

Diabetic Foot Care Education Programme

For the training of certified Diabetic Foot Care Assistants



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Front cover image: Sculpture of Hanna Mobach, the Netherlands.

Introduction

Diabetes mellitus is taking on pandemic proportions. Worldwide over 250 million people suffer from the disease and estimates for 2025 are predicted to be a total of 380 million people with diabetes. As a consequence the impact of diabetic foot disease is also on the rise. Epidemiological reports from every region of the world add up to more than a million amputations performed on people with diabetes each year. Therefore, every 30 seconds a lower limb is lost to diabetes.

A majority of amputations are preceded by ulceration. Both ulcerations and amputations have an enormous impact on people's lives. Decreased independence, social isolation and psychological stress are often encountered. Furthermore, diabetic foot disease is costly for society and is associated with a high mortality. Up to 85 percent of amputations are preventable. Using a proper protocol and a multidisciplinary approach will lower the number of people suffering from these dreadful complications of diabetes.

Podiatry is considered to be the cornerstone of adequate foot care. However, to date, only 19 of the 212 countries in the world have licensed podiatry education. These 19 countries train podiatrists for their own medical services but have supplied podiatrists to approximately 15-20 other countries. However this number is still inadequate for the extent of the diabetic foot problem worldwide and it is felt that there is a great need for diabetic foot education to be available in every country. It is therefore recognized that in countries where podiatry does not exist, interested health professionals should be offered a standardised form of diabetic foot care education to implement in their healthcare setting as an adjunct to their professional responsibilities. In the absence of podiatry the need for affordable and practical diabetic foot care education below the level of podiatry has to be recognized by designing suitable programmes to improve care.

The courses are not designed to be offered either to podiatrists or be run in countries where podiatrists practice. The exceptions to this are where podiatrists who wish to become Course Leaders will undertake the courses themselves. However it is envisaged that there may be a demand for courses where the few podiatrists there are in practice cannot cope with the number of diabetic foot patients e.g. Saudi Arabia has 7 podiatrists for a population of 27 million people.

The IDF consultative section /International Working Group on the Diabetic Foot (IWGDF) offers proposals for foot care training courses to educate certified Diabetic Foot Care Assistants (DFCA).

Successful courses to address local diabetic foot care issues are already in practice in a few countries but with the DFCA courses offered by the IWGDF working group on Diabetic Foot Care Education (DFCE) the aim is not to detract from courses already in place but offer a standardized international course that any country with no podiatry services can apply to undertake, rather than have to set-up their own individual courses.

Design

Education of diabetic foot care assistants is important in those countries where there are no licensed podiatrists practicing. This is to ensure that the healthcare provider currently dealing with the diabetic foot is doing so in a way that will protect the diabetic foot from ulceration and amputation.

Education of diabetic foot care assistants should be provided at 2 levels: DFCA I (basic course) and DFCA II (advanced course).

The courses contain a defined number of "contact hours" (CH = class contact with teacher or course leader) and "study and task hours" (Study load=homework, reading, projects, reflection etc.).

The course is designed for anyone dealing with the foot problems of diabetic people and each course will join people from varying disciplines each with his or her own approach to this multi-factored problem.

The programmes should be tailored for regional variations but comparing and contrasting variations of other countries is considered a valuable discussion point. The courses will be offered to a broad range of people, primarily those who already deal with the diabetic foot. Many of these people we feel are having to offer care in less than ideal circumstances and would benefit from the support these courses will give be it either practical or to enhance foot care awareness to their local community, be it to patients, carers, professional personnel or governing bodies.

The subjects that will be discussed are described in the Index.

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1 COURSES

1.1 BASIC COURSE (DFCA I)

Competencies:

The course will enable the participants to develop the following competencies:

- screening and examination of the diabetic foot,
- identifying the foot 'at risk'
- cutting and filing nails,
- removing simple callus (at the discretion of the Course Leader)
- assessing footwear,
- delivering education in footwear, foot care and hygiene,
- giving general advice to people with diabetes,
- understanding implications of neuropathy,
- reporting problems early,
- understanding what to do and where to go when foot problems develop,
- avoiding iatrogenic lesions,
- understanding common causes of diabetic foot problems.
- infection control and instrument sterilization

- A total of 36 hrs of contact time (CH) (plus additional private study time for homework). The programme can be provided in a flexible way. It can be full time, part time, evening classes or weekends, but must be completed within 2 months.
- List of equipment – to be decided (tbd)
- List of education materials (tbd, literature, digital, AV-material)
- Examination/test (tbd, continuous assessment?)

1.2 ADVANCED COURSE (DFCA II)

A recognized health professional qualification is a presumed requisite. Successful completion of the basic course is a condition for entry to the advanced course plus practical experience post-basic course in a diabetic clinic/wound care clinic/surgical or medical ward or other appropriate setting for at least 6 months.

Competencies:

The course will enable the participants to develop the following competencies:

- understanding common causes of diabetic foot problems,
 - screening and examination of the diabetic foot,
 - understanding implications of neuropathy, peripheral arterial disease (PAD) and infection,
 - assessing ulcers and devising treatment plans,
 - recognition of non- ulcerative pathology (specific dermatological factors associated with skin, nails and callus).
 - recognition of neuro-osteoarthropathy (Charcot foot),
 - removing callus, debriding ulcers, dressing ulcers,
 - assessing footwear and performing adaptations,
 - recognition of the importance of the off-loading,
 - avoiding iatrogenic lesions,
 - infection control and instrument sterilization
 - delivering education in footwear, foot care and hygiene,
 - advanced education for people with feet at-risk and specifically for the people with foot ulcers,
 - giving general advice to people with diabetes,
 - ensuring the people with diabetes understand what to do and where to go when foot problems develop,
 - knowing the importance of early detection and rapid referral.
- A total of 160-200 hrs of contact time (plus additional private study time for homework, projects, reflection). The programme can be provided in a flexible way (8 modules, from 6-30 contact hours per module; it can be full time, part time, evening classes or weekends, but must be completed within 6 months.
 - List of equipment – to be decided (tbd)
 - List of education materials (tbd, literature, digital, AV-material)
 - Examination/test (tbd, continuous assessment?)

2 Educational materials

- Literature (tbd)
- Study book(s)
- AV-material (DVD etc.)
- Hand-outs
- Others

3 Refresher courses

Basic course (DFCA I)

- After 1 year 2-3x4 hrs
- To be repeated after 3 years

Advanced course (DFCA II)

- After 1 year one week
- After 3 years one week

It is recognized that there should be some Continuing Assessment/Evaluation post-graduation however the logistics of this has yet to be addressed.

Eligibility Criteria

Participants will be:

- Doctor/Nurse/Allied Health Professional
- Beauty/Alternative Health industry practitioner (having worked in a beauty salon/alternative health business full-time for at least 1 year).

Participants will be referred by:

- Doctor/Nurse Manager/Allied Health Manager
- Beauty or Alternative Health industry Manager

4 Course Leader/Qualification of Teachers

Basic course (DFCA I):

- Podiatrist
- MD
- Skilled nurse
- Educator

All teachers should have experience in diabetic foot care management

Advanced course (DFCA II):

- Podiatrist
- MD

All teachers should have experience in diabetic foot care management. The practicalities of training course leaders and the logistics of delivering these courses has yet to be fully discussed. Courses to “educate the educators” should be considered.

5 Recognition

Both Basic and Advanced course participants will receive either a certificate (basic) or a diploma (advanced) and recognition by the ‘IDFCS/IWGDF’ (if agreed upon) after successfully passing the mandatory exam. Course leaders should be responsible for informing the assigned board responsible for auditing.

Continuing Education Points will be awarded.

Basic Course...XX points (tbd)

Advanced Course...YY points (tbd)

6 Registration/auditing

One body of administration (board) has to be set up, organized and funded as one of the issues assuring a standard and good level of quality of diabetic foot care assistants. Locally the Board will be represented by either the existing country representative or a 2nd nominated representative.

Both the paragraphs above (regarding recognition, registration/auditing) will be considered in more detail at a later stage.

7 Updating programme

Content of the programme and logistics have to be regularly updated.

8 Costs

- To be paid by local organisation/government
- Funding by sponsors (tbd)
- Others (this may include the participant fully or part funding themselves)

Funding is recognized to be the most difficult aspect of this entire project. It is hoped that everyone interested in getting these courses established will actively assist in approaching likely sources of funding.

IWGDF-DFCE COURSE

10 COURSE I BASIC COURSE FOR DIABETIC FOOT CARE ASSISTANT I

Block 1

1 hr	Introduction of the course, podiatry, diabetes, key elements First introduction of diabetic foot problems (PPT*)
1 hr	PR**: Inspecting of the foot: anatomy in vivo (using each other's feet)
1 hr	PR: Cutting callus (on sweet lime – balsawood)
0.5-1 hr	Anatomy of the skin, nails, callus and specific dermatological factors. (PPT)

Block 1: Introduction shows severity of the problem. Can be on power point prepared by the central committee with dark and light feet, and simply and easily translated. A little foot anatomy, with the participants examining and exploring their own feet and feet of their colleagues. Draw circles round the metatarsal heads, etc. Show them skeleton. It would be helpful to produce a video or DVD or handout. Everything included should be within the context of the diabetic foot and its problems. Callus removal should be taught by a podiatrist.

Block 2

1 hr.	Anatomy of the foot (PPT)
1 hr.	PR: Trimming nails
1 hr.	Diabetes and diabetic foot problems (PPT)
1 hr.	PR: Cutting callus

Block 2: Checking homework/revision of principles. Delegates cutting each others nails. Repeat some trimming of callus.

Block 3

1 hr.	Diabetic foot problems: lack of protective sensitivity and mechanical stress (PPT)
1 hr.	Prevention of diabetic foot problems (PPT)
1.5 hr.	PR: Screening the diabetic foot
0.5 hr.	Reflection, personal theoretical assignments (PPT)

Block 3: PowerPoint's. How you can prevent problems. The quick foot screen, according to the DF guidelines. Time for feedback, reflection, homework. For example, read an article in their own language, think about it and produce abstract to be presented during block 8.



F.e: hand-out 1 article about the diabetic foot and have them make an abstract of this article for all participants + short presentation (5 minutes)

Block 4

- 1 hr. Diabetic foot problems: causes of ulceration (PPT)
Neuropathy – vasculopathy – Limited Joint Mobility
- 1.5 hr. PR: Cutting nails/trimming callus on each other
- 1.5 hr. PR: Evaluation practical sessions: where are we?
Foot screening on a living person (*no matter diabetic or not*)

Block 4: At this stage callus cutting on non-diabetic volunteers will begin and then, depending on their skill, people with diabetes could be introduced. People with diabetes could be treated and also used during the screening session. Comparing results of screening between participants and teachers: are the findings the same? What mistakes are being made. People with diabetes must be happy to be screened by a lot of delegates and to stay for several hours.

Block 5

- 1 hr. Mechanical stress and its complications (callus – blisters – ulceration) (PPT)
- 1 hr. Footwear lecture (PPT)
- 1 hr. PR: Footwear inspection and advice
- 1 hr. PR: Foot care clinic on living persons

Block 5: Lecture on footwear and practical session. Shoe inspection: assessment of delegates' shoes. Maybe also pictures and samples. Practical work on real feet: friends, relatives, people with diabetes with and without diabetes.

Block 6

- 1 hr. The cornerstones of prevention of the diabetic foot (PPT)
- 2 hr. PR: Preventive screening, foot care and education of the patient



Every 2-3 participants have their own patient!

- 1 hr. Evaluation of the practical session, feedback and reflection

Block 6: Need for very intensive feedback, finding fault, preparing them for their examination day.

Block 7

- 1 hr. Complications of the diabetic foot: ulceration and infection (PPT)
- 1 hr. Preventing the foot from ulceration (shoes and felt paddings) (PPT)
- 2 hr. Diabetic foot clinic: treating people with diabetes, including psychological factors and foot care advice.

Block 7: Show them on a PowerPoint some of the further techniques that can be used. Emphasize that the basic course does not qualify them to debride ulcers or callus around ulcers and that if they find an ulcer they should tell the person to see a doctor immediately. Competencies at this stage should include: Screening and exam (including insensitivity and pulses and presence of any lesions); Cutting and/or filing nails; Removing simple callus;

Assessing footwear; Education in footwear and foot care (hygiene) and general advice for people with diabetes; implications of neuropathy; Reporting problems early; What to do and where to go; Avoiding iatrogenic lesions (tight bandages, etc.); Common causes of problems (e.g. use of bandage not sticky tape).

<u>Block 8</u>	<u>Examination day</u>
1 hr.	Presenting the personal assignments
1 hr.	Screening and treating 1 patient
1.5 hr.	Written test
0.5 hr.	Evaluation

Block 8. Criteria to be expected at examination. These are not secret: they can be handed out to the delegates halfway through the course. We will expect them to fulfil these criteria. How to evaluate their skills and knowledge? Should we avoid a written test? (tbd)

PPT*	→	Lecture with Power point presentation
PR**	→	Practical session

IWGFD-DFCE COURSE

11 COURSE II ADVANCED COURSE FOR DIABETIC FOOT CARE ASSISTANT II

1. Module Basic Medical Sciences (12 hours contact hours (CH) – study load 40 hrs.)

- **ANATOMY**

- 4x 45' Anatomy of the foot:

- osteology (how is bone tissue built? to be able to understand the process of developing a Charcot foot – osteoclasts, RANK and cytokines)
 - collagen tissue (to be able to understand Limited Joint Mobility)
 - cartilage tissue (to be able to understand the normal function of joints)

- 2 Study tasks about the anatomy of the foot → bones, arches etc.

- 2x 45' Anatomy in vivo:

- palpation of the anatomical structures of the foot
 - palpation of the arteries
 - measuring foot prints!

- 1 study task about the blood vessels of the leg and foot

- 4x 45' Functional anatomy:

- the anatomy of the foot during weight-bearing
 - the anatomy of the foot during walking
 - foot types

- 2 Study tasks:

- 1. Make 5 static and dynamic foot prints from different people and explain the findings (checklist!)
 2. About terminology and normal range of motion of the joints of the feet

- **PHYSIOLOGY**

- 2x 45' Physiology:

- the function of the skin. Dry skin. Callus. Breaks in the skin.
 - the vascularisation of the foot. Increased blood flow in neuropathy, reduced blood flow in neuro-ischaemia.
 - the innervation of the foot. Diabetic neuropathy.

- 3 Study tasks:

- 1. Understanding the development of callus
 2. Regulation of blood-flow and warmth by the arterial-venous shunting process
 3. Diabetic neuropathy

- **PATHOLOGY**

- 4x 45' Pathology:

- basic pathology of infection, signs and symptoms of infection (reduced in neuropathy and ischaemia), healing (need for control of hyperglycaemia, infection and off-loading to achieve this) Information re: microbiology and antibiotics can be obtained via homework study by consulting the Consensus DVD.

- basic pathology of type 1 and type 2 diabetes mellitus (DM)

2 Study tasks:

1. Diabetes and glucose metabolism: the differences in type 1 and type 2 DM
2. Immunology: the automatic (normal) response of the body to infection.

EXAMPLE OF A STUDY TASK:

Week : 1
Basic science: Anatomy
Subject : Foot prints
Study hours: 5
Handing in: week 3

Make 5 foot prints, both static and dynamic, of 5 different people. Explain findings in terms of foot type, pressure points and type of rolling off all foot prints. Knowledge of foot types and foot behavior during pronation, supination etc. Use a checklist for your conclusions. Explain your conclusions.

2. Module Diabetic Foot I (20 hours (CH) – study load 80 hrs.)

• **COMPLICATIONS OF DIABETES**

4x 45' Early and Late complications

- hypo – and hyperglycaemia
- retinopathy
- angiopathy
- nephropathy
- neuropathy – autonomic, motor and sensory

4 study tasks about above complications

6x 45' The diabetic foot

- complications due to neuropathy
- complications due to angiopathy
- complications due to Limited Joint Mobility
- mechanical stress
- ulceration
- amputation

2 larger study tasks about diabetic foot complications

2x 45' Who is at risk?

- risk factors for diabetes
- risk factors for diabetic foot

4x 45' Screening the diabetic foot

- according to the international consensus
- basic foot examination

2 study tasks:

- interpretation of paper patient cases

2x 45' Education and patient information

- how to educate the patient about his/her feet
- education strategies

Study task: Make your own education leaflet or poster.

7 hrs. Clinic work

EXAMPLE OF A STUDY TASK

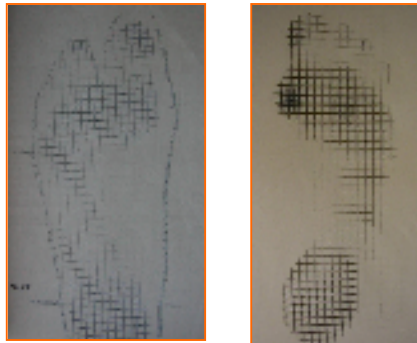
Week : 2
Basic science: Diabetology
Subject : Screening the diabetic foot
Study hours: 4
Handing in: week 4

You have screened the feet of a diabetic patient and have found the following results:

History: No complaints
Inspection: Right foot → claw toes (dig.2+3); reddish skin, swollen veins on dorsum of the foot
Left foot → normal aspect, pink skin, swollen veins on dorsum of the foot
Palpation: Normal temperature both feet
No pulses palpated on right foot
Tests: Monofilament right foot +/- left foot -
Tuning fork right foot +/- left foot +
Prayer sign:



Foot prints:



Answer the following questions:

1. Which screening items are abnormal
2. Which signs show neuropathy?
3. Which signs show ischaemia?
4. Explain both the static and dynamic foot prints in terms of risk for ulceration
5. Has this patient a foot/feet at risk?

3. Module Footwear (6 hours (CH) – study load 15 hrs)

- **FOOTWEAR FOR DIABETIC PATIENTS**

3 x 45 min. good footwear

- good shoes (both for adults and children)
- good socks (both for adults and children)
- special needs of insensitive feet
- special shoes (extra depth, X-sensible, sport shoes, bespoke (custom made) shoes, orthopaedic shoes (OS) KB correct to the right and one sentence

2 Study tasks:

1. About OS + SOS
2. Patient case study

3 x 45 min. footwear inspection

- systematic inspection of the shoe
- inspection of the outer sole of shoes
- inspection of each others shoes
- inspection of a collection of different shoes

Study task:

Make a checklist for shoe inspection → interpretation of 5 patient case studies.

2 x 4 min.' education of the patient about footwear

- how to do footwear education
- patient case studies

Study task: Patient case study

4. Module foot care for diabetic patients (20 CH – study load 30 hrs.)

As students have completed the Basic Course, this will be mostly clinical work (12 CH) under supervision.

Extra content in comparison with the Basic Course includes:

- treating minor pathology (in-growing toenails, corns) → 4 CH
- debriding non-infected wounds → 4 CH

Study task:

- describe 5 patients you have treated in the form of a patient report for the referring doctor.

EXAMPLE OF A STUDY TASK

Week : 4
Basic science: Diabetic Foot Care
Subject : Treating minor pathology
Study hours: 10
Handing in: Last study week of this module

Describe your treatment in terms of foot care for 5 patients you treated conforming to the following format:

1. History of the patient:
Describe the problem
Describe the diabetic status of the patient
Describe the complications that are present in this patient
Describe the complaint(s) and lesions you found
2. Screening of the foot
Which risk factors and/or signs of diabetic foot complications are present?
3. Treatment plan
What should you do and why?
4. Treatment goals
What do you want to achieve with your treatment?
5. Results
Describe the results of your treatment
6. Prognosis
What do you expect for the future?
7. Advice
What did you advise the patient to do?
What do you advise the referring doctor to do?
8. Conclusions
Finalize with your conclusions about the health situation of the feet of this patient

5. Module Diabetic Foot II (15 CH – study load 80 hrs.)

- THE COMPLICATED DIABETIC FOOT

8 x 45 min.

- the foot at-risk of ulceration
- the pathway to ulceration
- peripheral vascular problems
- neuropathic, ischaemic and traumatic ulcers
- neuro-osteoarthropathy (the Charcot foot)

2 study tasks:

- a. recognizing types of ulcers

b. early detection and treatment of the Charcot foot

- WOUND HEALING

8 x 45 min.

- normal wound healing
- delayed wound healing due to diabetes
- delayed wound healing due to infection
- delayed wound healing due to ischaemia
- classification of ulcers

2 Study tasks:

- a. classifying ulcers
- b. the infected foot

- AMPUTATIONS

2 x 45 min.

- the pathway to amputation
- etiology of amputating the diabetic foot

- WOUND TREATMENT

2 x 45 min.

- debridement in theory
- dressings

Study task:

- a. Describe the difference between neuropathic and ischaemic ulcers, and infected and non-infected ulcers.

EXAMPLE OF A STUDY TASK

Week : 6
Basic science: Diabetic Foot II
Subject : Recognizing types of ulcers
Study hours: 6
Handing in: Week 8

1. Define the ulcers pictured below and describe their typical signs:

A



2.
a

B



C



Write

treatment plan for all three ulcers

3. Formulate a footwear advice programme for all three feet

6. Module Biomechanics and off-loading (15 CH – study load 40 hrs.)

- **NORMAL WALKING**

6 x 45 min.

- understand the biomechanical principles of standing and foot load
- understand the biomechanical principles of walking (DVD!)

2 Study tasks:

- Analyze the range of motion in the most important joints of the foot during walking (MTP1- joint and ankle joint)
- Perform a gait analysis of a normal person without diabetes
Use the checklist given during the lessons

- **ABNORMAL WALKING IN PEOPLE WITH DIABETES**

6 x 45 min.

- effects of neuropathy on walking
- effects of peripheral disease on walking
- effects of Limited Joint Mobility on walking

2 Study tasks:

- Analyze the range of motion in the most important joints of the foot during walking (MTP1- joint and ankle joint) in a person with a known diabetic foot
- Perform a gait analysis of a person with a known diabetic foot
Use the checklist given during the lessons

- **OFF-LOADING**

8 x 45 min.

- understanding the principles of off-loading
- materials to be used on a insensitive and/or vulnerable foot
- 3 practical sessions of 90 min. to practice off-loading on each other

7. Module Foot care for people with diabetes and a foot at-risk (20 CH – study load 30 hrs.)

- **CLINIC WORK**

- Treating diabetic feet with minor pathology (in-growing toenails, corns, insensitive foot with callus formation) KB to right under “Treating”
- debriding diabetic feet with ulcer(s)
- simple wound care for diabetic feet with ulcer(s)

Study task:

Set up a preventive foot care programme for diabetic patients with a foot at-risk

EXAMPLE OF A STUDY TASK

Week: 2
Basic science: Foot care for diabetic feet at-risk
Subject: Prevention
Study hours: 10
Handing in: week 10

You are performing foot care in a diabetic clinic with patients at-risk of ulceration. Organize a prevention programme for your patients, and actually try it out on several patients. Evaluate your programme and make additional corrections to the programme.

This assignment includes the materials you need to perform your programme (PowerPoint, leaflets, hand-outs etc.).

8. Module Multidisciplinary teamwork (6 CH – study load 20 hrs.)

- MULTIDISCIPLINARY TEAMS: WHY AND FOR WHOM?

2 x 45 min.

- Defining the need for multidisciplinary team work for patients with ulceration
- Building a multidisciplinary team: how can you take the first step?

Study task:

Organize the ideal multidisciplinary team in your own surroundings

- INTERNATIONAL CONSENSUS GUIDELINES

2 x 45 min.

- Presentation of the international guidelines
- Add the local situation to the international guidelines

Study task:

Make an abstract of the international guidelines for colleagues in your multidisciplinary team (to be)

- PATIENT EDUCATION IN A MULTIDISCIPLINARY TEAM SETTING

4 x 45 min.

- Patient education: do's and don'ts
- The effectiveness of patient education in protecting the diabetic foot from ulceration

Study task as final assignment:

Organize a portfolio with the following documents, gathered from all previously made study tasks:

- checklist for screening the diabetic foot at-risk
- prevention programme for diabetic patients with feet at risk
- information about foot care and footwear for diabetic patients with feet at risk