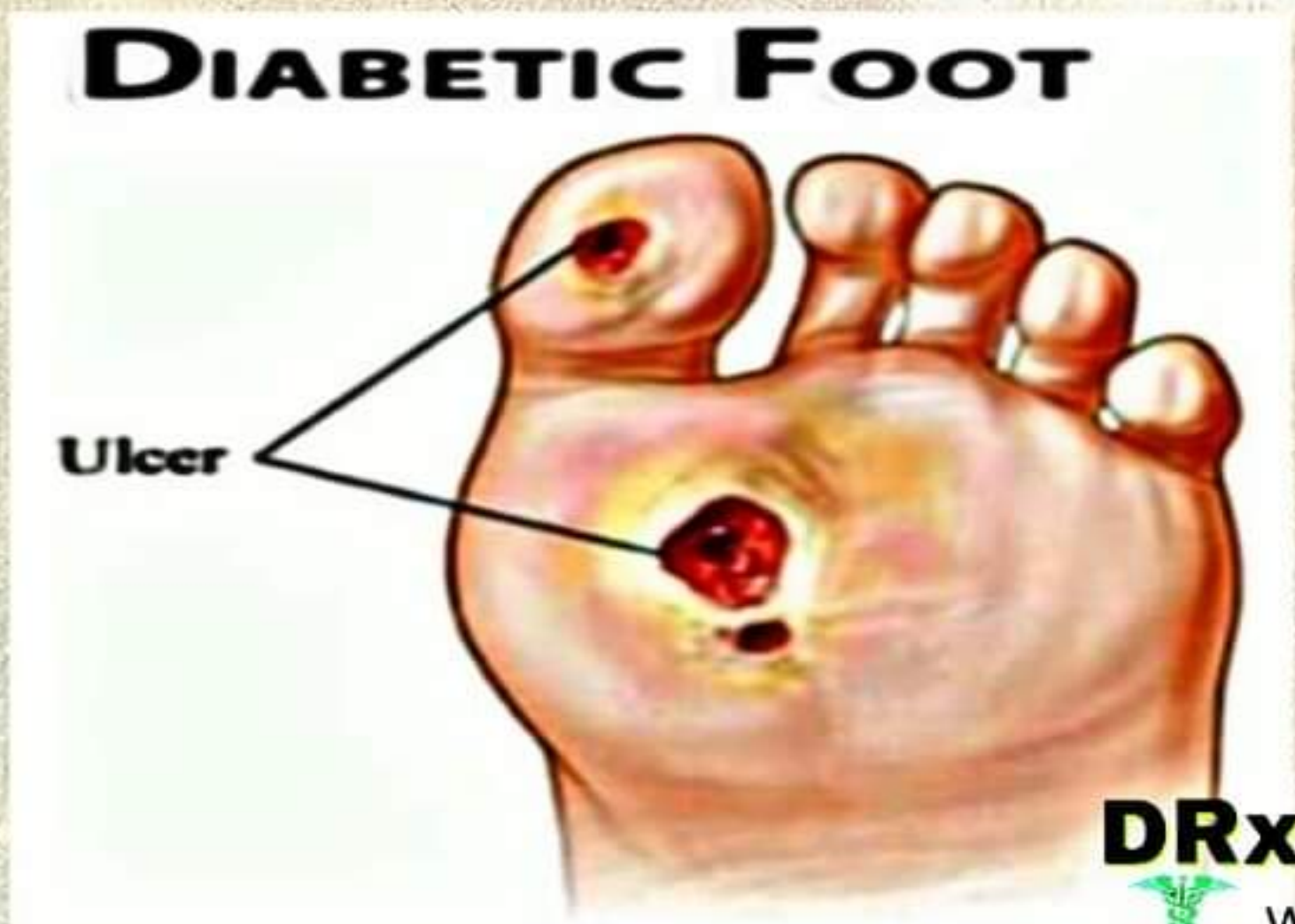
DIABETIC FOOT ULCER



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INTRODUCTION

- Diabetic foot is a foot that exhibits any pathology that results directly from diabetes mellitus or any long-term (or "chronic") complication of diabetes mellitus (Jeffcoate & Harding, 2003).

- Diabetic foot implies that the pathophysiological process of diabetes m ellitus does something to the foot that puts it at increased risk for "tissue d amage" and the resultant increase in morbidity and maybe amputation (Payne & Florkowski, 1998).

INCIDENCE

- Studies have indicated that diabetic patients have up to a 25% lifetime risk of developing a foot ulcer.
- The annual incidence of diabetic foot ulcers is ~ 3% to as high as 10%. (Armstrong and Lavery, 1998)

Risk factors

- Previous amputation
- Foot deformity
- Past history of foot ulcer
- Peripheral vascular disease
- Peripheral neuropathy
- Visual impairment
- Diabetic nephropathy
- Poor glycemic control
- Cigarette smoking

PATHOPHYSIOLOGY

- Neuropathy- leads to skin dryness and cracks, foot deformity and loss of protective sense in the foot
- Microangiopathy/vascular disease- lead to poor blood supply to the toes and foot and then ulcerate easily
- Immunopathy- Defects in leukocyte function (leukocyte phagocytosis, neutrophil dysfunction) and also deficient white cell chemotaxis and adherence

CLINICAL PRESENTATION

- Soft tissue infections (superficial to deep tissue infection e.g. cellulitis, necrotizing fasciitis, etc.)
- Osteomyelitis (bone infection)
- Septic arthritis (joint infection)
- Gangrene (dry or wet)
- Chronic non-healing ulcer
- Combination of more than one of the above mentioned condition

HISTORY

- Diabetic history
- Previous ulcer or amputation
- Symptoms of peripheral neuropathy
- Symptoms of peripheral vascular/ischemic problem
- Contributing factors
- Other complications of diabetes (eyes, kidney, heart etc).
- Current ulcer

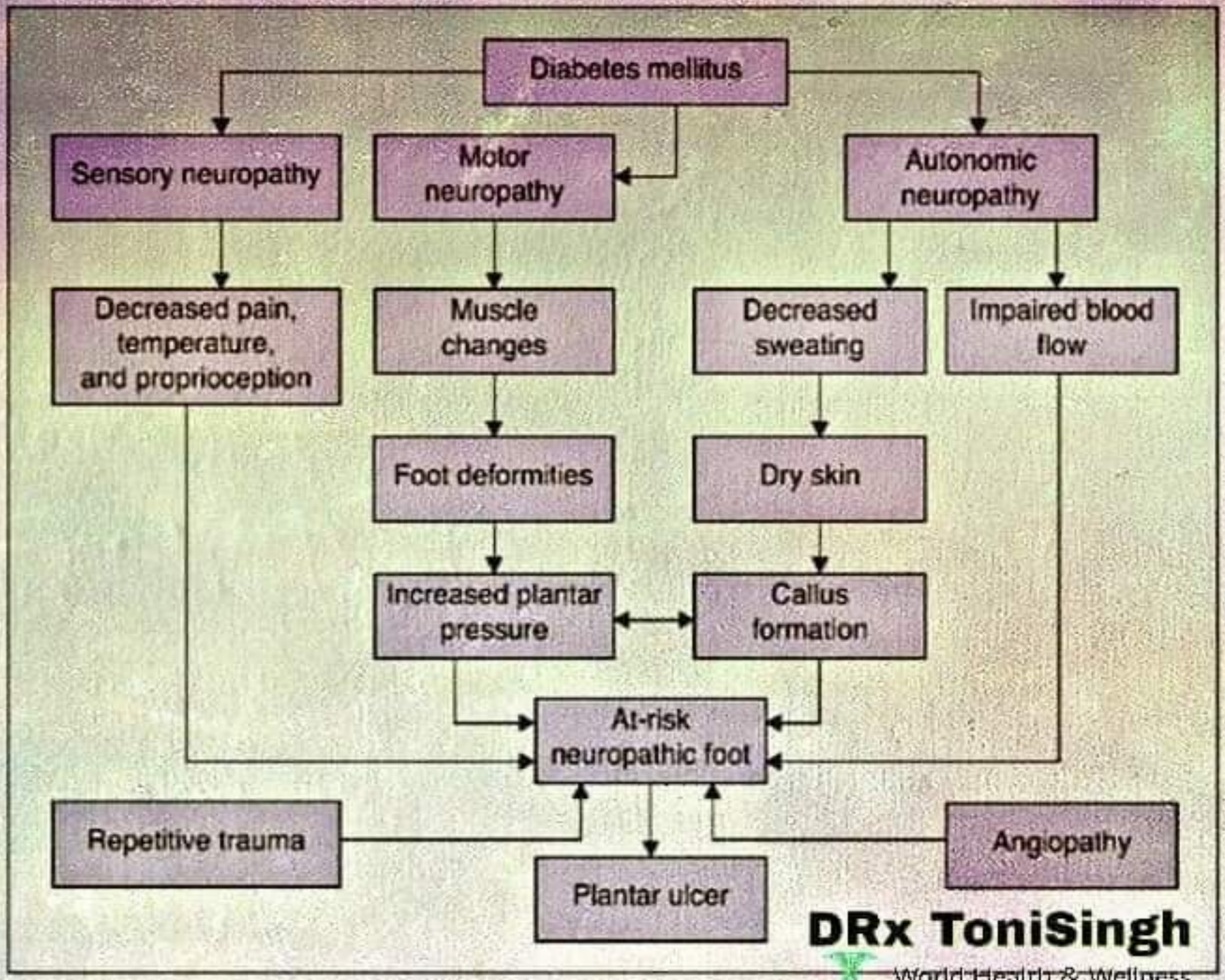
EXAMINATION

- Previous amputation/ulcer
- Deformity and footwear
- Inspect web spaces - signs of infection or wound
- Hypercallosity or nail deformity or paronychia
- Present of peripheral neuropathy with tuning folks, also mono filament and position sense.
- Peripheral pulses - peripheral vascular disease
- Ankle-brachial index (ABSI)
- Other relevant systems (renal, eye, heart etc)

Etiopathogenesis

- As we all know, DM is one of the metabolic conditions that disturbs wound healing process.
- Many studies have shown a prolonged inflammatory phase in diabetic wounds, which causes a delay in the formation of mature granulation tissue and a parallel reduction in wound tensile strength

- Altered metabolism
- Impaired nitric oxide synthesis
- Structural and functional changes in fibroblasts
- Increased matrix metalloproteinase (MMP) activity


Diabetes mellitus
Sensory neuropathy
Motor neuropathy
Autonomic neuropathy
Decreased pain, temperature, and proprioception
Muscle changes
Decreased sweating
Impaired blood flow
Foot deformities
Dry skin
Increased plantar pressure
Callus formation
At-risk neuropathic foot
Repetitive trauma
Plantar ulcer
Angiopathy
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Wagener's grading of diabetic foot ulcers

Grade 0: Foot at risk (with evidence of neuropathy)

Grade 1: Superficial ulcer

Grade 2: Deep ulcer (involving skin, subcutaneous tissue and muscle, without osteomyelitis)

Grade 3: Deep ulcer with osteomyelitis

Grade 4: Foot gangrene (half of foot)

Grade 5: Whole foot gangrene

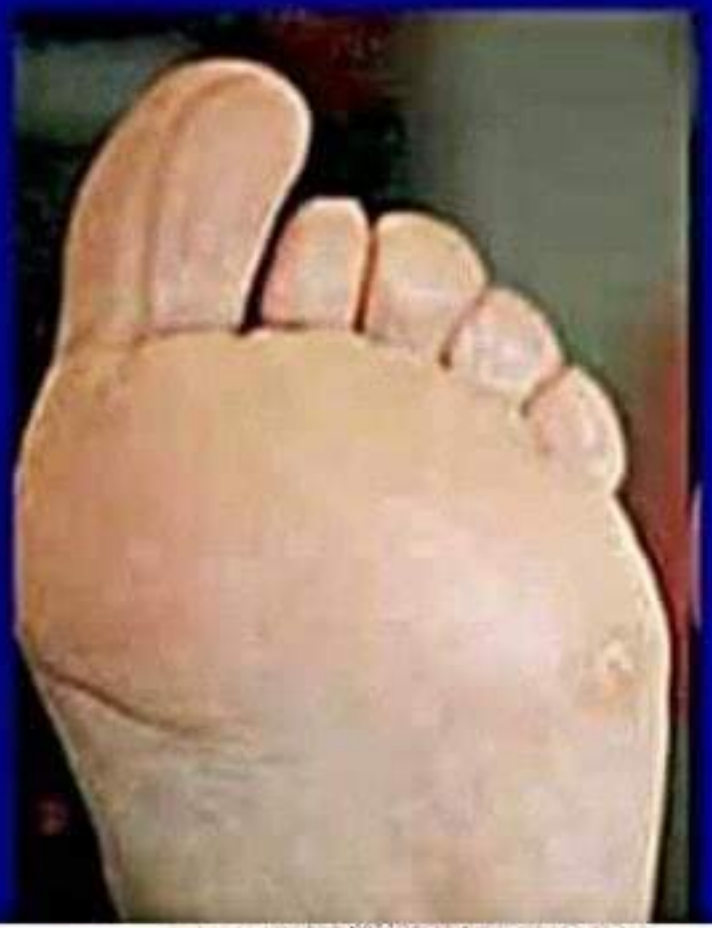
Grade 0

- Preulcer stage
- Skin is intact
- Redness of skin
- Calluses
- Bony deformities

It Can be prevented

It should be reassesd

Annually



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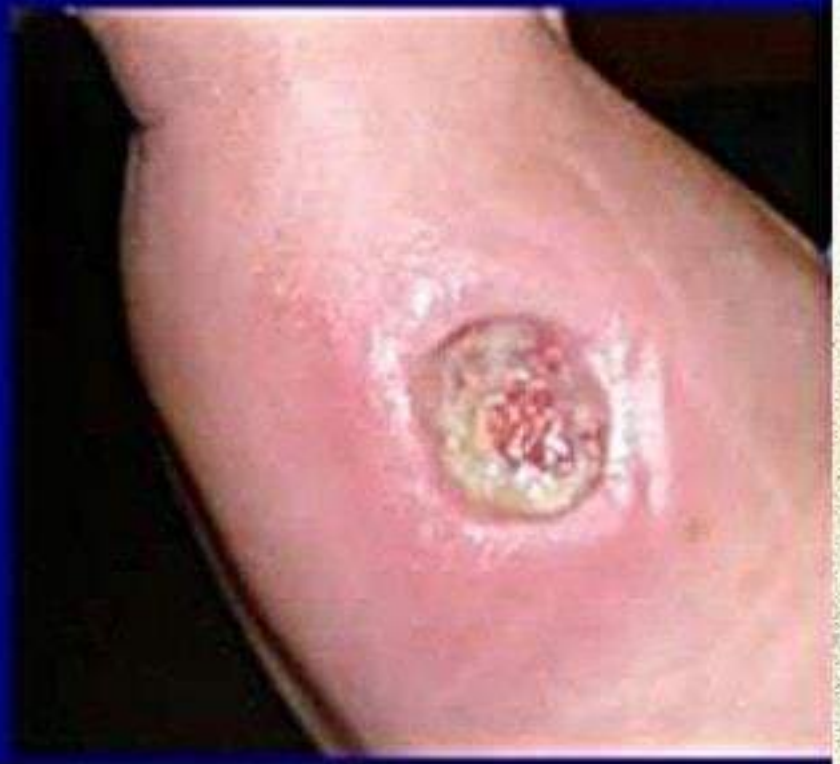
Wagner Classification of DFU

Grade 1

Superficial (shallow) Ulceration

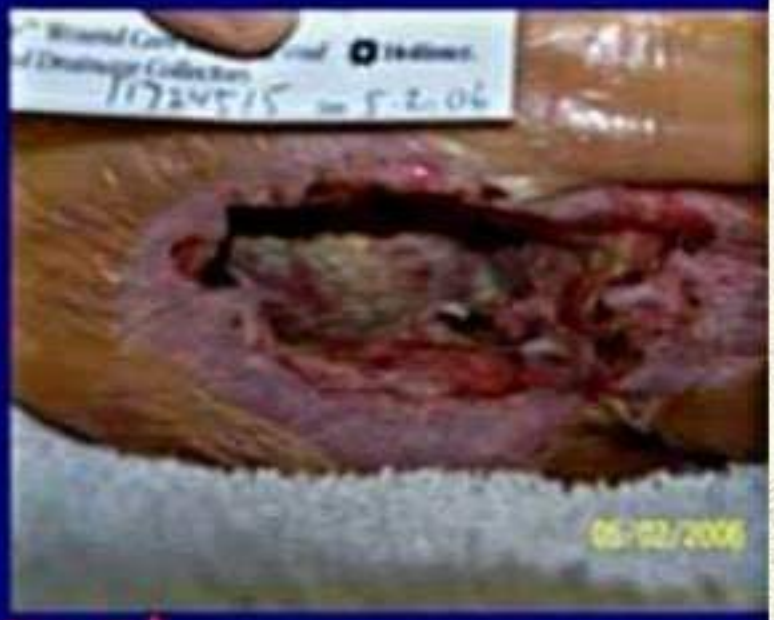
Should be reassesed every 3 monthly



Wagner Classification of DFU

Grade 2

- Deep ulceration
- Visible
  Tendon,
  or bone in wound



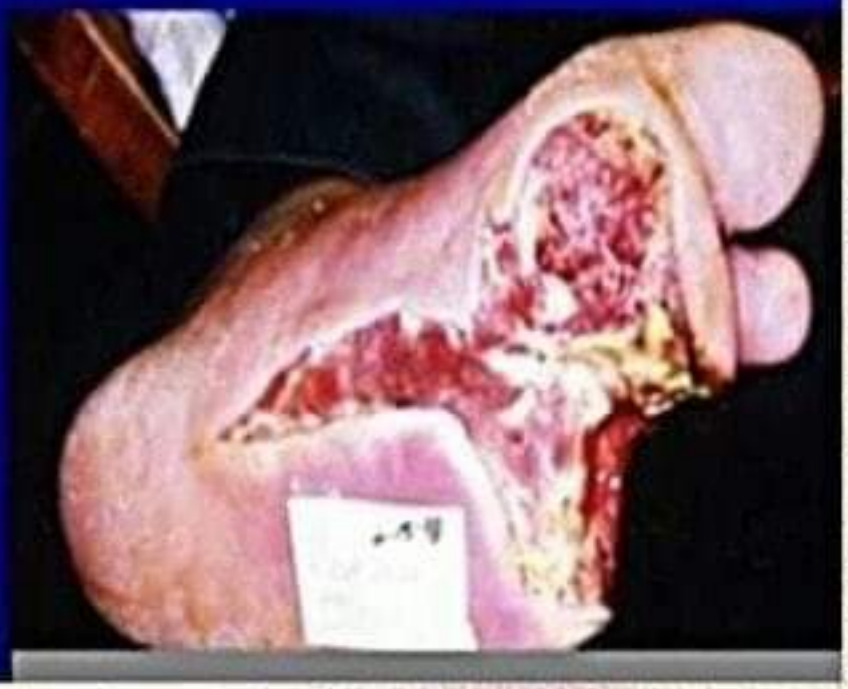
Aggressive treatment is must

Wagner Classification of DFU

Grade 3

- Deep Abscesses
- Osteo Myelitis(Infection of Bone)

Chances of loosing leg



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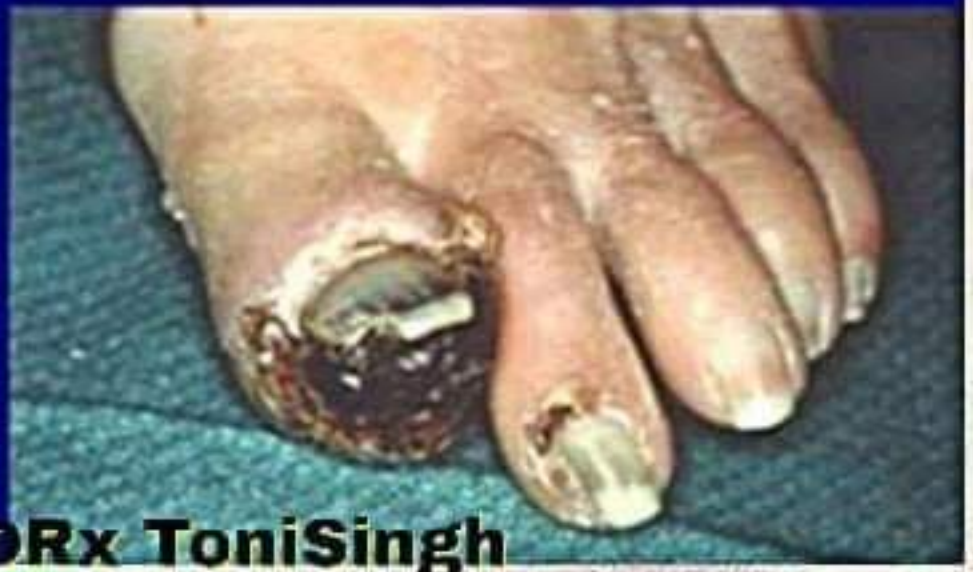
Wagner Classification of DFU

Grade 4

Localized gangrene of toes / forefoot

Needs Amputation (Cutting) of Toe or part of foot



Wagner Classification of DFU

Grade 5

Gangrene of entire foot or leg

Needs Amputatation (Cutting) of foot or leg