

# National Best Practice Recommendations for the Interprofessional Treatment of acute Diabetic Foot Syndromes (DFS)

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## Background

In 2021, 6.7M people died due to diabetes. The high human and financial burden of disease is mainly due to its severe secondary complications such as cardiovascular diseases, nephropathy (leading to dialysis), blindness, diabetic feet (leading to amputations) as well as certain cancers. Patients with diabetes have a 23-fold higher risk of amputations, with 85% of those amputated having had prior foot ulcers. The direct costs of diabetes and its complications was estimated in 2009 for the canton Vaud to be CHF 250 million, of which approximately 50% is due to secondary complications. Diabetic foot syndromes (DFS) pose a high risk for amputations as due to the loss of sensitivity in their feet, patients are not aware of injuries and the necessity of getting timely and appropriate care. Consequently, QualiCCare formed a DFS working group (WG), comprising of experts from 12 relevant medical and non-medical professions, under the lead of the SSED-WG diabetic foot (DF). Based on the IWGDF (International Working Group Diabetic Foot) Guidelines, the DFS WG developed a comprehensive practical guidance and four indication-specific recommendations, validated by all involved professional societies. To facilitate the implementation, setting-specific decision trees were developed for primary care providers.

## Methods

Four indication-specific subgroups were formed under the lead of members of the SSED-WGDF to prepare the indication-specific recommendations in a participatory process. The generic practical guidance was equally developed in the same process. Based on the IWGDF guidelines, the latter were adapted to Switzerland by the group. All recommendations and practical guidance were validated by the involved professional societies. To facilitate the implementation into practice, the primary care representatives of the DFS WG additionally prepared a triage decision tree for non-physician professionals, comprising of pharmacists, podiatrists, nurses and other relevant healthcare workers, as well as a second triage decision tree was prepared for general practitioners (GPs). A checklist, elaborated together with the decision trees, complements the latter and is meant to accompany any referral note to the next care level. The development took several bilateral and multilateral meeting as well as written feedback and a final group discussion with consensus-finding. The validation is performed by the DFS WG and their respective professional societies.

## Results

We provide national, validated best practice recommendations for the triage and treatment of acute DFS, comprising of one generic practical guidance, four indication-specific recommendations for specialists as well as two setting-specific decision trees as well as one profession-unspecific checklist for primary healthcare providers. The latter is proposed as a referral note to ensure the continuous care of DFS patients along the patient pathway from primary to tertiary on-site care. We propose the respective competences for each level as well as practical red flags for urgent referral.

## Conclusion

This multi-stakeholder initiative evolved from the motivation for action of one specialist society, namely the SSED, and QualiCCare to invite all concerned healthcare workers to elaborate together common best practice recommendations to optimize the care of patients with DFS. This bottom-up development can be a model for other societies and initiatives to work on common quality standards for interprofessional coordinated patient care.

## References

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### Diabetic Foot Syndrome (DFS) – First Line Management Guidance according to Risk

Pertinent history assessment (see appendix)	
<b>Clinical evaluation: Risk-Stratification</b> <b>→ Signs of Neuropathy?</b> If yes: Is acute Charcot Foot / diabetic neuro-osteopathy possible? → follow Charcot / offloading guidance and seek expert opinion (Level 2/3 care) To relieve pressure from neuropathic/angiopathic ulcers refer to Charcot guidance <b>→ Is there an ulcer / multiple ulcers?</b> If yes: assess severity according to depth and size (please refer to appendix), photo/doc required! <b>→ Suspected Peripheral arterial disease (PAD)?</b> → follow PAD guidance <b>→ Signs of infection / inflammation?</b> → follow infection guidance	
<b>«SIMPLE» low risk</b> All of: • Superficial wound (grade 1) • No infection • No arteriopathy (PAD) • No Neuropathy / NP without deformity	<b>Level 1: Primary care</b>
<b>«COMPLEX» intermediate risk</b> Any of: • Deep wound (≥ grade 2) • No improvement / worsening • Signs of infection • Arteriopathy (PAD) • Neuropathy with deformity • History of ulcer or amputation	<b>Level 2: DFU Specialists</b>
<b>«EMERGENCY» high risk</b> Any of: • Cellulitis • Gangrene • Systemic infection • Acute limb ischemia • Acute Charcot Foot	<b>Level 3: Interprofessional footcare team</b>
Doubt about severity Not confident in evaluation Refer to Level 2/3	

### Level 1A – DFS Management

**Criteria permitting standard care (1 – 2 weeks)**  
 → **Grade 1 ulcer** (see appendix)  
 → **Duration < 1 week**  
 → **Not on pressure exposed location** (not on plantar surface)  
 → **No Neuropathy** (Monofilament = 4/4, Pallesthesia > 4/8)  
 → **No PAD** (= 2 foot pulses perceptible, ABI ≥ 0.9)  
 → **No Infection** (IDSA\* Grade 1)

**1. Thorough history and examination**  
**2. Standard wound care**  
**3. Follow up within 1 week mandatory**

→ Signs of mild infection (rubor 0.5 – 2 cm; IDSA 2)  
 → Ulcer duration > 1 week, but < 4 weeks

→ Past amputations / DFU  
 → Deformity  
 → Suspected PAD (< 2 foot pulses perceptible, ABI < 0.9)  
 → Ulcer duration > 4 weeks  
 → Deep ulcer (≥ grade 2) and / or plantar ulcer (pressure exposed)  
 → Worsening findings or inadequate progress (woundsize reduction < 10% / week)

**RED FLAGS**  
 → Endstage renal disease (dialysis)  
 → Suspected critical ischemia\*\* emergency  
 → Consider if Grade 3 ulcer (see appendix)  
 → Worsening findings or no adequate progress (woundsize reduction < 50% within 4 weeks)  
 → Signs of severe infection (fever, IDSA 4)  
 → Suspected necrosis (black wound)  
 → Deformity needing surgical correction  
 → Suspected Charcot  
 → Acute painful neuropathy

\* Infectious Diseases Society of America  
 \*\* ABI < 0.5, tPO2 < 25mmHg, toe pressure < 30mmHg

### Diabetic Foot Syndrome (DFS) – First Line Management Guidance according to Risk

Risk Level	Primary Care	Standard Wound Care possible
«SIMPLE» low risk	Level 1: Primary care 1 A: Pharmacist, medical technician, Podiatrist, nurse, woundcare nurse 1 B: GP	
«COMPLEX» intermediate risk	Level 2: Off-site network of DFS Specialists GP, angiologist, diabetologist, infectiousologist, interventional radiologist, technical orthopedist, orthopaedic surgeon, podiatrist, specialized woundcare nurse, vascular surgeon & others as needed	<b>Need for structured care plan:</b> • Diagnostic workup • Efficient offloading • Appropriate treatment of → Arteriopathy (PAD) → Infection • Specialized wound care
«EMERGENCY» high risk	Level 3: On-site interprofessional diabetic foot care team, comprising outpatient and inpatient management	<b>Need for emergency care plan</b> Same as Level 2, plus: • Fast-track Revascularization • Orthopedic surgery • I.v. antibiotics • Strict offloading
Doubt about severity Not confident in evaluation		Refer to Level 2/3

Close follow-up is mandatory at each level (at least weekly)!  
 If no improvement is noted on reassessment or red flags\* occur, the highest level of care (Level 3) must be achieved applied.

\* any of the criteria listed above under «COMPLEX» and «EMERGENCY» definitions see next pages

### Level 1B – DFS Management

**Criteria permitting standard care (max 3 – 4 weeks)**  
 → **Grade 1 ulcer** (see appendix)  
 → **Duration < 4 weeks**  
 → **Not on pressure exposed location** (not on plantar surface)  
 → **No Neuropathy** (Monofilament = 4/4, Pallesthesia ≥ 5/8)  
 → **No PAD** (= 2 foot pulses perceptible, ABI ≥ 0.9)  
 → **No or mild infection** (IDSA Grade 1 and 2)

**1. Thorough History and Examination**  
**2. Standard wound care**  
**3. Targeted and effective Offloading**  
**4. At least weekly follow up mandatory**

→ Past amputations / DFU  
 → Deformity  
 → Suspected PAD (< 2 foot pulses perceptible, ABI < 0.9)  
 → Ulcer duration > 4 weeks  
 → Multiple ulcers  
 → Deep ulcer (≥ grade 2) and / or plantar ulcer (pressure exposed)  
 → Worsening findings or inadequate progress (woundsize reduction < 10% / week)  
 → (Consider: If Hx of past amputation / severe deformity, chronic charcot, Grade 3 ulcer)

**RED FLAGS**  
 → Endstage renal disease (dialysis)  
 → Suspected critical ischemia\*\* emergency  
 → Consider if Grade 3 ulcer (see appendix)  
 → Worsening findings or no adequate progress (woundsize reduction < 50% within 4 weeks)  
 → Signs of severe infection (fever, IDSA 4)  
 → Suspected necrosis (black wound)  
 → Deformity needing surgical correction  
 → Suspected Charcot  
 → Acute painful neuropathy

\* ABI < 0.5, tPO2 < 25mmHg, toe pressure < 30mmHg

