

PREVENTION AND TREATMENT OF VENOUS THROMBOEMBOLISM

International Consensus Statement 2013 Guidelines According to Scientific Evidence

Developed under the auspices of the:

Cardiovascular Disease Educational and Research Trust (UK)

European Venous Forum

North American Thrombosis Forum

International Union of Angiology and

Union Internationale du Phlebologie

Combined Modalities in Surgical Patients

Chapter 12

General Considerations

Combined Modalities in Surgical Patients

- **Increased efficacy of combined modalities is based on the multifactorial etiology of VTE as first described by Rudolph Virchow in the 19th century¹**
 - ▶ Physical methods improve venous stasis and protect venous endothelium, while pharmacological methods affect hypercoagulopathy
- **Combined modalities are more effective than single modalities was first shown by Borow in 1983²**

1. Virchow R. In Virchow R., ed. *Gesammelte Adhandlungen zur Wissenschaftlichen Medicin*. Frankfurt A.M.: von Meidinger Sohn & Comp, 1856. pp. 458-636.

2. Borow M, Goldson HJ. *Am Surg* 1983; 49:599-605.

Review of Evidence

Combined Modalities in Surgical Patients

- **Recent Cochrane review evaluated the efficacy of combined modalities versus single modalities¹**
- **Eleven studies (6 randomized and 5 controlled trials) were identified, which included 7431 patients**
 - ▶ Compared with compression alone, the use of combined modalities reduced significantly the incidence of both symptomatic PE (3% to 1%) (OR 0.39; 95% CI 0.25 to 0.63) and DVT (4% to 1%) (OR 0.43; 95% CI 0.24 to 0.76)¹
 - ▶ Compared with pharmacological prophylaxis alone, the use of combined modalities significantly reduced the incidence of DVT (4.21% to 0.65%) (OR 0.16; 95% CI 0.07 to 0.34).
 - ▶ The included studies were underpowered with regard to PE¹

Review of Evidence

Combined Modalities in Surgical Patients

- **The additive role of mechanical and pharmacological modalities suggests that venous stasis, endothelial damage and hypercoagulopathy are independent pathogenetic risk factors**
- **IPC reduces venous stasis by producing active flow enhancement, and also increases tissue factor pathway inhibitor (TFPI) plasma levels¹⁻³**

1. Kakkos SK, et al. J Vasc Surg 2005; 42:296-303.

2. Kakkos SK, et al. J Vasc Surg 2001; 34:915-22.

3. Chouhan VD, et al. Arterioscler Thromb Vasc Biol. 1999; 19:2812-2817.

VTE Prophylaxis Recommendations

Combined Modalities in Surgical Patients

- **Combined modalities (IPC and pharmacological prophylaxis) should be considered in all high risk surgical patients**
 - ▶ Level of evidence: High