Saving Limbs, Saving Lives:

A Call to Action to Reduce Inequalities in Lower Limb Amputation Rates

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ALL-PARTY PARLIAMENTARY GROUP ON VASCULAR AND VENOUS DISEASE

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Introduction

Derek Thomas MP, Chair of The All-Party Parliamentary Group on Vascular and Venous Disease

The All-Party Parliamentary Group on Vascular and Venous Disease was established to raise awareness of vascular and venous disease and to encourage actions to promote a greater priority for prevention, early detection and best treatment for these conditions.

A particular focus of the Group over several Parliaments has been looking at ways to reduce unnecessary lower limb amputations and associated early death related to Peripheral Arterial Disease (PAD).

The Group has been working to raise awareness of PAD within the general public and clinical community, promoting the benefits of better prevention, early identification and treatment. Through greater awareness of this condition we have seen the trend of major lower limb amputations decreasing, thereby improving patients' lives.[1] This is a major success, a change we should be proud of, and continue to ensure this trend endures.

However, in recent years the number of minor lower limb amputations has grown, showing there is still work to be done. Not only has this number grown, but new data has highlighted vast inequalities between certain groups and their likelihood of having a lower limb amputation.

New understanding of the data highlights a worrying regional, gender and ethnic divide which impacts on lower limb amputation rates. Furthermore, there is a lack in equality of access to treatment for sufferers of PAD who do not have a co-existing diagnosis of diabetes. These inequalities are unacceptable and must be addressed.

I would like to call on my parliamentary colleagues, the general public, the clinical community across medical, nursing and allied health professionals as well as special interest groups to work together to tackle these inequalities, and improve patient care. I hope by understanding these inequalities better, as this report seeks to do, we can take steps to overcome them.

Photographs courtesy of Parliament.uk

1. Ahmad N, et al. The prevalence of major lower limb amputation in the diabetic and non-diabetic population of England 2003-2013. Diab Vasc Dis Res. 2016 Sep;13(5):348-53

The National Amputation and Ulcer Challenge

Tackling amputation rates in the UK is a major healthcare challenge. Not least because every hour, in England, someone over 50 has a minor (partial foot) amputation. Every two hours someone loses their whole leg. These are life changing events which increase a patient's chance of further co-morbidities, a drastically reduced quality of life and premature death. The majority of lower limb amputations are a result of foot ulcers. Whilst the national focus is diabetic foot ulcers, half of all amputations are in people that do not have diabetes. Tackling this inequality is a national priority.

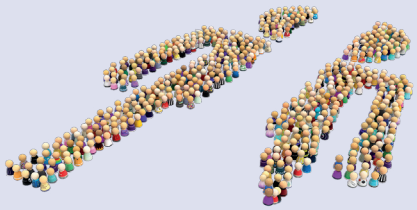
Furthermore, leg ulcers are three times more common than diabetic foot ulcers, and twice as common in women as men. Whilst not leading as often to an amputation, leg ulcers place a far greater burden on health services because of their volume and variation in healing rates. Generally, leg ulcers are treated by nurses, whilst foot ulcers are treated by podiatrists but protocols of care and outcomes vary greatly. Together, these chronic wounds* have been estimated to cost over £2.4 billion annually.[2]

The lessons learned from improved diabetes foot care services should be built upon,[3] applied and integrated across health and social care.

2. Guest JF, et al. Health economic burden that different wound types impose on the UK's National Health Service. Int Wound J. 2017 Apr;14(2):322-330
3. Paisey RB, Abbott A, Levenson R, Harrington A, Browne D, Moore J, Roe M. 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. Diabet Med 2018;35(1):53-62

* Chronic wounds defined as: diabetic foot ulcers, leg ulcers (arterial, mixed, venous and unspecified) and pressure ulcers.

What is the problem?



Half of all amputees in England do not have diabetes

Diabetes inequalities

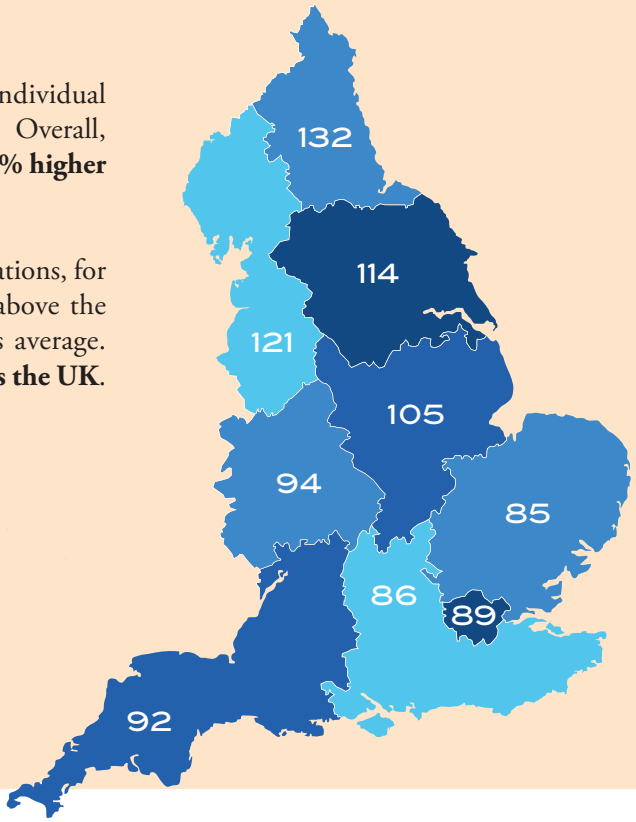
Whilst the national focus is prevention and treatment of diabetic foot ulcers, half of all amputees in England are people without a diagnosis of diabetes.[4,5] Further, the rising minor amputation rate appears to be primarily driven by men without a diagnosis of diabetes.[5] Although diabetic foot clinics have had a positive impact on improving care for patients with this disease,[3] people without a diagnosis of diabetes with ulcers are systemically excluded from Multidisciplinary Foot Services (MDFS) because they do not have diabetes. This is due to the fact that these clinics are commissioned to focus on high risk diabetes patients. People without a diagnosis of diabetes are often excluded from appropriate management because they do not have diabetes. Those without a diagnosis of diabetes that have a lower limb wound can be managed in the community but do not get the full range of services they need to prevent amputation. Its simply because the focus is on diabetes to the exclusion of everything else.[6] This highlights an inequality in access to support,[6] which may, as a result, have a significant impact on UK amputation rates.

Regional inequalities

There is further variation in amputation rates across both individual Clinical Commissioning Groups[7] and England as whole.[4,8,9] Overall, there is a North/South divide with major amputation rates **30% higher in Northern England compared with the South**.[9]

In addition to the North/South divide, there are regional variations, for example, the amputation rate in the North West is 21% above the national average, whereas in London it is 11% below this average. **Overall there is a 50% variation in amputation rates across the UK**.

Proportional Prevalence of Major Amputation across English Regions (relative to national average; England=100); Males and Females aged 50-84 Combined[9]



4. Moxey PW, Hofman D, Hinchliffe RJ, Jones K, Thompson MM, Holt PJE. Epidemiological study of lower limb amputation in England between 2003 and 2008. BJS 2010; 97: 1348-1353
5. Ahmad N, GN Thomas, Gill P, Torella. The prevalence of all cause major and minor lower limb amputation in the diabetic and non diabetic population of England 2003-2013. Diabetes and Vascular Dis Research 2016:13:348-353
6. Ahmad N, Adderley U, Ionac M, Bowling FL. The epidemiology of amputation inequality extends beyond diabetes in England (editorial). Journal of Lower Extremity Wounds (in press)
7. The National Diabetes Foot Care Audit 2014-2017. Available at : http://content.digital.nhs.uk/pubs/ndfa1417
8. Holman N, Young RJ, Jeffcoate WJ. Variation in the recorded incidence of amputation of the lower limb in England. Diabetologia. 2012 Jul;55(7):1919-25
9. Ahmad N, GN Thomas, Gill P, Chan C, Torella F. Lower limb amputation in England: prevalence, regional variation and relationship with revascularisation, deprivation and risk factors. A retrospective review of English hospital data. J R Soc Med. 2014 Dec;107(12):483-9

Gender inequalities

Further inequalities exist between men and women. 7 out of 10 major amputations in England are in men. This excess continues regardless of where patients live or their diabetes status.[5,9] The above to below knee amputation ratio also varies. In men it is 1:1, whereas in women it is 1.5:1, i.e. a far greater proportion of major amputations in women are above knee.[10] People with an above knee amputation are significantly less likely to become mobile through using a prosthesis.[11]

7 OUT OF 10 MAJOR AMPUTATIONS IN ENGLAND ARE IN MEN

Ethnic inequalities

Amputation rates are 70% higher in the Black as compared to the White populations of England.[12,13] This is particularly the case in the Black Caribbean rather than the Black African English population. In contrast, the amputation rate in the South Asian population is 40% lower than the White population in England – this is despite far higher rates of diabetes amongst this group.[12] The reason for this lower rate remains unclear.

AMPUTATION RATES ARE 70% HIGHER IN THE BLACK POPULATIONS OF ENGLAND

10. Ahmad N, GN Thomas, Gill P, Torella. Endovascular revascularisation is associated with a lower risk of above knee amputation than surgical or combined modalities. Analysis of English hospital admissions over a six year period. Int Angio 2016;35:498-503
11. Davies B, Datta D. Mobility outcome following unilateral lower limb amputation. Prosthetics and Orthotics International. 2009:27;186-90
12. Ahmad N, Chan C, Thomas GN, Gill P. Ethnic differences in lower limb revascularisation and amputation rates. Implications for the aetiopathology of atherosclerosis? Atherosclerosis 2014; 233:503-507
13. Public Health England. Diabetes Prevalence Model. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/612306/Diabetesprevalencemodelbriefing.pdf. Accessed 24 January 2019

Why is this important?

THE ANNUAL COST OF MANAGING CHRONIC WOUNDS* IN THE NHS IS ESTIMATED TO BE OVER

£2.4 BILLION[2]

The Burden of Leg Ulcers is Greater than Foot Ulcers

Whilst the burden of foot ulcers, both diabetic and non-diabetic is significant, the burden of leg ulcers is three times that of diabetic foot ulcers.[2] The combined burden on NHS resources is significant. The annual cost of managing chronic wounds* in the NHS is estimated to be over £2.4 billion.[2]

The impact of lower limb ulcers on a patient's life can be very detrimental and inhibitive, with patients often not able to lead a fulfilling life. Where ulcers are not appropriately treated, they can develop into a more severe condition, and may lead to lower limb amputation, which can devastate lives and reduce life expectancy significantly. For example, a study reports that of patients with critical limb ischemia who require a below-knee amputation, 30 per cent will die within the first two years of amputation.[14] Diabetes UK found that there were 25,527 major and minor amputations reported during the period 2013-2016.

It is for this reason the 'Legs Matter' Campaign, a joint initiative across several organisations including the Society Vascular Nurses, Tissue Viability Society, College of Podiatry, British Lymphology Society, as well as Accelerate, Lindsay Leg Club and Foot In Diabetes UK has been set up, which has been crucial to raising awareness.[15] Leg ulcers are generally treated in the community by the same healthcare professionals that treat foot ulcers. Addressing all lower limb ulcers in one strategy is common sense.

14. Norgren L, Hiatt WR, Dormandy JA, Nehler MR, Harris KA, Fowkes FG. Inter-Society Consensus for the management of Peripheral Arterial Disease (TASC II), J Vasc Surg 2007;45(Suppl S):S5-67
15. Legs Matter home page. Available at: https://legsmatter.org. Accessed 24 January 2019

* Chronic wounds defined as: diabetic foot ulcers, leg ulcers (arterial, mixed, venous and unspecified) and pressure ulcers.

What should be done?

How and why should we tackle these inequalities? The need for 'whole systems analysis'

There are multiple reasons for variation in outcomes. These include differences in patient demographics and risk factors as well as service quality, provision and uptake. Of these, the one most amenable to change and within the immediate gift of the NHS is how services are tailored for patients. To this effect, the upcoming National Wound Care Strategy Programme (NWCSP) will serve as a source of understanding of the steps required to develop a national standard on wound care.

Alongside, prevention of foot ulceration in people with and without a diagnosis of diabetes is key to improving patient outcomes and making system-wide savings. All parts of the healthcare system must be engaged to ensure prevention is viable.

Further, review of NICE guidelines should take place as and when cases of best practice arise in the treatment and management of leg ulcers.

The potential for partnership

Close attention must be paid to the potential partnerships can play in harnessing innovative solutions to improving care standards and reducing variation, e.g. Life Sciences Sector Deal 2 – which included the wound care sector into its remit.

CASE STUDY: MARS

Clinicians, commissioners and the Strategic Clinical Network across the whole of Greater Manchester have come together and developed the **Manchester Amputation Reduction Strategy (MARS)**.[16] This is an integrated whole systems programme that could be adapted nationally.

What is MARS?

The Manchester Amputation Reduction Strategy aims to reduce the number of major and of minor amputations currently being performed across Greater Manchester. It works on the basis that this will be achieved through the development and implementation of a commissioning strategy designed to prevent, manage and heal chronic foot and leg ulcers faster.

It is based on three principles. Firstly, we already know how to treat foot and leg ulcers – we just need to put it all together. Secondly, key to improving service outcome is an educated and empowered patient and fully staffed workforce. Finally, an amputation is the culmination of a number of steps and therefore each phase, in the iceberg of disease, leading to an amputation requires an intervention. MARS, therefore, has a Public Health, Community and Hospital focus.

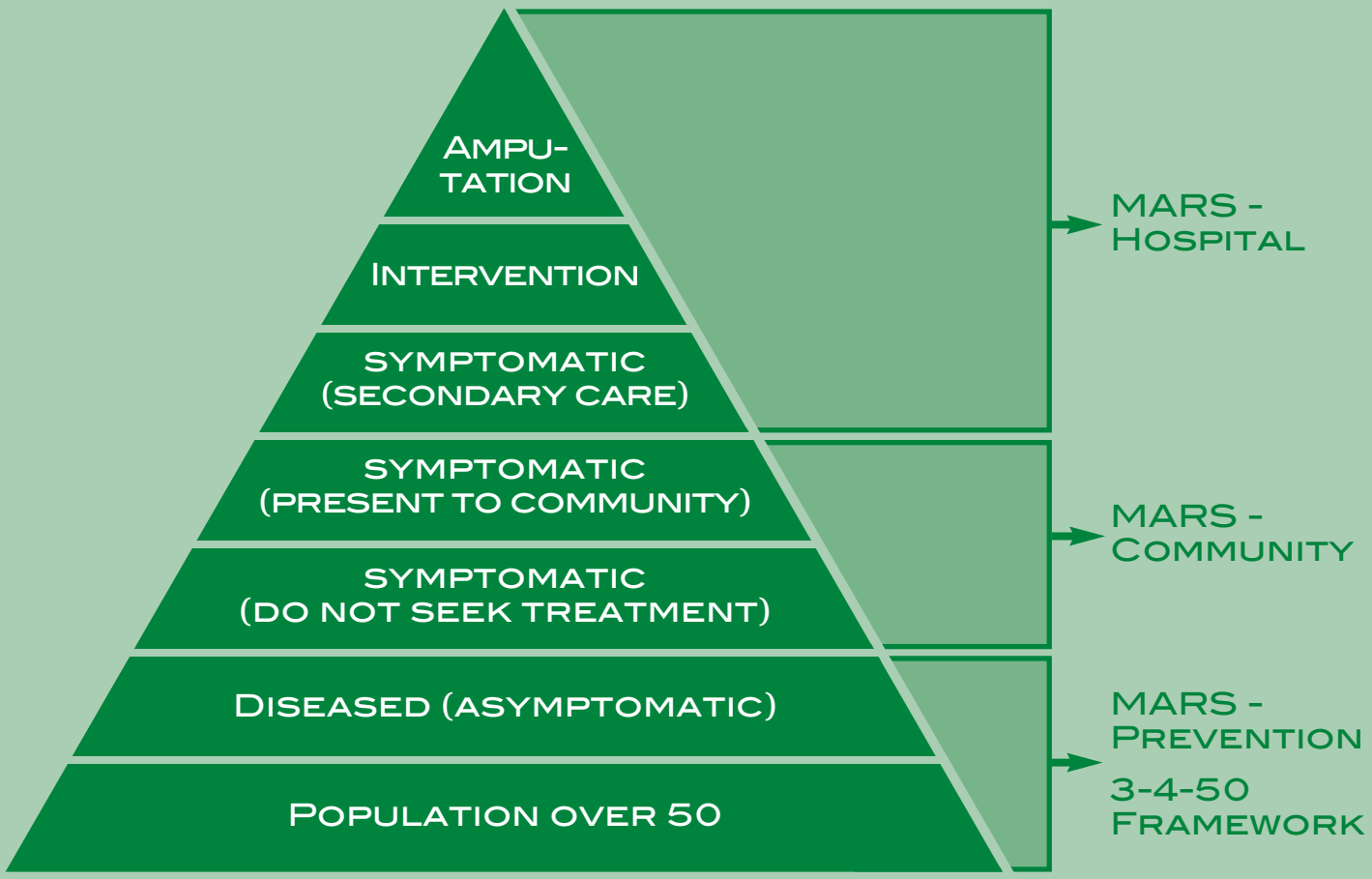
MARS acknowledges that prevention is key and aims to co-ordinate prevention initiatives using the 3-4-50 principle; that three lifestyle behaviours (poor diet, lack of exercise and smoking) lead to four health conditions (cardiovascular disease, respiratory disease, Type 2 diabetes and cancer) which lead to 50% of deaths.[17] It includes the role of schools and colleges in encouraging children to develop healthy lifestyles.

The plan recognises that change happens in communities, supported by local organisations. Targeted health promotion messages will be delivered to patients throughout the MARS pathway utilising appropriate technology and multi-disciplinary staff.

The 'MARS Community' aims to reduce the heterogeneity of service provision and patient flow in the community for foot and leg ulcers. MARS promotes a pathway with two components: a 'Triage Service' and a 'Protection Service'. The Triage Service will target, triage, diagnose and treat the population at risk and refer to the 'Protection' service, as per NICE guidelines, if patients have ulcers. The triage service will be the first point of call for health professionals wishing to refer into the service. Vascular trained podiatrists and nurses will support GPs to diagnose and manage asymptomatic and symptomatic lower limb vascular disease, ensuring patients are treated as per the 'Getting it Right First Time' (GIRFT) principles.

The 'protection' service will be one community wound care team that is integrated with the hospital team to ensure patients are treated close to home. It is envisaged that the team, at a CCG level, will be formed by the bringing together of adult community nursing, specialist nursing and podiatry services and managed by a non-medical consultant. There will be three tiers of management; tier 1 (adult community nursing) will manage wounds as per MARS pathways, tier 2 (specialist clinics) will be run by specialist podiatrists and nurses with the most complex wounds managed at the multi-disciplinary level (tier 3). Tier 1 and 2 will be in the community, and tier 3 in hospital outpatient setting. Patients will move through the tiers seamlessly as the wounds progress/deteriorate. All protocols and pathways will be evidence based and NICE compliant.

16. Ahmad N. Introducing the Manchester Amputation Reduction Strategy. The need for a cross sectoral, collaborative, whole systems analysis of services that leads to saving legs. Podiatry Now 2017:7:28-31
17. Dyson PA, Anthony D. Community Interventions for Health: A monograph. The Oxford Health Alliance 2015. Available at http://eprints.whiterose.ac.uk/97811/. Accessed 24 January 2019



ICEBERG OF DISEASE BURDEN LEADING TO AN AMPUTATION AND THE WHOLE SYSTEMS MARS SOLUTION

Call to Action

To tackle the rising prevalence of chronic leg and foot ulcers and subsequent inequalities in amputation rates, the APPG is calling all those who work in the design and delivery of lower limb, community, vascular and wound care services to work together to **reduce the prevalence of chronic ulcers by 30% and major amputations by 60% within 10 years.** The APPG hopes this can be achieved through the following short, medium and long term goals:

Short term (1-3 years)

Focus on hospital services particularly those involved with the care of ulcer patients, i.e. Surgical (Vascular, Podiatric, Plastic and Orthopaedic), Radiological, Nursing and Allied Health to provide a coordinated multidisciplinary approach to ulcer care. The focus is to provide a coordinated multidisciplinary approach to revascularisation, ulcer treatment and reconstruction. Where revascularisation is required, services should have access to most appropriate technologies and treatments to support improved outcomes. This can potentially reduce amputations by 20% within three years.[18]

Medium term (3-5 years)

Focus on community services to ensure equity of access and harmonisation of services and protocols of care. Patients should be assessed, triaged and treated close to their home with many traditional hospital services provided in the community. There should also be a move to developing integrated wound care teams that work across community and hospital care to ensure best practice is shared. The overall aim of community teams would be to reduce the prevalence of ulcers by 15% and lead to a further 20% reduction in amputations.

Long term (5-10 years)

Focus on Public Health and education services with the aim of preventing ulcers occurring in the first place by diagnosing PAD earlier and pro-actively managing cardiovascular risks. The objectives would be to improve vascular risk factor profiles and ensure that all people (both patients and health professionals) are more aware and better informed about early indications of PAD. This can produce a further 20% reduction in amputations and a further 15% reduction in the prevalence of ulcers.

These short, medium and long term strategies need to be planned, coordinated and run concurrently. As part of this, the APPG will campaign for a national strategy, that includes both foot and leg ulcers for patients with and without diabetes, like the MARS programme.

18. Ahmad N, Chadwick P, Fox M. A suggested whole system strategy to reduce lower limb amputations in Manchester, England – Introducing the MARS project. Podiatry Now 2017;20(7);28-31

Conclusion

Tackling amputation rates in the UK is a major healthcare challenge. The fact that every hour in England someone over 50 has a minor foot amputation and every two hours someone loses their whole leg is unacceptable. Further to this, there are significant inequalities in amputation rates across the country. Regional, ethnic and gender inequalities exist, as well as between people with and without a diagnosis of diabetes. Tackling inequalities in lower limb amputation rates, ulcer care and early identification of PAD should be a priority for those interested in improving patient care, saving the NHS money and saving more limbs and lives.

The All-Party Parliamentary Group on Vascular and Venous Disease will work to shine a light on those inequalities, which have yet to be discussed or recognised by government or policy makers.

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