ARH Foot Care Initiative

Fraser Health Authority

Dr Shaoyee Yao, Dr Scott Schumacher, Sarah Lacroix

Outline

A. Examine the background and rationale for the project. Define the scope of the problem (Dr S. Yao)

B. Provide clinical cases and discuss management of common foot lesions (Dr S. Schumacher)

C. Review 2 years results from the ARH pilot project (Sarah Lacroix)

Part A- Outline

1. Describe the prevalence of foot lesions in patients with kidney disease
2. Review the morbidity and mortality associated with foot lesions in dialysis patients

How many of your patients are affected with a foot lesion?

A. 5-10%

B. 10-15%

C. 15-20%

D. > 25%

What is the Scope of the Problem?

Difficult to capture given the only small observational studies published

Prevalence of Ulcer	Prevalence of Amputation	Source
≈ 10%	N/A	Otte J et al, J Vasc Surg 2015
≈ 38%	≈ 18%	Ndip et al. Diabetes 2010
≈ 17%	≈ 16%	Al Thani et al. J Diab Res 2014
≈ 17%	≈ 15%	Doria et al. Biomed Res Int 2016

Continuum of Risk

Prevalence of foot lesions increases as renal function declines

Table III. Hazard ratios (*HRs*) for incidence of foot ulceration in all individuals

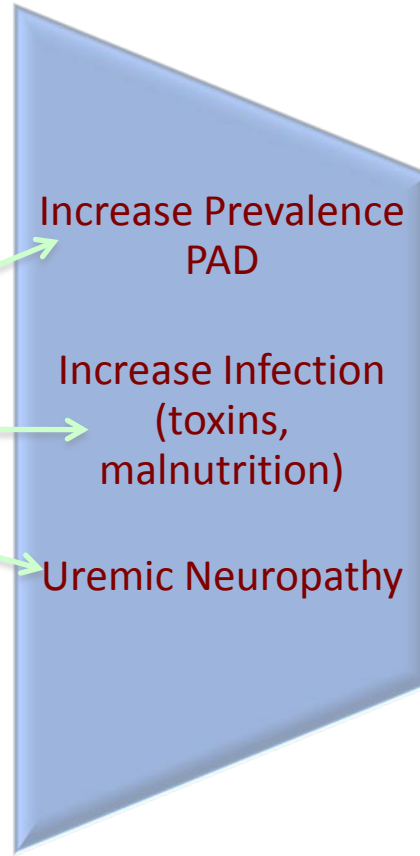| Variable	Univariate analysis		Multivariate analysis	
	HR (95% CI)	P value	HR (95% CI)	P value
CKD group (CKD 3 reference)				
CKD 4-5	3.8 (2.4-5.9)	<.001	4.0 (2.6-6.3)	<.001
Dialysis treatment	8.0 (5.1-13)	<.001	7.6 (4.8-12.1)	<.001
Diabetes mellitus	3.3 (2.4-4.6)	<.001	2.8 (1.9-3.9)	<.001
PAD	2.7 (1.9-3.6)	<.001	2.2 (1.6-3.1)	<.001
Peripheral neuropathy	2.9 (2.1-3.9)	<.001	1.6 (1.2-2.3)	.005
History of foot ulceration	4.3 (2.9-6.5)	<.001	2.3 (1.5-3.5)	<.001

Otte J et al, J Vasc Surg 2015

BC KIDNEY DAYS 2016
Hosted by BC Transplant and the BC Renal Agency

Is Dialysis an Independent Risk factor?

Risk factor	Prevalent foot ulcer		Univariate analysis		Multivariable-adjusted analysis	
	Yes	No	OR (95% CI)	P value	OR (95% CI)	P value
n	36	281				
Wearing bespoke footwear	33	8.3	5.6 (2.5–13)	<0.0001	2.2 (0.8–6.0)	0.129
Dialysis treatment	75	37	5.1 (2.3–11)	<0.0001	4.2 (1.7–10)	0.002
History of foot ulcer	56	21	4.8 (2.3–9.8)	<0.0001	3.1 (1.3–7.1)	0.008
PAD	72	48	2.8 (1.3–6.0)	0.009	1.6 (0.7–3.9)	0.257
White ethnicity	83	67	2.5 (1.0–6.1)	0.051	1.8 (0.7–4.9)	0.229
Retinopathy	81	69	1.9 (0.8–4.5)	0.144		
Neuropathy	81	71	1.5 (0.7–4.0)	0.245	0.7 (0.3–2.0)	0.542
Male sex	64	59	1.2 (0.6–2.6)	0.553		
Walking barefoot at home	36	34	1.1 (0.5–2.2)	0.840		
Known diabetes duration (years)*	24 ± 13	19 ± 11	1.0 (1.0–1.1)	0.009	1.0 (0.9–1.1)	0.121
Duration of dialysis (months)†	24 (28)	15 (22)	1.0 (0.9–1.1)	0.345		
Age (years)*	61 ± 12	64 ± 14	1.0 (0.9–1.1)	0.120		
Deformity	28	30	0.9 (0.4–2.0)	0.827		
A1C (%)	7.7 ± 1.3	7.9 ± 1.7	0.9 (0.7–1.1)	0.385		
Routine podiatry clinic attendance	44	62	0.5 (0.3–1.0)	0.055	0.9 (0.4–2.0)	0.707

Prevalence in PD (17%) ≈ HD (22%)

Ndip, A et al. Diabetes Care 2010

Traditional RF for Diabetic Ulcer

Exacerbating factors in ESRD

PAD

Infection

Neuropathy

Increase Prevalence PAD

Increase Infection (toxins, malnutrition)

Uremic Neuropathy

Peripheral VC (Intra/Post dialytic hypotension)

Increased Trauma

Neglect

Decreased Tissue Oxygenation (Anemia and Edema)
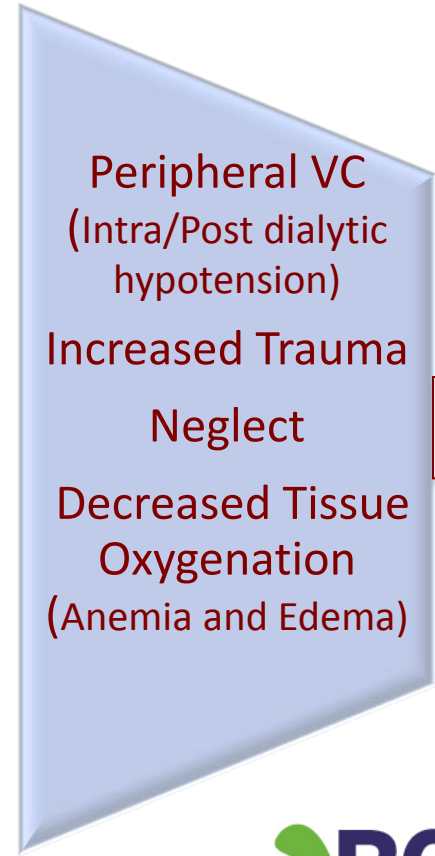
Higher Rate of Foot Ulcers

Papanas,N et al. Renal Failure 2007

Risk Factors for Foot Ulcer in Dialysis patients

Kaminski M Et al. NDT 2015

Morbidity and Mortality

Foot Ulcer
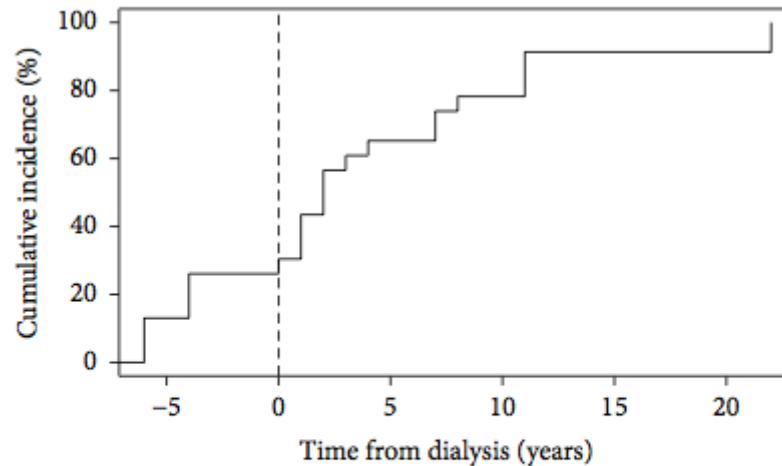
Amputation

Death
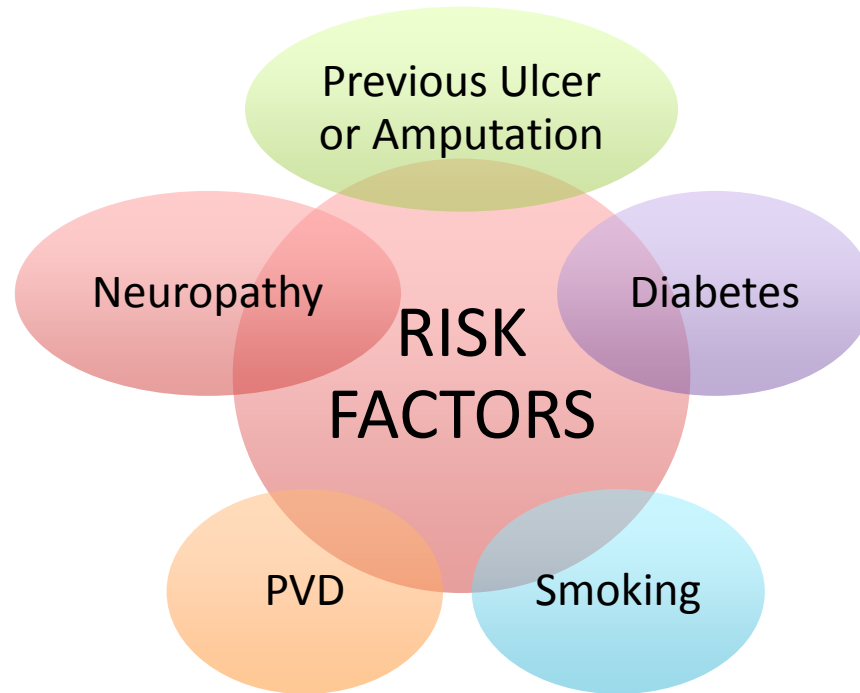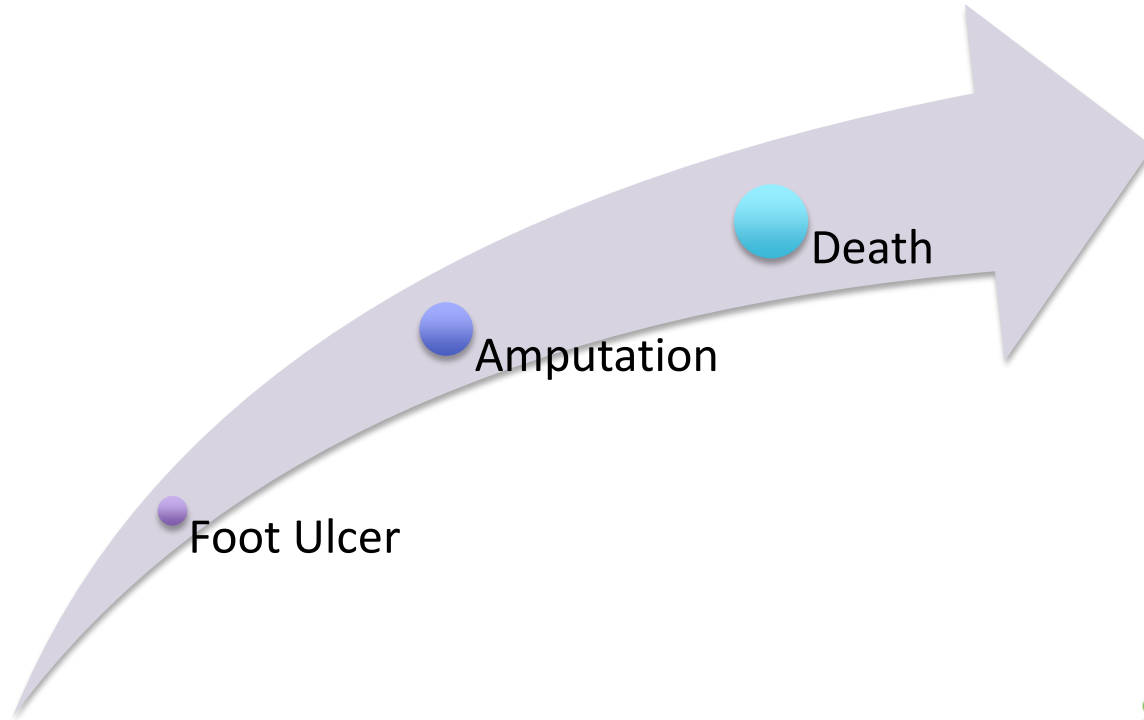
Amputation Risk

FIGURE 1: Cumulative incidence (%) of amputations depending on the time from initiating dialysis (years). All patients with an amputation were evaluated, including those who started dialysis after an amputation (with a negative number of years).
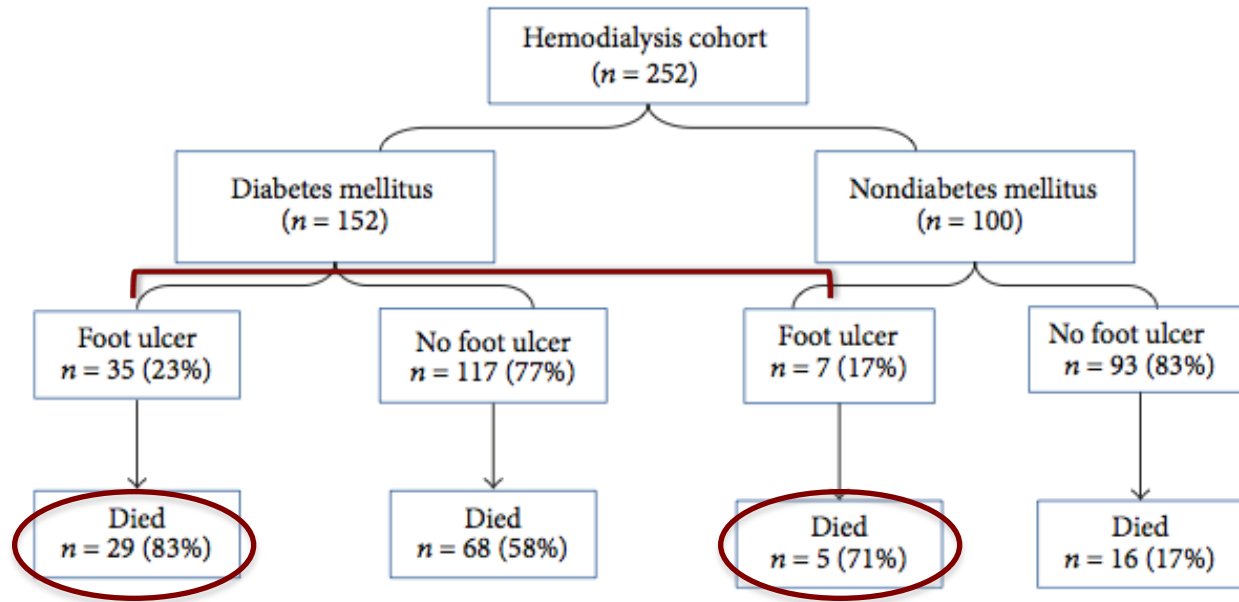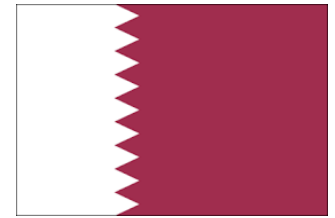
Amputation Rate ≈16%

Doria et al. Biomed Res Int 2016

Mortality

FIGURE 1: Study flow chart.

Al Thani et al. J Diab Res 2014

Mortality

Predictors of all-cause mortality in hemodialysis patients

OR: 3.6

OR: 4.1

FIGURE 5

Al Thani et al. J Diab Res 2014
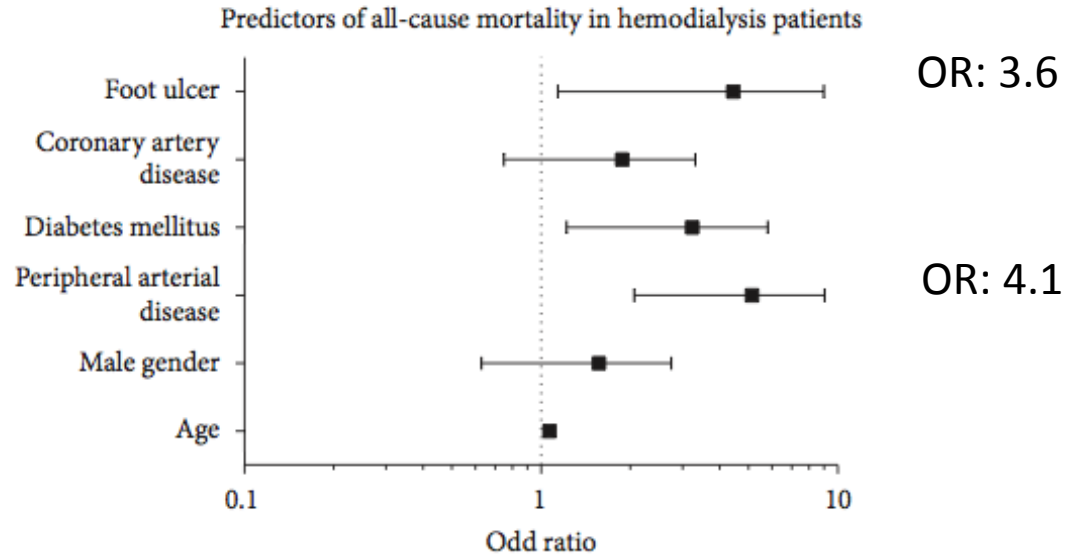
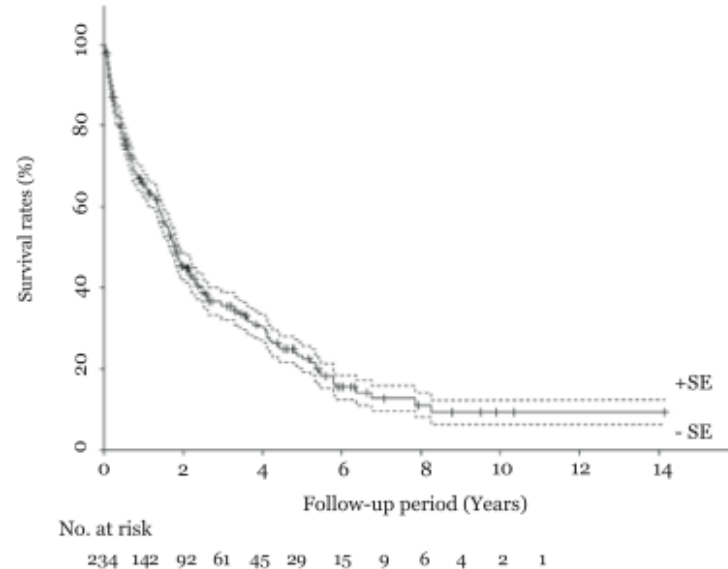# Mortality

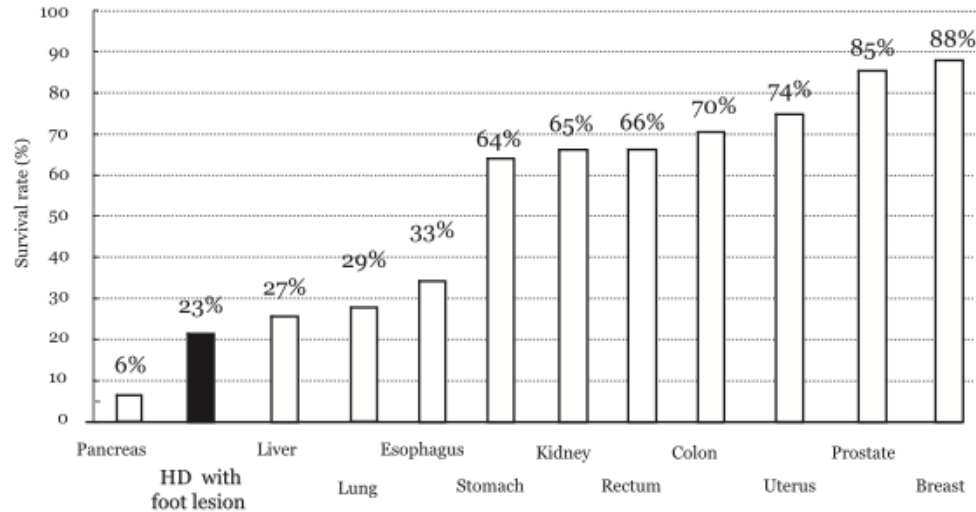Survival rates are drop precipitously

Fig 1. Overall survival rates in 234 hemodialysis patients with foot lesions. The *dotted lines* indicate the standard error (*SE*).

Orimoto et al. J Vasc Surg 2013

Worse than Cancer

5 year survival = 23% (with LL lesion) vs 43% (CORR Data 2010)

Orimoto et al. J Vasc Surg 2013

Summary so far…..

FU are common in HD patients (≈ 20%)

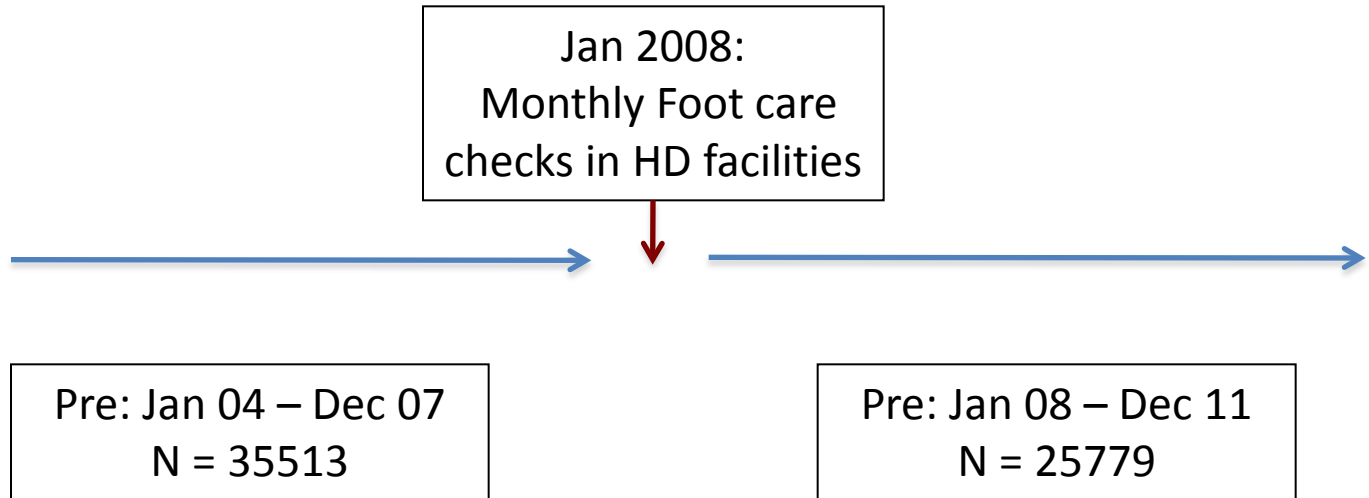FU are associated with amputations

FU are associated with significant mortality

What can we do?

Can a Foot Care Clinic Help?

Pre and Post study: Fresenius Medical Care NA Dialysis facilities

Jan 2008:
Monthly Foot care checks in HD facilities

Pre: Jan 04 – Dec 07
N = 35513

Pre: Jan 08 – Dec 11
N = 25779

Pernat A et al. BMJ Open Dia Res Care 2016

FMS- Foot care checks

- Monthly

- Done by Dialysis RN

- History, Physical (nails, pulses, sensation and footwear inspection)

- Appropriate referral to Orthopedics, Podiatry and feedback to patients (From RN)

17% decrease rate of amputations

Pernat A et al. BMJ Open Dia Res Care 2016

Summary so far.....

1. Foot lesions in the dialysis patient is common

2. Foot lesions in dialysis patients is associated with _significant_ morbidity and mortality

3. Early intervention may prevent devastating consequences

BC KIDNEY DAYS 2016
Hosted by BC Transplant and the BC Renal Agency