

A review of compression to enhance circulation – Wellness

Compression garments are being used to apply mechanical pressure on the surfaces of body areas to compress, stabilize and to support the underlying tissues^[1]. They have been extensively studied and applied in the fields of medical, sports, and body-shaping applications^[2]. Compression devices are used to improve blood circulation. They are well known in the medical community as Intermittent Pneumatic Compression 'IPC' devices. IPC devices are used to manage several medical conditions which will be explained briefly in this paper. These devices are recognized as 'recovery devices' in the sports community, and 'pneumatic massagers' among the health and wellness enthusiasts.

Compression garments and devices are being utilized for medical reasons for many years such as to treat lymphedema^[3, 4], varicose veins^[5, 6], as a symptom alleviator for arthritis^[7] and as a prophylaxis for deep vein thrombosis^[8].

IPC devices have been incorporated for non medical purposes over time such as in travel, occupations requiring prolonged standing, to aid recovery in sports as well as among seniors.

Compression therapy which is widely used as a treatment modality is being increasingly incorporated into non-medical conditions such as air travel, sports and in various occupations that need prolonged standing as a preventive strategy and to improve the QOL. In the last few years, there has been increasing interest in whether compression stockings (or 'flight socks') reduce the risk of deep vein thrombosis and other circulatory problems in airline passengers. A Cochrane review of eleven randomized trials (n = 2906) was published in 2016, authors' aim was to assess effectiveness of compression stockings for the prevention of DVT in people travelling on flights lasting at least four hours. This review concluded that there is high-quality

evidence that airline passengers can expect a significant reduction in the incidence of symptomless DVT if they wear compression stockings^[9].

Many workers are required to stand for long periods of time without being able to walk or sit during the work shift. In operating rooms, for example, nurses and doctors must stand for many hours (4-12) during surgical procedures. Similarly, direct care nurses, hairdressers, and store clerks spend large fractions of their working time standing without the ability to sit down. Prolonged standing at work has been shown to be associated with a number of potentially serious health outcomes, such as lower back and leg pain, cardiovascular problems, fatigue and discomfort^[10]. The Canadian Centre for Occupational Health and Safety has reported that working in a standing posture on a regular basis can cause sore feet, swelling of the legs, varicose veins, general muscular fatigue, and low back pain and other health problems and also suggests use of floor mats, shoe inserts, compression hosiery, and ergonomic seating to avoid exposure^[11].

Numerous studies have investigated the wearing of support stockings or hosiery during standing at work using several subjective and biomechanical/physiological measures. Several studies concluded that compression stockings are effective in reducing edema^[12, 13] in the ankles and legs, and also reduced the amount of venous pooling^[14] and discomfort^[15, 16] in the lower body following prolonged standing. However, in one study conducted with the participation of 130 nurses, 23 ironers, and 35 laundry workers concluded that wearing compression stockings had no significant improvement in venous pressures or reactive oxygen metabolites^[17].

Even though the findings with the physiological/ biomechanical measures were less convincing^[17], most of the studies mentioned above support the use of compression stockings in the reduction of leg complaints such as fatigue, pain, and swelling during work which requires prolonged standing.

Walking is a common activity of daily living which involves coordination between all levels of the nervous system, many parts of the musculoskeletal system, respiratory system and cardiovascular system^[18]. Walking difficulty is a common problem among the elderly population^[19, 20, 21, 22]. As the walking difficulty gradually develops, many older adults are referred to a geriatric specialist^[18]. Gait impairments and walking difficulties may greatly affect the QOL of the elders^[23] and restrict the personal independence of those affected^[19, 20, 21, 22]. The prevalence of venous insufficiency increases with age^[24] and deep venous valves change with age, with thicker valves in older individuals which predispose them for DVT and chronic oedema^[25]. Swelling can also occur as a result of OA among the elderly population^[26].

Interventions to improve walking have historically been multifactorial. Commonly used exercise interventions in elderly subjects are muscle strengthening, power and resistance training as well as coordination training^[27].

Application IPC is a possible solution; however, most of the elderly population use static compression socks to overcome the walking difficulties which is less effective than the IPC devices. Elders find it difficult to handle most of the bulky and complex IPC devices in the market, therefore there is a necessity to introduce smaller and simple ones which has the same efficacy as the currently available devices.

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