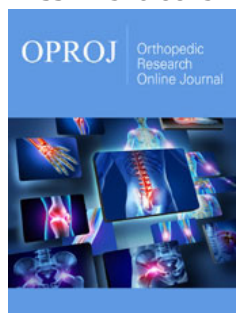


# Family Health Nursing Approach to Leg Ulcers

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## Abstract

Family Health Nursing focuses its action on the user and family and, due to its centrality and proximity, it is the main responsible for monitoring chronic diseases, where leg ulcers stand out. Given the complications that they represent in the user and family, it is essential that the Family Nurse masters their characteristics, to distinguish their etiology, as well as the different treatments available, adapting them to the particularities and background of the user. Compressive therapy is a good alternative to apply to venous ulcers, if the essential criteria for its application are met. It is up to the Nurse to evaluate them and, when properly instructed, their application, to enhance health gains and cost adequacy.

**Keywords:** Leg ulcer; Family health; Therapeutics

## Introduction

Of the different nursing specialties is Family Health (Regulamento n.º 428/2018) which implies greater involvement with the user and family. It is the Family Nurse who will know you best and who, most assiduously, will accompany you in situations of chronic illness, such as leg ulcers. Its function is to promote health and prevent disease, through health education, management, coordination and evaluation of care, which must be centered on the person, as an individual inserted in a certain family system and social context.

In view of the need to define an adequate treatment plan, based on scientific evidence, it is essential that nurses identify the etiology of the leg wound and, therefore, master its characteristics.

## Theoretical Framework

Leg ulcers are included in the group of chronic wounds, due to their long durability - greater than six weeks - and high recurrence in a short period of time [1,2].

Studies [3,4] indicate that these injuries are impactful for both the user and their family. In the individual it affects (1) their physical and occupational function, by limiting the activities of daily living, pain, edema and difficulties in performing personal hygiene; (2) its psychological function, due to anxiety caused by the fear of visualizing the lesion and its odor, leading to a change in body image, shame, disgust and difficulty in social contact; (3) financial level, due to incapacity for work, which leads to absenteeism and dismissal, and expenses with treatments, whether with medication or transportation; and (4) their social interaction, due to limitations that the treatment itself invokes, namely in the performance of some sports and trips to the beach. All of them have implications for the family system due to the isolation and social restrictions they represent.

There is no consensual definition of leg ulcer; however, the most comprehensive is the presence of "(...) continuity solution in the leg that occurs in previously injured skin reaching the papillary dermis and that leaves a scar" (Andriessen, 2002 quoted by Furtado [2]).

According to Morison [5] leg ulcers can have different causes, namely: venous insufficiency, arterial occlusion, microcirculatory disorders, physical or chemical injuries, neuropathies, infectious diseases, hematological diseases, coagulation disorders, metabolic diseases, neoplasms, ulcers secondary to drugs and ulcerative dermatoses. About 80 to 90% of cases represent ulcers of venous etiology [6].

A differential diagnosis is essential for the prognosis and decision-making of the care plan to be carried out. Thus, it is vital to assess the user holistically, paying special attention to his or her background, personal and family, signs and symptoms. It is also recommended to evaluate the Ankle Brachial Pressure Index (ABPI) and in some cases the venous and arterial flow of the lower limbs [2].

### Arterial ulcer

Patients with arterial leg ulcers have the most advanced form of peripheral arterial disease, the most common underlying pathological process of which is atherosclerotic disease. It is associated with an ABPI <0.5-0.7, an age over 65 years and several comorbidities, such as: smoking, hypertension, dyslipidemia, hyperhomocysteinemia, inflammatory markers, hyperviscosity and hypercoagulability states, renal failure chronic and diabetes mellitus [7].

These ulcers usually appear in bony prominences of the foot and are the result of minor trauma. Peripheral pulses are weak or absent. There is a deficient capillary filling time, the skin is cold, shiny and with diminished hair follicles, due to weak peripheral perfusion, loss of subcutaneous tissue (due to weak perfusion and decreased muscle exercise due to functional limitation of the leg), there may be necrosis of the foot or toes, mostly associated with trauma, and pain at rest, enhancing intermittent claudication [2].

### Venous ulcer

Venous ulcers represent the most advanced stage of chronic venous disease, so its approach implies an understanding of the etiological mechanisms of Chronic Venous Insufficiency (CVI), which very briefly result from a vicious cycle between chronic venous hypertension, heart failure valve system and the structural and functional modification of the walls of the veins to which an inflammatory response that promotes skin changes is associated. The veins of the lower leg are divided into perforating, deep (carrying most of the blood) and superficial (just below the skin). The evidence explains "(...) that the fragility of the vein wall conditions dilation with secondary enlargement of the valve ring, preventing adequate coaptation of the valve leaflets". The perforating veins may also become incompetent in a primary way, however the most common is the coexistence of the incompetence of the perforating veins and the

great saphenous vein. Hence, some authors defend the reestablishment of the valve competence of the perforators by removing the saphenous vein system [8]. In more detail, and according to Escalera [8], "(...) the perforators act as safety valves allowing the escape of blood under high pressure, which is conducted to the superficial veins promoting the dilation of capillaries and leakage of contents intravascular in the interstitial space".

In venous ulcers, the patient experiences pain and swelling of the legs, and the symptoms are accentuated at the end of the day and with the leg hanging, relieving with the elevation of the same. Mostly, they are located 2.5cm above the malleolus to the prominence of the tibia (gastrocnemius muscle). The edges are generally sunken, irregular and rounded, there is abundant edema and exudate, there is reference to pain, history of varicose veins, varicose eczema, white atrophy and lipodermatosclerosis and hyperpigmentation of the adjacent skin [2].

### Venous drainage of the lower limb

Draining venous blood from the legs to the heart needs to overcome gravity. It is the muscles surrounding the thigh, leg and foot and the compression of the network of veins on the plantar surface of the foot that favor venous return. The tibia (gastrocnemius muscle) appears as the most important muscle of the leg, staying active during gait and with the movement of the ankle. However, due to the increase in age and the consequent inactivity, its function decreases [9]. In the process of transition from horizontal to vertical, the pressure of the venous system, due to the accumulation of blood in the lower extremities, increases. As the person moves, the pumping effect of the muscles reduces this pressure and forces the blood flow to the heart. Immobility will increase this pressure again. In a healthy individual, during exercise the venous pressure drops to about 30mmHg, however, in the presence of venous disease the reduction is much less expressive, so rest and elevation of the leg help in the relief of symptoms [9].

On the other hand, when muscle relaxation, it is the valves in the veins that prevent blood reflux. The valves are found in the perforating and superficial veins. Chronic venous insufficiency occurs when these valves do not work properly, due to weakening resulting from varicose veins, deep vein thrombosis, venous obstruction or trauma. This results in blood reflux, preventing the reduction of venous pressure and resulting in venous hypertension [9]. Negative chest pressure during inhalation also helps venous return [9].

In a resting individual the venous pressure of the lower limb is determined by the distance between the ankle and the heart. Venous hypertension is related to the maintenance of high mean venous pressure in the ankle. This hypertension causes abnormalities in the capillaries of the leg tissues, making them more permeable and, therefore, allowing blood cells, proteins and fluids to escape into the tissues. In addition, it may be related to an increased inflammatory response, changes in the microvasculature and reduced oxygenation of the skin and tissues. Venous hypertension

causes changes in subcutaneous tissues and skin, such as edema, lipodermatosclerosis, varicose eczema, white atrophies and hyperpigmentation, contributing to skin fragility and an increased risk of leg ulceration and delayed healing [9].

### ABPI (Ankle-Brachial Pressure Index)

The ABPI is an internationally validated, non-invasive measure. It is the ratio between the systolic pressure obtained in the lower limb and the highest value of systolic pressure obtained in the upper limbs. The interpretation is made with the aid of reference value tables, where an ABPI  $\geq 1$  is normal and "(...) lower values reveal arterial compromise, the greater the closer to zero". It takes between 10 and 15 minutes, can be performed by a Nurse or Doctor, and needs as instruments of a sphygmomanometer and a stethoscope or, for greater precision, an Ecodopler [10].

The calculation of this Index is essential for decision making in the treatment of a leg ulcer. It is important to mention that in patients with venous ulcers, due to the frequent presence of edema, palpation of the pulses can be difficult, so that, if other evaluation strategies are not used, decision making is limited [10].

### Treatment of leg ulcers

The treatment of a leg ulcer implies a constant review of the care plan, with systematic assessments and appropriate prescriptions for the stage of the wound, considering the patient's background and available resources [6]. In arterial ulcers, referral to vascular surgery is essential for eventual revascularization. The control of symptoms, namely pain, and the use of dressing material agreed with the principles of ulcer treatment is a priority. Compressive therapy is contraindicated.

In venous ulcers, treatment must respect four elements: (1) venous stasis, by rest and compression therapy; (2) topical therapy with cleaning the wound bed, with warm water for irrigation or serum, eventually debridement, maintaining a clean, humid environment and exudate absorption; (3) control of possible infections, namely associated with the duration of the wound, where some studies demonstrate that the use of the drug pentoxifylline and purified flavonoid micromized have a very positive effect on healing; (4) patient education about signs, symptoms, wound complications and hygienic-dietary measures [6,8].

In addition, in the treatment of venous ulcers, to improve venous return, circulation activating exercises can be performed, from which stand out:

- a) supine position, place the lower limbs elevated, above the level of the heart, for about 2-3 minutes
- b) sitting, with the lower limbs hanging down, doing dorsiflexion and plantar flexion of the foot and toes, for 3 minutes
- c) supine position, place the lower limbs supported at the level of the heart for 5 minutes.

The importance of keeping the perilesional skin clean and hydrated is emphasized, in order to prevent infections in the injured tissue. In venous ulcers, proper compression is essential for the healing process, as it allows the reduction of superficial venous pressure, facilitates venous return, increases the speed of flow in deep veins and reduces edema [2].

### Compression therapy

Compressive therapy is called the application of compression of the lower limb, using specific bandages, compression stockings or a pneumatic device, to prevent reflux, by promoting the reabsorption of fluids from the interstitial to the intravascular space [11]. Its main objective is to correct complications of chronic venous insufficiency, so the use of external compression systems on the lower limbs is used to increase pressure on the skin and underlying structures. In this way, it counteracts the force of gravity, acts on the lymphatic and venous systems, redistributes fluids, reduces edema and pain and promotes ulcer healing [8,9].

The most used compression therapies are compression stockings and bandage components around the leg (full leg or up to the knee), the former being more suitable for preventing ulcer recurrence and the latter for ulcer treatment [8,9]. Compressive therapy systems are categorized in particular by the pressure they produce, being less than 20mmHg considered gentle, moderate 20-40mmHg, 40-60mmHg strong and 60mmHg very strong [8,12]. Compression systems can contain inelastic and/or elastic materials, most of which function as inelastic, even if they contain elastic components [8,9].

Compression therapy works by creating a closed system that allows for uniform distribution of internal leg pressures and by varying interface pressures according to the tension of the applied bandage and the shape of the limb. Compression bandages maximize the effect of muscle movement, reducing the diameter of the veins inside the leg, favoring venous return. Thus, the volume of local blood is reduced, helping to produce a more adequate venous pressure, and edema, by decreasing fluid output from capillaries and reabsorption of the vascular and lymphatic systems [8,12].

It should be noted that the incorrect application of the bandages can cause damage to the tissues, namely pain, due to pressure, in the bony or tendinous prominences, this is because, imagining circles in the limb, the pressure will be greater the smaller the circle. Hence the importance of padding in pressure risk areas [8].

Studies [13,14] show that, compared to conventional treatments, healing rates increase when adequate compression is applied and that it is less expensive.

In ideal compression therapy there are factors to consider, they are:

- a) incorporate an inelastic component. which will produce a greater variation in interface pressure during gait (massage effect), being more effective in venous return, compared to

elastic systems, as it produces higher pressure peaks during gait and lower peaks at rest; hence the importance of encouraging the user's gait [8]

b) be comfortable, particularly at rest; Compression therapy is effective in different sizes and shapes of the limbs, and can be used even in deformed limbs, since its cohesive properties allow the bandage to mold to the limb and restart in any part of it, after cutting, with subsequent filling of any gaps; as a rule, it is tolerable to high pressure during movement, however at rest it can become uncomfortable and therefore unsafe; discomfort can cause poor adherence, reducing the rate of healing and increasing the time for healing [9].

c) allow functionality and movement, and the system must be as adapted and as thin as possible, allowing the continuation of usual activities so that, as already mentioned, it enhances its action.

d) be easy to apply and adaptable.

e) be durable and non-allergenic; some users may develop skin allergy if the system used contains latex, which is why, whenever possible, it is essential to collect a detailed medical history that warns of allergic history in order to make the most appropriate material possible [8,9]

Having ensured these factors, it is still vital:

a) examine the patient globally, with an assessment of the peripheral blood supply, his neurological and cardiac status, the condition of the skin, the presence of edema, allergic history, level of mobility and shape of the limbs; eventually, request an opinion on vascular surgery.

b) inform about the treatment plan.

c) follow the manufacturer's instructions, namely, the application of bandages with maximum ankle dorsiflexion.

d) ensure compression on the calf muscles, as, as mentioned, the pressure will decrease the greater the circumference and it is vital to ensure sufficient pressure in the twin muscle to provide venous return.

e) resort to the use of padding, when necessary, to ensure the adjustment of the bandage and protect areas from pressure damage or to manage excessive exudate; nevertheless, it is necessary to remember that when increasing the circumference of the limb with the padding, compression will be reduced and therefore the compression therapy system; some systems already incorporate textiles in bandages to prevent this volume.

f) use elastic stockings after healing to prevent recurrences and teach the patient about appropriate placement and importance of use.

g) systematically update and reassess the care plan and records of interventions.

h) ensure good skin care and ask the user to lift the limbs when at rest.

i) promoting the user's adherence to treatment, namely through the discussion of possible options and the method of application [9,15,16].

After consultation with the above topics and confirmation of the presence of a patient with venous ulcers, ABPI>0.8 and tolerance to compressive therapy, this treatment maybe used.

## Conclusion

The leg ulcer has multifactorial implications for the patient and family. It is therefore essential that the Family Nurse, due to its centrality in the health of the patient and family, effectively distinguishes the different types of chronic leg ulcers and the most appropriate treatments for each of them, respecting the personal and hereditary antecedents. In addition, he should know and make use of compressive therapy, whenever it is considered the most appropriate, to prevent the use of differentiated care, reduce the cost and duration of treatment and avoid possible hospitalizations and associated morbidities. In this way, it will increase health gains and will be responsible for the reduction and adequacy of costs associated with health care.

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