



Diabetic foot

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Definition

- Any infection involving the foot in a person with diabetes originating in a chronic or acute injury to the soft tissues of the foot, with evidence of pre-existing neuropathy and/or ischemia

Foot problems are an important cause of morbidity in patients with diabetes mellitus.

The lifetime risk of a foot ulcer for patients with type 1 or 2 diabetes may be as high as **34 percent** .

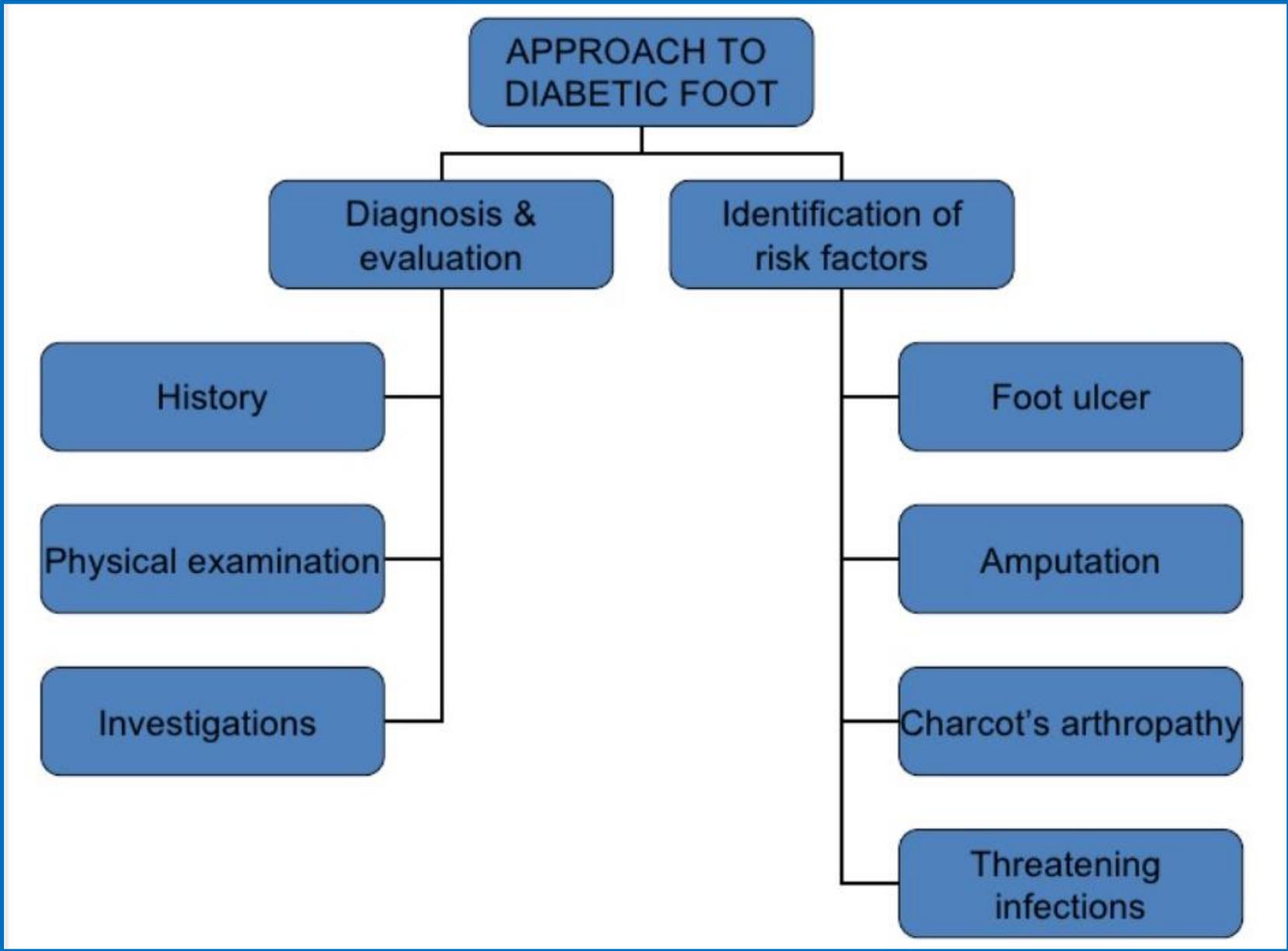
Management of diabetic foot ulcers accounts for a large number of inpatient stays, has a high rate of hospital readmission, and is associated with a 2.5-fold risk of death compared with patients with diabetes without foot ulcers .

A potentially preventable initiating event, most often minor trauma that causes cutaneous injury, can often be identified.

Foot amputations, many of which are preventable with early recognition and therapy, may be **required in up to 20 percent** of diabetic foot ulcers .

These observations illustrate the importance of frequent evaluation of the feet in patients with diabetes to identify those at risk for foot ulceration .

Systematic screening examinations for neuropathic and vascular involvement of the lower extremities and careful inspection of feet may substantially reduce morbidity from foot problems.



Risk factors

Several risk factors are predictive of ulcers and amputation. Early recognition and management of risk factors is important for reducing morbidity of foot ulceration. Most are readily identifiable from the history or physical examination. The most important risk factors are :

- Previous foot ulceration
- Neuropathy (loss of protective sensation)
- Foot deformity
- Vascular disease

Risk classification

There are several risk classification systems designed to predict foot ulcer in patients with diabetes . Risk categorization can be used to design preventive and monitoring strategies . One system, developed by the International Working Group on the Diabetic Foot, stratifies patients as follows :

- Group 0 – No evidence of neuropathy
- Group 1 – Neuropathy present but no evidence of foot deformity or peripheral vascular disease
- Group 2 – Neuropathy with evidence of deformity or peripheral vascular disease
- Group 3 – History of foot ulceration or lower extremity amputation

During 30 months (mean) of follow-up, ulcers occurred in 5, 14, 13, and 65 percent of patients in groups 0, 1, 2, and 3, respectively.

Only patients in groups 2 and 3 had amputations (2 and 26 percent, respectively).

History

Duration of diabetes

Glycemic control

Presence of micro- or macrovascular disease

History of prior foot injury resulting in deformities or prior ulcers

Lower limb bypasses or amputation

Presence of claudication

History of cigarette smoking

Two cohort studies have demonstrated an increased risk of foot ulcers in those with a longer history of diabetes .

This may be related to the finding that the risk of peripheral artery disease and peripheral neuropathy appears to increase with the duration of diabetes .

The patient should be questioned about foot and leg discomfort. An older scoring system to assess symptoms quantitatively remains a useful guide to collect a history of diabetic neuropathy :

- What is the sensation felt? – Burning, numbness, or tingling (2 points); fatigue, cramping, or aching (1 point). Maximum is 2 points.
- What is the location of symptoms? – Feet (2 points); calves (1 point); elsewhere (no points). Maximum is 2 points.
- Have the symptoms ever awoken you at night? – Yes (1 point).
- What is the timing of symptoms? – Worse at night (2 points); present day and night (1 point); present only during the day (no points). Maximum is 2 points.
- How are symptoms relieved? – Walking around (2 points); standing (1 point); sitting or lying or no relief (no points). Maximum is 2 points.

The total neuropathy symptom score can then be determined:

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- 0 to 2 – Normal
 - 3 to 4 – Mild
 - 5 to 6 – Moderate
 - 7 to 9 – Severe

Preventive foot care

- Avoid smoking
- and

DIABETIC FOOT CARE (PATIENT EDUCATION)

DO NOT WALK BAREFOOT



DIABETIC FOOT CARE (PATIENT EDUCATION)

Use a magnifying hand mirror



Inspect your feet daily



DIABETIC FOOT CARE (PATIENT EDUCATION)

Moisturize your foot



Cut nails carefully



DIABETIC FOOT CARE (PATIENT EDUCATION)

**Wear clean, dry, and right
type of socks**



**After washing, make feet dry
with soft towel**



DIABETIC FOOT CARE (PATIENT EDUCATION)

Look at your feet before
walking



Clean your shoes before you
put them on



Assessment of pedal pulses

History

Physical examination

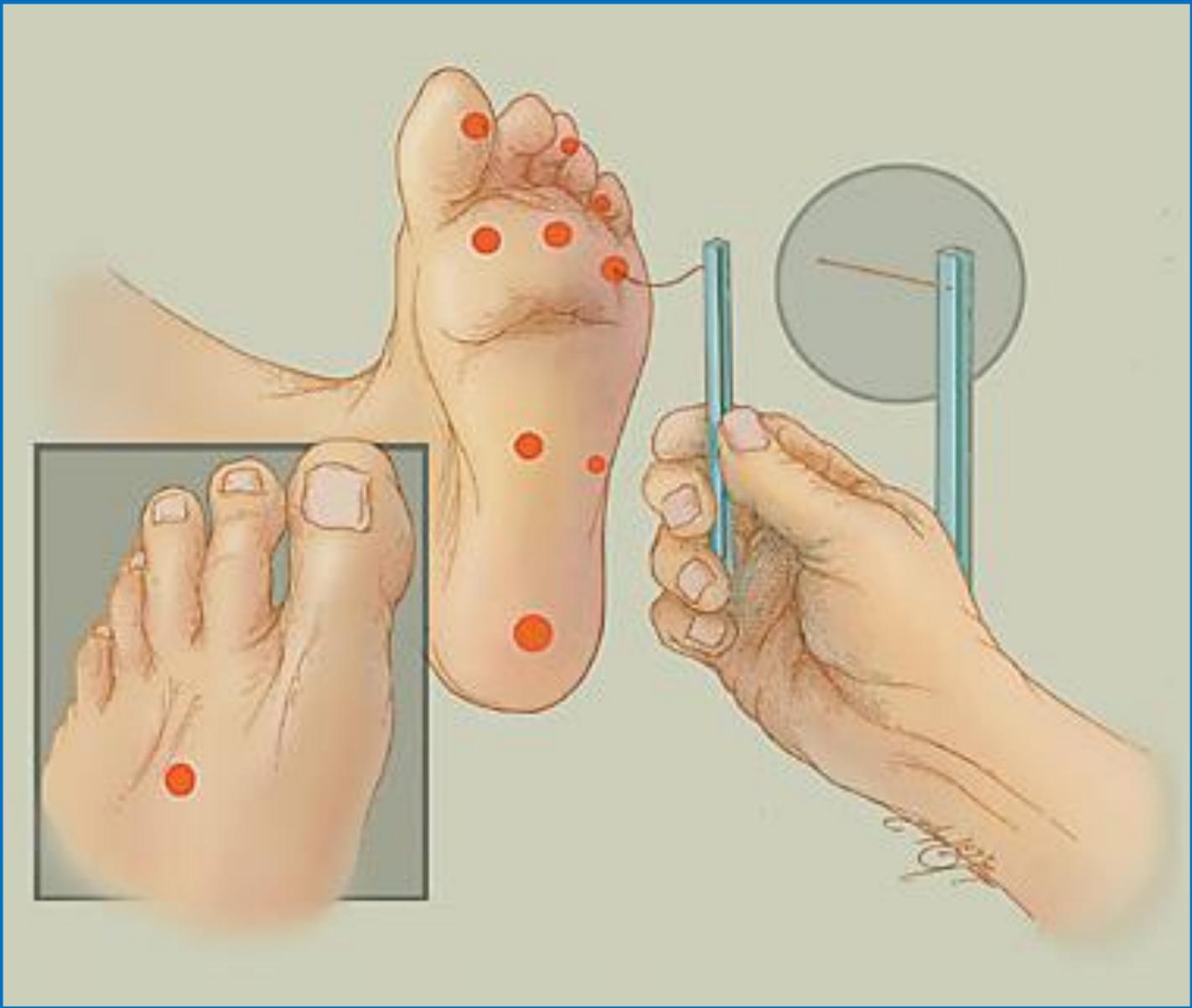
Evaluation of peripheral artery

Assessment for loss of protective sensation

Monofilament at specific sites to detect loss of sensation in the foot .

Vibration using a 128-Hz tuning fork , pinprick sensation, and ankle reflexes.

The pinprick examination is best performed with a new, clean safety pin, which should be discarded in a sharps container after use.



Vibration testing

– Vibration testing is typically conducted with a 128 Hz tuning fork applied to the bony prominence at the dorsum of the first toe, just proximal to the nail bed.

The quickest method of testing is to ask the patient to report the perception of both the start of vibration sensation and the cessation of vibration on dampening.

The test should be conducted twice on each great toe. The sensitivity and specificity of vibration testing for peripheral neuropathy have been estimated to be 53 and 99 percent, respectively .

Screening for Neuropathy



- 128 Hz tuning fork for testing of vibration perception

Vibration testing

The vibration-perception threshold (VPT) is defined as the lowest voltage at which vibration can be sensed on the pulp of the big toe.

The value in normal subjects increases with age from approximately 6 volts at age 30 years to 20 volts at age 75 years .

