



UEMS PRM Section & Board

Clinical Affairs Committee

New accreditation procedure

Programme n°7

Multiprofessional management of the diabetic foot

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II. Summary

Diabetic foot complications can have a great impact on quality of life and should be considered as a multi-organ disease and a lifelong condition [3]. International consensus meetings on the diabetic foot provide practical guidelines for management and prevention of the diabetic foot, and specific guidelines for management of infection, wounds, osteomyelitis, footwear and off-loading [2].

Up to 50% of people with type 2 diabetes have significant neuropathy. Foot ulcers usually result from a combination of internal and external factors such as loss of protective sensation due to neuropathy, increased biomechanical stress, impaired skin perfusion and external trauma. They often repeat, are recalcitrant to healing and susceptible to infection [3]. Shoe-related trauma is the most frequent event precipitating an ulcer. Prevention and treatment of foot ulcers can be reached by regular inspection, identification of at-risk feet, education, appropriate footwear and treatment of non-ulcerative pathology.

In patients with both neuropathy and ischemia (neuro-ischemic ulcer), symptoms may be absent, despite severe peripheral ischemia [2,4,5,8]. Micro-angiopathy should not be accepted as a primary cause of an ulcer and a non-healing ulcer is not an indication for a major amputation. Peripheral arterial disease is the most important factor related to outcome of a diabetic foot ulcer. Open bypass and endoluminal therapy is important to achieve healing in a diabetic foot ulcer [5,7].

Up to 70% of all lower-leg amputations are related to diabetes. Up to 85% of all amputations are preceded by ulcers. Also co-morbidities as well as tissue loss/involvement are strongly related to the outcome and the probability of healing [6-8]. Multidisciplinary approach to management and prevention can reduce the amputation rates by 45-85% [1,2].

A multiprofessional diabetic foot team may consist of a vascular surgeon, PRM physician, podiatrist, plaster department, wound nurse, orthopedic shoe technician, diabetologist and dermatologist. Foot examination should be performed at least once a year depending of the risk profile of the diabetic foot. Identification and treatment of patients at risk are the most important aspects of amputation prevention and ameliorating quality of live of patients with diabetic foot problems.

III. General foundations of the Programme

A. PATHOLOGICAL AND IMPAIRMENT CONSIDERATIONS

1. *Aetiology*

Hyperglycaemia and oxidative stress leads to a number of changes in the cellular biochemistry including the increased formation of glycation end products and sorbitol [1] which exceeds the antioxidant defence capacity [9] and plays a crucial mediatory role in the pathogenesis and progression of complications in diabetes. Furthermore it does impair cell migration and angiogenesis to support collagen synthesis for mature granulation and re-epithelialisation [10] with subsequent delayed wound healing [11] and can also lead to relative immunodeficiency and a decrease in neuropeptides associated with neuropathy.

Multiple internal and external risk factors contributing to the development of skin breakdown are unperceived trauma with sensory neuropathy, foot deformity, a history of previous foot ulcers, ill-fitting shoes [8], bare foot walking, visual problems and co-existent peripheral vascular disease, infections include fungal (most frequent) and bacterial skin infection, nail disease and other types of diabetic dermopathy [12-14]. Bacterial damage will cause wound deterioration delaying wound healing, increasing the risks of further morbidity and mortality [15].

Infection is seldom the direct cause of an ulcer, but an infected ulcer greatly increases the risk of subsequent amputation [68].

2. *Natural history and relationship to impairment*

One of the first signs of diabetic foot problems often is the development of neuropathy which often leads to an insensitive sometimes deformed foot and limited joint mobility with as result abnormal biomechanical loading of the foot with thickened skin (callus) formation. Often the patient continues walking on the insensitive foot, impairing subsequent healing. Neuropathy causes a lack of proprioceptive feedback on mobility, postural stability [21,22] and ulcer recurrence. It can have a great impact on the patients' physical and psychological well-being and often has a negative effect quality of life in diabetes.

Presence of a diabetic foot ulcer is associated with an extensive co-morbidity that increases significantly with severity of the foot disease [2, 23]

During the course of the disease, diabetes often leads to various disabilities and lifelong chronic complications including major or minor lower extremity amputations due to accompanying peripheral vascular disease (PAD) and infection.

3. *Diagnosis approach and prognosis*

The diagnosis of a developing diabetic foot has to be established in an early phase of the disease. Neuropathy, deformity and ulcer development in combination with peripheral arterial disease are main problems and can lead to amputation.

Non-ulcerative skin pathology and infection still remains a major threat to the diabetic foot. Early recognition and management of the minor infections could ultimately prevent the occurrence of more major infections [30-31].

Factors related to the outcome of neuropathic ulcers have been related to the initial size of the ulcer, the duration of the ulcer at admission/start of treatment and probing to bone with a high probability for infection (osteitis, deep abscess) [25,26,32,33,60]. It is important to differentiate between neuropathic, neuro-ischemic and ischemic foot ulcers.

1 Recurrent ulcers were related to metabolic control, severity of neuropathy, previous ulcer
2 and previous amputation [34,35,69].

3 Charcot neuro-osteoarthropathy (CN) is a major complication of diabetes. It often presents
4 without warning and can rapidly deteriorate into severe and irreversible foot deformity
5 leading then to ulceration and amputation [36].

6 Co-morbidity, such as cardiovascular disease, end-stage renal disease, severity of PAD,
7 extent of tissue involvement and oedema are strongly related to primary healing and
8 healing with or without minor amputation [4,23,24].

9 Recent research has emphasized the importance of psycho-social factors in the
10 development and outcome of diabetic foot ulcers. Studies have shown that perceptions of
11 the individual's own risks based on symptoms, and their own beliefs in the efficacy of self-
12 care can affect foot-care practice [2].

13 **4. Impairment treatment principles**

14 The diabetic foot should be considered a lifelong condition.

15 Basis of the treatment is to keep feet in good shape by podiatry, ulcer , wound and
16 infection treatment, vascular management, early and aggressive treatment of ulcers by
17 plaster treatment, offloading by means of adequate (orthopedic) footwear [16-20,46,71-76]
18 and multidisciplinary rehab treatment including prosthetic fitting in case of amputation.

19 Systemic factors that impair healing including hyperglycaemia need to be treated [37].

20 Ulcers dramatically increase the risk of developing a new ulcer or other pathologies, should
21 be considered as a multi-organ disease. A multiprofessional treatment to management and
22 prevention has been associated with an improved healing rate and a reduction of the
23 amputation rate in comparative studies [38-44].

24 It has to be recognized according to the consensus document [1,2] that a 'non-healing'
25 ulcer per se is not considered as a primary indication for amputation.

26 Patient centred concerns including pain, depression and a decreased quality of life may all
27 impede adherence to treatment plan [45].

28 Patients with a foot ulcer have limitations in daily living, leisure activities, employment, and
29 often have attitudinal differences towards health and illness. As a consequence, multi-
30 professional management has been recommended, allowing the practitioner to look beyond
31 the physical problems.[47-48].

32 Quality of life, reduction in physical activity, attitudes and beliefs of health and illness are
33 factors that play a role and influence outcome in DF and need attention. Education,
34 psychology, non intentional and intentional non-adherence ([49] can play an important role
35 in the multiprofessional treatment of patients with a chronic disease.

36 Treatments have to be focused to delay and reduce in high-risk groups complications such
37 as foot ulcerations and amputations for as long as possible foot care knowledge and
38 behaviour of patients seem positively influenced in the short term [50] .

39 Physical and Rehabilitation Medicine (PRM) can play a central role when multidisciplinary
40 rehabilitation is needed.

41 **B. ACTIVITY LIMITATIONS AND PARTICIPATION RESTRICTIONS**

42 Diabetic foot problems can lead to restrictions in activity and participation.

43 Multi factorial problems are involved in the changes in gait and balance with impaired
44 mobility and functional disability together with peripheral neuropathy, foot deformations,
45 muscle strength, sensory impairment, muscle activity, coordination and shoe- and
46 offloading problems with often increased risks for falls and fractures and accumulation or
47 worsening of impairments [51,77-79]. Peripheral arterial disease was more strongly
48 associated to mobility- related disability and walking limitation, while peripheral neuropathy
49 was more related to activity of daily living disability. Further progression in diabetic foot

1 complications may lead to minor or major amputations. Also depressive symptoms were
 2 related to an excess risk of disability associated with diabetic foot [52] and impairments in
 3 lower extremity physical functioning and loss of physical independence have a major impact
 4 on quality of life.

5 Diabetes gives a two- to threefold increased risk of being unable to do mobility-related tasks
 6 and co-morbidities, such as coronary heart disease and stroke accumulate the effect of
 7 multiple diabetes-related medical conditions and impairments [53,54].

8 Health-related quality of life due to foot ulcers and /or neuropathy have decreased physical,
 9 emotional and social function and severe restrictions in daily activities, problems with
 10 interpersonal relationships and changes in self-perception [55]. Early results of interventions
 11 to improve physical functioning are promising and need to be further explored within clinical
 12 practice. Both beliefs and expectations about health and illness relating to diabetes and the
 13 diabetic foot have to be taken into account when preventing and managing foot problems
 14 [56-59].

15 Multidisciplinary rehabilitative interventions may be indicated as an integrated part of the
 16 multiprofessional diabetic foot management structure.

17 **C. SOCIAL AND ECONOMIC CONSEQUENCES**

18 **1. Epidemiological data**

19 More than 50% of diabetic patients with a foot ulcer had signs of infection at
 20 admission/arrival to a hospital based multidisciplinary foot team. Fifty percent of these
 21 ulcers were of neuro-ischemic origin and one-third of the patients with a foot ulcer had signs
 22 of both peripheral artery disease (PAD) and infection. 32% with a previous foot ulcer
 23 developed a new ulcer within 1 year of observation and 45% developed a new ulcer within 2
 24 years of observation [37].

25 Healing rates in trials of patients with neuropathic foot ulcers up to 20 weeks should be 55 –
 26 60% according to recent data, especially when strict off-loading strategies are maintained,
 27 indicating substantial improvement in the basic care and control arms in recent studies.
 28 Signs of PAD can be found in more than half of the patients with a foot ulcer [2,5, 23-25,
 29 27,29].

30 A substantial number of studies have shown that a decrease (40 – 79%) in the major
 31 amputation rate can be achieved [1,2].

32 A strategy which includes prevention, patient and staff education, multi-disciplinary
 33 treatment of foot ulcers, and close monitoring can reduce amputation rates by 49 – 85%.
 34 [1,2].

35 The main target of our multiprofessional DF outpatient clinic is to achieve less major
 36 amputations.

38 **2. Social data**

39 A decreased physical, psychological and social function in patients with diabetic foot
 40 disease is well known. People with foot ulcers and amputation often suffer from depression
 41 and have a reduced quality of life. Social isolation, poor education and low socio-economic
 42 status place people with diabetes at higher risk of foot problems and increased risk of
 43 amputation. Studies have shown that perceptions of the individual's own risks based on
 44 symptoms and their own beliefs in the efficacy of self-care can affect foot-care practice and
 45 concordance by the patient [48,49,55-59,70]

46 **3. Economic data**

47 The future for diabetes has been described as the global epidemic of the 21st century, the
 48 increasing incidence of diabetes (in 2007 over 246 million people affected by diabetes) will

1 place considerable strain on resources [61]. The importance of health economics and
 2 reimbursement in the prevention and treatment of the diabetic foot cannot be
 3 underestimated [62-66]. Foot complications are among the most serious and costly
 4 complications of diabetes mellitus.

5 Ulcers of the foot in diabetes are a source of major suffering and cost [61,67] Amputation of
 6 all or part of a lower extremity is usually preceded by a foot ulcer.

7 Management of patients with diabetic foot problems according to guideline-based care is
 8 cost effective and even cost saving compared to standard care and improves survival and
 9 reduced numbers of diabetic foot complications and costs [5,63-66].

10 **D. LEGAL FRAMEWORK**

11 The DF team and programme are working within the legal framework of Dutch medical and
 12 patient right laws and Dutch medical reimbursement system.

13 **E. MAIN PRINCIPLES OF YOUR PROGRAMME**

14 The diabetic foot team works multiprofessional.

15 The DF patients can be referred by:

- 16 • General practitioners
- 17 • Medical specialist from the hospital and region
- 18 • Members of the DF team

19 Goals of the program:

- 20 • Screening and treating DF problems as early as possible to prevent complications
- 21 • Education and follow-up preventing recurrence and / or complications
- 22 • Reducing minor and major amputations

23 Cornerstones of diabetic foot management are:

- 24 • Identification of the foot at risk, by screening, regular inspection and examination of
 25 the foot.
- 26 • Education and foot care and shoe advice
- 27 • Regular inspection and examination of the foot at risk.
- 28 • Treatment and follow-up of DF pathologies (callus deformities ulcers infection,
 29 wounds, , PAD, ,)
- 30 • Adequate off-loading and foot protection (plaster , (modified) footwear)
- 31 • Orthotic and prosthetic devices
- 32 • Multidisciplinary rehab treatment

33

34

35

IV. Aims and goals of the Programme

A. TARGET POPULATION

1. *Inclusion/exclusion criteria*

Patients with diabetic foot problems. The diabetic foot can be defined as an umbrella term for foot problems in patients with diabetes mellitus, due to arterial abnormalities and diabetic neuropathy, as well as a tendency to delayed wound healing, infection or gangrene.

2. *Referral of patients to DF team*

Direct access to the DF programme *	Yes
Referral from general practitioners	Yes
Referral from other specialists	Yes
Referral from specialists in PRM	Yes

(*) On both working locations (hospital and rehab centre)

3. *Stage of recovery*

Within two weeks of onset	Yes/No
2 weeks to 3 months after onset	Yes/No
3 months or longer after onset	Yes/No

This item is not relevant for our programme. Patients with DF problems can be referred directly to members of DF team, if necessary the same day.

B. GOALS OF THE PROGRAMME

1. *In terms of body structure and function*

ICF code	ICF label
B750-789	Movement functions
B260-279	Sensory functions
B730-749	Muscle functions
B710-729	Function of the joints and bones
B280-289	Pain
S750	Structure of the lower extremity

S8104	Skin of the lower extremity
B410-429	Functions of the cardiovascular system
S410	Structure of the cardiovascular system

1

2

3

2. In terms of activity and participation

4

ICF code	ICF label
D160-179	Applying knowledge
D410-429	Changing and maintaining body positions
D450-469	Walking and Moving
D5-9	Items concerning participation

5

6

7

V. Environment of the programme

A. CLINICAL SETTING

Individual practice or part of a doctor's group practice	Yes/No
Individual practice in a private hospital	Yes/No
Part of a local (public) hospital	Yes/No
Part of a regional hospital (or rehabilitation centre)	Yes/No
Part of a university or national hospital	Yes/No

B. CLINICAL PROGRAMME

Inpatients in beds under PRM responsibility *	Yes/No
Inpatient beds belonging to other departments (vascular surgery)	Yes/No
Day programme (most of the day in outpatient setting, not home)	Yes/No
Outpatient clinic (assessment and/or treatment, for up to 3 hours/day)*	Yes/No
Community based (in the patient's home or workplace or other relevant community location, eg sports centre)	Yes/No

(*) In Delft activities of the DF team take place on 2 locations, hospital and rehab centre. The 2 institutes are located next to each other. The data above concern the hospital part.

In the hospital the DF team consultations are located on the vascular surgeon consultation ward. For clinical rehab treatments there is a PRM department in the hospital for consultations on every specialist department. But in the hospital has no PRM inpatient beds. The rehab centre has facilities for outpatients. Inpatient facilities are also nearby in the rehab centre as a part of the rehab organisation.

The PRM physicians who are participating in the DF team are working in the hospital as well as in the rehab centre.

C. CLINICAL APPROACH

Uniprofessional	Yes/No
Multiprofessional	Yes/No

D. FACILITIES

Does your programme have a designated space for:	
For assessments and consultations?	Yes/No
For an ambulatory or day care programme?	Yes/No
For inpatient beds?	Yes/No
For therapeutic exercises?	Yes/No
For training in independence and daily living?	Yes/No
For vocational and/or recreational activities?	Yes/No

The rehab centre taking part in the DF team has facilities for outpatients. Further more there are facilities for podiatry, prosthetics/orthotics, and orthopaedic shoe technicians. The plaster department is in the hospital.

Inpatient rehab facilities are also nearby in the rehab centre as a part of the rehab organisation.

VI. Safety and patient rights

A. SAFETY

The safety concerns of persons in the unit where the programme takes place, relate to:	
Emergencies (fire, assault, escape)	Yes
Medical emergencies	Yes
Equipment	Yes
Handling of materials	Yes
Transports	Yes
The safety of persons in the programmes of your unit is provided by:	
Written standards from National Safety Bodies	Yes
Written standards from National Medical Bodies	Yes
Unit-specific written rules	No
Periodic inspection	
Internal	Yes
External	Yes

The hospital and rehab centre are teaching hospitals, including PRM and vascular surgery and have regular site-visits by national medical authorities. And also national inspections and external visitations are scheduled on a regular basis.

B. PATIENT RIGHTS

Has your programme adopted a formal policy or statement of patients' rights?	Yes
Does this statement specify the influence that the patient should have in the formulation and implementation of the programme?	Yes
Is the statement known to all personnel involved in delivering the programme?	Yes
Is this checked periodically?	No
Is the statement made known to and is available to all persons visiting your unit?	Yes

Patient rights are regulated by law. Every health care institute has to follow these rules and has to be equipped with an patient complain organisation and committee.

1

C. ADVOCACY

2

Give at least one example of how your organisation advocates for people your programme deals with:

Presentations internal/external on diabetic foot treatment aspects
--

Organising and stimulating patients with diabetic foot problems to participate in screening and follow-up and use adequate footwear

To stimulate regular foot inspection of regular foot care

Participation in (multi-centre) research and publications

3

4

VII. PRM Specialists and team management

A. PRM SPECIALISTS IN THE PROGRAMME

Does your PRM physician have overall responsibility and direction of the multiprofessional team?	Yes
Does your PRM physician have overall responsibility and direction of the rehabilitation programme, not only medical responsibility?	Yes
Does he/she have a European Board Certification in PRM?	Yes
Does he/she meet National or European CME/CPD Requirements?	Yes
Number of CME or EACCME points earned in the last 3 years:	120 conform Dutch Medical regulations
The <i>two primary functions</i> for the PRM specialist in your Programme are to:	
Treat comorbidity	No
Assess the rehabilitation potential of the patient	Yes
Analyse & treat impairments	Yes
Coordinate interprofessional teams	No

The PRM physician has the overall responsibility and direction of the multiprofessional rehab team in the rehab centre. The hospital also has a rehab team.

Which rehabilitation professionals work on a regular basis (minimum of once every week) in your programme? (give the number)	
Physiotherapists	Yes
Occupational therapists	Yes
Psychologists	Yes
Speech & Language therapists	Yes
Social workers	Yes
Vocational specialists	No
Nurses	Yes
Orthotists/prosthetists assistive technicians/engineers	Yes
Other (please specify)	Orthopedic shoe technician Podiatry Gait lab technician (only rehab centre)

Rehab teams in hospital as well as in rehab centre.

1

How often does your staff receive formal continuing education (mark as is)?	
In team rehabilitation:	Every year Every second year Other period Not regularly
In their own profession:	Every year Every second year Other period Not regularly
Do team activities in your rehabilitation programme include the following?	
Is the patient at the centre of a multiprofessional approach?	Yes/No
Do you always give informed choices of treatment?	Yes/No
Do you regularly promote family involvement?	Yes/No
Does your organisation of multi professional team working include:	
Holding regular team meetings with patient's records only (more than 2 members)	Yes/No
Holding regular team meetings (more than 2 members) with the presence of the patients	Yes/No
Joint assessment of the patient or joint intervention	Yes/No
Regular exchanges of information between team members	Yes/No

2

Rehab teams in hospital as well as in rehab centre.

VIII. Description of the programme

A. TIME FRAME OF THE PROGRAMME

1. *Phases of the programme*

- Referral phase: There is direct entrance to the members of the DF team in case of acute DF problems.
- Diagnostic phase: screening of the diabetic foot, additional investigations such as lab, X-ray, vascular lab invasive / non-invasive.
- Treatment phase: by members of the diabetic foot team in relation to the diagnostic findings.

2. *Follow up procedure*

Treatments and follow-up by one or more members of the DF team depend on risk level, progression and type of treatment/follow up needed:

- Regular controls of adequate footwear and off-loading.
- High risk patients should be included in a comprehensive foot care programme and control system.
- Examination at least once a year for potential foot problems.
- Patients with demonstrated risk factor(s) (Simm's classification) should be examined more often every 1 – 6 months. Absence of symptoms does not mean that the feet are healthy; a patient might have neuropathy, peripheral vascular disease, or even an ulcer without any complaints.

B. ASSESSMENT

1. *Disease and impairment - diagnosis approach*

Diagnosis and treatments are focused on the diabetic foot (DF).

The multiprofessional team members are : vascular surgeon , PRM physician, podiatrist , wound nurse , plaster technician and on demand dermatologist, diabetologist. Rehabilitation treatments in the rehab centre are coordinated by the PRM physician and there are separate consultations with the prosthetist/orthotist and orthopedic shoe technician.

In the hospital within the DF team the vascular surgeon and PRM physician are steering the consultations and the other members of the team.

Members of the DF team are working in one or both of the following health care institutes:

- Reinier de Graaf Hospital Delft
- Sophia Revalidatie Rehab Centre Delft

Both institutes are located next to each other.

Type and location of the DF team activities :

- 1 • Reinier de Graaf Hospital:
 - 2 ○ Podiatric screening / treatment of the diabetic foot
 - 3 ○ DF team consultations and screening
 - 4 ○ Plaster treatment in the plaster department
 - 5 ○ Inpatient treatment at the vascular surgeon department. For inpatients with
 - 6 DF problems vascular surgeon department and PRM department are
 - 7 working closely together
 - 8 ○ Lab, X-ray and non-invasive vascular investigations can if necessary
 - 9 directly been done
- 10 • Sophia Revalidatie Rehab Centre:
 - 11 ○ Prosthetic and orthotic department
 - 12 ○ Orthopedic shoe department
 - 13 ○ Podiatric screening / treatment of the diabetic foot
 - 14 ○ Outpatient multidisciplinary rehabilitation treatments
 - 15 ○ Gait analysis laboratory.

16 2. **Activity**

17 Goals of the treatments are to diminish impairments and to keep patients as ambulant as
18 possible.

19 Education on foot care and shoe advice; Inappropriate footwear is a major cause of
20 ulceration. Appropriate footwear should be used both in- and doors. Education of patient
21 and relatives focused on wound and skin abnormalities, instruction on appropriate self-care
22 and on how to recognize and report signs and symptoms by regular inspection and
23 examination of the foot at risk and to determine the cause and prevention of recurrence.

24 3. **Participation - environmental and personal factors**

25 If necessary multidisciplinary rehab treatments can be started when there are participation
26 problems.

27

28 C. INTERVENTION

29 1. **Interventions by members of the diabetic foot team**

30 a) **Diagnostic phase: screening and education**

31 Identification of the foot at risk conform to a screening list. If the screening is abnormal
32 patient will be referred to the DF team. Screening takes place conform the guidelines and is
33 concentrated on the following items:

34 Podiatry Screening

35 Neuropathy can be detected using the 10-g (5.07 Semmes – Weinstein) monofilament and
36 tuning fork (128 Hz).

37 Screening list:

- 38 • The foot is at risk if any of the below are present:
 - 39 - Foot / Toe Deformity or bony prominences Yes/No
 - 40 - Skin not intact (ulcer) Yes/No
 - 41 - Skin/ nail abnormalities Yes/No

- 1 • Neuropathy
- 2 - Monofilament undetectable Yes/No
- 3 - Tuning fork undetectable Yes/No
- 4 • Abnormal pressure, callus Yes/No
- 5 • Loss of joint mobility Yes/No
- 6 • Foot pulses
- 7 - Tibial posterior artery absent Yes/No
- 8 - Dorsal pedal artery absent Yes/No
- 9 • Discoloration on dependency Yes/No
- 10 • Oedema Yes/No
- 11 • Any others
- 12 - previous ulcer Yes/No
- 13 - amputation Yes/No
- 14 • Inappropriate footwear Yes/No

15

16 LAB / x-ray / (non) invasive imaging vascular tree

17

18 **b) Treatment phase:**

19 **Podiatrist:** podiatric treatment of the diabetic foot (nails, callus removal , debridement). In
20 a high-risk patient callus, and nail and skin pathology should be treated regularly.

21 **Vascular surgeon:** decision on conservative and/or surgical treatment of infection,
22 osteomyelitis, surgical debridement and revascularization procedures as angioplasty or
23 bypass- surgery. And surgical treatment of non-ulcerative pathology such as musculo
24 skeletal procedures (tenotomy of claw toes, Achilles tendon lengthening, bone removal) to
25 make offloading in combination with orthopedic footwear more efficient.

26 **PRM physician:**

- 27 • PRM consultations together with orthopedic shoe technician , plaster technician
28 focusing on adequate fitting and offloading adapted to the altered biomechanics
29 and deformities. shoe advice, amputation advice, orthotic /prosthetic advices, pre-
30 and post-operative amputation advice and rehab treatment. Rehab multidisc
31 treatment
- 32 • Treatment by wound nurse: a standardized and consistent strategy for local wound
33 care is essential. Optimum wound care cannot compensate for continuing trauma
34 to the wound bed, or for ischaemia or infection. Severe problems due to infection,
35 necrosis, gangrene, vascular insufficiency can make hospitalization necessary.
- 36 • Ulcer treatment : relief of pressure and protection of the neuropatic ulcer, by
37 adequate off-loading, restoration of skin perfusion, treatment of infection, local
38 wound care
- 39 • Metabolic control and treatment of co-morbidity
- 40 • Education of patient and relatives
- 41 • Determining the cause and preventing recurrence

1 D. DISCHARGE PLANNING AND LONG TERM FOLLOW UP

2

3

Frequency and type of follow up depends on the type of diabetic foot problems.

IX. Information management

A. PATIENT RECORDS

Do the rehabilitation records have a designated space within the medical files?	Yes
Do you have written criteria for:	
• Admission	No
• Discharge	No
Do your rehabilitation plans include written information about aims and goals, time frames and identification of responsible team members?	Yes
Do you produce a formal discharge report (summary) about each patient?	Yes

B. MANAGEMENT INFORMATION

Does your programme show evidence of sustainability?	
• Established part of public service:	Yes
• Has existed for more than 3 years:	Yes
• Has received national accreditation (where available):	No
How many new patients (registered for the first time) are treated in your programme each year:	See below
In your day care or inpatient programme:	
• What is the mean duration spent in therapy by patients on this programme	*
• How many hours a day do the patients spend in therapy.	*
Give the mean duration of stay spent in the programme:	*

(*) The programme is primarily a multiprofessional outpatient programme for patients with DF problems; duration of follow up depends on the risk profile of the DF.

C. PROGRAMME MONITORING AND OUTCOMES

Does your programme have an overall monitoring system in addition to patient's records?	Yes
Are the long term outcomes of patients who have completed your programme regularly monitored?	

• Impairment (medical) outcomes:	Yes
• Activity/Participation (ICF) outcomes:	No
• Duration of follow up of the outcomes:	Yes
Do you use your outcome data to bring about regular improvements in the quality of your programme's performance?	Yes
Do you make the long term overall outcomes of your programme available to your patients or to the public?	Yes

Monitoring takes place on number of patients, frequency of consultations, plaster treatments, screening data, orthopedic shoe (referral) data , amputation/ vascular treatment data. Data are used for publication and presentations.

Amputations RdGG Hospital Delft, 2004-2008

Amputation level	2004	2008	2008 DM	2008 % DM and amputation
Transfemoral	7	4	2	50
Through knee	8	7	7	57
Below knee	20	19	12	63
Foot	21	19	14	73
Toe	46	25	20	80
Total	102	74 (-28 %)	55 (55% DM)	

Amputations RdGG Hospital 2008

Amputation level	Nr	Infection	Ulcer/necrosis	Vascular	Vascular surgery –prior to
Transfemoral	4	2	1	1	3
Through knee	7	3	2	2	0
Below knee	19	5	7	7	6
Foot	19	12	6	1	4
Toe	25	8	10	7	5
Total	74	30	26	18	18
%		40,5	35	24	24

Patient data DF 2009

914 patient contacts

233 new DF referrals

174 patient contacts in relation with plaster (TCC) treatment

X. Quality improvement

A. WHICH ARE THE MOST POSITIVE POINTS OF YOUR PROGRAMME?

- Integrated multiprofessional diagnosis and treatment
- Follow up / screening / treatment in relation to underlying DF problems
- Educate DF patients to participate in active foot care
- Participating in research , multicentre plantar pressure reseach (DIAFOS project)
- Publication (Schepers T, Berendsen HA, Oei IH, Koning J. J Foot Ankle Surg. 2010 Mar-Apr;49(2):119-22.

B. WHICH ARE THE WEAKEST POINTS OF YOUR PROGRAMME?

- Patient data are registrated in different databases.

C. WHICH ACTION PLAN DO YOU INTEND TO IMPLEMENT IN ORDER TO IMPROVE YOUR PROGRAMME?

1. *Extrinsic conditions that you wish to obtain*

- More use of monitoring plantar pressure, more adequate off-loading

2. *Intrinsic improvement of the programme*

- Ameliorating monitoring system for follow up
- Making patient data registration more efficient

1 XI. References

2 A. LIST OF REFERENCES

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38 B. DETAILS ABOUT NATIONAL DOCUMENTS

39 Richtlijn diabetische voet 2007