

ACCP Guidelines 2008

Geerts W, Bergqvist D, Pineo GF et al (2008). Prevention of venous thromboembolism: the eighth ACCP conference on antithrombotic and thrombolytic therapy. *CHEST*; 133: 381-453

What is ACCP?

The American College of Chest Physicians (ACCP) is a society of physicians, surgeons, allied health professionals and scientists: it publishes in the journal "CHEST" (www.chestnet.org).

Methodology

ACCP have published evidence-based guidelines on the prevention of venous thromboembolism (VTE) in hospitalised patients. Recommendations are based upon a systematic review of the literature undertaken using the following format:

Evidence:

- Grade A: Randomised clinical trials (RCT) with consistent results and low risk of bias
- Grade B: Randomised clinical trials (RCT) with inconsistent results or methodological weaknesses
- Grade C+: Observational studies or robust generalisations between RCT and non-RCT populations
- Grade C: As for C+ but findings were less compelling

Recommendations:

- Grade 1: Strong evidence that the benefits outweigh the risks and costs
- Grade 2: Magnitude of benefits, risks, burdens, and/or costs were less well defined

General overview

- Most hospitalised patients have at least one risk factor for VTE; the risks are cumulative
- Every hospital should have a written institutional policy for preventing VTE
- Policy should include strategies to increase adoption and adherence such as computer-generated reminders, pre-printed orders, periodic audit and evaluation
- Passive methods such as educational meetings and literature distribution are not effective as sole methods
- Thromboprophylaxis will improve patient safety and reduce cost
- Routine prophylaxis is recommended for all patients who belong to each of the major target groups

Key to the following section

- IPC: Intermittent pneumatic compression
- LDUH: Low-dose unfractionated heparin
- LMWH: Low molecular weight heparin
- GCS: Graduated compression stockings
- VTE: Venous thromboembolism

Advice related to mechanical prophylaxis

Intermittent pneumatic compression, graduated compression stockings and foot pumps

- IPC is recommended primarily in patients at high risk for bleeding (Grade 1A)
- IPC is recommended as an adjunct to anticoagulant-based thromboprophylaxis (Grade 2A)
- Careful attention is directed towards ensuring the proper use of and optimal adherence with these methods.

The ACCP document comments on the differences between IPC devices:

- Length i.e. calf, calf and thigh, foot
- Compression type: single uniform pressure, symmetrical or sequential
- Compression profile: cycle time, pressure, speed, delay etc.
- Not all devices have clinical evidence and there is an unfounded assumption that all IPC devices are equally effective; many have not been subject to any clinical evaluation nor is it a requirement prior to distribution.

Advantages

- Do not increase bleeding risk
- Can be used in patients with high bleeding risk
- Studies have demonstrated efficacy in a number of patient groups
- Can be used as adjunct to pharmacological prophylaxis to enhance effectiveness
- May reduce leg swelling

Limitations

- Fewer studies with smaller numbers of participants compared to pharmacological methods
- No established parameters in terms of size, pressure or physiological parameters
- No requirement to have clinical studies
- All studies were un-blinded thus the risk of bias is high
- Less effective than anticoagulants in high risk groups
- Greater effect in reducing calf DVT than proximal DVT
- Effect on death and PE unknown
- Use may delay or prevent implementation of more effective pharmacological methods
- Often poor staff and patient compliance
- Studies using mechanical forms of prophylaxis may overestimate use compared with routine use
- There are associated costs with purchase, storage, dispensing and cleaning

Recommendations for the use of mechanical methods of prophylaxis by medical speciality

General surgery:

- IPC is recommended for patients at high risk of bleeding until the bleeding risk diminishes (Grade 1A) after which pharmacological prophylaxis should be substituted or combined
- In high-risk patients with multiple risk factors, pharmacological methods combined with use of GCS or IPC is recommended (Grade 1C)

Gynaecologic surgery:

- *Laparoscopic procedures* + additional risk factors: LMWH, LDUH, IPC or GCS is recommended (Grade 1C)
- *Major gynaecological surgery* for benign disease and no additional risk factors: LMWH or LDUH are effective; IPC from pre-surgery until fully ambulant is also recommended (Grade 1B)
- *Major gynaecological surgery for malignancy* or + additional VTE risk factors: LMWH, LDUH or IPC when continued until hospital discharge (grade 1A); or a combination of pharmacological and IPC (Grade 1C)

Urologic surgery:

Although VTE is considered to be the most important non-surgical complication, there is a lack of objective data regarding VTE prophylaxis in this speciality.

- *Major open urologic procedures*, routine prophylaxis with IPC is an option (Grade 1B)
- For urologic patients who are actively bleeding or at very high risk for bleeding, use of IPC is recommended until the bleeding risk diminishes (Grade 1C+) whence pharmacological prophylaxis should be commenced
- For multiple risk factors; combining IPC with LDUH or LMWH is an option (Grade 1C+)

Laparoscopic surgery:

Both pneumoperitoneum and the reverse Trendelenburg position reduce venous return from the legs and despite the lack of evidence, both the European Association for Endoscopic Surgery and the Society of American Gastrointestinal Endoscopic Surgeons recommend that intraoperative IPC be used

for all prolonged laparoscopic procedures. However, the ACCP group believes that the available evidence *does not* support a recommendation for the routine use of thromboprophylaxis in these patients. Routine prophylaxis (other than early ambulation) is not recommended for patients undergoing entirely laparoscopic procedures.

- For laparoscopic procedures where additional factors are present: LMWH, LDUH, fondaparinux, IPC or GCS can be recommended (Grade 1C)

Bariatric surgery:

- Routine thromboprophylaxis with LMWH, LDUH three times daily, fondaparinux, or the combination of one of these pharmacological methods with optimally used IPC is recommended. (each Grade 1C)

Thoracic surgery:

- Where the risk of bleeding is high properly fitted GCS and/or IPC (Grade 1C) is recommended

Coronary artery bypass surgery:

- LMWH, LDUH or properly fitted GCS and/or IPC is recommended
- Where the risk of bleeding is high properly fitted bilateral GCS or IPC (Grade 1C) is recommended

Orthopaedic surgery:

This patient group is at particularly high risk for VTE. Routine VTE prophylaxis has been the standard of care for in excess of twenty years.

- *Elective total hip replacement*: LMWH, fondaparinux or a vitamin K antagonist is recommended. IPC or use of a venous foot pump is recommended in those who have a high bleeding risk. Once the risk has diminished, pharmacological prophylaxis should be substituted or added to the regimen
- *Elective knee replacement*: LMWH, fondaparinux or vitamin K antagonist is recommended. IPC is an alternative option to anticoagulant thromboprophylaxis (Grade 1B). The use of venous foot pump alone as a sole method of prophylaxis is not recommended. IPC or use of a venous foot pump is recommended in those who have a high

bleeding risk. Once the risk has diminished, pharmacological prophylaxis should be substituted or added to the regimen

- *Hip fracture surgery:* LMWH, fondaparinux or a vitamin K antagonist is recommended. IPC or use of a venous foot pump is recommended in those who have a high bleeding risk. Once the risk has diminished, pharmacological prophylaxis should be substituted or added to the regimen
- *Elective spine surgery:* For those with additional risk factors, use of post-operative pharmacological prophylaxis is recommended or IPC commenced perioperatively. For those with multiple risk factors, combination of mechanical and pharmacological prophylaxis may be used

Neurosurgery:

- Mechanical thromboprophylaxis is commonly used in neurosurgery as there is potential for intracranial or spinal bleeding. IPC appears to be highly effective at preventing DVT in this patient group. IPC is recommended as thromboprophylaxis in patients undergoing elective major neurosurgery. Other acceptable options include the use of perioperative LDUH or postoperative LMWH. The combination of thromboprophylaxis with LMWH and GCS is more efficacious than that with GCS alone.

Trauma:

Patients recovering from major trauma have the highest rates of developing VTE. Mechanical prophylaxis is widely used in trauma as it does not increase the risk of bleeding. Prophylaxis should be routine and in the absence of contraindications, LMWH should be utilised alone or in combination with a mechanical method. Mechanical prophylaxis with IPC is recommended if LMWH prophylaxis is delayed or contraindicated due to active bleeding or a high risk of haemorrhage (Grade 1B). When the risk subsides, LMWH should be substituted or added to the regimen.

Spinal cord injury:

Routine prophylaxis is recommended with LMWH, once primary haemostasis is evident. IPC can be added to the regimen. Sole prophylaxis of IPC can be used soon after injury where risk of bleeding is high but should be substituted/ added with pharmacological prophylaxis as soon as possible.

Burns:

Routine prophylaxis with pharmacological prophylaxis for extensive burns or other co-morbid conditions. Where bleeding risk is high, use of IPC is recommended until risk diminishes.

Medical conditions:

50-70% of symptomatic VTE occur in non-surgical patients. In acutely ill immobile medical patients, LMWH, LDUH or fondaparinux is recommended. In medical patients with risk factors for VTE and in whom there is a contraindication to anticoagulant prophylaxis, optimal mechanical prophylaxis with GCS or IPC is recommended (Grade 1A).

Cancer patients:

VTE is one of the most common complications seen in patients with cancer. No recommendations are made with respect to IPC. Cancer patients undergoing surgery should receive aggressive thromboprophylaxis as recommended in surgical sections of the article.

Critically ill patients:

Most critically patients have multiple risk factors for VTE and thromboprophylaxis with LMWH or LDUH should be routine for most patients. For patients who are at high risk for bleeding, optimal mechanical prophylaxis with GCS and or IPC is recommended until the bleeding risk diminishes after which there should be substitution/ addition of pharmacological prophylaxis.

Other specialities:

With respect to IPC, no specific recommendations were given for **Vascular surgery, Travellers, Knee Arthroplasty, Cancer** patients although, for many, the need for prophylaxis is evident.