# Venous thromboembolism — a major health and financial burden: how can we do better to prevent this disease?

Beng H Chong, Jeffrey Braithwaite, Mark F Harris and John P Fletcher

*VTE prophylaxis is effective and safe, but grossly underused in Australian hospitals*

In this issue of the Journal, Ho and colleagues (*page 144*) report their findings from a Perth community-based study of venous thromboembolism (VTE).[1] They found an incidence of VTE, which includes deep vein thrombosis and pulmonary embolism, of 0.83 (95% CI, 0.69–0.97) per 1000 population per year. This figure is consistent with hospital discharge data from the Australian Institute of Health and Welfare, which predict an estimated 14 716 VTE cases in 2008[2] or an incidence of 0.74 per 1000. This incidence comes with high costs to Australian society in terms of deaths, morbidity and health care expenditure.

VTE is a major cause of hospital deaths — Australian Institute of Health and Welfare data indicate that 7% of all deaths in Australian hospitals are due to VTE,[2] and autopsy studies suggest the percentage may be as high as 10%.[3] Thus, VTE causes more deaths than any common cancer (breast, lung, prostate or bowel) and is 40 times more deadly than HIV/AIDS in Australia. VTE also causes significant long-term morbidity from post-thrombotic syndrome (chronic leg swelling, pain and skin ulcers) and pulmonary hypertension.

A report by Access Economics estimated that the cost to Australia of treating VTE is currently $1.72 billion annually (0.15% of gross domestic product).[2] This estimate includes costs attributable to direct health system expenditure ($148 million), productivity loss ($1.38 billion) and efficiency loss ($162 million). If costs relating to premature mortality are included, then VTE represents the most costly disease burden among the 16 diseases (including cancer, dementia, osteoporosis, cardiovascular disease and schizophrenia) that have been studied and ranked by Access Economics in recent years. The key to saving lives, improving patient outcomes and reducing the huge financial cost to individuals and the nation lies in prevention of this disease.

Evidence-based findings from well designed studies have clearly shown that prevention is possible.[4,5] With a modest outlay, VTE incidence can be significantly reduced, effectively and safely, using anticoagulants such as unfractionated or low-molecular-weight heparins, or, particularly if a risk of bleeding exists, by mechanical means (compression stockings and intermittent calf compression). However, current data suggest that VTE prophylaxis is grossly underused in hospitals in Australia and overseas.[6]

The ENDORSE study (which enrolled over 68 000 medical and surgical patients in 32 countries, including Australia) showed that 51.8% of hospital inpatients were at risk of VTE, but only 58.5% of at-risk surgical patients and 39.5% of at-risk medical patients received VTE prophylaxis.[6] This is consistent with the findings of a prospective audit carried out by the National Health and Medical Research Council (NHMRC) National Institute of Clinical Studies in Australian hospitals in 2005–2006 (Dr Sue Phillips, Director, Research Implementation Program, National Institute of Clinical Studies, NHMRC, Melbourne, personal communication). These studies show that many at-risk hospital patients in Australia and overseas, especially medical inpatients, are left unprotected against VTE.

Adoption of clinical guidelines by hospitals can lead to increased levels of appropriate prescribing of VTE prophylaxis.[7] However, the risk of thromboembolic events continues after hospital discharge, and far less research has been conducted into the use of VTE prophylaxis in the community. There is an increasing trend for at-risk medical patients (eg, patients with chronic lung disease or cardiac failure) to be managed in the community, especially through hospital-in-the-home and early discharge programs.[8] With increasingly short hospital stays for both surgical and medical patients, it is important that community-based doctors are aware of the importance of VTE risk assessment and the continuation or commencement of VTE prophylaxis for their patients.

The Australia & New Zealand Working Party on the Management and Prevention of Venous Thromboembolism has been convened to formulate a national strategy to promote the optimal use of VTE prophylaxis. Initiatives of the Working Party will include:

- Developing simple, user-friendly VTE prevention guidelines that will assist doctors to identify and treat at-risk patients. The fourth edition of the Working Party's VTE prevention guidelines — based on the recommendations of the American College of Chest Physicians[4] and the International Union of Angiology,[5] but adapted to local conditions (see http://stgcs.med.unsw.edu.au/stgcsweb.nsf/page/TBD) — has recently been published.[9]
- Promoting hospital and community education programs to create awareness of the VTE prevention guidelines and enhance understanding of VTE risk assessment.
- Researching and developing recommendations for reminder systems, including computer alerts[10] or interventions by a VTE nurse or pharmacist, with the intention of reminding doctors to prescribe appropriate VTE prophylaxis.
- Establishing VTE centres of excellence that will act to promote optimal VTE patient care.
- Lobbying federal and state governments to initiate health policies that will lead to increased use of VTE prophylaxis in Australian hospitals, including designating VTE prophylaxis rate as a hospital performance indicator. This is particularly relevant now, while the federal government is working with state governments to reduce surgical waiting lists. If patients undergoing surgery do not receive appropriate VTE prophylaxis, this could lead to increases in adverse outcomes of VTE and fatal pulmonary embolism.
- Hosting a national VTE summit to generate new ideas for improving VTE prevention.

VTE is a significant health issue internationally and in Australia. It is a common cause of hospital deaths and a considerable financial burden on governments and individuals. Doctors, nurses, health administrators and governments should work together to ensure all surgical and medically ill patients in hospital have their VTE and bleeding risk assessed, and to maximise appropriate use of VTE prophylaxis. Achieving this will improve patient outcomes, save lives and reduce health costs.

## Acknowledgements

We wish to thank Ms Nicola Chapman for her assistance in preparing this manuscript, and the investigators of the Collaboration for Thrombosis and Bleeding Disorders Research and the members of the Australia & New Zealand Working Party for their ideas and comments, which have contributed directly or indirectly to this editorial.

## Competing interests

Beng Chong and John Fletcher are members of the Australia & New Zealand Working Party on the Management and Prevention of Venous Thromboembolism. They have both received travel assistance from Sanofi-Aventis to attend meetings. John Fletcher has also received speaker fees for educational meetings from Sanofi-Aventis.

## Author details

**Beng H Chong,** MB BS, FRACP, PhD, Director,[1] and Professor of Medicine, St George Clinical School[2]

**Jeffrey Braithwaite,** MBA, PhD, FCHSE, Director, Centre for Clinical Governance Research in Health[2]

**Mark F Harris,** MB BS, FRACGP, Director, Centre for Primary Health Care and Equity, School of Public Health and Community Medicine[2]

**John P Fletcher,** MD, MS, FRACS, Head, Discipline of Surgery[3]

1 Department of Haematology, St George Hospital, Sydney, NSW.

2 University of New South Wales, Sydney, NSW.

3 University of Sydney, Sydney, NSW.

*Correspondence:* beng.chong@unsw.edu.au

## References

1 Ho WK, Hankey GJ, Eikelboom JW. The incidence of venous thromboembolism: a prospective, community-based study in Perth, Western Australia. *Med J Aust* 2008; 189: 144-147.

2 Access Economics. The burden of venous thromboembolism in Australia. Report for the Australia and New Zealand Working Party on the Management and Prevention of Venous Thromboembolism. May 2008. http://www.accesseconomics.com.au/publicationsreports/showreport.php?id=161 (accessed May 2008).

3 Sandler DA, Martin JF. Autopsy proven pulmonary embolism in hospital patients: are we detecting enough deep vein thrombosis? *J R Soc Med* 1989; 82: 203-205.

4 Geerts WH, Pineo GF, Heit JA, et al. Prevention of venous thromboembolism: the Seventh ACCP Conference on Antithrombotic and Thrombolytic Therapy. *Chest* 2004; 126 (3 Suppl): 338S-400S.

5 Nicolaides AN, Fareed J, Kakkar AK, et al. Prevention and treatment of venous thromboembolism. International Consensus Statement (guidelines according to scientific evidence). *Int Angiol* 2006; 25: 101-161.

6 Cohen AT, Tapson VF, Bergmann JF, et al. Venous thromboembolism risk and prophylaxis in the acute hospital setting (ENDORSE study): a multinational cross-sectional study. *Lancet* 2008; 371: 387-394.

7 Schumock GT, Blackburn JC, Nutescu EA, et al. Impact of prescribing guidelines for inpatient anticoagulation. *Ann Pharmacother* 2004; 38: 1570-1575.

8 Caplan GA. Hospital in the home: a concept under question [editorial]. *Med J Aust* 2006; 184: 599-600.

9 Fletcher J, Baker R, MacLellan D, et al; The Australia & New Zealand Working Party on the Management and Prevention of Venous Thromboembolism. Prevention of venous thromboembolism: best practice guidelines for Australia and New Zealand. 4th ed. Sydney: Health Education and Management Innovations, 2008.

10 Kucher N, Koo S, Quiroz R, et al. Electronic alerts to prevent venous thromboembolism among hospitalized patients. *N Engl J Med* 2005; 352: 969-977. ❑