8. Balgrist Symposium zum Diabetischen Fuß: Was gibt es Neues in der Behandlung?
8. Balgrist Symposium
zum Diabetischen Fuss:
Was gibt es Neues in der Behandlung?

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The Diabetic Foot in Remission:

Toward More Ulcer-Free and Activity-Rich Days
What we will discuss:
Humility > Hubris
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zum Diabetischen Fuss:

Was gibt es Neues in der Behandlung?
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2009
For the first time in the history of humankind:

Non-communicable diseases (NCDs) have become the leading cause of global mortality (60%)

BMJ 2009;339:b2857
For the first time in the history of humankind:

Diabetes is now responsible for 4 million deaths each year, overtaking HIV/AIDS

BMJ 2009;339:b2857
A new world view?
Three Ages of Death

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Decay
Diabetic foot complications are common, complex and costly.
Diabetic foot complications are common

Armstrong DG, Diab Foot J, 2015
Diabetic foot complications are common

Global burden of disease

Lazzarini, Pacella, Armstrong, van Netten, Diabetic Med, 2018
Diabetic foot complications are complex

Skrepnek, Mills, Lavery and Armstrong, Diabetes Care, 2017
Every 1.2 seconds, someone develops a diabetic foot ulcer

Armstrong, Boulton, Bus New England Journal of Medicine, 2017
Every 20 seconds, someone with diabetes undergoes an amputation
Armstrong, Boulton, Bus New England Journal of Medicine, 2017
Time’s up.
Diabetic Foot = Cancer?
Was gibt es Neues in der Behandlung?
Was gibt es Neues in der Behandlung?

Diabetic Foot Ulcers and Their Recurrence

David G. Armstrong, D.P.M., M.D., Ph.D., Andrew J.M. Boulton, M.D., and Sicco A. Bus, Ph.D.

Complications of diabetes that affect the lower extremities are common, complex, and costly. Foot ulceration is the most frequently recognized complication. In a community-based study in the northwestern United Kingdom, the prevalence of active foot ulcers identified at screening among persons with diabetes was 1.7%, and the annual incidence was 2.2%.1 Higher annual incidence rates have been reported in specific populations: 6.0% among...
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Figure 2. Incidence of Ulcer Recurrence.

Data are from nine prospective follow-up studies, one retrospective study, and the control groups (i.e., patients who received usual care) in nine randomized trials with a total of 3,846 patients and a total of 3,846 follow-up ulcer years.
Recurrence is Likely
Diabetic Foot = Cancer
Wound Healing = Remission

Armstrong and Mills, JAPMA 2013
Armstrong, Boulton and Bus, NEJM, 2019
**Diabetic Foot Risk Stratification and Triage**

**ACTIVE**
- Presence of active ulceration, infection, with or without ischaemia, gangrene or unexplained hot, red, swollen foot with or without the presence of pain.

**IN REMISSION**
- More than one risk factor present e.g. a combination of loss of sensation, signs of peripheral arterial disease, callus or deformity, unable to or has no help to self care or an eGFR ≤ 15.

**MEDIUM**
- One risk factor present e.g. loss of sensation, signs of peripheral arterial disease, unable to or has no help to self care or an eGFR ≤ 15.

**LOW**
- No risk factors present e.g. no loss of sensation, no signs of peripheral arterial disease and no other risk factors.

**As below and in addition:**
- Rapid referral to and management by a member of the multidisciplinary diabetes foot team or directly to vascular when appropriate.

**As below and in addition:**
- Assessment by podiatrist experienced in the diabetic foot.
- Referral to other relevant specialists as required.
- Further review of patient's own or prescription footwear and insulin by an orthotist/podiatrist, especially for those in remission.

**As below and in addition:**
- Additional foot assessment and agreed treatment/management plan by podiatrist or other trained HCP where required.
- Review of patient's own footwear.
- Consider the provision of specialist footwear and insoles if required, measured and fitted by an orthotist/podiatrist.

**Annual screening by trained Healthcare Worker. Agree personal footcare and self care management plan (as anyone who is 'Low Risk' has no greater chance of developing a foot ulcer than somebody without diabetes). Review footwear. Provide written and verbal education including information on how to access podiatry (urgent or otherwise) as required. Provide cardiovascular risk reduction information. Encourage and signpost all smokers to a smoking cessation programme.**

These risk categories relate to the use of the SCI-Diabetes foot risk stratification tool.
Figure 3. Risk Factors Independently Associated with Ulcer Recurrence.

Data are from five studies that reported an odds or risk ratio.\textsuperscript{28,31,42,52,54} According to Monami et al.\textsuperscript{42} (blue), risk factors for ulcer recurrence are a vibration perception threshold greater than 25 V and a Geriatric Depression Scale score of 10 or higher.
The NEW ENGLAND JOURNAL of MEDICINE

Vibration perception threshold >25 V: 12.05
Presence of a preulcerative lesion: 10.95
Presence of peripheral artery disease: 10.10
Callus
Callus = Breast Lump
On Advocacy
No one wants to be defeated
The Diabetic Foot In Remission: How can I prevent (severe) recurrence?
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Diabetic Foot Ulcer
A pressure activity imbalance
Dosing activity as a drug
Dosing activity as a drug
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Was gibt es Neues in der Behandlung?
Wounds tend to heat up before they break down
Wounds tend to heat up before they break down.
Wounds heat up before they break down


Ulcerated

Unulcerated
Smart Bathmat

Frykberg (Najafi) et al., Diabetes Care 2017

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Smart Sox

A Subscription Prescription?

Armstrong DG, J Wound Care, 2019
Reyzelman, et al, JIMR, 2018
CONGRATS! TECH COMPANY @SIRENCARE'S #DIABETICFOOT SOCK WINS @TECHCRUNCH CES2017 BATTLE
A smart shoe provides relief to diabetic feet

EPFL researchers together with the University Hospitals of Geneva have developed a shoe sole with valves that electronically control the pressure applied to the bottom of diabetic feet. This therapy will help treat serious foot ulcers and reduce the risk of amputation.

Pataky Lab
An Arranged Marriage?
Wearables +
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Injectables
Armstrong, Najafi, Shahinpoor, Gerontol, 2017
Smart Blood Vessels?
Conclusion
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zum Diabetischen Fuss:
Was gibt es Neues in der Behandlung?
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“Don’t just do something...  
...stand there”  
Lewis Carroll
Conclusion
8. Balgrist Symposium

zum Diabetischen Fuß:

Was gibt es Neues in der Behandlung?
“Position yourself well enough, and circumstances will do the rest”

Mason Cooley
“Not everything that’s counted counts…
…and not everything that counts can be counted”

Einstein
Grand Unifying Metrics

- Ulcer-free days
- Hospital-free days
- Activity-rich days
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