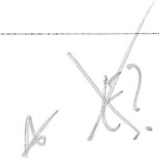


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1) JOBST® Opaque compression hosiery in the management of venous disease Zahra Pah-Lavan and Sylvie Hampton

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JOBST® Opaque compression hosiery in the management of venous disease

Zahra Pah-Lavan, Sylvie Hampton

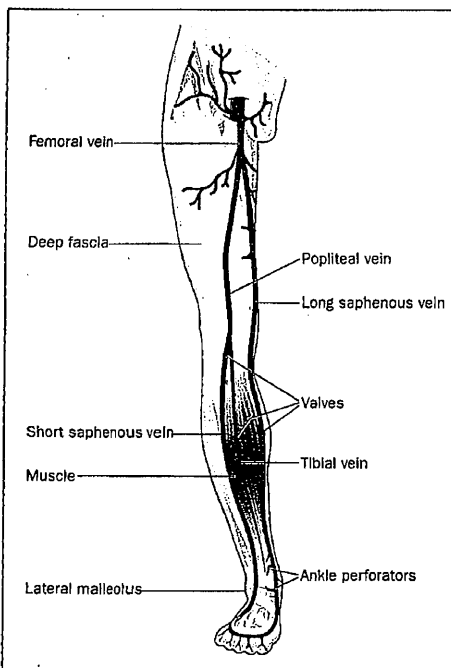
Abstract

Prevention of leg ulceration is a simple process involving assessment, accurate measurement of the leg and application of appropriate compression hosiery along with appropriate care of the skin. Persuasion of at-risk individuals to be aware of and follow prevention options needs to be incorporated in the ongoing health promotion activities of the practitioner (Price and Harding, 1996). This product focus examines the potential contributions of the new JOBST® Opaque gradient compression hosiery (with the innovative JOBST® soft care yarn) in prevention and management of venous disease and deep vein thrombosis, without sacrificing comfort and style in order to promote patient concordance.

Key words: Dressings ■ Leg ulcers

Epidemiological studies have consistently shown that venous disease accounts for about 70% of lower limb ulcers in the UK (Vowden and Vowden, 2001). Much of the research in leg ulceration concentrates on the healing of these uncomfortable and distressing outcomes of venous disease. Therefore, in order to reduce the cost associated with treatment and to reduce the psychological cost to the patient, venous disease should be noted before ulceration and the pathology managed correctly. There are several signs and symptoms that will alert the practitioner to venous disease, before ulceration, when compression therapy can be initiated as a prevention measure.

Figure 1. Veins of the leg.



Aetiology of venous haemodynamics

The lower limbs contain both deep veins (femoral, tibial and popliteal), which lie within a tough muscle sheath (deep fascia) and superficial veins (long and short saphenous veins) (Figure 1) which lie outside this fascia (Gray, 1977). Superficial veins carry blood under low pressures and the deep veins under higher pressures. Perforator veins or communicating veins connect them, through the fascia (Dale and Gibson, 1990).

Venous return from the lower limb is influenced by respiration and the pressure exerted on the veins by the action of the calf muscle pump, which has a pressure

and suction effect acting as pumps, forcing deep, venous blood upwards towards the heart (Williams, 1996a). When the muscles contract, they compress the deep veins of the calf, raising the intravenous pressure (Sigel et al, 1973), closing the distal valve in the deep vein as well as the perforator vein valves, and blood is propelled upwards towards the heart. On relaxation of the calf muscle a rapid decrease in pressure in the deep vein occurs and the proximal valves close. The pressure at this stage in the superficial vein is higher than that in the deep vein and the blood is aspirated through the perforating veins into the deep veins ready for another contraction of the calf muscle pump (Browse and Burnand, 1982).

The flow of blood upwards towards the heart depends on the integrity of the bicuspid valves, which can be congenitally absent, or become traumatized by injury, infection, or as a result of deep venous thrombosis (Ludbrook and Beale, 1962). The speed at which the venous blood returns up the leg is a marker of venous function and would be expected to be slower where there is venous valve incompetence. Incompetent valves increase the pressure in the venous system, which is transferred to the dermal capillary bed, resulting in the classical signs of chronic venous insufficiency, such as ankle flare, lipodermatosclerosis, atrophie blanche and oedema (Ertl, 1991) and varicose veins (Ertl, 1991). The problem of venous insufficiency can be addressed through appropriate use of compression hosiery (Hampton and Collins, 2003) and is a particularly useful method as the patient can have greater independence if he/she is able to remove and replace the compression stockings independently.

Appropriate use of compression hosiery applies to those with the potential of venous ulceration or swollen legs. Care should be taken not to use compression hosiery on legs with poor arterial supply. Figure 2 shows the progress of venous disease.

Signs and symptoms indicating the need for compression hosiery

Swollen ankles are a common sign of venous incompetence (Roekaerts and Vanden Bussche, 1980). The ankle feels 'tight' and this can cause aching in this area. The normal capillary pressure gradient is such that 80–90% of fluid is reabsorbed by the capillaries with the remainder being absorbed by the lymphatic system (Szuba and Rockson, 1997). In venous disease, this system ceases to work effectively and the fluid

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collects within the veins, causing the veins to swell allowing the fluid to seep into the surrounding tissues. Compression therapy will reduce the swelling and reduce discomfort in the lower leg (Hampton and Collins, 2003).

Varicose veins are a visible and often early sign of venous insufficiency in superficial vessels that are abnormally lengthened, twisted, or dilated (Goldman et al, 1994) (Figure 3). This can be uncomfortable and distressing and painful with the potential to bleed. Varicose veins are often attributed to a hereditary weakness of the vein. Increased pressure from standing for a long time or exertion, or factors such as pregnancy, or lessened support by the tissues surrounding the veins that occurs with ageing and obesity causes the weakened veins to dilate (Jawien, 2003). Compression hosiery will relieve the symptoms and prevent this problem from worsening (Weiss and Duffy, 1999).

Stripping and ligation of varicosities to remove incompetent superficial veins is one option for treatment. It is well accepted that use of gradient compression hosiery is beneficial after vein stripping, but not every patient will be suitable for surgery and the time spent awaiting surgery may be variable across the UK. A recent study (Guest et al, 2003), comparing superficial venous surgery to compression therapy, suggests that application of compression alone may have a similar effect on healing rates and quality of life for patients.

Haemosiderin is a brown stain found on the lower limb (Figure 4). This is caused by the veins becoming stretched because of the high pressures from hydrostatic pressure. This opens the cell junctions and permits red blood cells to pass through into the tissues. Normally they are too large to pass from the venous system. Iron from red cells deposits into the tissues and stains the area brown permanently (Hampton and Collins, 2003). Venous stasis dermatitis (varicose eczema) is a common skin disorder characterized by red, scaly and often very irritating patches of skin on the lower limbs (Wilson et al, 1991).

This is an uncomfortable and distressing condition that may be helped by compression therapy (Harms, 1979). Atrophy blanche are small patches of pure white tissue which are bloodless, extremely painful and a precursor to ulceration (Hampton and Collins, 2003).

Effective treatments

National guidelines for the management of leg ulcers were published by both the Royal College of Nursing (RCN)

Institute et al (1998) and Scottish Intercollegiate Guidelines Network (SIGN) (1998). These

recommend that assessment and clinical investigations should be undertaken by nurses who have been trained in leg ulcer management (Vowden and Vowden, 2000). Of equal or even greater importance is the prevention of leg ulcers which should also be undertaken by experienced and knowledgeable nurses.

External gradient compression therapy using hosiery is regarded by those with knowledge of tissue viability as the single most important element in the prevention of venous ulceration and has the overall effect of improving blood flow through reducing the blood volume in the veins and reducing the distension. Elasticity of the vein wall is lost when veins are distended and it may be that compression helps in some way to restore vein wall tone (Clarke et al, 1989). Compression also improves valve function (Moffatt and Harper, 1997).

Patient assessment

It is essential to assess arterial status in the limb before applying compression (Vowden and Vowden, 1997) and Doppler ultrasound is invaluable as a diagnostic tool to nurses who are trained in its use and the interpretation of results. Compression should only be considered if the patient's ankle brachial pressure index is between 0.80 and 1.25 with triphasic or biphasic sounds (Bentley, 2003). Greater readings than 1.25 or lower than 0.8 with monophasic sounds strongly indicate arterial disease and compression should not be applied (Hampton and Collins, 2003).

Effects of compression on venous flow

Sustained graduated external compression by hosiery systems is an effective way of over-coming venous hypertension (NHS Centre for Reviews and Dissemination, 1997) and has been the documented treatment for venous ulceration since the days of Hippocrates (Blair et al, 1988; Callam et al, 1992; McCollum et al, 1998). Compression reduces blood pressure in the superficial venous system, aids venous return of blood to the heart by increasing the venous flow velocity and lessens oedema by reducing the pressure difference between the capillaries and tissue (Cullum and Roe, 1995). Compression

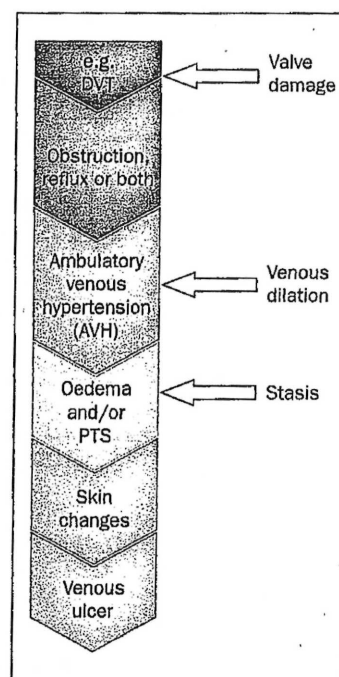


Figure 2. Progression of venous disease. PTS = post-thrombotic syndrome; DVT = deep vein thrombosis.

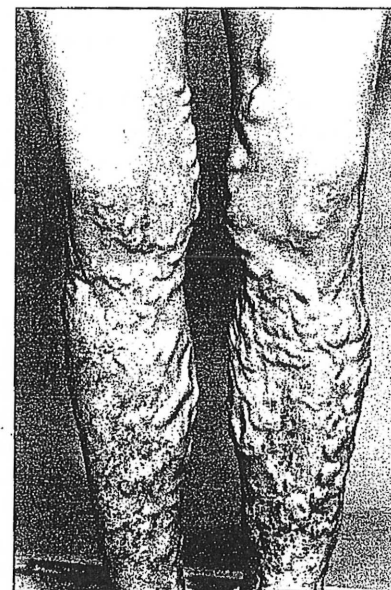


Figure 3. Varicose veins.



Figure 4. Haemosiderin.

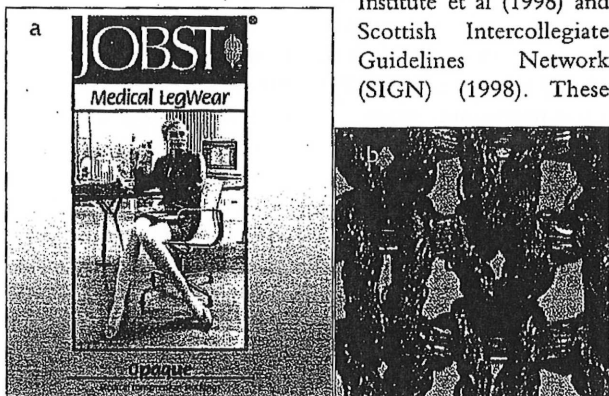


Figure 5a. JOBST® Opaque hosiery (b) microscopic view of JOBST® Opaque knit structure.

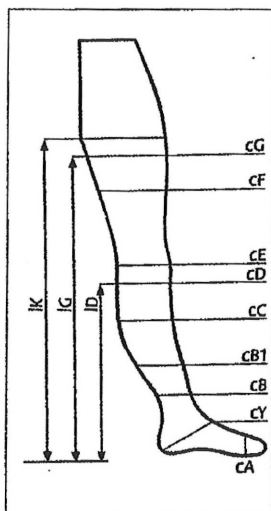


Figure 6. Measuring system JOBST® Opaque.

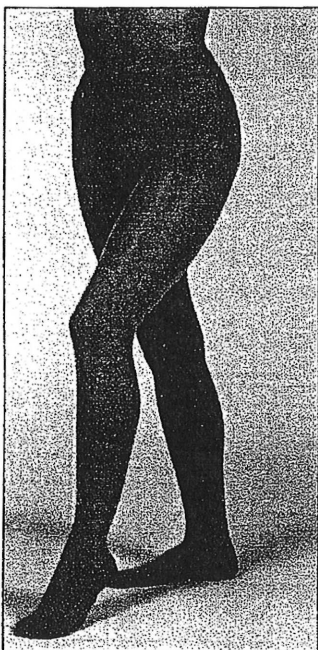


Figure 7. JOBST® Opaque pantyhose.



Figure 8. JOBST® Opaque silicone thigh band.

hosiery is the simplest method of obtaining the required gradient compression (Hampton, 2003). JOBST® Opaque compression hosiery is available in two compression classes with six ready-to-wear sizes which provide optimum compression for the individual patient. For measurements falling outside these six sizes, there are custom-made options available.

Gradient compression hosiery is regarded as a prerequisite for the prevention of venous leg ulceration (Edwards and Moffatt, 1996) and can be used prophylactically for the prevention of deep vein thrombosis and lymphoedema (Williams, 1996b). Once the need for compression hosiery is established, it must be worn for life as it can only halt the progression of damage within the veins and skin while it is being used as an active treatment (O'Hare, 1997). Klyszcz et al (1997) reviewed the effect of compression therapy on skin microcirculation and observed an overall improvement in the function of skin microcirculation. The range of JOBST® Opaque hosiery is a simple solution for patients with chronic venous insufficiency who have these signs and symptoms and find concordance to treatment difficult (Hampton, 2003).

JOBST® Opaque hosiery

JOBST® Opaque hosiery is a new type of compression hosiery, designed for mild to moderate venous indications and is an excellent aid for the management of varicose veins and the prevention of venous leg ulcers, particularly for individuals who wish to wear hosiery that is stylish and comfortable. The yarn selection and knitting design make JOBST® Opaque very durable (Figures 5a and b).

There are six styles and six sizes that are tailored to suit the patient's needs. The JOBST® Opaque hosiery is available in two compression classes (Table 1). Careful measurement of both legs is essential to ensure a good fit and, therefore, correct compression profile (Cornwall et al, 1987) (Figure 6).

There is no objective way of measuring patient concordance with compression hosiery and patients may tell the nurse/researcher what they think they want to hear (Harker, 2000). It is therefore important for the patients to have a clear understanding of their condition, as well as the benefits and contraindications of compression hosiery (Merrett and Hanel, 1993). The increasing awareness of society to advances in technology and the increased knowledge of the public regarding health (Bevis and Krulik, 1991) mean that teaching is now a necessary role for professional nurses (Leddy and Pepper, 1993). JOBST® Opaque supports patients, healthcare professionals and pharmacists with information

and advice on the management of venous conditions with special information about the benefits of JOBST® Opaque.

Factors that affect patient compliance include the patient's motivation (Moffatt and O'Hare, 1995), knowledge and understanding of treatment, previous experiences and future expectations (Travers et al, 1990; Edwards and Moffatt, 1996). The new skin-friendly JOBST® softcare yarn provides a soft feel, elegant look and comfort. Its soft opaque texture effectively conceals visible signs of venous conditions making it an elegant option for any occasion (Figure 7). JOBST® Opaque offers an extensive range of styles which includes tights (male and female styles), maternity tights, thigh-length stockings and below-the-knee stockings available with a choice of open or closed toe depending on the style and compression class. Further options such as two different silicone thigh bands (Figure 8) in two widths are available. The new JOBST® Opaque hosiery is designed to fit most standard sizes and is available in four colour choices (sand, perle, topas and black).

Table 1. The two compression class sizes of JOBST® Opaque hosiery

- Class I (18–21 mmHg): this class is suitable for mild disease, such as tired, heavy legs, mild swelling of ankles, feet or legs, mild varicosis without significant oedema and the onset of pregnancy-related varicosis. They can be worn for travel to help prevent deep vein thrombosis
- Class II (23–32 mmHg): this class is for moderate to severe varicosis and is excellent for prevention of the development of venous ulceration following vein surgery, post-traumatic and postoperative oedema, chronic venous insufficiency, moderate oedema and superficial thrombophlebitis

JOBST® Opaque leg therapy with pioneering JOBST® softcare yarn conforms to the German RAL standard for compression hosiery. Unique function and performance tests at JOBST® confirm the high quality. The combination of multifibre JOBST® softcare yarn and 3-D knit structure make the new JOBST® Opaque hosiery smooth and easy to wear and remarkably durable compared to some competing brands (BSN medical, data on file). To prolong the life of JOBST® Opaque compression hosiery, patients also need to know about feet and nail care to avoid discomfort or snagging. Patients should be advised to smooth out any wrinkles and not to fold or knot the top of the hosiery as this may lead to unwanted, increased localized pressure (Cowan, 1997). Attention must be drawn to the manufacturer's instructions on frequent washing to prolong the life of the stocking and patients should be made aware that their hosiery should be replaced when they become slack after approximately 6 months of wear.

JOBST® Opaque compression hosiery for travellers

Scurr (2001) and Eklof et al (1996) have highlighted the risks faced by travellers who remain seated in one position for long periods, particularly on aircraft and the conditions of long-haul flights, i.e. cramped seating, lack of exercise and the possibility of dehydration which causes the venous return to be impaired. When this happens, for some travellers, Virchow's triad becomes a reality (Nielsen, 1991).

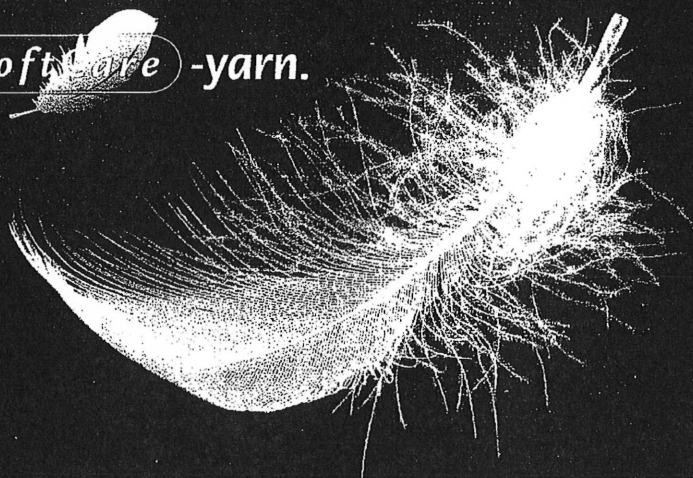
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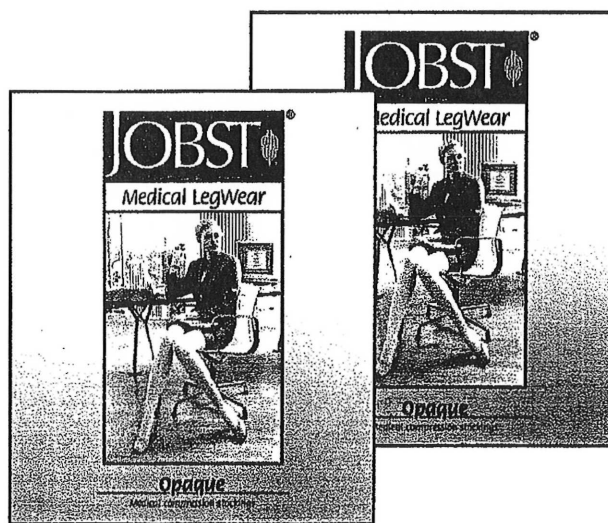
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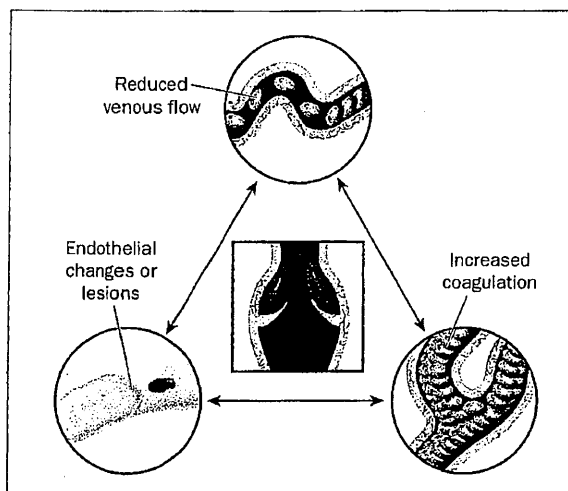


Figure 9. Virchow's triad.

Virchow's triad (Figure 9) indicates that three elements can cause thrombosis: damage to the veins (comes to many people as they age); reduced venous flow (caused in this case by immobility during the flight); and increased coagulation (potentially because of dehydration) (Nielsen, 1991). Wearing compression hosiery can help improve the circulation

and prevent the swollen, tired legs that often occur owing to air flight while providing elegance and comfort.

Conclusion

Active and effective prevention of leg ulceration is easily achieved with compression hosiery such as JOBST® Opaque. Early clinical management of venous disease with compression hosiery is an effective method of reducing the number of venous leg ulcers and lowering the treatment cost to the NHS (NHS Centre for Reviews and Dissemination, 1997).

Successful collaborative care requires a partnership between nurse and patient. Educated nurses help improve patient care, manage efficacy and acceptability of successful cost-effective treatment and need to be sensitive to patients' feelings and concerns. Well-supported patients with a good understanding of the mechanism of their disease and available treatments can actively participate in their own care (Poulton, 1991). BSN medical is committed to improving education for patients and nurses to reach the ideals of well-supported patients. JOBST® Opaque range of hosiery complements these ideals as they are tailored to help manage mild to severe venous indications and are an effective option for primary prevention of venous ulceration. **BJN**

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KEY POINTS

- Swollen ankles and skin changes, such as pigmentation (haemosiderin) and stasis dermatitis, are signs and symptoms of venous disease which compression hosiery may benefit.
- Leg ulceration may be prevented by appropriate use of compression hosiery.
- JOBST® Opaque compression hosiery provides choice, comfort and style to patients requiring compression for mild to moderate venous indications and is a useful medical device to help prevent the development of leg ulceration.