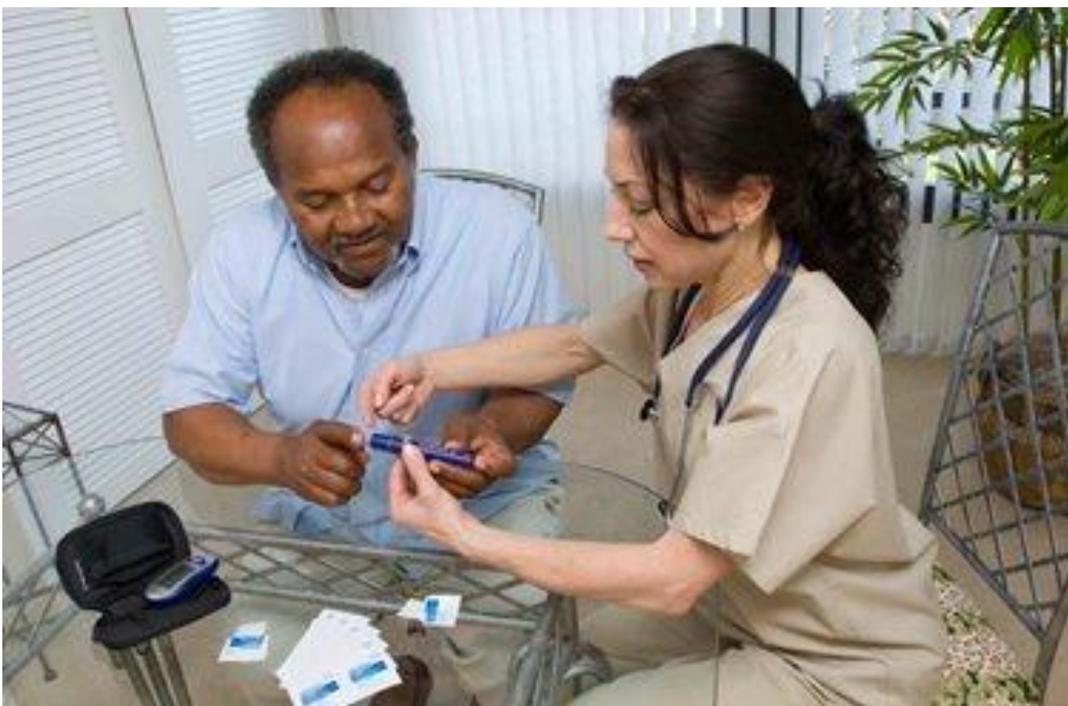


Institutional/ health care system

- Provision of appropriate services
- Convenient, responsive services
- Friendly, culturally competent environment
- Sufficient resources for services

Structural

- Poverty
- Access to services
- Cost of services
- Political context & priorities
- Education curriculum



What might be the main reason for the high risk of subsequent amputation (independent of race)?

What I thought it might be (and was not):

- Caring for the amputation (post-op care)

What might be the main reason for the high risk of subsequent amputation?

What I thought it might be (and was not):

- Caring for the amputation (post-op)

What it *probably* is

- Underlying risk factors that led to the initial toe amputation
 - Poorly controlled diabetes
 - Peripheral neuropathy
 - Peripheral artery disease

Well it's a pathway... I don't think doing something right before a person's about to have an amputation is going to reduce the number of amputations as much as doing things before, in the pathway.

- Podiatrist (05025)



We need to go upstream

Before the amputation

Problems

Checking your feet daily in a comprehensive way is hard

Not having others in the home who can help

Not knowing what to look for

Hard to get a clinician to look at what may be a wound/sign of infection

Hard to get to the clinic if you can get someone to look at it

And, these problems may be worse for certain subgroups.

What might help?

Use technology to make it easy for patients to know when something is wrong

Provide “eyes” in the home

Overcome barriers to getting an appointment/coming to the clinic

Public health interventions that work make doing the “right” thing easy





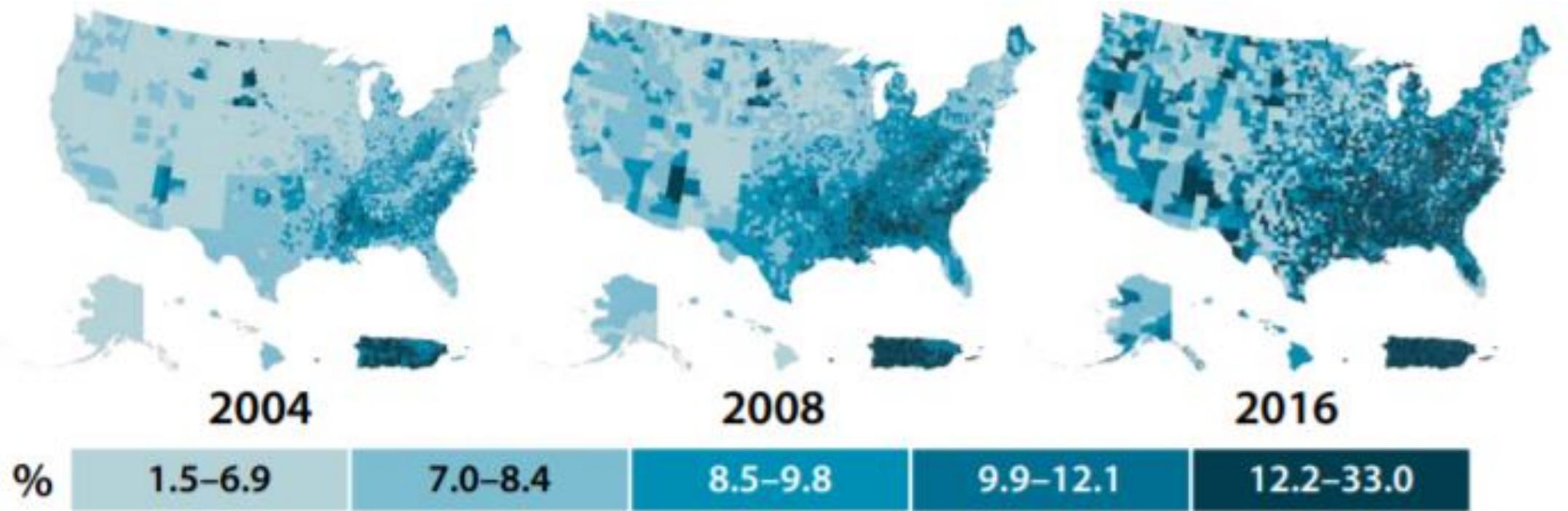
Can temperature sensing mats help reduce disparities?



**Thank you!
Questions?**

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Extra slides

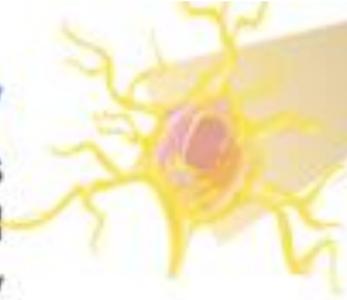


Diabetes prevalence varies across the US and has increased substantially over time

The “pathway” that led to the initial amputation

Neuropathy

Hyperglycemia damages nerves in the peripheral nervous system. This may result in pain and/or numbness. Feet wounds may go undetected, get infected and lead to gangrene.



Extremities

Peripheral vascular disease results from narrowing of blood vessels increasing the risk for reduced or lack of blood flow in legs. Feet wounds are likely to heal slowly contributing to gangrene and other complications.

Proposed reasons for geographic variation in amputation

Variation in population characteristics

- Disease severity
- Education/SES → Self care and access to care
- Surgical capacity

Variability in diagnosis and management of risk factors leading to the amputation

- Risk assessment
- Therapeutic footwear
- Patient education

“Variability happens when physicians do not agree on the best way to diagnose or manage the problem.”
- Wrobel et al, Diabetes Care, 2001