

# 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 19<sup>th</sup> century<sup>1</sup>**
  - ▶ 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 1983<sup>2</sup>**

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 modalities<sup>1</sup>**
- **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)<sup>1</sup>
  - ▶ 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 PE<sup>1</sup>

# 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 levels<sup>1-3</sup>**

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