How should rehospitalisation of subjects with diabetic foot ulcer be prevented?

In 2010, 15,458 people with diabetes were hospitalised with foot ulcers. In the subsequent 12 months, 44% of them were admitted again for a new injury or an amputation, and 20% died (data from CNAMTS [National Salaried Workers’ Health Insurance Fund]).

What you need to know

The occurrence of diabetic foot ulcer is an emergency that requires evaluation and treatment by a multidisciplinary care team specialised in the treatment of the diabetic foot. It frequently leads to hospitalisation. Diabetic foot ulcer is at high risk of infections and amputations and mortality. They also have a short-term and long-term impact on quality of life. The risk of amputation is in part due to the quality of the healthcare pathway during the hospital treatment.

The risk of readmission is high. An avoidable hospitalisation is defined as an unplanned hospitalisation connected to the foot ulcer and associated with failure of the organisation of the discharge from hospital or the monitoring of the patient to proceed correctly or, in certain cases, to poor compliance.

Many factors play an important role and must be taken into account when organising the discharge from hospital: socioeconomic factors, social isolation, patient’s living conditions, access to care, prospects of compliance with off-loading, patient’s priorities.

The coordinated medico-surgical intervention of professionals trained in the specificities of the diabetic foot is essential at each step of the pathway to optimise chances of healing.

Once healing has been achieved, the podiatric risk is grade 3 with an elevated risk of recurrence\(^1\): attention should be paid to modification of the footwear, and to following the prevention pathway that incorporates education and close monitoring.

---

\(^1\) A history of foot ulcers lasting more than 4 weeks and/or amputation of a leg.
What should be done during the hospitalisation

- After admission, make contact with the community care team, in particular the patient’s primary physician and nurse, to find out about difficulties involved in care at home. Depending on the context, the following may also be contacted: the family, the home nursing services, home help services, health networks, etc.
- Collect the information about the patient’s living conditions, and about his/her socioeconomic data and priorities (see the questionnaire in annex 1).
- Initiate or reinforce therapeutic patient education (TPE).
  TPE is an integral part of the therapeutic strategy. An educational assessment evaluates the skills the patient needs to acquire to play an active role in the treatment of the injury. The family should be involved. If the patient is treated with insulin, education about insulin treatment should be considered to safeguard the patient’s self-sufficiency. Achievement of the educational objectives requires the continuation, after discharge, of the education started in hospital (see monitoring form for the objectives in annex 2).
- Decide on the modality of discharge: home discharge, with or without coordination strengthening, outpatient hospitalisation at home, or follow-up care and rehabilitation. The process for the choice of the modality of discharge from hospital is shown schematically in annex 3. The patient must be informed about the care required after discharge and, if the patient is to return home, it is necessary to make sure that he/she accepts the visits of healthcare professionals and carers that have been planned.
  - The multidisciplinary care team in hospital leads to the development of a care plan sent to all the carers, in the hospital, in the community, or in a reception facility; this plan may be incorporated in the "What happens now" section of the "Discharge document". It contains at least:
    - the description of the foot ulcer with a photograph taken on the day of discharge;
    - off-loading modalities;
    - wound care modalities;
    - the treatment for infection, for pain;
    - whether preventive anticoagulation is required, depending on the type of discharge;
    - any sessions of physiotherapy for off-loading’s adaptation, the development of balance, the range of motion.

If necessary, the care plan is complemented by arranging social care and home adaptation.

- Hospital discharge must be deferred or the modality of hospital discharge must be changed if the resources available for the organisation of follow-up do not permit the implementation of complex care. Hospital discharge may even be considered as a temporary measure with planned readmission to hospital.

What should be done at the time of discharge

A healthcare professional responsible for coaching the discharge is designated. This could be a nurse, another member of the team with experience in the coordination function. This member of staff:
- checks with the patient and the care team that the criteria for discharge have been satisfied and that the necessary interventions were performed during the period of hospitalisation (see checklist in annex 4);
- offers patient information and transmits documents:
  - the hospital discharge document,
  - the educational objectives monitoring form,
  - the contact number or secure internet address to contact in the event of questions or problems, indicating, if there are several contributors to the hospital treatment, the person to contact,
  - information documents relating to:
    - warning signs (see box 2),
    - off-loading advice,
    - nutritional advice;
- depending on the situation, plans a patient contact call 24 to 48 hours after discharge to make sure that the planned actions have been implemented (care and assistance).
What should be done at home\textsuperscript{2} until wound healing

Coordination of care and monitoring
This is organised by the diabetic foot care team in the hospital and the home care team (outpatient care team or hospitalisation at home team). Roles and responsibilities must be clearly defined. Training and protocols can contribute to this. The coordination may be optimised by using tools such as a liaison diary or distance communication tools such as the telemedicine device that is now being tested (see box 1).

Community care follow-up after 8 days
The primary care physician re-evaluates the patient's overall situation and, if necessary, modifies the treatment and the care plan, informing the diabetic foot care team.

Diabetic foot care team follow-up
- The patient is seen again in consultation after a period of 8 to 30 days, following the schedule defined before discharge. The frequency of follow-up is subsequently modified according to the severity of the ulcer, clinical progress of the wound since hospital discharge and quality of the home wound care such as debridement, removal of callus.
- During each specialist consultation criteria to be checked are as follows: adherence and efficacy of off-loading, wound healing progress, absence of infection, achievement of blood glucose targets, nutritional status, the contralateral foot (under greater stress due to off-loading). The care protocol and laboratory monitoring are modified on the basis of the results. The forwarding of information to the community care team is carried out on the basis of a liaison diary.
- Following the specialist consultation, the re-education and equipment service, as well as the pedorthist/orthotist can be solicited to modify the off-loading.

Community care medical and social workers
- off-loading monitoring;
- continuation or reinforcement of therapeutic education using the therapeutic education objectives monitoring form (see annex 2);
- wound care, identification of warning signs (see box 2). In the event of warning signs, the members of the specialist team may be joined by the patient, his/her family or a carer by telephone or via a secure internet connection;
- renewal of the initial prescription for the devices (dressings), which must be written in a way that is sufficiently precise to avoid unintentional changes;
- renewal of the physiotherapy sessions;
- monitoring of the contralateral foot;
- management of diabetes, comorbidities and nutritional status;
- delivery of the services of the home help department, home meal deliveries, etc.

Strengthening of monitoring at home in complex situations\textsuperscript{3}
In these situations (see annex 3), the monitoring described above may be coordinated by a member of a healthcare network, a coordinator from a multidisciplinary healthcare facility or a nurse in the specialist team in the outpatient unit or a mobile wound care team. The telemedicine device that is currently being tested could also become a tool of strengthened coordination (see box 1).

The functions of the coordinator are as follows:
- to supervise and verify the effectiveness of the planned interventions;
- to provide advice and training to community healthcare professionals;
- to be the first-line contact in case of worsening or intercurrent event occurrence;
- to be the contact for the home nursing care services and the home help services;
- to support caregiver: transmission of skills and identification of distress.

What should be done to prevent recurrence after healing
- Evaluation of the achievement of the objectives of therapeutic patient education, and, if they have not been achieved, to arrange educational reinforcement sessions.
- Verification of the modification of footwear within the framework of monitoring by a specialist centre, with the involvement of the

\textsuperscript{2}This situation applies to the discharge of the patient to his/her own home; it may also apply to a return home after a period of follow-up care and rehabilitation or after hospitalisation at home.

\textsuperscript{3}For situations fitting the indications for hospitalisation at home, the implementation of hospitalisation at home itself responds to the needs of stronger coordination.
physician in the physical and rehabilitation medical service or the pedorthist/orthotist, or the podiatrist, and the prescription of foot orthoses or modified shoes.

- Prescription of podiatrist foot care at a frequency of 1 session every 2 months (forfeit of reimbursement of 6 sessions within 1 year)
- In the event of suspected recurrence, refer the patient to the multidisciplinary foot care team without delay and, if possible, within 48 hours.

What to avoid

- Changing prescriptions (local care, antibiotic treatment) without first consulting the specialist centre.
- Prescribing restricted diets to people with foot ulcer.
- Failure to report the problems encountered in the liaison diary: non adherence with off-loading, replacement of dressings by the patient, etc.
- Neglecting to take notice of the patient’s views, to take his/her priorities and those of his/her family into account.
- Neglecting to monitor the contralateral foot.
- Delaying the re-evaluation of an aggravated injury.
- Using stains, adhesive tape or detergents.

Conditions to be met

- Providing specifications for multidisciplinary diabetes foot care team.
- Identification of nearby specialist centres of private healthcare professionals and ensuring rapid access to their services in case of need.
- Information of those involved of the skills required and their role in the pathway.
- Improvement of the training of the nurses in wound debridement and care procedures.
- Development of methods of exchanging information between healthcare professionals, particularly using telemedicine.
- Development of support for the coordination and enhanced care for outpatients.
- Provision of information about the available resources: directories of resources, one-stop shop.
- Identify and reduce inequalities in the access to care.

Proposed monitoring criteria

- Number of diabetic patients who have been hospitalised for foot ulcer and followed-up in specialist consultations / number of diabetic patients who have been hospitalised for foot ulcers.
- Number of patients rehospitalised as emergencies for foot ulcers in the course of the last 12 months / number of patients hospitalised for foot ulcers in the course of the last 12 months.
- Number of patients followed up in hospitalisation at home after hospitalisation in medicine, surgery and obstetrics / number of patients hospitalised in medicine, surgery and obstetrics.
- Reasons for emergency rehospitalisation.
- Number of patients monitored as outpatients with enhanced coordination.

Examples of ongoing projects

- Experimentations of wounds telemedicine monitoring are currently in progress: DOMOPLAIES trial in ARS Languedoc-Roussillon et Basse-Normandie, CAREDIAB telemedicine project in the Champagne-Ardennes region, mobile injury project at Saint-Brieuc Hospital, TELEHPAD teleconsultation and tele-expertise project at the Mutualité Française Côtes d’Armor for patients in long-term care establishments.
- A joint computerised dossier shared by the specialist department and the hospitalisation at home service has been implemented in some centres.
- A wound-healing monitoring software system, DSP, has been developed.
- Availability to healthcare professionals in the PACA region of a coordination and support platform (RSPILHUP).
- A support programme for patients returning home is planned from 2015 in the form of a new section of the National Salaried Workers’ Health Insurance Fund return home programme: diabetic foot injuries, bedsores, ulcers.
Annex 1: Example of a living conditions questionnaire for the patient

This is not a self-administered questionnaire; the questions can be reformulated if the patient does not understand them. It is useful to involve the family, with the patient's agreement.

1. Do you live in a single-family house or in a flat?
2. Does the building have a lift?
3. Do you have steps within your home?
4. Do you have your bedroom, shower room, and toilets on the same floor?
5. Can you move around your home in wheelchair?
6. Are the toilets and shower room accessible in a wheelchair?
7. Do you live on your own?
8. If so, who does the shopping? the cooking? the housekeeping?
9. Do you have a remote alarm?
10. Who, if anyone, shares your home? Partner, child/children, siblings(s), etc.
11. Can your family take responsibility for the shopping, the cooking, the housekeeping?
12. Do you have dependants?
13. Do you have pets?
14. Who lives there in your absence?
15. Can someone open the door for the various members of the hospitalisation at home team?
16. Does your primary care physician carry out home visits?
17. Have you ever had a registered nurse for insulin injections? for dressings?
18. Do you go to the podiatrist? How often?
19. Do you have the assistance of the home nursing care services and/or the home help services?
20. What are your resources?
21. Do you work? In what field?
22. Would absence from work pose a problem?
23. What are the constraints that seem to you the most difficult to overcome?
### Annex 2: List of educational objectives to be evaluated with the patient (consensus agreement)

<table>
<thead>
<tr>
<th>Educational objectives</th>
<th>explained to the patient</th>
<th>acquired</th>
<th>being acquired</th>
<th>not acquired</th>
</tr>
</thead>
<tbody>
<tr>
<td>With respect to off-loading modality</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• The patient understands why it is indicated and its importance (including the risks of not wearing it)</td>
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<td></td>
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</tr>
<tr>
<td>• The patient is physically capable of complying with use of the off-loading modality</td>
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<td></td>
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</tr>
<tr>
<td>• The off-loading modality is compatible with the patient’s daily life</td>
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<tr>
<td>• The patient accepts the off-loading modality</td>
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</tr>
<tr>
<td>With respect to the wound</td>
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</tr>
<tr>
<td>• The patient understands and accepts that the treatment will take a long time</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>• The patient (or his/her family) knows the different steps of the application of the dressing and knows that he/she must not replace the dressing</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>With respect to infection</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>• The patient (or his/her family) can identify the warning signs: fever, pain, disagreeable wound odour, redness, purulent discharge</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>• Once the patient has identified the signs, he/she knows what to do</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Optional</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>With respect to the treatment for diabetes (blood glucose level)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• The patient knows his/her treatment and the objectives of the treatment</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• The patient adjusts his/her treatment on the basis of the self-testing results</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• The patient self-injects insulin</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>With respect to diet</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• The patient understands the importance of protein intake for fostering healing</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• The patient knows which foods are rich in protein</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• The patient knows how to increase the protein content of his/her diet, if necessary</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Annex 3: Selection of the form of discharge (consensus agreement)

1. Take into consideration the preferences of the patient and his/her family
2. Evaluate the medical and social complexity of the situation

No unfavourable conditions

Poor vascular status
Or an extensive or bilateral foot ulcer
Or difficulties with off-loading
Or unfavourable social or living conditions
Or the need to strengthen the coordination of the care team

Dressings taking > 30 min
Or negative pressure treatment
Or antibiotics for hospital use only

Patient lives alone, with a risk of falls, or non-adherent with off-loading or with elderly partner providing little assistance
Or with cognitive disorders leading to non-compliance with off-loading or other treatments
Or accommodation not very accessible or not very functional or unhealthy

Organize return home with the normal healthcare team, the home help services and the family as required

Organize return home with augmented coordination

Refer to hospitalisation at home

Refer to hospitalisation at follow-up care and rehabilitation

Contact with the nurse and the general practitioner, verification of their agreement with the proposed care plan and of the training of the registered nurse in the care of diabetic foot ulcers

Contact structure for coordination or outpatient intervention by a specialist hospital team

Contact the hospitalisation at home team
Get confirmation of the indication and the possibility of hospitalisation at home

Contact the follow-up care and rehabilitation team
Check training in the care of diabetic foot ulcers

No facilities
Expertise not available

Hospitalisation at home not indicated
Hospitalisation at home refused
Expertise in the care of diabetic foot injuries not available

Coordinator not available

Expertise not available

Consider a different form of discharge

November 2014

THE ORIGINAL FRENCH VERSION IS THE LEGALLY BINDING TEXT
**Annex 4: Checklist for verification at the time of discharge (consensus agreement)**

<table>
<thead>
<tr>
<th>Discharge criteria</th>
<th>Return home</th>
<th>HC</th>
<th>FCR</th>
</tr>
</thead>
<tbody>
<tr>
<td>The wound has stabilised, the infection and ischaemia are under control.</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>The pain is under control.</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>The off-loading modality is in place, it is appropriate to and supported by the patent.</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>The point relating to complications and comorbidities has been implemented. The patient’s self-sufficiency in respect of activities of daily life has been verified, as have his/her cognitive functions. In case of doubt, in a patient over 75 years old, a geriatric evaluation has been performed.</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>The target levels for fasting and postprandial blood glucose levels and for HbA1c have been specified as a function of age and the associated complications and comorbidities. If necessary, multi-injection insulin therapy has been prescribed.</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>Screening for undernutrition has been performed: the food intake has been evaluated, weight monitoring and laboratory tests have been initiated. The situation with regard to the patient’s nutritional needs been taken into consideration for the return home.</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Information for the patient</th>
<th>Return home</th>
<th>HC</th>
<th>FCR</th>
</tr>
</thead>
<tbody>
<tr>
<td>The patient has been taught to use the off-loading modality</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>The prescriptions have been given to the patient and explained to him/her.</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>The follow-up appointments have been arranged and the patient has been informed: with the follow-up diabetic foot consultation and, if necessary, with the endocrinologist/diabetologist, vascular surgeon, infectologist, podiatrist, physician for re-education and equipment.</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Contacts and continuity of care</th>
<th>Return home</th>
<th>HC</th>
<th>FCR</th>
</tr>
</thead>
<tbody>
<tr>
<td>A discharge document containing the care plan is given to the patient and addressed to the general practitioner and other relevant healthcare professionals.</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>A warning is programmed to make sure that the results of examinations that have not yet been received are forwarded to the general practitioner.</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>The general practitioner has been contacted and informed of the date of discharge.</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>The nurse has been contacted, informed of the care plan for the injury, and an appointment has been made for the day of discharge, showing the time of discharge, for the insulin injection, if necessary.</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>The prescriptions have been sent to the pharmacist so that the medication and devices (drain, dressings, medical or orthopaedic equipment) will be available on the day of discharge or sent to the home if necessary.</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>The necessary social care for the return home have been arranged and organised for the day of discharge.</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>The following have, as necessary, been contacted: masseur/physiotherapist, the podiatrist (for the care of the contralateral foot), the provider if the patient has an insulin pump.</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>The coordinator of the support network or platform has been contacted in the case of augmented monitoring.</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>A telephone call to the patient has been scheduled during the 48 hours after discharge.</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>A visit by the general practitioner within 8 days after discharge has been organised.</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Logistics</th>
<th>Return home</th>
<th>HC</th>
<th>FCR</th>
</tr>
</thead>
<tbody>
<tr>
<td>The date and time of discharge are compatible with the reception of the patient.</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>The travel warrant and the certificate of incapacity for work, if required, have been prepared.</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
</tbody>
</table>

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4. The majority of patients are not in pain, but pain that may be manifest at rest or that is provoked by care procedures may be encountered, particularly in patients with vascular injuries. Such pain may be difficult to control using normal treatments, including morphine.

5. The management of undernutrition can normally be carried out at home and should not delay discharge.
Box 1: Telemedicine experimentations specified in article 36 of LFSS [Social security Finance Law] 2014

Teleconsultation in the presence of the patient and tele-expertise relating to the medical file (photos or videos and clinical record card) to allow specialist teams to transfer information with the intention of improving care.

The use of mobile tablets facilitates the access to and organisation of care closer to the patient.

The objective is to improve:
- the accessibility of care;
- the organisation of care;
- patient quality of life.

The impact under investigation is also the reduction in cost (consumption of care and transport) with a view to consistency and breaking down the barriers between the hospital and community care in the care pathway.

Experimentations are being carried out in nine pilot regions. The Haute Autorité de Santé will provide evaluation of these experimentations as well as position for their generalisation.

Box 2: Warning signs to look out for and report

- Occurrence of fever
- Occurrence or intensification of pain
- Occurrence in the location of the wound:
  - of a disagreeable odour;
  - of redness;
  - of "purulent" discharge.