

# THE KEY TO SURVIVING A LOWER EXTREMITY AMPUTATION IS PREVENTING IT!

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## BACKGROUND

- Lower extremity amputations (LEAs) are a devastating complication of diabetes adding to the burden for patients and their caregivers as well as the healthcare system
- DCPNS continues to lead intensive LEA prevention efforts for patients at highest risk while promoting population-based prevention messages to the broader diabetes population

**1992** Guidelines highlighted the need for routine foot care assessments for the diabetes population

**1997** Released *Surveying and Preventing Diabetes Complications in Nova Scotia*, which included a chapter on Foot Problems

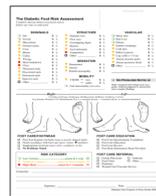
**2004** Hosted a *Diabetes Foot Care Roundtable* to identify issues, needs, and strategies regarding prevention, screening, and management of diabetic foot complications

**2007** Released *The Diabetic Foot in Nova Scotia: Challenges and Opportunities*

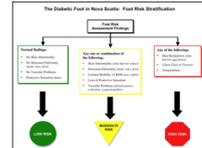


**2010** Updated standardised provider and patient resources for use across multiple care settings

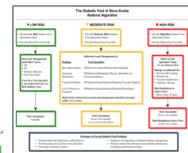
**FOOT RISK ASSESSMENT FORM**



**FOOT RISK STRATIFICATION FORM**



**REFERRAL ALGORITHM**



**2017** Expanded report, *Diabetes and Lower Extremity Amputations, 2017* (forthcoming)

## PURPOSE

- Type 1 and type 2 diabetes are distinct diseases with different underlying aetiologies and patterns of progression
- We examined time from the first LEA in period (1996/97-2012/13) to death (1996/97-2012/14) among Nova Scotian adults (≥ 20 years) with type 1 and type 2 diabetes

## METHODS

- Individual-level linkage of the following:
  - Canadian Institute for Health Information Discharge Abstract Database, 1996/97-2012/13 (LEAs)
  - Nova Scotia Insured Persons Database, 1996/97-2013/14 (date of birth, date of death, sex)
  - DCPNS Registry, 1996/97-2013/14 (diabetes type/duration)
- Cohort defined as all diabetes cases with LEAs in the period
- For this analysis, the cohort was the entire population of interest :
  - Inference testing inappropriate (no p-values)
  - Differences evaluated in terms of clinical significance

### Key Measures

#### DIABETES TYPE

Clinically confirmed diabetes type (1 or 2)

#### DIABETES DURATION AT FIRST LEA

Number of years from diabetes diagnosis to the first LEA in the period

#### LEA ADMISSION

Any acute hospital admission with ≥ 1 procedure code denoting an amputation of the lower limb (pelvis to toe)

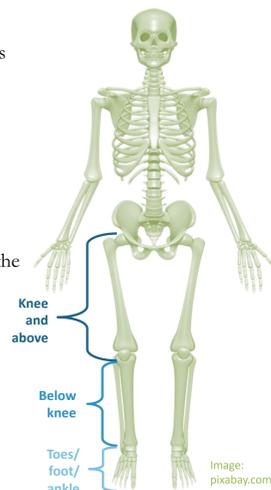
#### SURVIVAL POST-LEA

Number of years from the first LEA in the period to death or end of the period

#### LEVEL OF LEA PROCEDURE

LEA procedure performed closest to the pelvis for a given admission:

- Toes/foot/ankle
- Below knee
- Knee and above



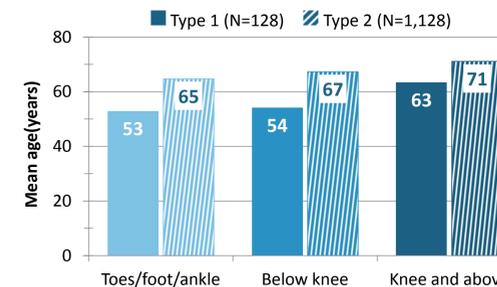
## RESULTS

- 1,256 NS adults (≥ 20 years) with one or more LEA admissions (1996/97-2012/13) attended an NS Diabetes Centre at least once through to March 31, 2014 – 10% had type 1 diabetes

	Type 1 N=128	Type 2 N=1,128	Total N=1,256
Sex:			
Female	42 (33%)	353 (31%)	395 (31%)
Male	86 (67%)	775 (69%)	861 (69%)
Level of LEA:			
Toes/foot/ankle	79 (62%)	570 (51%)	649 (52%)
Below knee	40 (31%)	285 (25%)	325 (26%)
Knee or above	9 (7%)	273 (24%)	282 (22%)
Multiple LEA admissions	51 (40%)	359 (32%)	410 (33%)

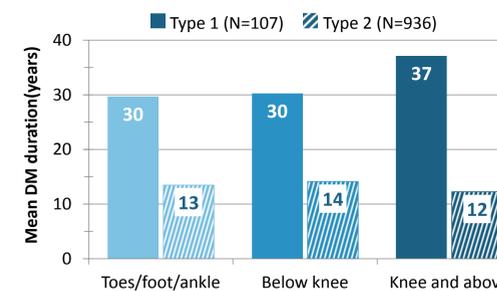
### AGE AT FIRST LEA ADMISSION IN THE PERIOD

- Overall, those with type 1 diabetes were 13 years younger than those with type 2 at the time of their first LEA
  - This difference was slightly smaller (8 years) for those who had their first LEA at the knee or above



### DURATION OF DIABETES AT FIRST LEA ADMISSION IN THE PERIOD

- Those with type 1 diabetes had the disease for 30 or more years at the time of their first LEA, compared to 12-14 years for those with type 2 diabetes
  - Those with type 1 diabetes who required an LEA at the knee or above had the longest duration of diabetes (37 years)

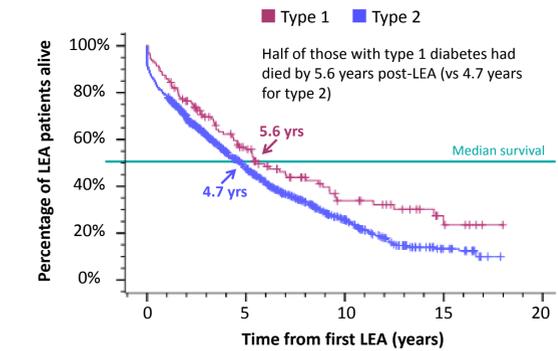


### SURVIVAL POST-LEA

#### Those with type 1 (vs type 2) diabetes,

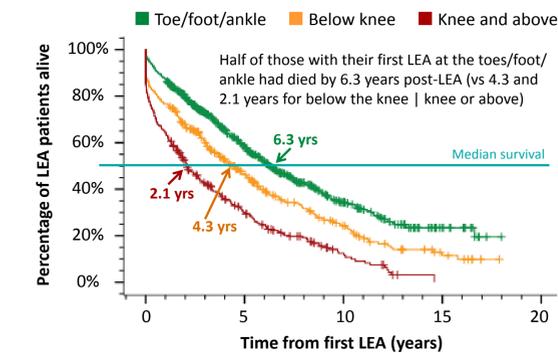
- Lived one year longer post-LEA and this difference held across all levels of LEA
- Were more likely to be alive at any point post-LEA
  - 1 month: 96% (vs 90%)
  - 5 years: 57% (vs 48%)
  - 10 years: 34% (vs 26%)
  - 10 years: 24% (vs 13%)

## RESULTS



#### Those with the first LEA admission in period resulting in a procedure at the toes/foot/ankle (vs below knee | knee or above),

- Lived 2 to 4 years longer post-LEA
- Were more likely to be alive at any point post-LEA
  - 1 month: 97% (vs 87% | 81%)
  - 5 years: 58% (vs 46% | 30%)
  - 10 years: 34% (vs 24% | 13%)
  - 15 years: 23% (vs 12% | 0%)



## CONCLUSIONS

- Individuals having LEAs present differently by diabetes type (type 1 vs type 2),
  - With type 1 diabetes, LEAs occur at younger age, after a longer duration of disease, and at a lower level
- Time from first LEA to death was similar for those with type 1 and type 2 diabetes despite a younger age at presentation for those with type 1 diabetes, with only half surviving 5-6 years post-LEA
  - Regardless of diabetes type, time to death was shorter for those requiring LEAs closer to the pelvis
- LEAs are associated with poor survival rates, reinforcing the need for continued focus on prevention strategies. Our plans include the following:
  - Health promotion and disease prevention messages and policies
  - Population-based initiatives focussed on wellness and risk factor reduction to delay or prevent diabetes and progression to complications
  - Education of healthcare providers about the value of routine foot assessments, standard assessment tools, etc
  - Education of persons with diabetes about preventive practices and signs/symptoms of pending foot problems
  - Improved access to foot care /footwear (e.g., improved insurance and publicly-funded coverage)
  - Early identification of high-risk foot
  - Multidisciplinary treatment of foot ulcers

## DIABETES CARE PROGRAM OF NOVA SCOTIA

Website: [diabetescare.nshealth.ca](http://diabetescare.nshealth.ca)

The Diabetes Care Program of Nova Scotia (DCPNS) was originally one of the Provincial Programs funded by the Nova Scotia (NS) Department of Health & Wellness. In April 2016, the DCPNS transferred to the Nova Scotia Health Authority (NSHA). Implemented in 1991, the DCPNS has a mandate to standardize and improve the quality of care provided through Nova Scotia's 38 Diabetes Centres.

- The DCPNS:
- Advises on service delivery models
  - Provides support, services, and resources to diabetes healthcare providers
  - Establishes and monitors adherence to diabetes guidelines
  - Collects, analyzes, and distributes diabetes data for NS

DCPNS mission: *To improve, through leadership and partnerships, the health of Nova Scotians living with, affected by, or at risk of developing diabetes*