



The Use of Sequential Compression Devices to Prevent Venous Thromboembolism

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Introduction

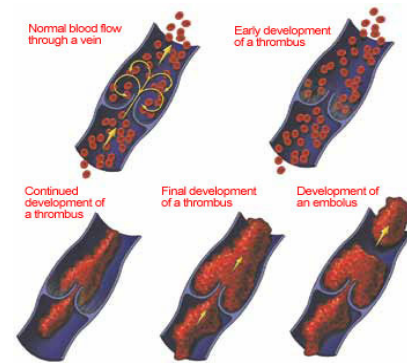
Venous thromboembolism (VTE), also known as a blood clot, is one of the leading cause of morbidity in hospitalized patients (Kahn, et.al., 2013). The use of sequential compression devices (SCD) to prevent venous thromboembolism is usually the first choice for prevention because it is a safe and effective method of preventing a blood clot without the risk of bleeding. However, nurse/patient compliance with using SCD's is not always present.

Objectives

- To demonstrate the effectiveness of Sequential Compression Devices (SCD) in preventing Venous Thromboembolism (VTE) or Deep Venous Thrombosis (DVT).
- Explain factors affecting compliance of wearing SCD's and introduce recommendations to increase compliance

Background

- Approximately 1 million cases in the U.S. each year (Bartholomew, Ozaki, 2014)
- Nearly two thirds of all VTE's result from hospitalization
- Of those, approximately 300,000 of these patients die



Mechanism of Action of SCD's

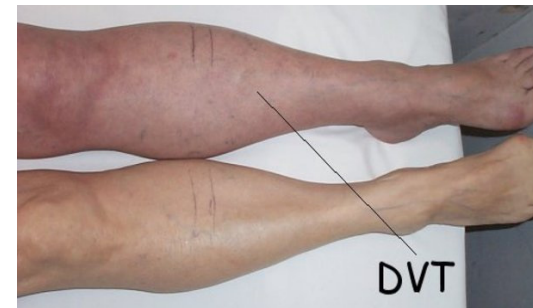
- Compression of pump displaces blood proximally from the limb preventing blood pooling in the underlying deep veins
- Deflation allows the veins to refill with blood
- Basal and peak femoral blood flow are increased by the mechanical compression of the limb
- Muscle contraction is simulated by fluctuating the concentration of tissue plasminogen activator (tPA) through the vessels

Main Factors Contributing to VTE

Virchow's Triad (Morre, Nichols-Whiley, Orlosky-Novack, 2013)

Stasis	Vessel Wall Injury	Hypercoagulability
<ul style="list-style-type: none"> • Interrupted blood flow • Contributing factors include: <ul style="list-style-type: none"> ➢ immobilization from casts or splints ➢ Bed rest ➢ Obesity ➢ Paralysis/Hemiplegia ➢ Atrial Fibrillation ➢ Tumors 	<ul style="list-style-type: none"> • Injuries to vascular endothelium • Contributing factors include: <ul style="list-style-type: none"> ➢ Surgery ➢ Venipuncture ➢ Hypertension ➢ Atherosclerosis ➢ Chronic Inflammation/Infection ➢ Implants/Medical Devices ➢ Bumps/Bruises 	<ul style="list-style-type: none"> • Alteration in constitution of blood causing increase clotting • Contributing factors include: <ul style="list-style-type: none"> ➢ Cancer ➢ Estrogen ➢ Post-operative especially hip and knee ➢ Inherited protein deficiencies

Signs and Symptoms of DVT



- Swelling in one or both legs
- Pain or tenderness
- Warmth
- Redness

Factors Affecting Compliance

- Lack of knowledge regarding importance of using SCD's
- Devices are removed for therapy or when off unit and are often failed to be replaced after activity
- Patients or family may remove due to discomfort associated with intermittent compression
- Patient may have bowel/bladder urgency
- Wearing SCD's may be perceived as a fall risk

Recommendations for Change

- Increase staff knowledge by educating on DVT prevention and use of SCD pumps
- Promote compliance by having resources readily available on units to increase workflow efficiency
- Reinforce patient education throughout patient stay
- Encourage patient to direct care by requesting SCD's
- Consider having patients wear SCDs around the clock including in therapy for patients who are high risk



Conclusion

The use of SCD's is a simple and cost effective way to prevent DVT's. Education on use of SCD's in the rehabilitation setting could potentially increase compliance and lead to reduction in length of stay by preventing VTE complications during hospitalization.

References

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