

Brief guide

Diabetic foot syndrome



Your partner for wound care



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A diabetic foot is one of the most serious and most neglected consequences of diabetes. Identification of individuals at risk by GPs is a precondition for effective prevention of complications with the feet. Often, the trigger for the development of a diabetic foot is a trivial injury to the foot.

DFS stands for a complex of symptoms.

Diabetes mellitus causes damage to blood vessels and nerves.

Consequences:

- Toes and feet lose feeling, stimuli such as pain, pressure and temperature are not noticed, or too late.
- Blood vessels constrict, an arterial occlusive disease (PAOD) may develop.

Because the disappearance or loss of sensation of pain and awareness of symptoms frequently leads to a lack of concern with regard to visible changes to the feet, in the worst case even to tolerance of wounds and necroses on the feet, asking about complaints is not sufficient.

75 - 80% of over 60,000 amputations annually could be avoided through fast and targeted action.

With your competence, you can make a major contribution to diabetics keeping their feet!

Risk factors for the development of foot lesions

| Area | Risk factors |
|---------------------------|--|
| Glucose metabolism | <ul style="list-style-type: none">• Poorly controlled diabetes mellitus, loss of visual acuity, e.g. diabetic retinopathy• Obesity |
| Neuropathy | <ul style="list-style-type: none">• Sensitive: reduced sensation of pain / over-sensitivity to contact stimuli• Autonomous: impaired sweat secretion• Motoric: deformities of the feet |
| PAOD | <ul style="list-style-type: none">• Poor wound healing |
| Foot deformities | <ul style="list-style-type: none">• Hallux valgus, claw toes, osteoarthropathies such as Charcot's foot• Consequences of operation after partial amputations or previous |

| Area | Risk factors |
|------------------------------|---|
| Trauma | <ul style="list-style-type: none"> • Unsuitable footwear • Objects in shoes or socks • Injury during pedicure or by walking in bare feet • Falls, accidents |
| Infections | <ul style="list-style-type: none"> • Interdigital mycosis, nail diseases • Fungal infection of the skin • Bacterial infections with rhagades |
| Psycho-social factors | <ul style="list-style-type: none"> • Unawareness, trivialisation • Anxiety, neglect, atrophy of the neophenomenological body |

Source: Diagnostik, Therapie, Verlaufskontrolle und Prävention des diabetischen Fußsyndroms

Ed.: W.A. Scherbaum, T. Haak

Authors: S. Morbach, E. Müller, H. Reike, G. Rümenapf, M. Spraul

Differential diagnosis of the diabetic foot

| | Neuropathic foot | Angiopathic foot |
|--------------------------|--|--|
| Medical history | <ul style="list-style-type: none">• Long-term diabetes: HbA1c >7.5% | <ul style="list-style-type: none">• In addition to DM risk factors, such as increased LDL, hypertension, CHD, smoker |
| Localisation | <ul style="list-style-type: none">• Mainly plantar at heels and balls of feet, less often dorsal, pressure sores and calluses | <ul style="list-style-type: none">• Acral necrosis (toe or heel) |
| Sensation of pain | <ul style="list-style-type: none">• Almost to completely painless wound, tingling, numbness in the feet in particular at night | <ul style="list-style-type: none">• Stress pain, also pain at rest |

| | Neuropathic foot | Angiopathic foot |
|---|--|--|
| Visual and palpation examination | <ul style="list-style-type: none"> • Well supplied with blood, warm, dry, rosy • Foot deformities such as claw and hammer toes | <ul style="list-style-type: none"> • Cold, pale-livid coloured skin • Nails grow very slowly • Gait disorder, intermittent claudication |
| Foot pulse | <ul style="list-style-type: none"> • Depending on room temperature, present sensation | <ul style="list-style-type: none"> • Weakened to missing |
| Sensation | <ul style="list-style-type: none"> • Reduced to none | <ul style="list-style-type: none"> • Present |

Source: extract from „Der diabetische Fuß – ein Bildatlas“ (Dietmar Seiler, Hans Schweiger) Deutscher Universitäts-Verlag GmbH, Wiesbaden 1999



WARNING: mixed forms consisting of neuropathic and angiopathic foot are not rare! Because of simultaneous neuropathy the familiar symptoms of PAOD are not present.

Checklist for medical assistants and/or wounds expert

- Examination of both feet
 - Check of skin temperature on both feet and legs
 - Check pulse through palpability on both sides (ADP and ATP)
- Check
 - for visible wound secretion in stockings, on shoe insole or in the shoe
 - for wound odour
 - for signs of an infected wound
 - shoes and insoles for fit
 - hosiery for intruding seams
 - shoes for foreign bodies



- Neuropathic screening
 - Tuning fork
 - Monofilament
 - Sharp/blunt
 - Tip Therm (cold/warm)
- Where applicable, information on relief shoes, walking aids, wheelchair and/or bed rest
- Pass tips on to patients
 - Take care when showering/taking a bath (use shower plaster)
 - Do not use cool packs or hot water bottles
 - Do not use PVP iodine ointments
 - Check wounds daily for changes
- Clarification whether home wound care is necessary
- Give the patient the health guide „Best regards to the feet“

Checklist for the GP

Medical history:

- Verified diabetes mellitus
- Known PAOD
- Existing PNP
- Visible foot deformities
- Overheated and/or reddened foot
- Trauma
- Lesions, recurrences
- Entry point for infections, e.g. rhagade on the heel
- Signs of an infection, beginning sepsis
- Concealed wound
- Hyperkeratosis
- Bone contact
- Interdigital mycoses
- Existence of wound odour
- Existing pain, location

Diagnostics:

- Blood sample (inflammation and kidney profile)
- Smears
- Immediate antibiotics
- Antibiosis in accordance with antibiogram

- Further diagnostics
 - Sonography
 - Doppler/duplex sonography
 - PTA (balloon dilatation)
 - MRI
 - X-ray (on suspicion of Charcot's foot)

WARNING: an infection with the corresponding inflammation leads to increased pressure and correspondingly local blood circulation requirements and this reduces perfusion in the small vessels!



Examination methods

| Examination | Informative value of the examination method |
|---|--|
| Ultrasound (Doppler) of the foot arteries and determination of the ankle-brachial pressure index | The examination provides information on possible circulatory disorders. The ankle-brachial pressure index can also be calculated. This is the ratio of systolic blood pressure values in the upper arm and above the ankle. An ankle-brachial pressure index < 0.9 suggests an arterial occlusive disease. |
| X-ray examination of the tarsal bones | If already existing changes to the foot bones caused by inflammation are suspected, an X-ray may detect fractures. |
| Reflex tests | In the case of a neuropathic diabetic foot the idio-reflexes of the calf or foot may be weaker or no longer triggerable at all. |

| Examination | Informative value of the examination method |
|---|---|
| Tuning fork test | Sensation of vibration is tested with the help of a tuning fork (based on Rydel-Seiffer C1285 / C64 Hz) through continuous vibration of the fork. Sensation of vibration is reduced in a neuropathic diabetic foot. |
| Monofilament test | The monofilament consists of a plastic thread that normally has a diameter of 0.1 mm and bends on application of a defined force. The monofilament is applied to the sole. |
| Wound smear | As soon as wounds on the feet are found, a smear should be taken in order to be able to determine the exact bacterial pathogen and to initiate suitable therapy. |
| Pedograph (pressure measurement of the foot) | A change to the foot's pressure load through misalignments can be shown with pedography, in which the patient stands and walks on a panel fitted with sensors. |

Interdisciplinary treatment of the DFS

Optimisation of the metabolism, DMP, diet, regular foot check-ups

GP

Wound débridement, pressure relief, optimisation of the metabolism, diabetes training etc.

Diabetologist (ZAFE)

Optimisation of the circulation

Vascular therapist (angiologist)

Fitting the individual shoe with insoles, relief shoe, orthoses, etc.

Orthopaedic shoemaker



Wound care by specialist

Active nursing, wound expert

Gait training

Physiotherapist, ergotherapist

Regular podolog. complex treatment every 4 - 6 weeks

Podology

General therapy strategies

- Revascularisation
- Optimisation of the metabolism
- Pressure relief
- Antibiotics therapy
- Structured wound treatment
- Minimal surgery
- Diet

Diabetic foot ulcers – simple and time-saving care

DracoFoam *Zehenkappe*



- Simple and time-saving care
- Thin foam, easy to apply and pleasant to wear
- Available in two sizes
- Individually adjustable
- Suitable for all toes

DracoFoam *Zehenkappe* can be individually adjusted by cutting



Caps can be individually shortened



Available as well as short cap



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