Norfolk and Norwich University Hospitals NHS
NHS Foundation Trust

Can a Good Diabetes Foot Service Reduce Amputations?

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Let's Get to the End First

Can a Good Diabetes Foot Service Reduce Amputations?

Yes …….(BUT)

Timeline

Maurice J Lewi MD founds the New York College of Podiatric Medicine

Joslin sets up one of the worlds first hospital diabetic foot clinic at the New England Deaconess Hospital

The term 'chiropody' is changed to 'podiatry'

F William Wagner in LA leads an MDT and develops the Wagner-Meggitt classification and Foot clinic at King's set up by Mike Edmonds

1st Malvern Foot conference

1987 Lawrence Harkless chair of the first ADA Council on foot care

1032 distal bypasses presented at SVS 2002 with highly beneficial outcomes – prompts George Andros to say "I am absolutely drunk with delight…the most important diabetic vascular paper in 30-plus years"

1989 St Vincent declaration

1911

1922

1928

1957

1981

1986

2002

2018

?

Diabetes related foot disease almost universally fatal

In 1925, Joslin reports that a reduction in deaths from diabetic coma from 60% to 5%

1931

RD Lawrence starts the King's diabetes clinic

1949

Vascular surgery for the preservation of the diabetic foot starts at NEDH

1965

Paul Brand sets up a clinic in Louisiana. The importance of neuropathy increases

1984-90

Dedicated vascular unit set up at NEDH and interventional radiology begins enabling ultradistal revascularisation Over 1000 distal bypasses performed over the next 10 years

1991

First Noordwijkerhout meeting with first International Consensus on the Diabetic Foot from the IWGDF produced in 1999

Sanders JL et al J Vasc Surg 2010;52:3S-16S

Epidemiology

- 7,000 lower limb amputations per year in England
- Foot disease costs £972M-1.13B (~£1 in every £150 spent in the NHS)
- Amputation is associated with poorer QoL and higher mortailty
- Inpatient care costs £44M per year, with post-amputation care costing a further £21M

Kerr M https://www.diabetes.org.uk/professionals/resources/shared-practice/footcare Last accessed 1/5/18
Graz H et al Diab Res Clin Pract 2018;135:158-165

What Does NICE Say?

The presence of multidisciplinary care with a well-designed team reduces rates of amputation and the length of hospital stay.

https://www.nice.org.uk/guidance/ng19 Last accessed 1/5/18

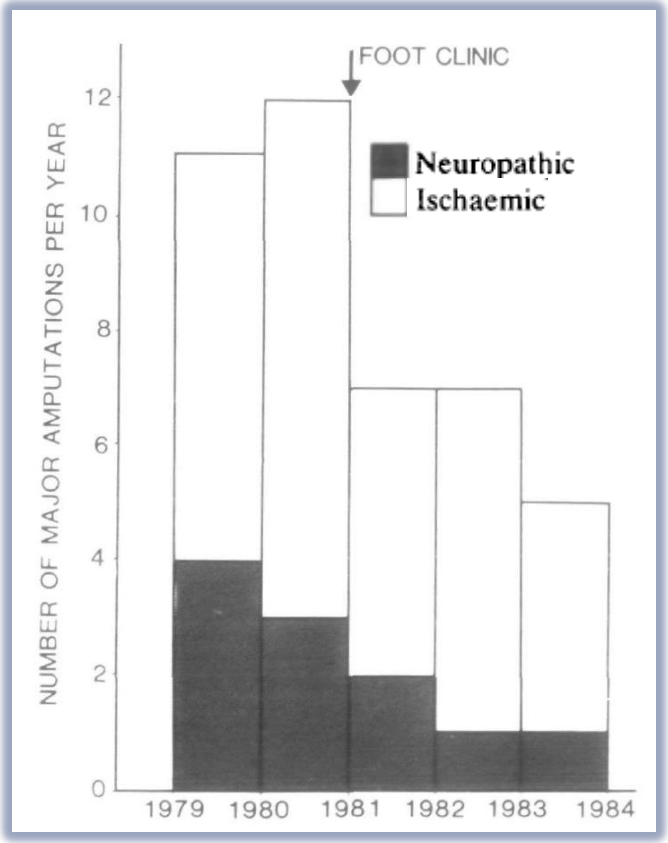
Let's Talk About Evidence

- Foot disease has remained the most common cause for a 'diabetes specific' acute hospital admission for >50 years

	2010	2011	2012	2013	2015
Foot disease	44.3%	47.1%	45.2%	47.2%	49.5%
Hypoglycaemia	20.4%	16.1%	16.4%	17.7%	14.7%
Hyperglycaemia	17.3%	18.0%	18.3%	15.8%	15.8%
HHS	5.3%	5.5%	6.3%	4.7%	4.6%
DKA	12.7%	13.2%	13.7%	14.7%	15.3%

Malins JM. Clinical diabetes mellitus. London. Eyre and Spottiswoode. 1968
NaDIA 2016 - https://digital.nhs.uk/catalogue/PUB23539 (Last accessed 1/5/18)

King's Data from 1979-1984



- For the first time, the clinic brought together a podiatrist, nurse, shoe-fitter, physician and surgeon
- Separate clinics for neuropathic ulcers and ischaemic ulcers
- Holistic approach
  - Intensive chiropody
  - Sepsis control
  - Provision of foot wear
  - Treatment of oedema
  - Pain relief
  - Education
  - Vascular investigation
  - Smoking cessation

Edmonds ME et al QJM 1986;60(2):763-771

Or Ipswich 1995 - 2005

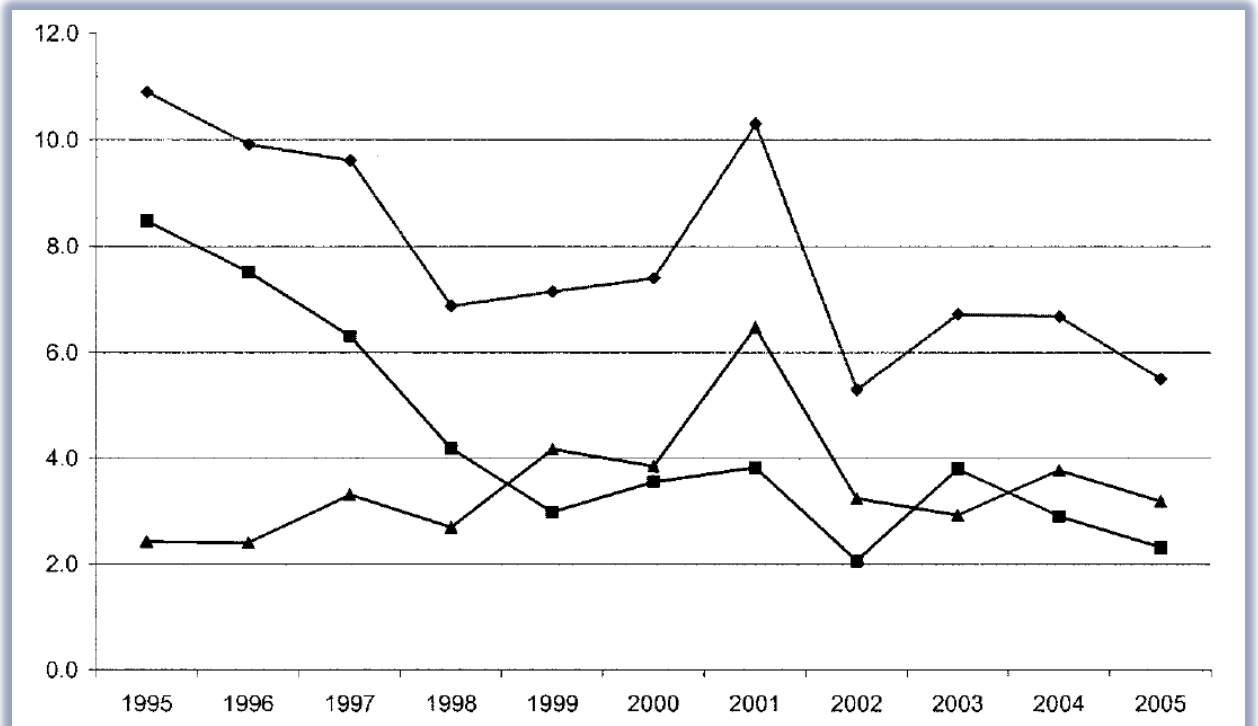


Figure 1—*Changes in amputation rates expressed per 100,000 of the general population for total (◆), major (■), and minor (▲) amputations.*

- Twice weekly ward rounds by a DSN or podiatrist
- Benefits likely to be due to 'Improvements in vascular, radiological and microbiological services, and in multidisciplinary working'

Krishnan S et al Diabetes Care 2008;31(1):99-101

There Are Several Other Examples

Reduction of Lower Extrem
Patients with Non–Insulin-D

Reducing Amputation Rates in Patients

Decreasing In
Amputation in

Reduced Incidence of Lower-Limb
Am
a G

Decreasing amputation rates in patients with diabetes—a population-based study

Amputation Pre
Surgery and P

Reduced Incidence of Lower-Extremity
Amput

Decreasing incidence of

P. Holstein[1], N. Ellitsgaard[2], B. Bornefeldt

Reduction in I
Lower-Extremi
Netherlands: 19

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A

José Ant
Sara Jim
Carmen
Fernand
and Julia

WILLIAM H
JAN A. RAU
DIRK RUWA

Reducing major lower extremity amputations after the introduction of a multidisciplinary team in patient with diabetes foot ulcer

Chuan Wang[1], Lifang Mai[1], Chuan Yang[1], Dan Liu[1], Kan Sun[1], Weidong Song[2], Baoming Luo[3], Yan Li[1], Mingtong Xu[1], Shaoling Zhang[1], Fangping Li[1], Meng Ren[1] and Li Yan[1*]

BMC Endocrine Disorders (2016) 16:38

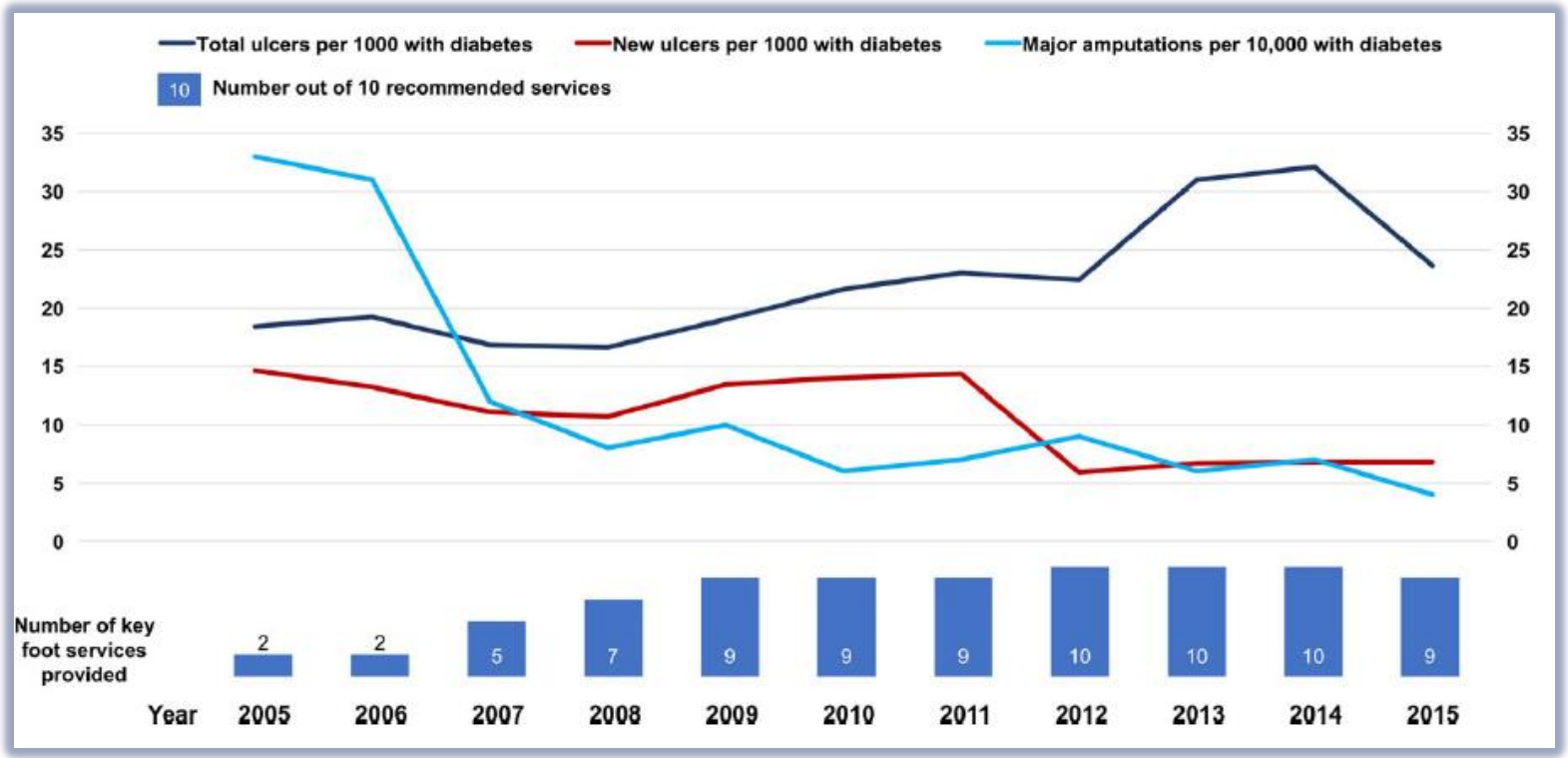
Most Recently

Diabetes-related major lower limb amputation incidence is strongly related to diabetic foot service provision and improves with enhancement of services: peer review of the South-West of England

R. B. Paisey[1], A. Abbott[2], R. Levenson[3], A. Harrington[4], D. Browne[5], J. Moore[3], M. Bamford[3], and M. Roe[3] on behalf of the South-West Cardiovascular Strategic Clinical Network peer diabetic foot service review team

Diabet. Med. 35, 53–62 (2018)

Peer Review and Education

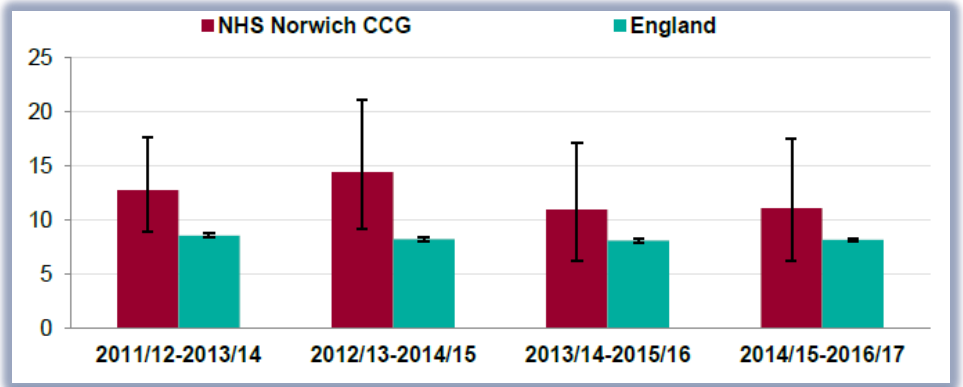


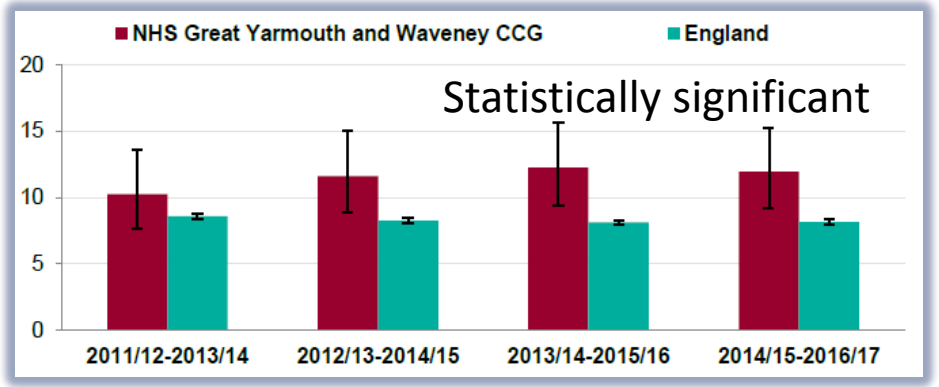
Paisey RB et al Diabet Med 2018;35(1):53-62

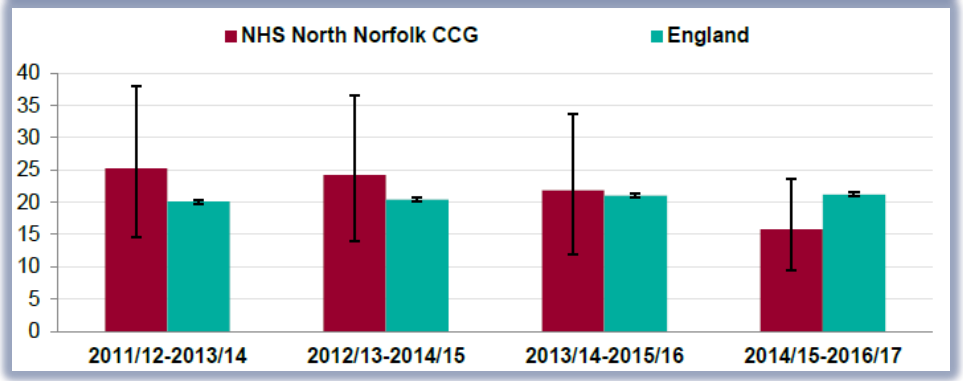
The MDT Foot Service in Norwich

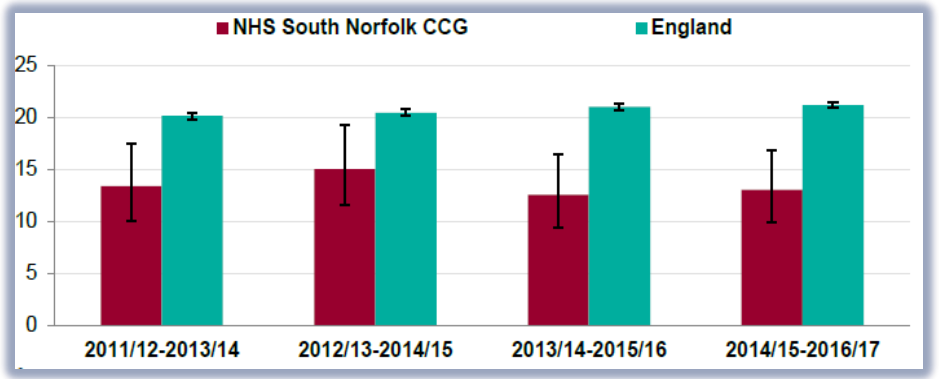
- 1 medical foot clinic per week (with access to me at all other times)
- 1 vascular foot clinic per week
- 1 orthopaedic foot clinic every other week
- Same day referral service (mostly)
- Weekly MDT inpatient foot ward round
- Daily podiatry inpatient ward round
- Weekly orthotist clinic
- 2 podiatry rooms running 8.30am – 5.30pm daily

Amputation Data From Our Four CCG's 2010-17









Directly standardised rate per 10,000 people with diabetes

https://fingertips.phe.org.uk/profile/diabetes-ft/area-search-results/E39000031?search_type=list-child-areas&place_name=East Accessed 2nd May 2018

Are We Therefore a Suboptimal Service?

Orthopaedic surgeons x 2

Podiatrists x 6

Vascular surgeons x 2

Diabetes doctor x 1

Orthotist x 1

Health Care Assistants x 2

Admin team x 2

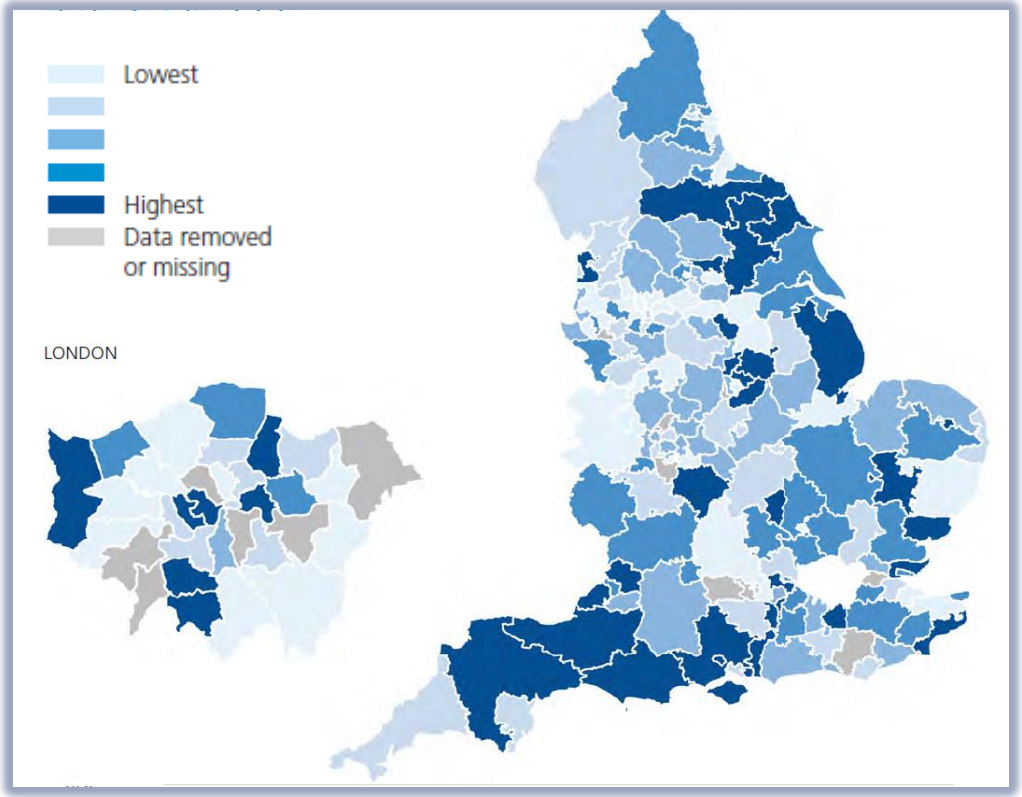
Research administrator x 1

Microbiologist x 1

Statistician x 1

Amputation specialist nurse x 1

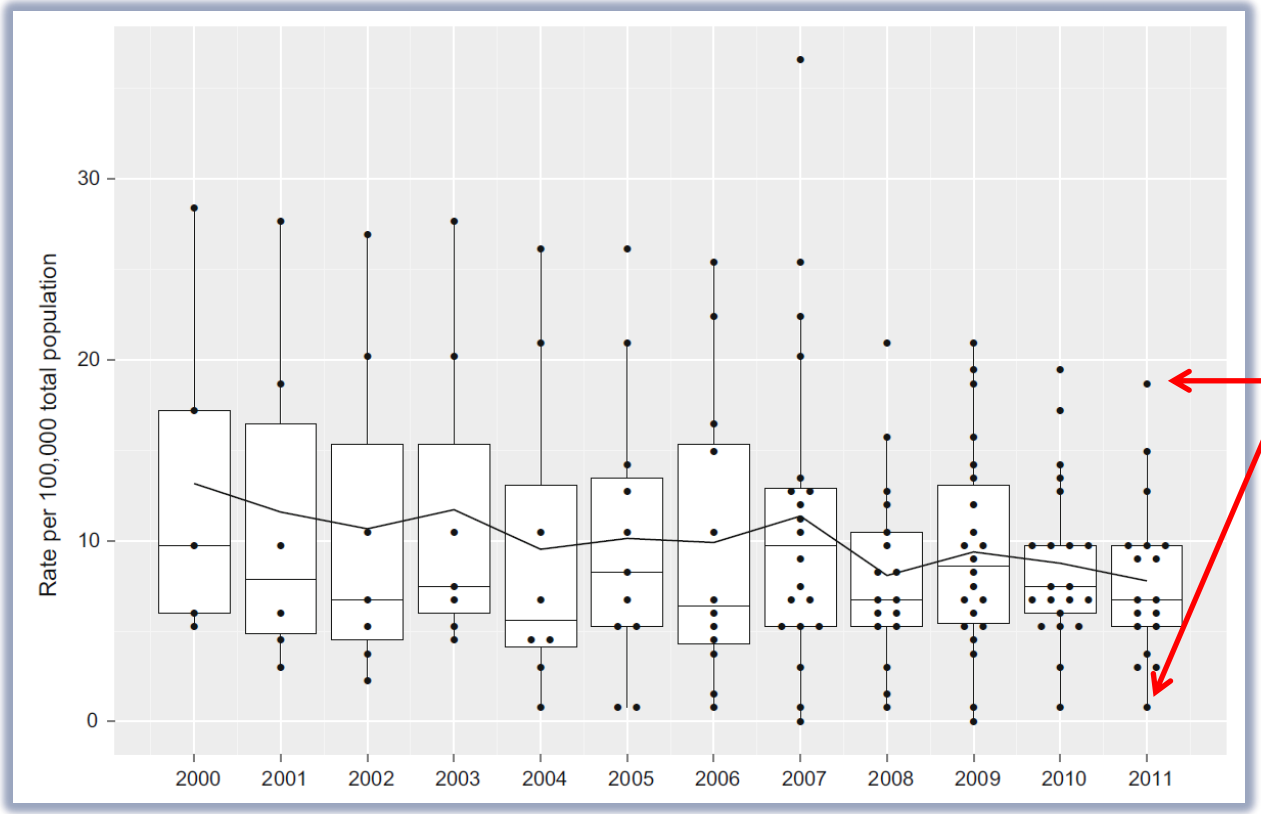
Variation Across the UK - 2015



Variation across the UK is 3.9 fold between the highest and lowest

Public Health England 2016 http://fingertips.phe.org.uk/documents/Atlas_2015%20Compendium.pdf
Last accessed 1/5/18

Amputations Rates Across the OECD



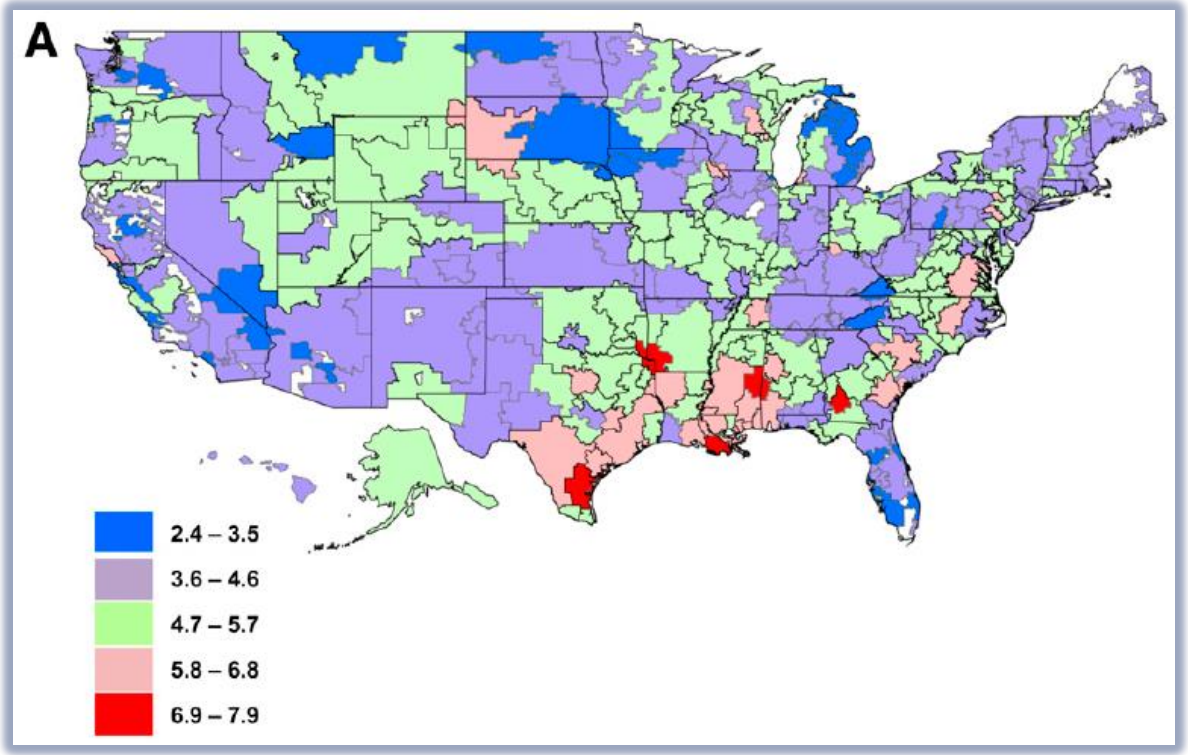
Across the 26 countries, there was a 40% decline in amputation rates

There was a huge variation – 18.4 vs 1.1 per 100,000 population (Germany vs Hungary)

These data equate to 216 amputations per day (1 every 7 mins)

Carinci F et al Acta Diabetol 2016;53(5):825-832

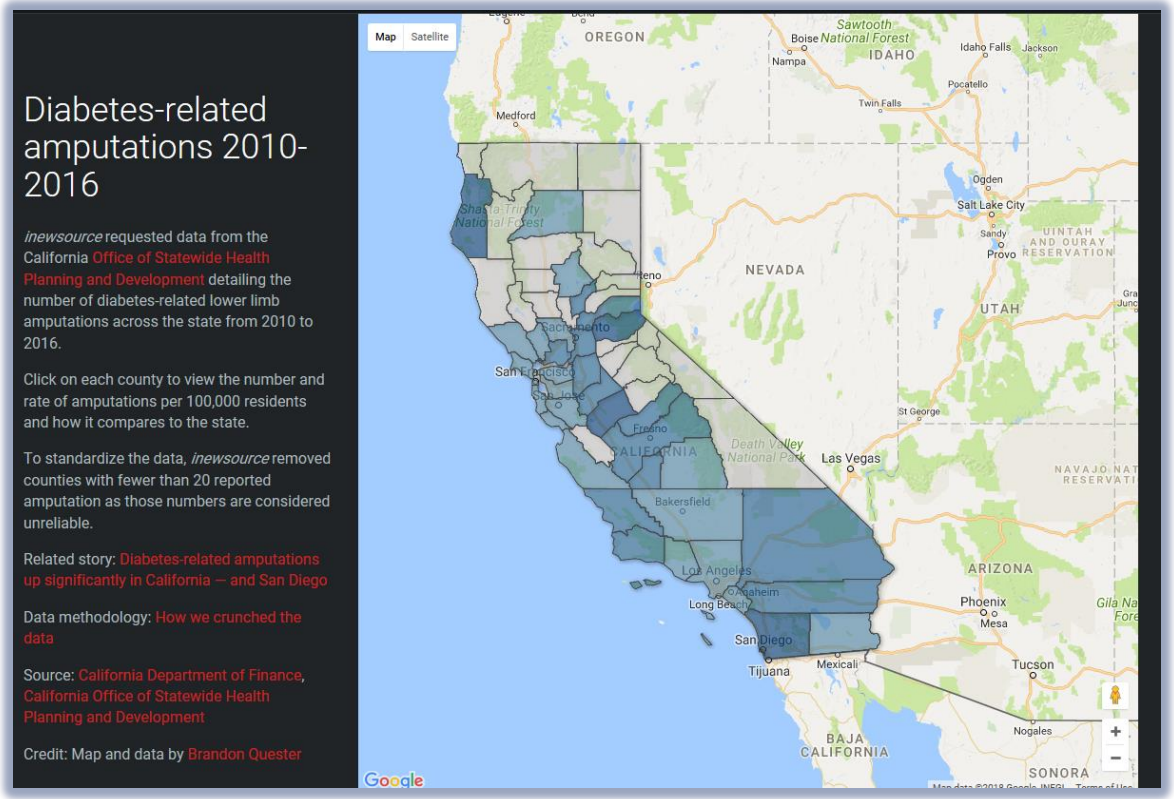
The Variation Across the US



Incidence of LEA per 1000 people on Medicare with diabetes by hospital referral region

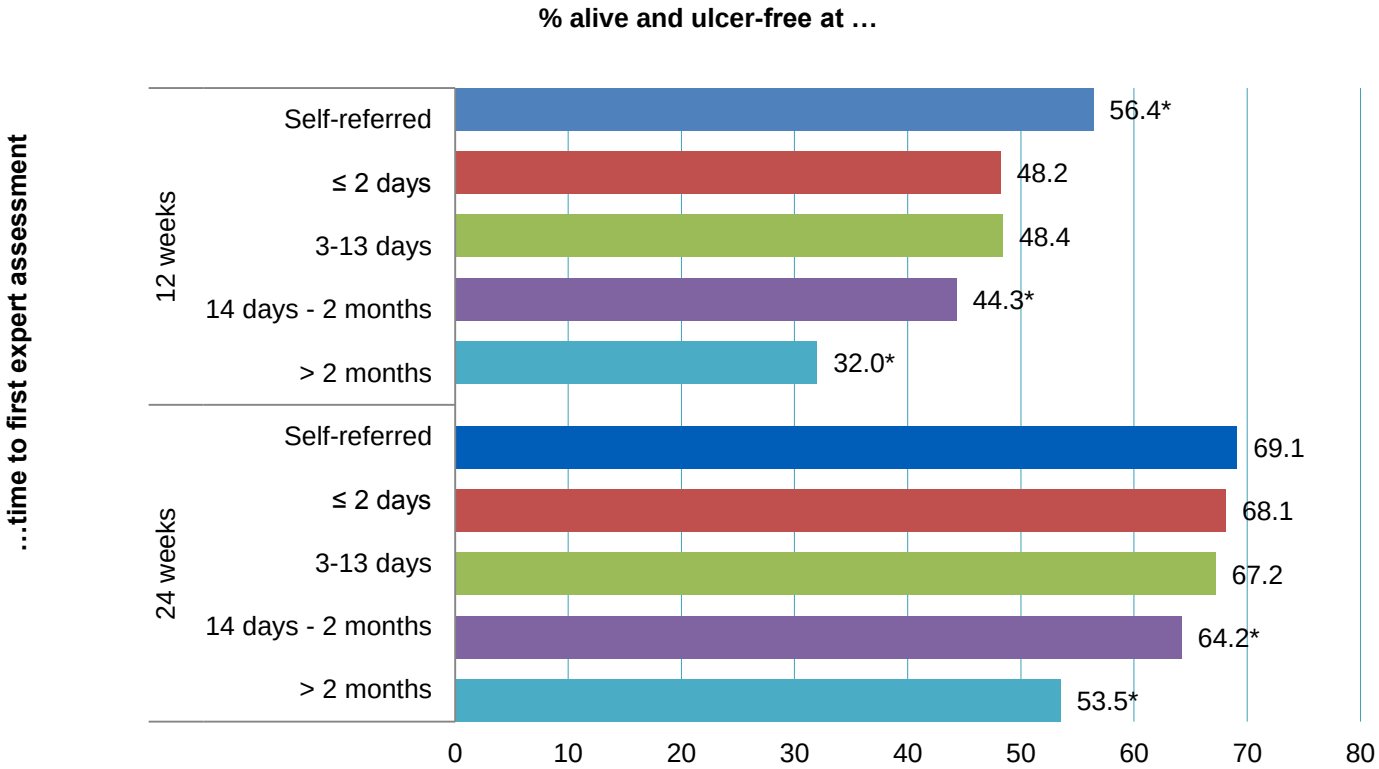
Margolis DJ et al Diabetes Care 2011;34(11):2363-2367

Even Within States



https://data.inewsource.org/interactives/diabetes-related-amputations-2010-2016/ Last accessed 1/5/18

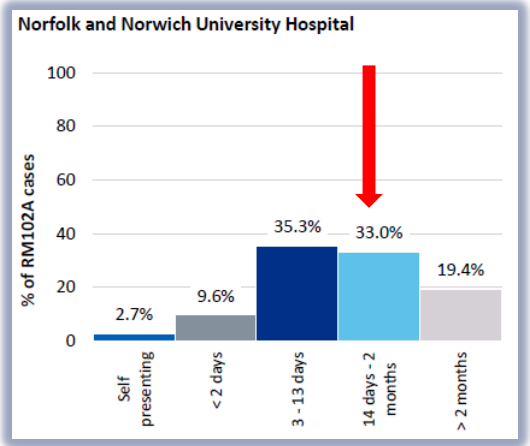
Maybe it is to do with Primary Care?

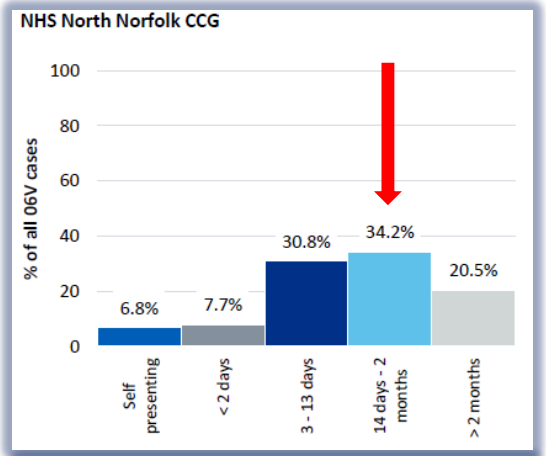


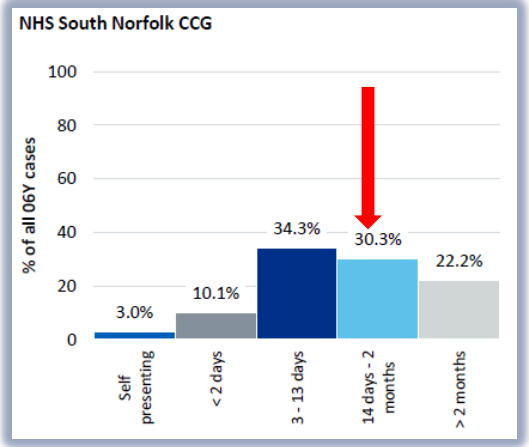
People who have an expert assessment of their ulcer **within two weeks** of their first presentation to an HCP are **more likely** to be alive and ulcer-free than those seen later

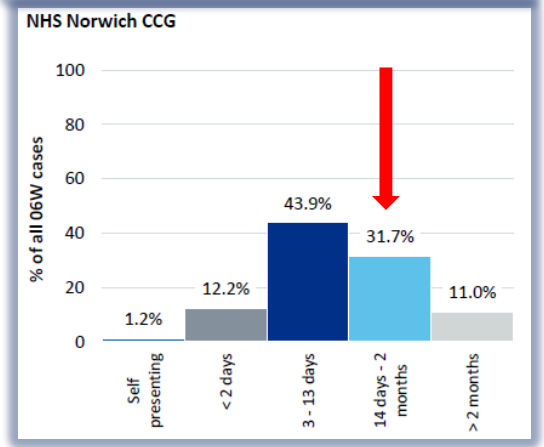
National Diabetes Foot Care Audit - 2014-2016. http://www.content.digital.nhs.uk/catalogue/PUB23525 Last accessed 1/5/18

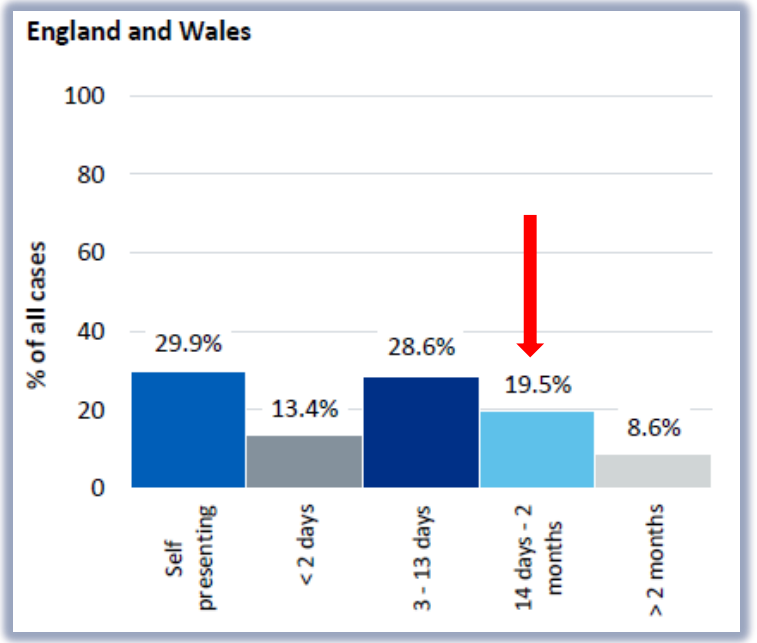
Back to My Service – Time to Assessment 2014-16









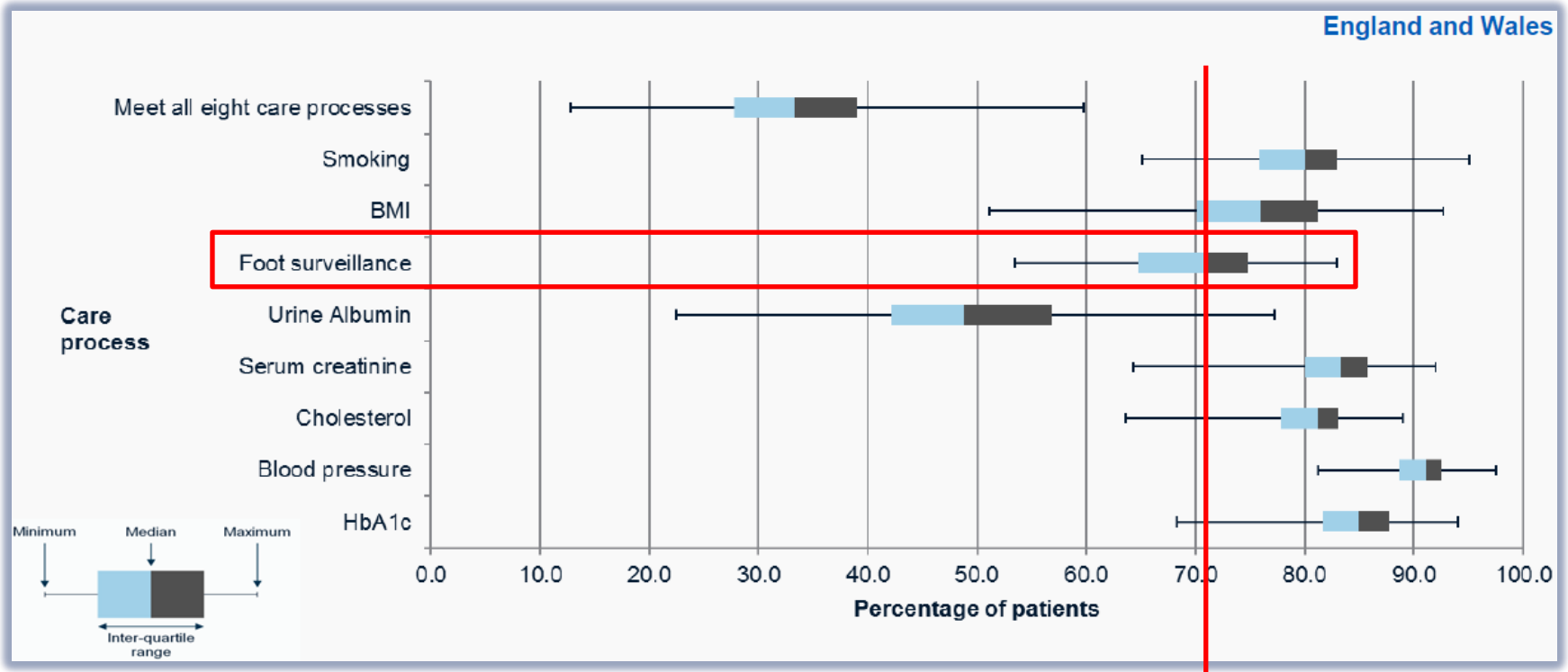


Primary Care

- Substantial variations in recording of foot examinations across CCG's examination (68%-94%) but also variations with age and type of diabetes
  - Overall 87% T2DM vs 72% T1DM
  - In those <40 years old 74% T2DM vs 60% T1DM
- Secondary care outcomes are only as good as primary care referrals?
- Maybe it is about patient education – which is predominantly provided by primary care

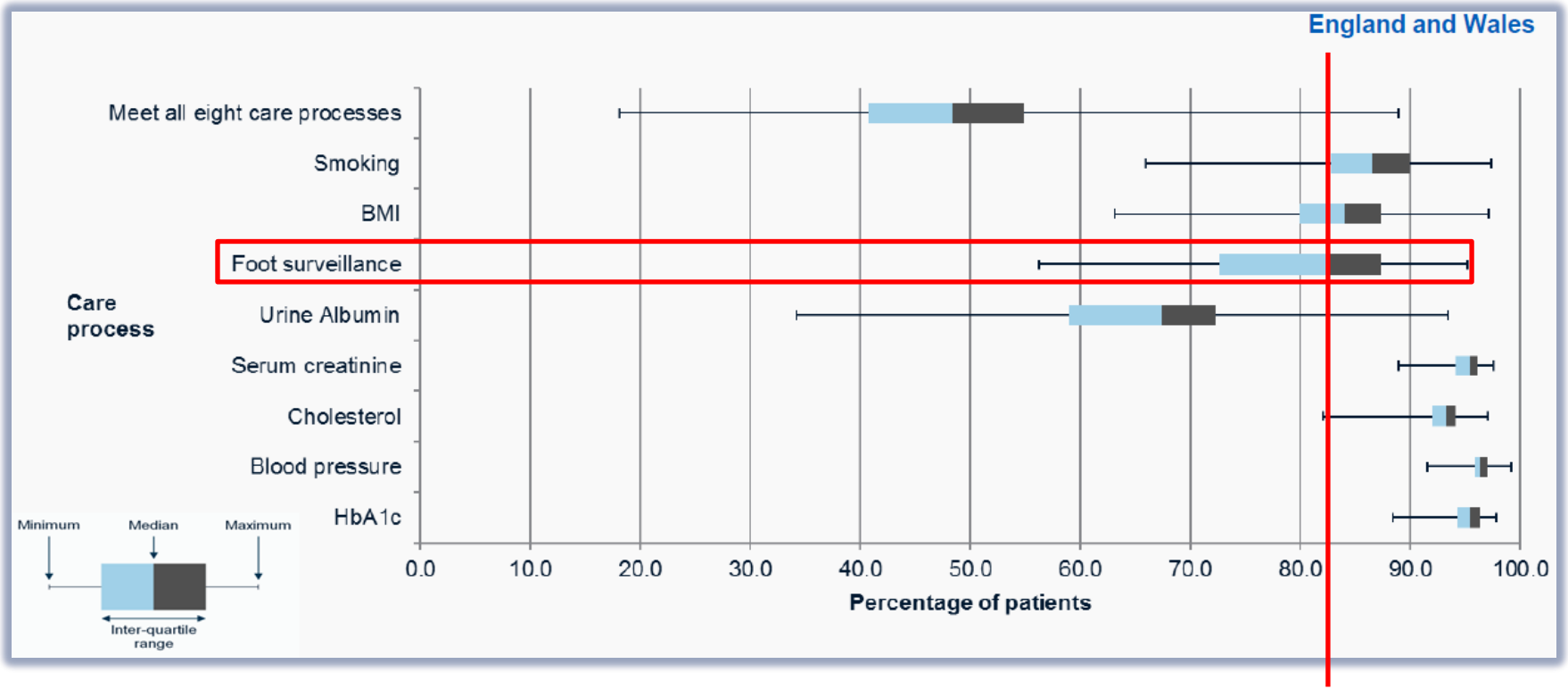
Kerr M https://www.diabetes.org.uk/professionals/resources/shared-practice/footcare Last accessed 1/5/18
National Diabetes Audit 2017 https://digital.nhs.uk/catalogue/PUB30247 Last accessed 1/5/18

Care Processes – Type 1



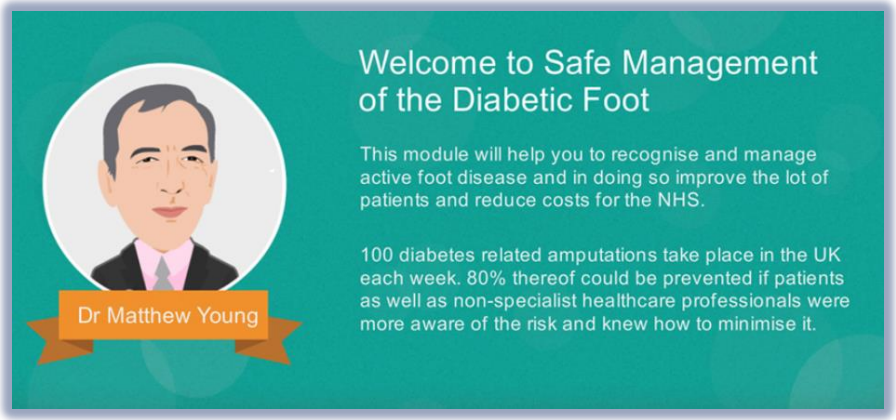
National Diabetes Audit 2017 https://digital.nhs.uk/catalogue/PUB30247 Last accessed 1/5/18

Care Processes – Type 2

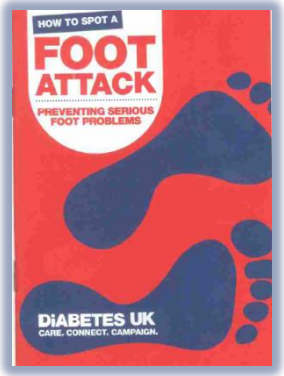


National Diabetes Audit 2017 https://digital.nhs.uk/catalogue/PUB30247 Last accessed 1/5/18

Ways to Help?



mydiabetes*myway
...the interactive diabetes website



Prevention - avoid foot injury NHS

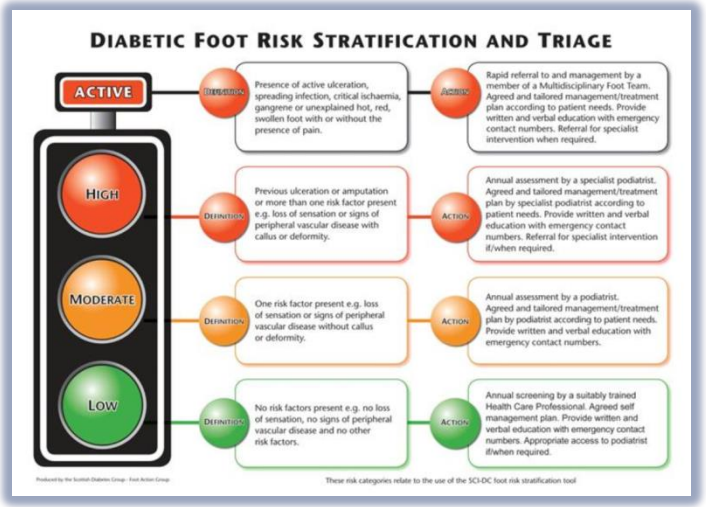
- Do not walk bare footed
- Have your shoes properly fitted
- Always check your shoes for sharp objects such as tacks or stones
- Prevent burns by not warming your feet on a radiator or hot-water bottle, and always check bath temperature with your hands
- Inspect your feet daily for cuts, bruises and infection

If you go into hospital for *any* reason -

- Your feet must be examined on admission
- Your feet must be protected as your risk of heel ulcers is increased
- Contact the Diabetes Team or PALS service if problems arise

If on admission you have a foot problem e.g. ulcer, fracture, infection

- Tell the admitting doctor/nurse so it can be immediately inspected
- You must be seen by the Diabetes Foot Team (diabetes doctor or podiatrist) within 24 hrs - **Ask to be referred showing this card**



The Vascular Society and Then Back to NICE

Service Design

Effective care requires multidisciplinary team working between professionals in different specialties and, in some cases, in different hospitals or across primary and secondary care.

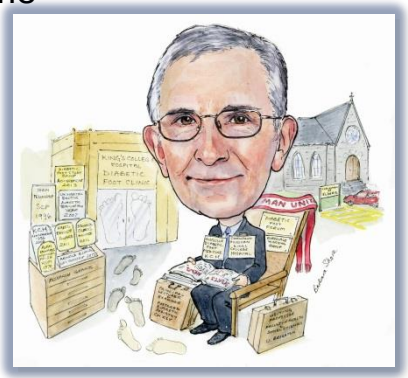
The presence of multidisciplinary care with a well-designed team reduces rates of amputation and the length of hospital stay.

A culture of sharing of information, skills and abilities will be created by integrating the multidisciplinary foot care service with other services responsible for caring for people at risk of, or with, diabetic foot problems. This could lead to people with diabetes becoming better informed, having faster access to treatment, and fewer mistakes being made.

https://www.vascularsociety.org.uk/_userfiles/pages/files/Resources/030416%20DiabeticFoot%20FINAL%20pdf.pdf
https://www.nice.org.uk/guidance/ng19 Last accessed 1/5/18

The 10 Foot Commandments

1. I am thy foot forever. Take good care of me, for thou shalt have no foot other than me
2. Thou shalt regularly debride me, when I develop callosities and ulcers
3. Thou shalt fit me with casts and insoles to offload my high pressure areas
4. Thou shalt carefully look for early signs of infection in me and treat it aggressively



5. Thou shalt diagnose ischaemia without delay and revascularise me
6. Thou shalt educate all patients how to examine me and take care of me
7. Thou shalt carefully inspect the shoes that I have to wear and encourage the use of appropriate footwear
8. Thou shalt continuously aim to achieve tighter blood glucose control for me
9. Thou shalt not commit amputation on me, unless there is a compelling reason
10. Thou shalt not covet thy neighbour's amputation rates, but try to improve yours

Papanas, Edmonds et al BMJ 2005;331(7531):1497

The 10 Foot Commandments (Version 2)

1. I am thy foot forever. Take good care of me, for thou shalt have no foot other than me
2. Thou shalt regularly debride me, when I develop callosities and ulcers
3. Thou shalt fit me with casts and insoles to offload my high pressure areas
4. Thou shalt carefully look for early signs of infection in me and treat it aggressively and refer urgently to a specialist team as soon as problems arise
5. Thou shalt diagnose ischaemia without delay and revascularise me (endovascularly if possible)
6. Thou shalt educate all patients and HCPs how to examine me and take care of me and know when to refer
7. Thou shalt carefully inspect the shoes that I have to wear and encourage the use of appropriate footwear
8. Thou shalt continuously aim to achieve tighter blood glucose, blood pressure and lipid control for me
9. Thou shalt not commit MAJOR amputation on me, unless there is a compelling reason
10. Thou shalt not covet thy neighbour's amputation rates, but try to improve yours

Papanas, Edmonds et al BMJ 2005;331(7531):1497

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