

Multidisciplinary Approach to Limb Salvage: It Works and How to Embrace It and Not Fight It

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No Financial Disclosures

How to Build a Multidisciplinary Program

**How Did we Realize we
Needed to Build a
Multidisciplinary Program**



Diabetes

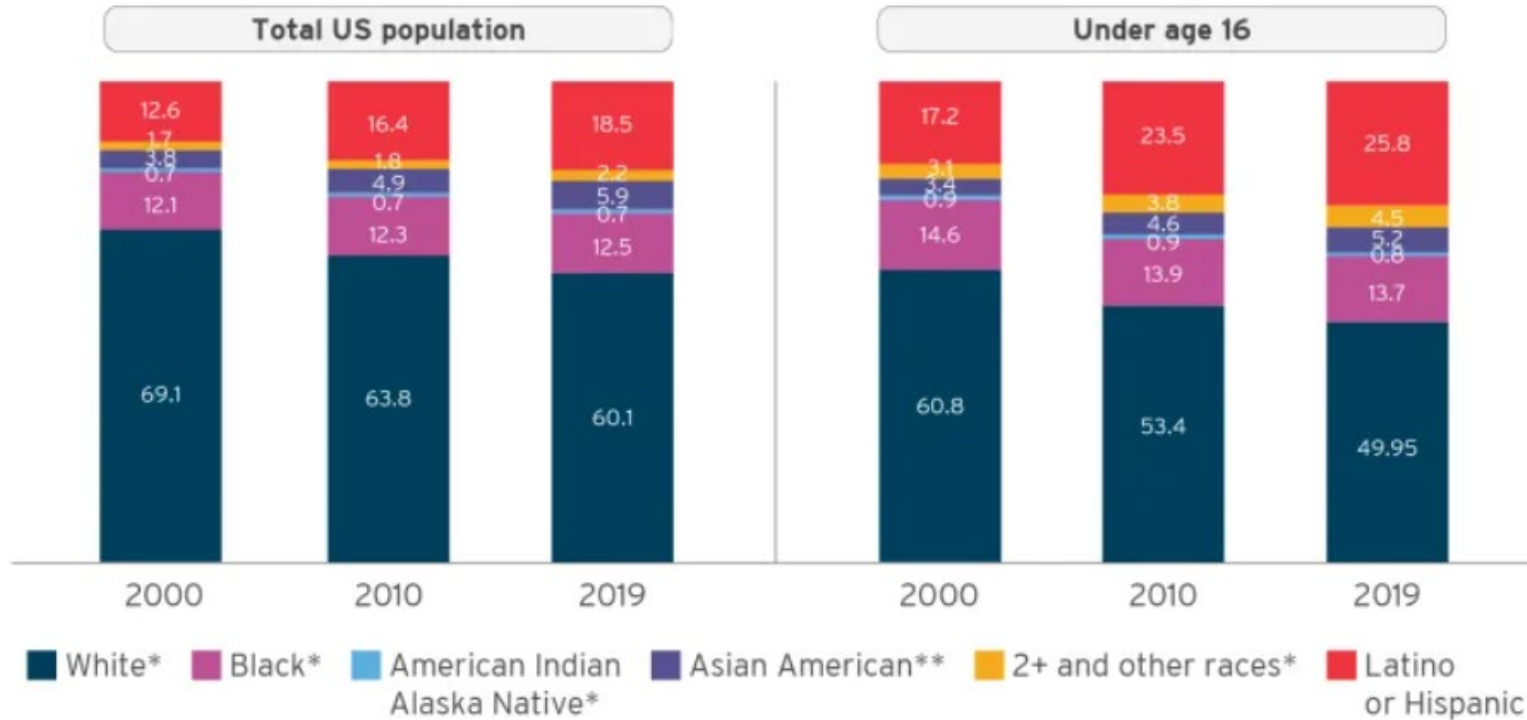
- More than 34 million people of all ages (about 1 in 10) have diabetes, and 88 million adults (1 in 3) have prediabetes.²
- Diabetes complications are increasing for young adults aged 18 to 44 and middle-aged adults aged 45 to 64.³
- Diabetes is more common among Asians, non-Hispanic Blacks, and Hispanics than non-Hispanic Whites.
- Nearly 1 in 5 adolescents aged 12 to 18 years and 1 in 4 young adults aged 19 to 34 have prediabetes.⁴

1. Projection of the year 2050 burden of diabetes in the US adult population: dynamic modeling of incidence, mortality, and prediabetes prevalence. *Popul Health Metr.* 2010;8:29.
2. *National Diabetes Statistics Report, 2020*. Atlanta, GA: Centers for Disease Control and Prevention US Dept of Health and Human Services; 2020.
3. Resurgence in diabetes-related complications. 2019;321:1867–1868.
4. Prevalence of prediabetes among adolescents and young adults in the United States, 2005–2016. *JAMA Peds.*



Race-ethnic profile for total US and under age 16 populations

2000, 2010, and 2019



* members of race group who do not identify as Latino or Hispanic

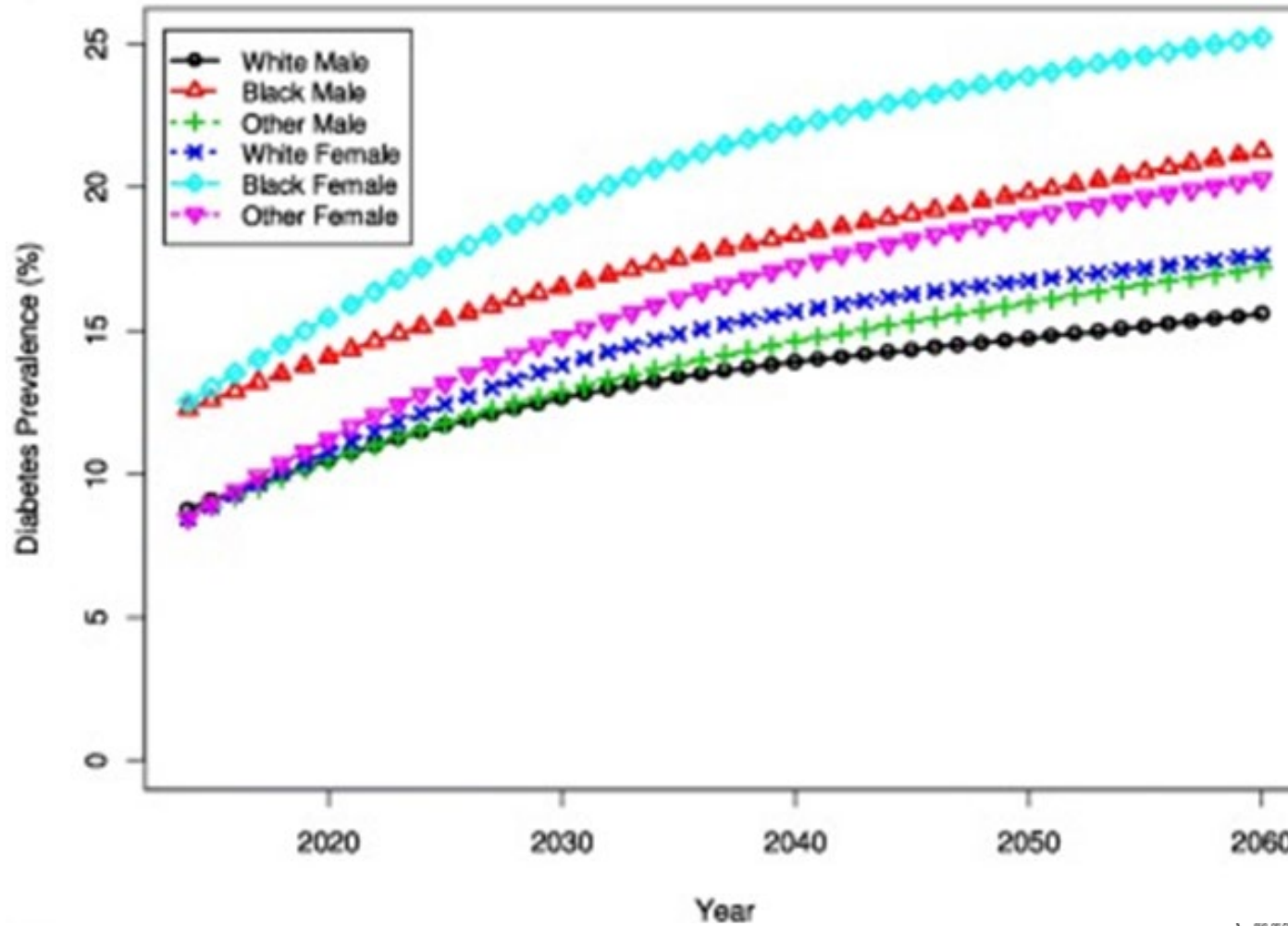
* non-Latino or Hispanic Asians, Hawaiians and other Pacific Islanders

Source: William H Frey analysis of 2000 US Census and Census population estimates, released June 25, 2020

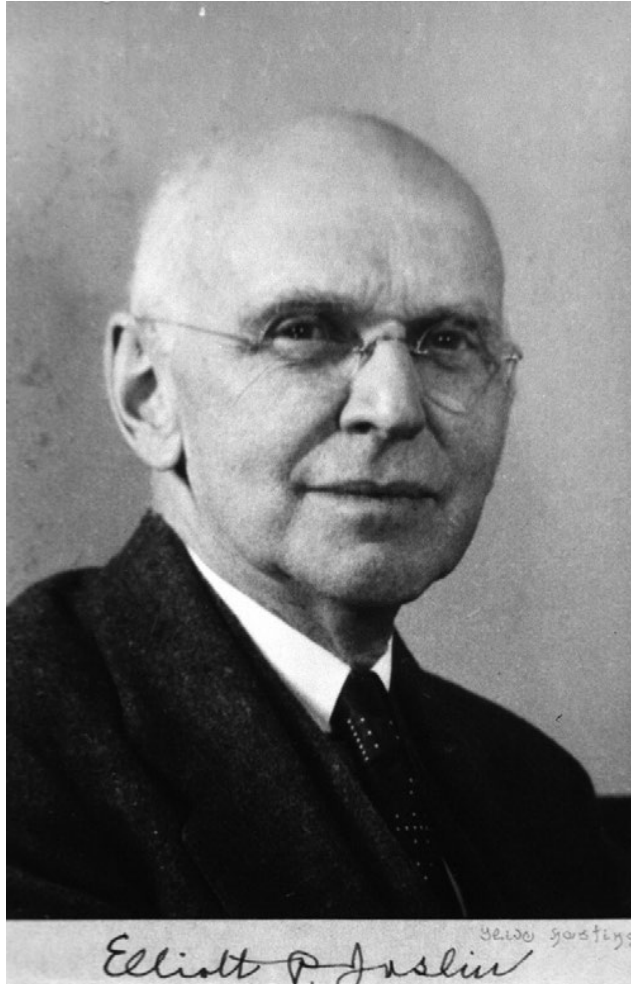
B Metropolitan Policy Program
at BROOKINGS



Diabetes Impact



Team Approach



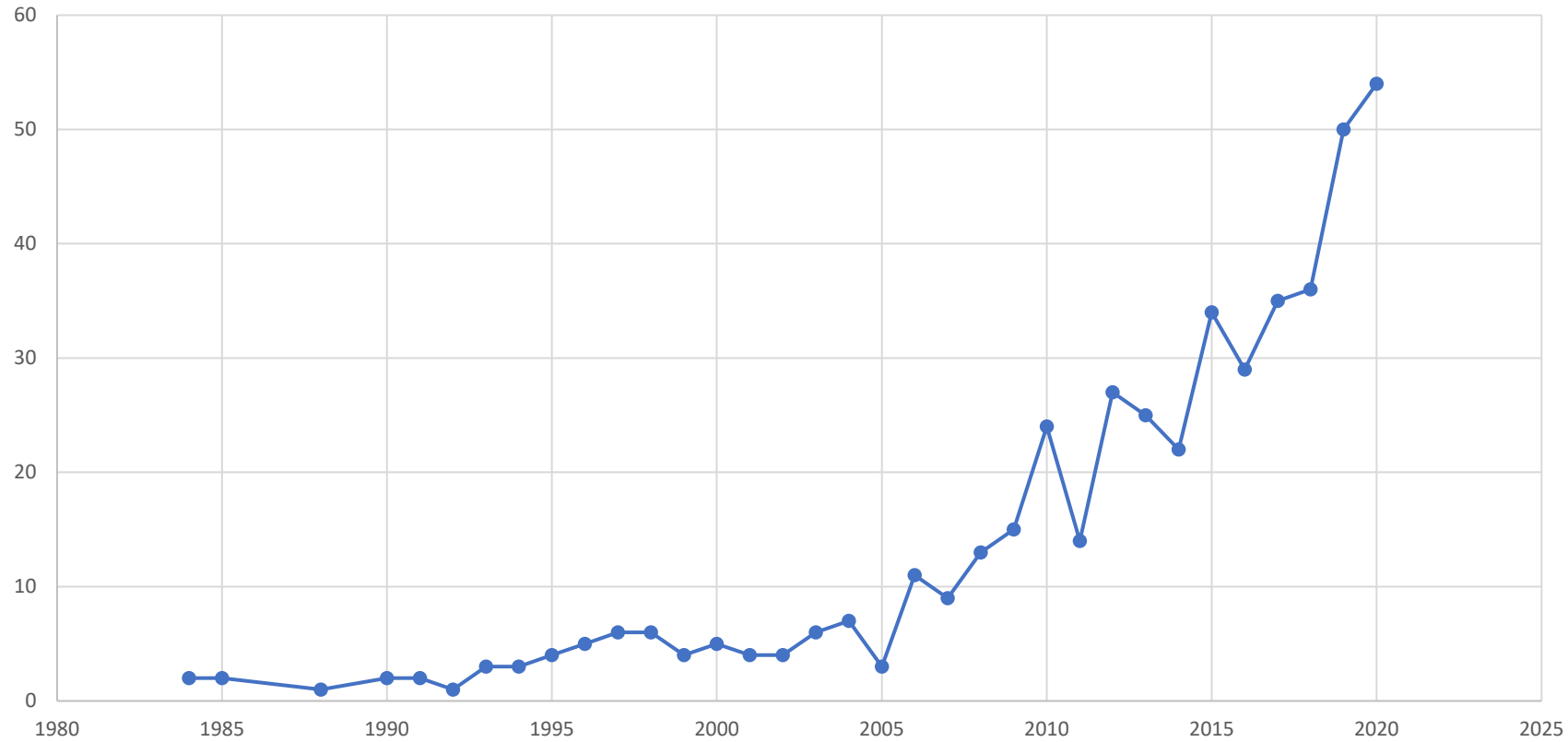
1869-1962

- Dr. Elliott Joslin
- Diabetologist
- Director of George F. Baker Clinic at New England Deaconess Hospital
- Gangrene worsened with age, duration of diabetes, and in uncontrolled patients



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Limb Salvage Multidisciplinary



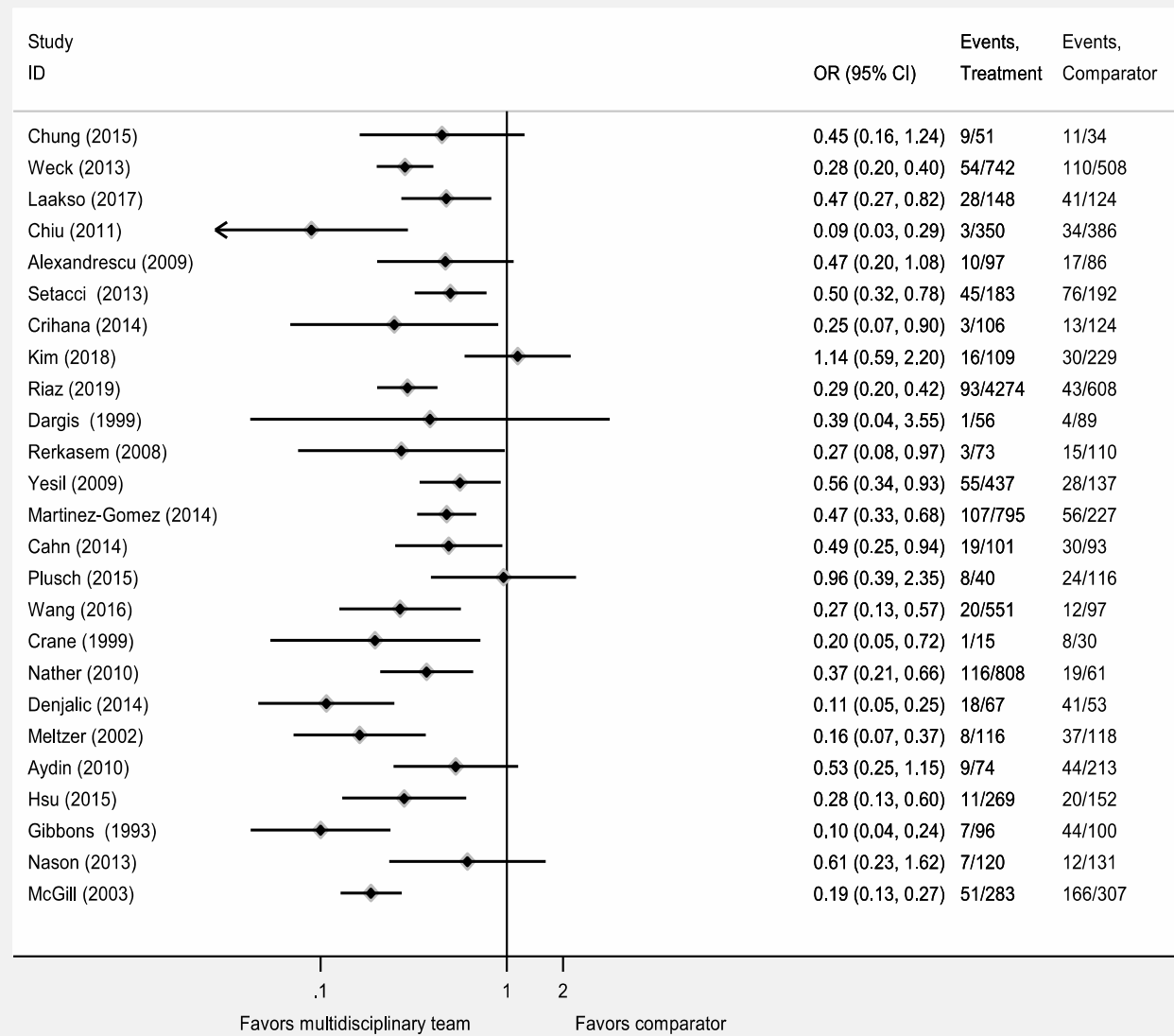
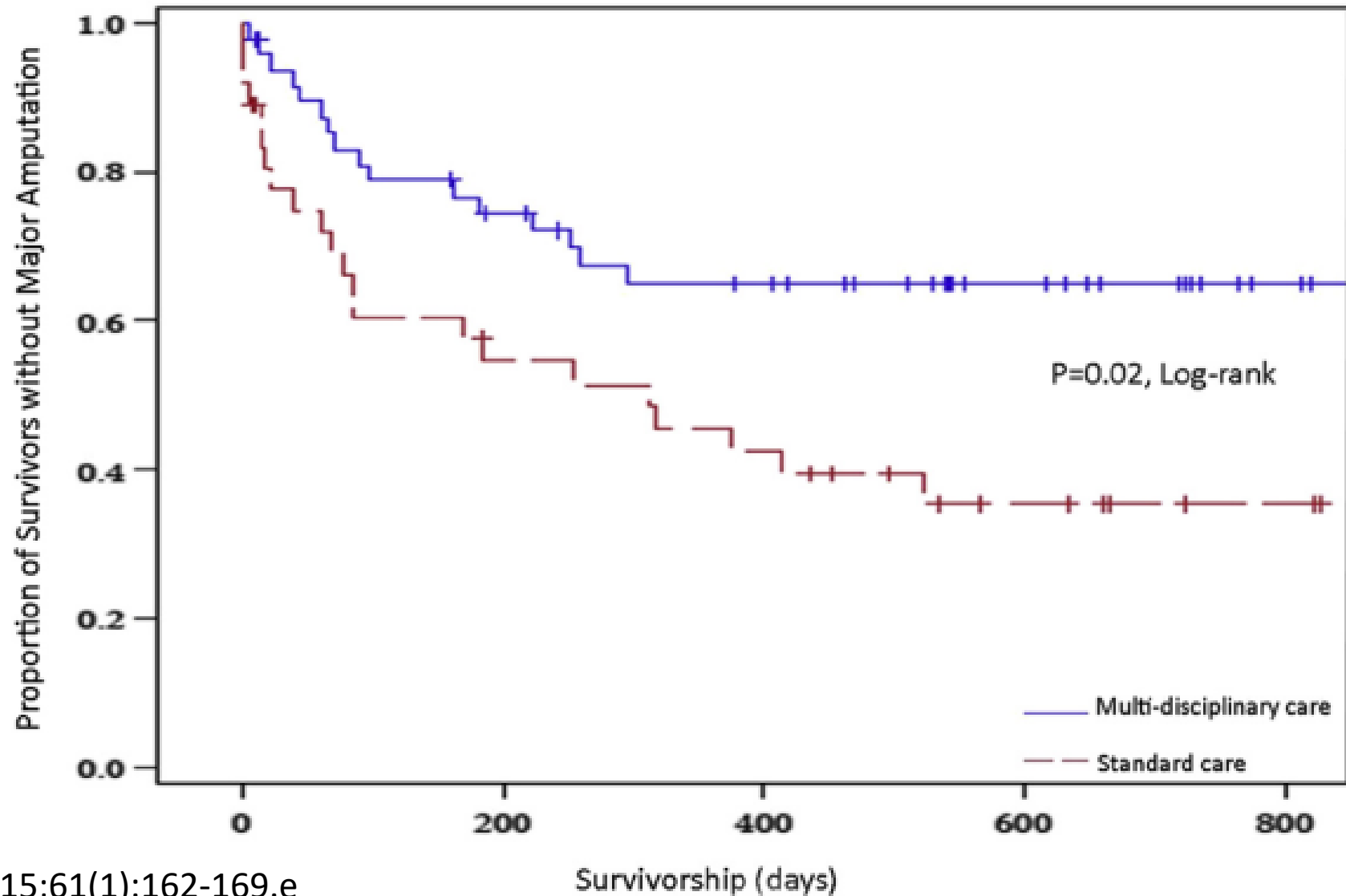
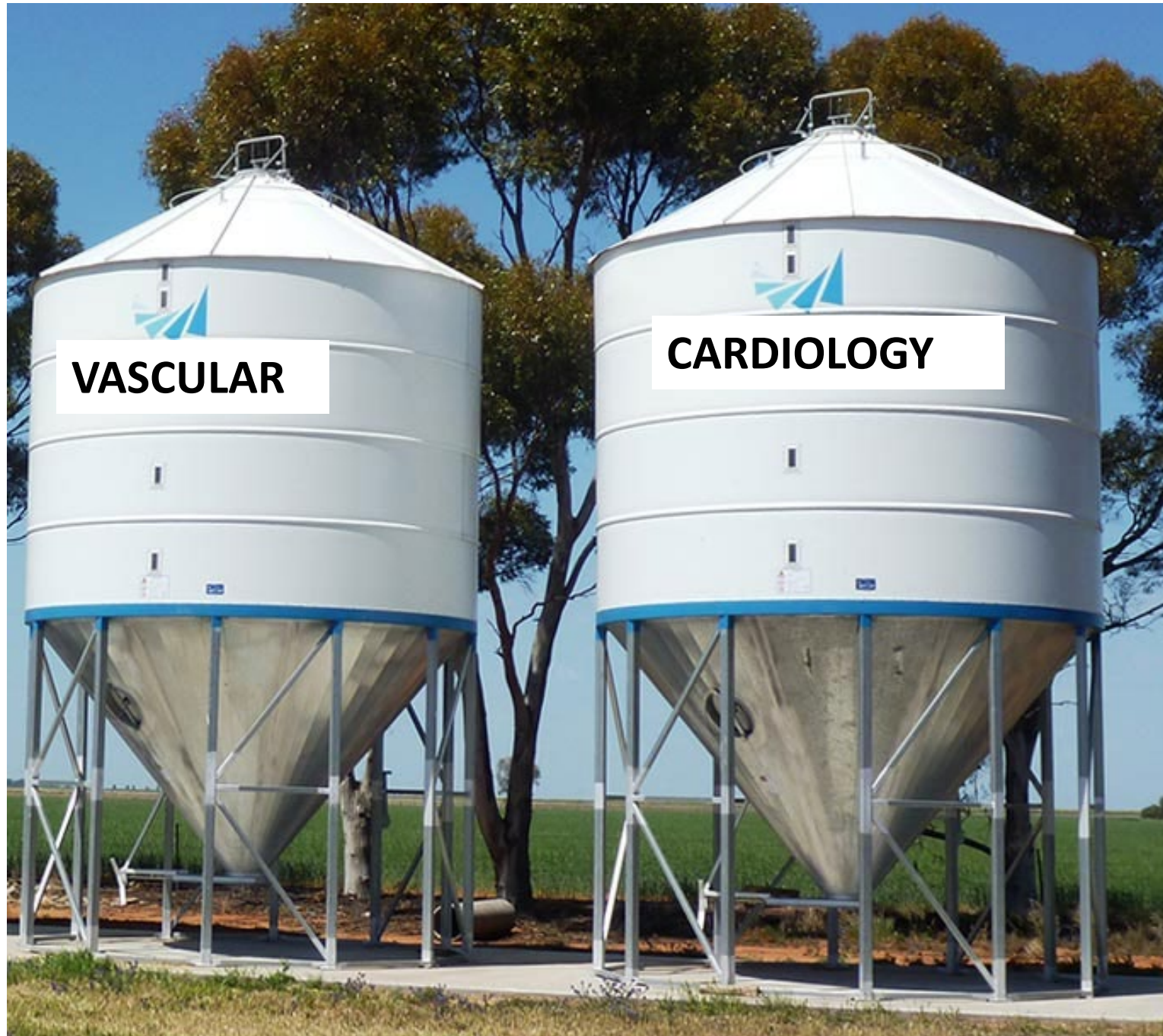


Fig 3. Forest plot of the estimated odds ratios (ORs) for the change in major amputation rates after initiation of multidisciplinary care compared with standard care for 25 of the 33 included studies for which odds ratios could be calculated. *CI*, Confidence interval; *ID*, identifier.



Amputation-Free Survival: Multi-disciplinary care versus Standard wound care





VASCULAR

CARDIOLOGY



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Best **E**ndovascular vs. Best **S**urgical **T**herapy in Patients with **C**ritical **L**imb **I**schemia

Sponsored by the National Heart Lung and Blood Institute



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BEST-CLI Trial at USC



Top 50 Sites

Institution

Enrolle

Keck Medical Center of USC	73
Boston Medical Center	68
University of Massachusetts Medical School	56
Dartmouth Hitchcock Medical Center	44
Mercy Hospital Medical Center - Iowa Heart Center	40
Westchester Medical Center	38
University of Florida - Gainesville	37
Chu de Quebec - St-Francois d' Assise Hospital	34
Yale New Haven Hospital	29
Portland VA Medical Center	29
University of Nebraska Medical Center	28
Prisma Health (was Greenville Memorial Hospital)	27
University of Oklahoma Health Sciences Center	26
Medical College of Wisconsin	26
Gundersen Health System	24
San Francisco VAMC	24
Indiana University Medical School	24
University Hospitals of Cleveland - Case Western Reserve University	24
Brigham and Women's Hospital	24
Helsinki University Hospital - Finland	23



Cardiology

- Combined services
- Vascular Medicine
- Opened doors of Cath Lab
 - Vascular Fellows
 - Technical considerations
- Mutual appreciation
- Research projects



USC CLI Team



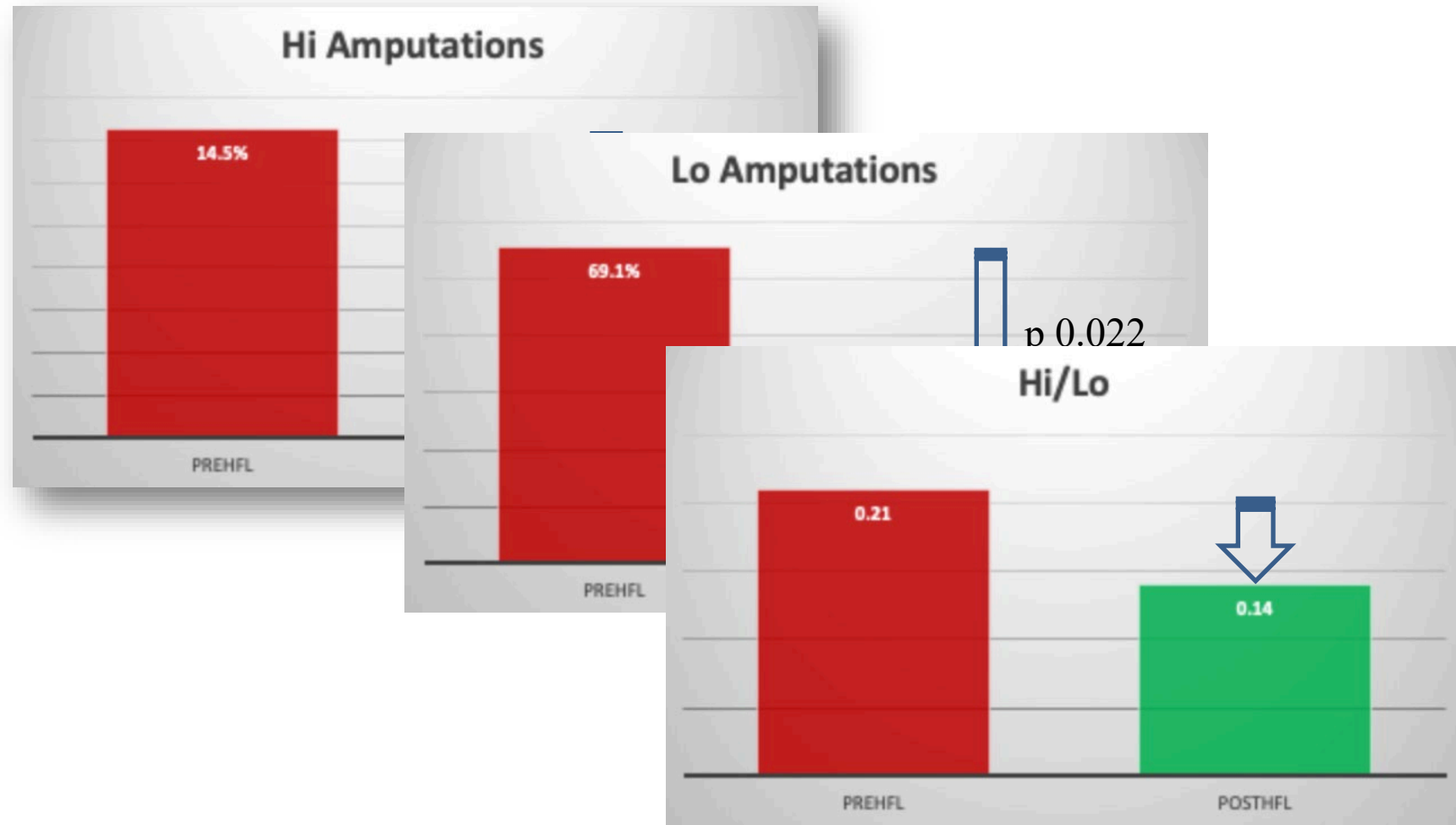
- Vascular Surgeons
- Interventional Cardiologist
- Vascular Medicine
- Nurse Practitioner
- Research Coordinator
- Vascular Surgery Fellows
- Vascular Medicine Fellow

Additional CLI Team Members

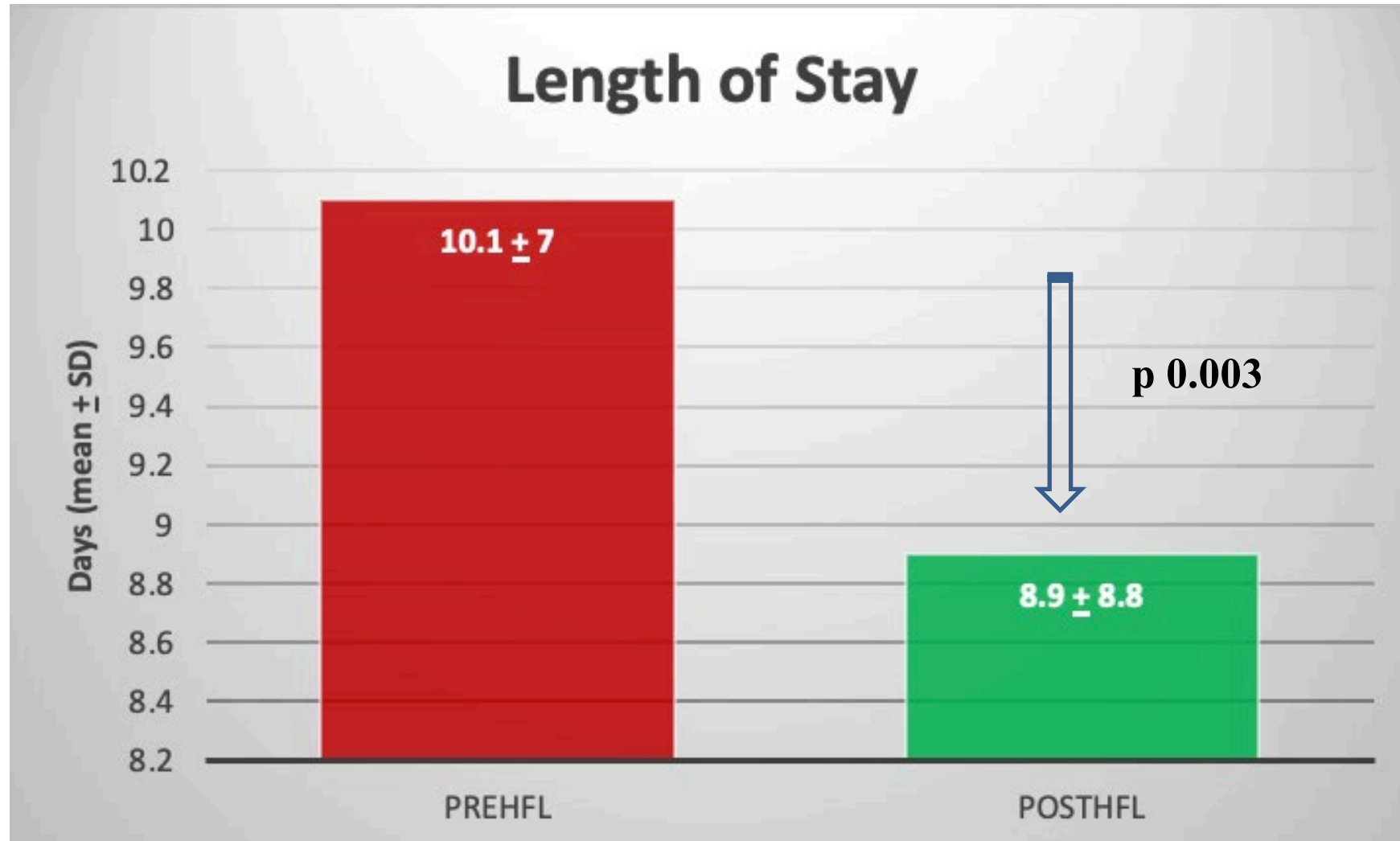


- Podiatry
- Ortho Foot/Ankle
- Plastic Surgery
- Wound Care Team
- Infectious Disease
- Nutrition
- Physical Therapy
- Endocrinology

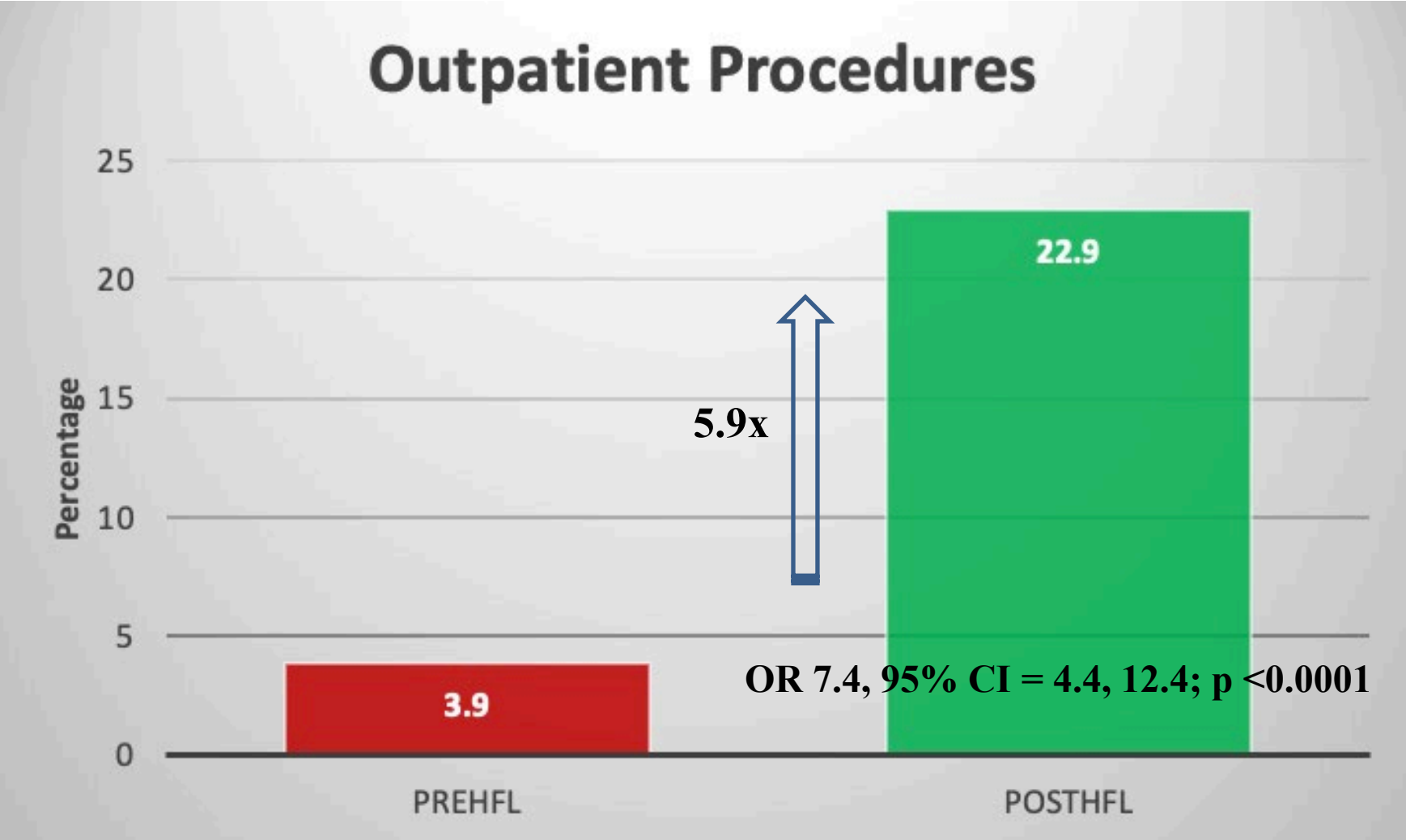
Limb Salvage Team



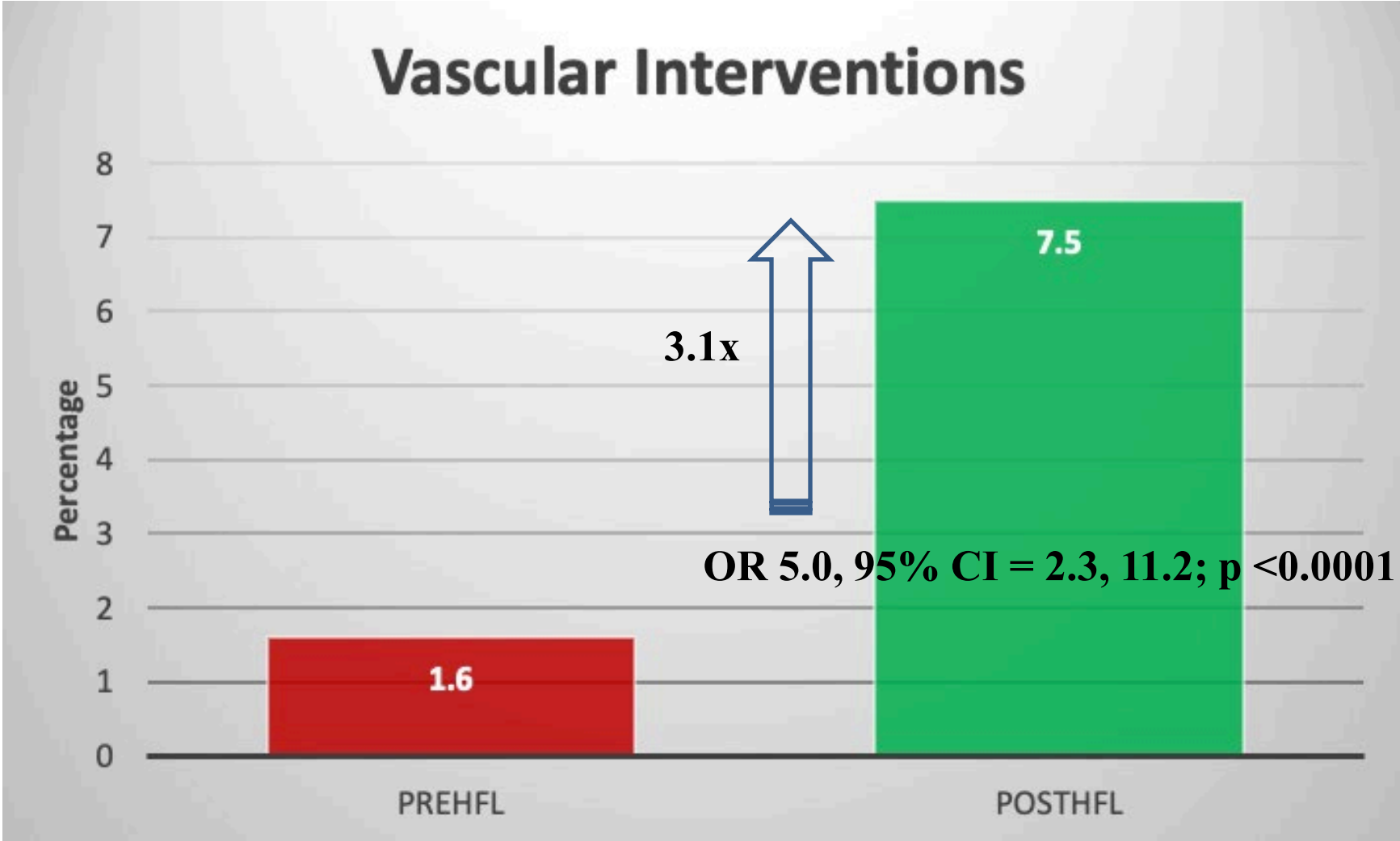
Limb Salvage Team



Limb Salvage Team



Limb Salvage Team



Hot Foot Line

Implementation of a “Hot Foot Line” and Limb Preservation Program:

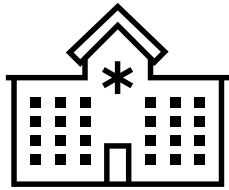
- **Decrease in high-level amputations**
- **Decreased LOS**
- **Increased outpatient** procedures



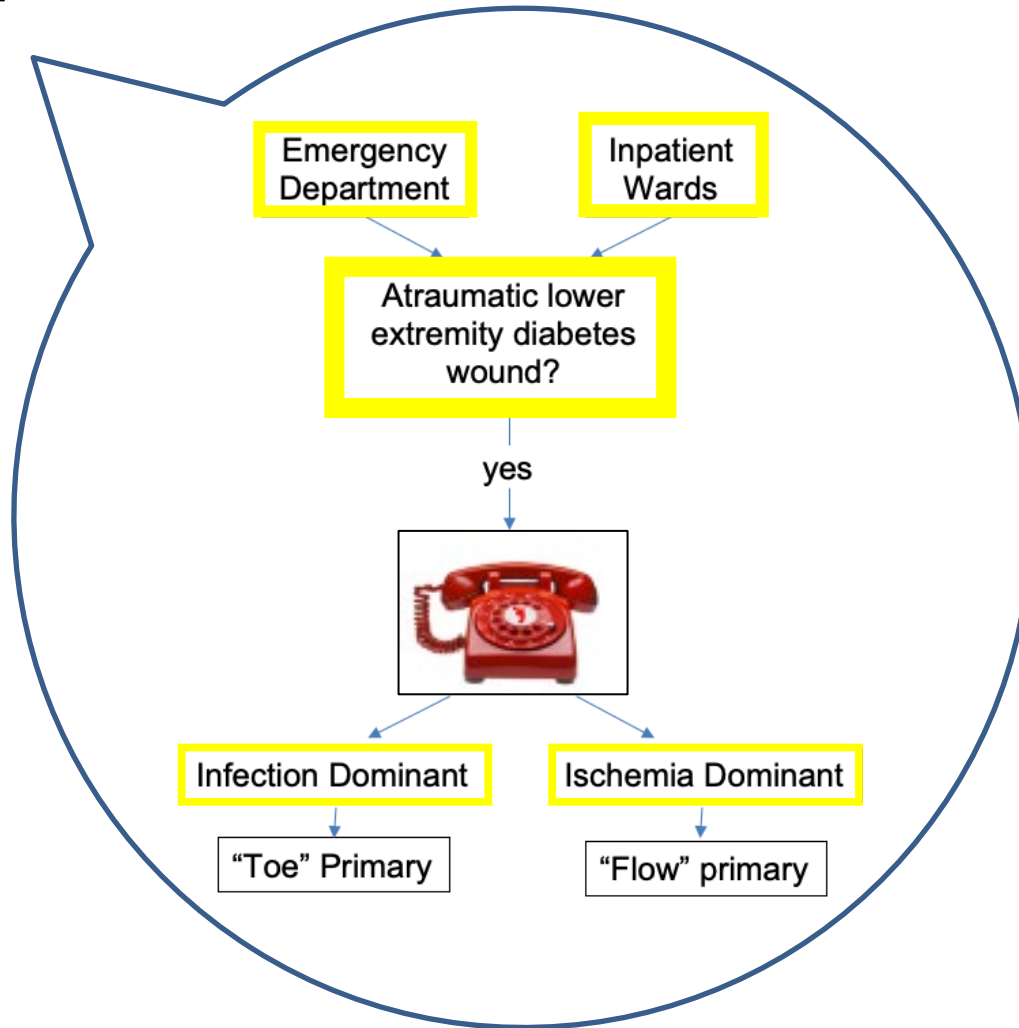
HFL/LPC was associated with:

- **Increased use of noninvasive vascular testing**
- **Increased vascular consultation**
- **Increased revascularization** procedures

Goal



**Hot Foot
Line (HFL)**



Discussion

Limitations

- Accountability for hi amputations done at other facilities
- **Person-power for HFL**

Future Directions

- **Cost effectiveness**
- Patient function, QoL
- Staffing
- **Clinic Space**
- **Operative Time**



Learning Points

- More cases
- Harder Cases



CLINICAL RESEARCH STUDY LOWER EXTREMITY ARTERIAL DISEASE | VOLUME 67, ISSUE 5,
P1455-1462, MAY 01, 2018

The Society for Vascular Surgery Wound, Ischemia, and foot Infection (WIFI) classification system correlates with cost of care for diabetic foot ulcers treated in a multidisciplinary setting

Caitlin W. Hicks, MD, MS • Joseph K. Canner, MHS • Hikmet Karagozlu, MBA • ...

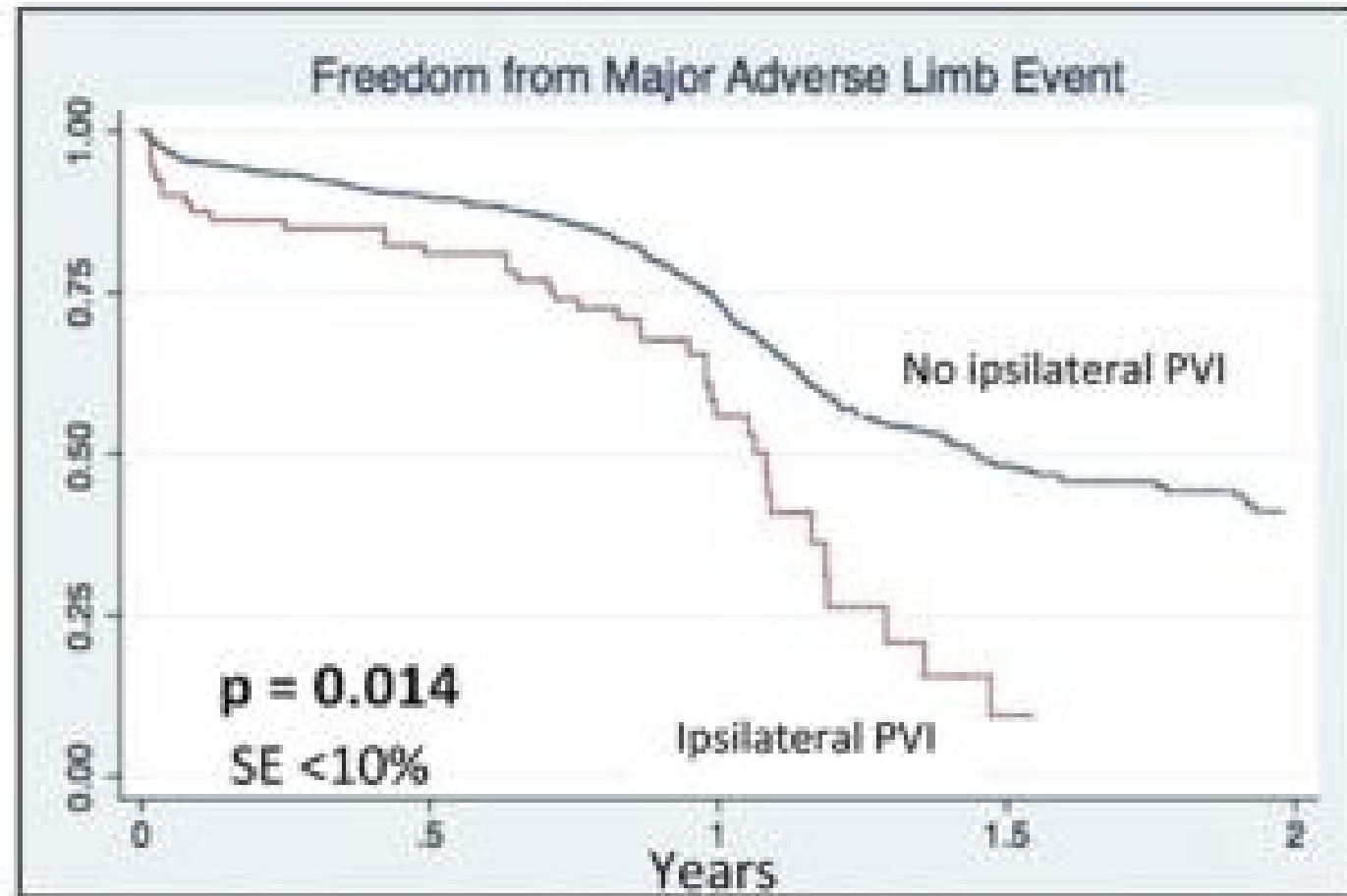
Ronald L. Sherman, DPM, MBA • James H. Black III, MD • Christopher J. Abularrage, MD   •

Show all authors

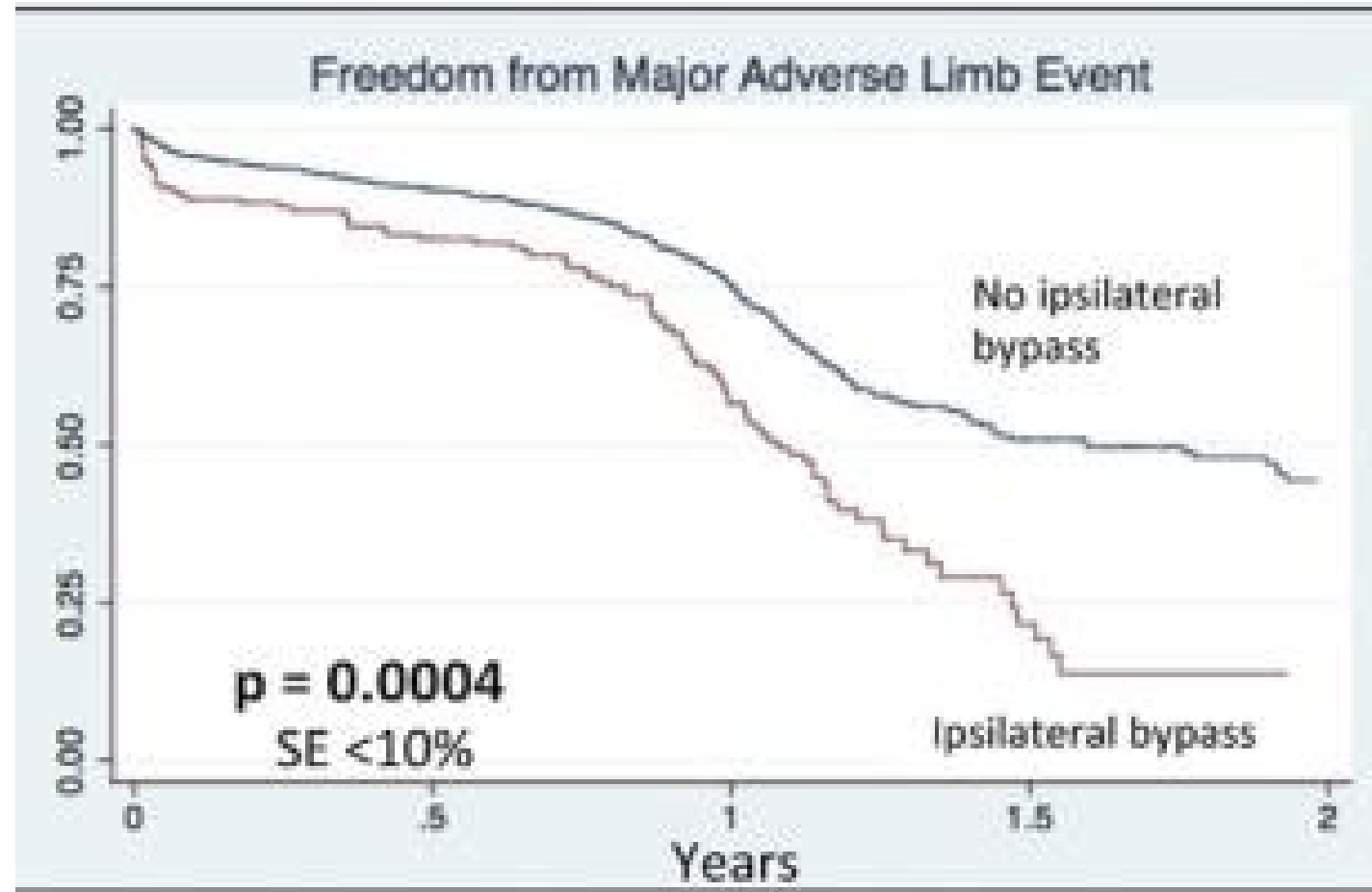
- Increasing WIFI stage prolonged time to healing
- Required more surgical procedures
- Increased cost of care



Prior failed ipsilateral percutaneous endovascular intervention in patients with critical limb ischemia predicts poor outcome after lower extremity bypass



Prior failed ipsilateral percutaneous endovascular intervention in patients with critical limb ischemia predicts poor outcome after lower extremity bypass



Learning Points

- More cases
- Harder Cases
- Release control/Trust
 - Wound Care
 - Partial amputations
 - Flaps
 - Outcomes

A.T.S.

- 57 year old landscaper presented with blister on heel
- HTN, DM, elevated cholesterol
- No pedal pulses
- Told needed AKA
- Presented for second opinion



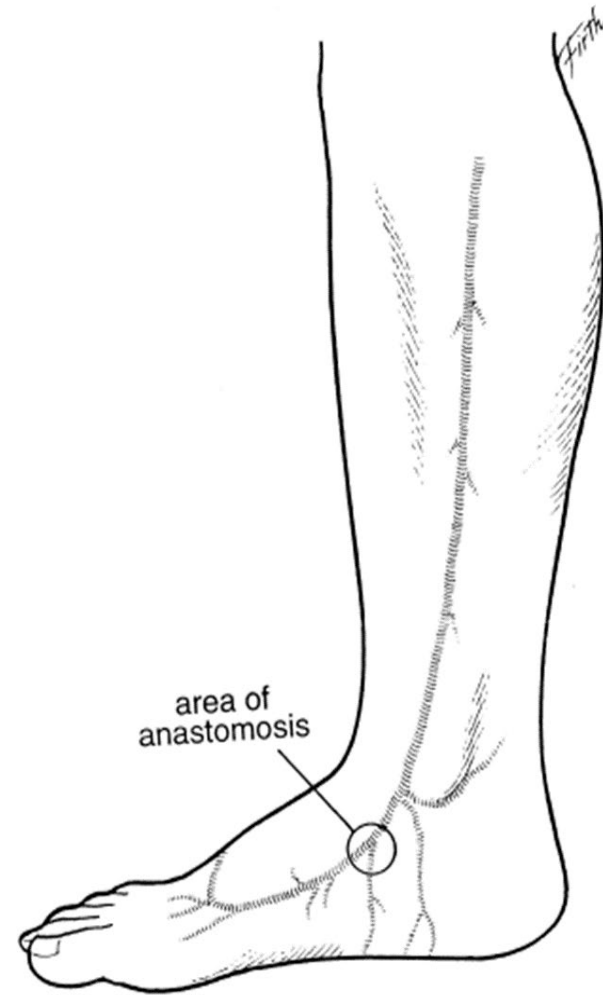






Technique

- Proximal saphenous vein
- Venous arch/Hallux tributary
- Valve lysis (direct, dilators, Fogarty catheters)
- Guide-wire
- Ten centimeters



Mechanism



- Increased venous hypertension
- Retrograde perfusion to nutrient vessels
- Increase tissue oxygenation
- Angiogenesis

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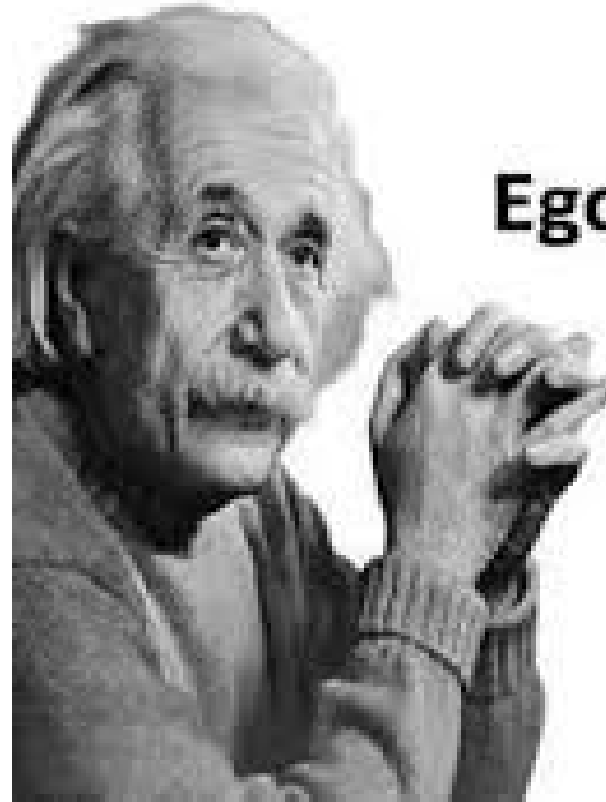


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Learning Points

- More cases
- Harder Cases
- Release control/Trust
 - Wound Care
 - Partial amputations
 - Flaps
 - Outcomes
- **Release EGO!!!**



$$\text{Ego} = \frac{1}{\text{Knowledge}}$$

*"More the Knowledge
Lesser the Ego,
Lesser the Knowledge
More the Ego..."*

-Albert Einstein.



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Conclusion

- Multidisciplinary approach to Limb Salvage is beneficial
 - Amputation rates
 - Length of Stay
 - Outside of CLTI
- Finances will require more research
- Intangibles of growth, especially with the surgeon

