

Patient referral flow to the diabetic foot room: experience report

Fluxo de encaminhamento de pacientes para sala de pé diabético: relato de experiência

Flujo de referencia de paciente a la sala de pie diabético: reporte de experiencia

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RESUMO

Objetivo: descrever experiência de implantação de um fluxo de encaminhamento de pessoas com DM para uma sala de pé diabético. **Método:** Estudo descritivo no formato de relato de experiência, ocorreu entre janeiro de 2023 à janeiro de 2024, no subúrbio ferroviário, na Atenção Primária de Salvador, Bahia, Brasil. **Resultados:** A implantação do Fluxo de encaminhamento de pessoas com diabetes foi organizada de modo a conter orientações gerais na chegada do paciente, as atribuições da equipe da Atenção primária e o passo a passo de como fazer teste de monofilamento de semmes-weinstein de 10 g, como fazer o teste de toque leve ou ipswich touch test e como fazer o teste do Índice tibial braquial (ITB), para a partir desses testes fazer a Estratificação de Risco, conforme o IWGDF 2019, recomendações de tratamento e frequência da avaliação dos pés dos pacientes diabéticos acompanhados na APS. **Conclusão:** A implantação de um fluxo de encaminhamento para pessoas com diabetes para uma sala de pé diabético poderá favorecer a organização das unidades da atenção primária de modo que haja ampliação do rastreio e prevenção de úlceras em pés destas pessoas, redução da morbimortalidade, melhoria dos hábitos de vida saudáveis e redução de custos para o SUS.

Descritores: Pé diabético; Fluxo; Atenção Primária à Saúde.

ABSTRACT

Objective: to describe the experience of implementing a flow of referral of people with DM to a diabetic foot room. **Method:** descriptive study in the format of an experience report, took place between January 2023 and January 2024, in the railway suburb, in Primary Care in Salvador, Bahia, Brazil. **Results:** The implementation of the Referral Flow for people with diabetes was organized to contain general guidelines upon the patient's arrival, the responsibilities of the Primary Care team and step-by-step instructions on how to perform a 10 g Semmes-Weinstein monofilament test, such as do the light touch test or ipswich touch test and how to do the Tibial Brachial Index (ABI) test, using these tests to carry out Risk Stratification, according to IWGDF 2019, treatment recommendations and frequency of assessment of patients' feet diabetics monitored in PHC. **Conclusion:** The implementation of a referral flow for people with diabetes to a diabetic foot room could favor the organization of primary care units so that there is expansion of screening and prevention of foot ulcers in these people, reduction of morbidity and mortality, improvement of health habits healthy lives and cost reduction for the SUS.

Descriptors: Diabetic Foot; Flow; Primary Health Care.

RESUMEN

Objetivo: describir la experiencia de implementar un flujo de derivación de personas con DM a una sala de pie diabético. **Método:** estudio descriptivo, en formato de relato de experiencia, realizado entre enero de 2023 y enero de 2024, en el suburbio ferroviario, en Atención Primaria de Salvador, Bahía, Brasil. **Resultados:** La implementación del Flujo de Derivación para personas con diabetes se organizó para contener lineamientos generales a la llegada del paciente, las responsabilidades del equipo de Atención Primaria e instrucciones paso a paso sobre cómo realizar una prueba de monofilamento de Semmes-Weinstein de 10 g, como hacer la prueba de tacto ligero o prueba de tacto ipswich y cómo hacer la prueba de Índice Tibial Braquial (ITB), utilizando estas pruebas para realizar la Estratificación de Riesgo, según IWGDF 2019, recomendaciones de tratamiento y frecuencia de evaluación de los pies de los pacientes diabéticos monitoreados en APS. **Conclusión:** La implantación de un flujo de derivación de personas con diabetes a una sala de pie diabético podría favorecer la organización de las unidades de atención primaria para que se amplíe el cribado y la prevención de las úlceras del pie en estas personas, se reduzca la morbimortalidad y se mejoren los hábitos de salud saludables, vidas y reducción de costos para el SUS.

Descriptores: Pie Diabético; Flujo; Atención Primaria de Salud.

ORIGINAL

Introduction

Diabetic foot stands out as the most frequent complication that occurs in people diagnosed with Diabetes Mellitus (DM1) and DM2¹. When people with diabetic feet are not monitored and oriented, the development of diabetic foot ulcers (DFUs) can occur, resulting in a significant prevalence rate, morbidity and mortality, and increased costs associated with hospital admissions, compromising people's quality of life². Thus, it is believed that there is a need for actions aimed at preventing this complication, especially in the context of Primary Health Care, which is the gateway to the Unified Health System, which is essential for the prevention of the disease.

The International Working Group on the Diabetic Foot (IWGDF) defines diabetic foot as an infection, ulceration, and/or destruction of soft tissues associated with neurological changes and varying degrees of Peripheral Arterial Disease (PAD) in the lower limbs. These alterations, without due care, can worsen and culminate in limb amputation³.

The data on diabetic foot are alarming in Brazil and it is observed that the care of these patients occurs mainly in PHC. According to a study conducted by Toscano et al. (2018), from a perspective that there are 9.2 million adults in Brazil, about 829,724 would develop neuroischemic foot, of which 43,726 had ulcers. It is estimated that most of these individuals would be followed up in PHC (n = 42,983), and of these, half would have an infected ulcer (n = 21,492). Thus, the estimate of amputees would be 11,284⁴.

The costs caused by diabetic foot are high in several parts of the world. In the United States, they comprise about 28 thousand dollars for each admission due to ulceration; in Sweden, \$18,000 in cases without amputation and \$34,000 in those with amputation. In relation to Brazil, in 2014, about R\$ 335,500 million were spent on diabetic foot on an outpatient basis, representing 0.31% of GDP². In addition, it is important to consider that the costs for the treatment of ulcers of a higher degree of complexity are eight times higher when compared to those of low grade³. At the international level, this reality is no different, as shown by a study in England that estimates in 2014 and 2014 the cost of 837 and 962 million pounds, respectively, 90% of which are used for ulcers.⁵

In this context, it is essential to develop research and good practices that can contribute to reducing these costs, as well as to control factors that predispose to diabetes and avoid further complications due to standing ulcers. Such actions require professionals prepared to assess, guide and monitor diabetic people who are at risk or have already developed the comorbidity¹. It is the responsibility of the nurse working in PHC to provide care to this population according to health needs, control and monitoring of diseases, registration, home visits, participation in the reception of diabetic people, in addition to nursing consultations, procedures and management of supplies.³

The identification of the foot at risk or risk factors that may develop DFU can be easily detected by the nurse through the clinical history and through the recommended risk classification system, where, depending on the risk identified, there is a need for frequency of evaluation and examination of the feet².

Although the guidelines, manuals and protocols emphasize the importance of preventing diabetic foot, prevention has not been developed effectively, and it is considered a challenge for nursing performance in PHC⁶. Thus, this study sought to describe the experience of implementing a flow of referral of people with DM to a diabetic foot room.

Method

This is a descriptive study in the format of an experience report that took place between January 2023 and January 2024, in Primary Care in Salvador, Bahia, Brazil. The scenario of this experience report is the Sanitary District of the Railway Suburb, which consists of an intermediate administrative unit, connecting the level of the Municipal Health Secretary with the Health Units and brings together 35 neighborhoods of Salvador, Bahia, Brazil with a territorial extension of 63.33 km², being considered the 3rd largest district in population of the capital (Salvador -Bahia). This is responsible for assisting an estimated population of 347,521 people in 2020.

The population that accesses dressing services in 23 Basic Health Units, 22 with the Family Health Strategy (ESF) and 01 without ESF. The district also has 03 expanded Family Health Centers in Primary Care (Nasf-AB). It should be noted that 285 people with complex wounds are followed up in the 23 basic health units, due to various etiologies: venous ulcers, arterial ulcers, diabetic ulcers, leprosy ulcers, sickle cell ulcers, pressure ulcers and many other etiologies without a confirmed diagnosis, and about 30% are people with diabetic ulcers.

The period of organization of the flow of patient referral to the diabetic foot room was from January 2023 to January 2024, through virtual meetings between the district reference of dressings of that district, the reference of chronic diseases of the Central level of Salvador, Bahia and the professionals who are in direct and indirect care to people. Through these meetings, it was discussed what would be the best flow of patients to the diabetic foot room for the care of each category (community health agents, nurses, nursing technicians and doctor). The attributions of each professional category in this process were discussed, as well as the step-by-step performance of some procedures such as: how to do the 10 g Semmes-Weinstein monofilament test, how to do the light touch test or Ipswich touch test and how to do the Brachial Tibial Index (ABI) test with portable vascular doppler to make Risk Stratification from these tests, according to the IWGDF 2019, treatment recommendations and frequency of foot assessment of diabetic patients followed up in PHC.

To continue the implementation of the flow of referral of people with DM to a diabetic foot room, meetings were held with the professional categories involved to guide everyone on what should be done so that the care provided to this person could generate effectiveness and problem-solving. To this end, manuals from the Ministry of Health, wound protocol from the municipality of Salvador and documents that guide the performance of each category were used to help in risk stratification according to the International Working Group on Diabetic Foot (IWGDF) to sensitize professionals and make it clear how the referrals/guidelines would be.

Results

The results were organized in such a way as to contain general guidelines on the arrival of the patient and his/her referral to neighboring units, the attributions of nurses, physicians, technicians and Community Health Agents (CHA), how to perform the 10 g Semmes-Weinstein monofilament test, how to perform the light touch test or ipswich touch test and how to perform the Brachial Tibial Index (ABI) test with portable vascular doppler to use these tests to perform the Risk Stratification, according to the IWGDF 2019, treatment recommendations and frequency of foot assessment of diabetic patients followed up in PHC.

General guidelines for diabetic people monitored in PHC

The diabetic person will arrive at the USF Teotônio Vilela (welcomed at the reception according to the territorialization of dressings in the District of Subúrbio Ferroviário. At the reception, she will be sent to the dressing room for reception and listening by the nursing technician.

In the dressing room, if it is from the Teotônio Vilela area, it will be accompanied by the unit, if it is from another unit, it will be referred according to territorialization by the team after welcoming and listening (nursing technician and nurse, if available at the time). The referral must be made with a form containing the patient's name, SUS card number, unit that will be referred and date of scheduling the ITB exams as well as the name of the professional who welcomed the patient.

The nurse should schedule the Vascular Doppler test on the spreadsheet according to the days of each unit so that the patient can leave with the appointment date or contact the dressing room reference, according to residence, for scheduling.

It is worth noting that being a patient from the territory of the nursing unit, she will schedule an evaluation by filling out the worksheet available in the drive, entitled: Evaluation form and multiprofessional follow-up of diabetic foot. Nurse will schedule a time for medical evaluation (available 1 weekly shift for this purpose). When attended by the team: nurse/doctor, the worksheet with the date of the next evaluation and necessary referrals will be filled out, according to the Table entitled IWGDF 2019 Risk Stratification System, treatment recommendations and frequency of evaluation.

Nurses' attributions to diabetic patients monitored in PHC

One of the nurse's duties is to perform the feet with the monofilament test and the Ankle Brachial Index (ABI) test (schedule 1 x a month) in the units and weekly in Teotônio Vilela (together with the doctor).

After performing the tests, the nurse will be able to classify the patient's risk according to the Table entitled IWGDF 2019 Risk Stratification System, treatment recommendations and date of the next evaluation.

In addition, the nurse is responsible for health education for the feet of diabetic people and referral to the Diabetes and Endocrinology Center of Bahia (CEDEBA) and the Center for Rehabilitation Specialties (CER)-Coutos for the acquisition of special shoes.

Another important attribution of the nurse refers to observing in the date sheet of the next evaluation which patients will be evaluated in that month.

Attributions of the physician to the diabetic person monitored in PHC

One of the doctor's duties is to carry out an evaluation of the diabetic person with a drug prescription and evaluation of laboratory tests. Regarding the tests: you should do the monofilament and Ankle Brachial Index (ABI) test together with the nurse in the first consultation (schedule 1 x a month) in the units and weekly in Teotônio Vilela.

The physician must classify the patient's risk according to the Table entitled IWGDF 2019 Risk Stratification System, treatment recommendations and date of the next evaluation.

In addition, the doctor is also responsible for health education for the feet of diabetic people and referral to the Diabetes and Endocrinology Center of Bahia (CEDEBA) and the Center for Specialties in Rehabilitation (CER)-Coutos for the acquisition of special shoes.

Attributions of the nursing technician to the diabetic person monitored in PHC

The nursing technicians are responsible for identifying diabetic people in the procedure room/dressing room to signal the nurse/doctor for foot evaluation. In both rooms mentioned above, the technician must check capillary glucose, do health education and even identify patients for the use of special prevention shoes.

Attributions of community health agents to diabetic people monitored in PHC

Regarding the attribution of community health agents, it is important to actively search for cases for evaluation in home visits, whether of new patients or absentees. Provide health education focused on healthy feet and publicize in homes that the unit has an evaluation room for diabetic people to minimize the risk of ulceration.

How to do 10 g semmes-weinstein monofilament test

The 10g Semmes-Weinstein monofilament test should be performed at three points: halus (distal phalanx); 1st and 5th fingers (metatarsal heads). It is observed that the

The patient's inability to feel the 10g filament in (01) one point, demonstrates loss of protective sensitivity, that is, the absence of protection in the feet. It is important that the identification of the tested site is confirmed.

It should be noted that the monofilament should be used carefully, as follows: show the filament to the patient and apply it to his hand so that he recognizes the type of stimulus as well as explain in detail what the test consists of. Therefore, the patient should be asked to keep their eyes closed

during the test and pay attention and simply answer "yes" when they feel the filament or "no" if they do not feel it.

It is important to note that when applying the monofilament, it should be kept perpendicular to the tested surface (90°) at a distance of 1-2 cm; with a gentle movement, making it bend over the skin and remove it. The total duration of the procedure, skin contact, and monofilament removal should not exceed two seconds. The professional who will perform the exam should avoid asking about the sensitivity of the monofilament at the site so as not to induce the response.

If the monofilament slips down the side, the patient's eventual response should be disregarded and the same site should be tested again later. It is important that a random sequence is used at the test sites. In the case of ulcerated, necrotic, scarring or hyperkeratotic areas, the perimeter of the perimeter should be tested. If the patient does not respond to the application of the filament at a certain site, continue the sequence and return to that site later to confirm.

To store the filament, it must be protected, taking care not to dent or break it, if necessary, clean it with a 1:10 sodium hypochlorite solution. An important recommendation is that each monofilament should be used every 10 (ten) patients per day and a 24-hour "rest". Monofilament has a half-life of 500 hours if used in good conditions.

How to take the light touch test or ipswich touch test

The Ipswich touch test can be used to screen for loss of sensitivity when the 10 g monofilament or 128 Hz tuning fork is not available. The test has a reasonable agreement with these tests to determine loss of sensation, but its accuracy in predicting foot ulcers has not been established.

To perform the test, the procedure must be explained and everything must be understood. The professional should instruct the subject to close their eyes and say yes when they feel the touch. The examiner lightly and sequentially touches with the tip of the index finger the tips of the first, third, and fifth toes of both feet for 1-2 s. It should be noted that when touching, you should not push, tap lightly or poke. Loss of sensitivity is likely when light touch is not detected at ≥ 2 sites.

How to do the ITB test with a portable vascular doppler

The ankle-brachial index (ABI) is a test that shows high sensitivity for patients with arterial vascular insufficiency of the lower limbs, carotid atherosclerotic disease, patients with left ventricular hypertrophy and hypertension. ABI is considered the gold standard for the diagnosis of peripheral arterial obstructive disease (PAD) in patients with type 2 diabetes. Intermittent claudication is the most common clinical manifestation of PAD. The index is calculated by rationing the systolic pressure of the right or left brachial artery (whichever is greater) and the systolic pressure of the anterior tibial or posterior tibial malleolar arteries (whichever is greater).

Calculate the ABI according to the formula:

$$\text{ABI} = \frac{\text{Ankle pressure}}{\text{Arm pressure}}$$

Step by step of performing the ABI exam: The professional should make sure that the patient has not smoked at least 2 h before the test and then should position the patient in the supine position with the head and heels completely supported on the bed, to keep him at rest for 5 to 10 min. It is important to note that the patient should be instructed to remain still during the examination.

To start the examinations, the sphygmomanometer should be placed around at least 40% of the limb, the gel should be applied to the Doppler sensor, and placed in the wrist zone at an angle of 60° to the probable trajectory of the vessel analyzed (usually, 45° to 60° with the skin). Move the probe until the clearest sound becomes audible. The practitioner should progressively inflate the cuff up to 20 mmHg above the level of disappearance of the flow signal and then deflate slowly to detect the pressure level at the reappearance of the signal.

The sequence of systolic blood pressure measurements should preferably be right arm, right ankle, left ankle, left arm, and again right arm (repeated to avoid falsely high values resulting from anxiety or the "white coat effect"). SBP should be measured in the pedal (on the dorsum of the foot) or posterior tibial (posterior to the medial malleolus) arteries.

Table 1 - ABI values and relationship with arterial circulation and probable PAD.

Value of the ITB	Arterial circulation
Greater than 0.9-1.2	Normal.
=0.8-0.9	Mild peripheral disease.
Less than or equal 0.8-0.6	Significant arterial disease = refer to an angiologist.
Less than 0.5	Critical ischemia = refer to a specialist angiologist or vascular surgeon.
Greater than 1.2	Vascular specialist consultation (signs of intermittent claudication and pain at rest).

How to assess the risk of ulceration in diabetic patients

Health professionals (physician or nurse) should assess the loss of protective sensitivity (PSP) and peripheral arterial disease (PAD) with the 10gsm monofilament test and the ABI test with the portable vascular doppler.

In category 0 or very low risk of ulceration, the characteristics to be evaluated state that the patient does not have loss of protective sensitivity or peripheral arterial disease; the recommendations for treatment are related to education and health for the patient and focused on self-care, use of drug therapy, and glycemic control, with follow-up to approximate annual evaluation in PHC.

In category 1 or low risk of ulceration, if the patient has loss of protective sensitivity or peripheral arterial disease, the recommendations for treatment are the same as for category 0 and the use of special shoes should be considered. Follow-up assessment will take place twice a year.

In category 2, or moderate risk of ulceration, the characteristics evaluated may be: loss of protective sensitivity and peripheral arterial disease or loss of protective sensitivity and foot deformity or peripheral arterial disease and foot deformity and the treatment recommendations are the same as for category 1 and the use of shoes for deformity/offloads should be considered, in addition to consultation and follow-up with a vascular surgeon/angiologist by the State Reference Center for diabetes and endocrinology care (CEDEBA) or scheduling the Life system, which is a system operated by the municipality of Salvador. The follow-up evaluation will take place three times a year with specialist physicians and continuity in PHC with clinical physicians.

In category 3 or high risk of ulceration, the characteristics evaluated are loss of protective sensation or peripheral arterial disease and one or more of the following criteria: (History of standing ulcer, A lower limb amputation, End-stage renal disease (ESRD)) and the recommendations for treatment are the same as for category 2. The follow-up evaluation will take place six times a year with specialist physicians and continuity in PHC with clinical physicians.

Table 2 - IWGDF 2019 Risk Stratification System, treatment recommendations and frequency of evaluation.

Category	Risk of Ulceration	Features	Treatment Recommendations	Follow-up Evaluation
0	Very Low	No PSP and no DAP	Patient education focused on self-care, use of drug therapy, glycemic control	Annual (clinical and/or specialist physician)
1	Low	PSP or DAP	Patient education, use of drug therapy, glycemic control, consider wearing special shoes	6-12 months (twice a year)
2	Moderate	PSP + PAD, or PSP + foot deformity or PAD + foot deformity	Patient education, use of drug therapy, glycemic control, Consider the use of shoes for deformity/offloads; consultation and follow-up with a vascular surgeon/angiologist (CEDEBA) or Life scheduling.	3-6 months (three times a year). (By medical specialist)

3	High	PSP or PAD and one or more of the following criteria: History of standing ulcer, A lower limb amputation, End-stage renal disease (ESRD)	Patient education, use of drug therapy, glycemic control, Consider the use of shoes for deformity/offloads; consultation and follow-up with a vascular surgeon/angiologist (CEDEBA) or Life scheduling.	Every 1-2 months (six times a year). (By medical specialist)
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Legend: PSP (loss of protective sensitivity), PAD (peripheral arterial disease)

Discussion

Primary Health Care (PHC) is characterized by a set of health actions, at the individual and collective levels, and is the preferred contact of users with health systems. These health actions are developed by health professionals together, but each one with specific attributions. It is the responsibility of the medical and nurse professional to carry out the health care of the enrolled population, health care actions according to the health needs of the population; health education actions; consultations and procedures; participation in user embracement and input management⁷.

Thus, PHC plays a fundamental role in the prevention process, as it is the main gateway to the health system, and should cover health promotion, prevention, and recovery and ensure comprehensive care, especially with regard to the care of diabetic patients⁸. In this context, nursing stands out for being the professional who is in direct contact with the community, and it is their responsibility to ensure comprehensive care in the promotion and protection of health, disease prevention, diagnosis, treatment, rehabilitation and maintenance, in addition to promoting educational actions to raise awareness among diabetic patients⁹.

The prevention of LTD has been discussed by several authors and health professionals, in this sense, the first International Consensus on Diabetic Foot was created in 2001, which recommends the following pillars to prevent these injuries: (1) identification of the foot at risk; (2) regular foot examination; (3) educational approach; (4) ensure the use of appropriate footwear and (5) treatment of risk factors. Studies have proven that interventions, especially those that include regular examination of the feet, along with risk classification and educational actions, reduce the prevalence of injuries by half¹⁰.

The identification of the foot at risk or risk factors that may develop LDP can be easily detected through the clinical history and through the risk classification system recommended by the IWGDF, where depending on the identified risk, the need for frequency of evaluation and examination of the feet is verified¹¹.

Regarding regular foot examination, experts recommend that patients diagnosed with DM should be examined and evaluated, preferably, by primary

care nurses, as recommended by the Diabetic Foot Manual, at least once a year. When presenting risk factors, these patients should be examined more frequently to reduce this complication². This clinical examination, associated with the clinical history and anamnesis, can identify the two most important risk factors for foot ulcerations, peripheral neuropathy and PAD³.

As for the exam, it should include clinical history; evaluation of the anatomy of the feet, checking for deformities in the feet characteristic of diabetic neuropathy, evaluation of skin color, hydration, temperature, presence of calluses, edema and ulcerative signs; palpation of the wrists of the feet; evaluation of tactile and protective sensitivity; and observe foot hygiene. Tactile evaluation can be performed with Semmes-Weinstein monofilament, which is the recommended method for screening diabetic neuropathy and protective with a 128 Hz tuning fork¹².

Education is the first line of defense to prevent PDL, as it aims to modify patients' behavior regarding self-care, improve knowledge, and teach them to recognize potential injuries and problems in their own feet and promote adherence to the guidance received, such as the use of appropriate shoes, glycemic control, among others. Research has proven that these educational interventions, when applied, are effective and reduce foot ulcers¹³. These educational actions for the prevention of diabetic foot should include: encouragement of daily inspection of the feet, glycemic control, development of skills to identify and notify any changes in the lower limbs; explain the importance of wearing appropriate shoes, moisturizing the skin, and cutting the nails correctly¹⁴.

Conclusion

The study described the successful experience of implementing a referral flow for people with DM to a diabetic foot room in a health district in the city of Salvador, Bahia State, Brazil.

It is important to note that the step-by-step process for organizing a flow for people with DM will contribute to expanding the screening and prevention of foot ulcers in diabetic people, in addition to creating a flow of care for foot exams within PHC, considering that there are already consultations aimed at this public, in addition to reducing the impacts on the lives of patients and consequently the costs for the SUS and minimizing The numbers of amputations.

The relevance of this study, as mentioned above, consists of social, professional and scientific impacts. It is important to emphasize that, when referring to the repercussions, it is understood that the visibility and deepening of the theme result in the provision of qualified, humanized and effective services for diabetic people assisted with a reduction in preventable diseases, expansion of screening and prevention of foot ulcers in these people, reduction of morbidity and mortality, improvement of healthy lifestyle habits and reduction of costs for the SUS.

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