How will health-care organizations meet venous thromboembolism targets?

Health-care organizations need to develop a strategy to ensure that all hospitalized patients receive appropriate thromboprophylaxis. This review describes an evidence-based model which could improve service delivery, meet national targets, save money and reduce the incidence of hospital-acquired venous thromboembolism.

The efficacy and cost-effectiveness of venous thromboprophylaxis has been well documented (Bergqvist et al, 1997; Dentali et al, 2007). However, evidence suggests a shortfall in the number of patients receiving adequate thromboprophylaxis (Monreal et al, 2004; Cohen et al, 2008).

In the UK pulmonary embolism following deep vein thrombosis is estimated to cause between 25 000 and 32 000 deaths each year accounting for 10% of all in-hospital deaths (House of Commons Health Committee, 2007). Pulmonary embolism is responsible for more than five times the total deaths attributed to all hospital-acquired infections (House of Commons Health Committee, 2007). The financial burden of managing venous thromboembolism in the UK is estimated at £640 million and approximately 25% of patients who suffer from a deep vein thrombosis will develop venous leg ulceration resulting in further costs of up to £400 million per year (Tooher et al, 2005). The NHS Litigation Authority has handled over 450 claims related to venous thromboembolism between 1995 and 2003, resulting in payouts totalling almost £19 million (Scurr, 2007).

In the UK quality improvement is a key strategy for the NHS and is being used as a driver for implementation of the venous thromboembolism risk assessment. The Department of Health (2010) has published a standardized risk assessment tool for venous thromboembolism for all hospitalized patients. The Commission for Quality and Innovation Payment Framework has introduced financial incentives for meeting prophylaxis risk assessment targets. The current financial climate and reducing NHS budgets are creating big challenges for all health-care organizations. The authors' aim was to design an evidence-based thromboprophylaxis delivery model to provide a framework which can be used to provide a sustainable improvement in service delivery in this area allowing organizations to meet targets and, by reducing the incidence of venous thromboembolism, achieve improvement in patient outcomes and a financial gain.

Method of literature review

Guidelines published by Department of Health and National Institute for Health and Clinical Excellence were used to identify current recommendations and practice in the UK as well as studies on quality improvement strategies for venous thromboembolism prevention. Additional studies were identified with multiple Medline and PubMed searches. A comprehensive list of search terms was applied (including – but not limited to – thrombosis, thromboembolism, prophylaxis, improvement, implementation, intervention, strategy, guideline, pay-for-performance and accountability). The titles and abstracts of articles in English were examined and excluded if the content was not relevant to the topic. The reference lists of key articles were also searched for relevant articles. Medical Research Council recommendations for the design and evaluation of complex interventions were used to design a comprehensive thromboprophylaxis delivery model supported by an overview of the current literature on venous thromboembolism prevention and quality implementation strategies.

Delivery prophylaxis model

The challenge of translating evidence into practice is a widespread problem. Multifaceted interventions are more likely to develop the processes by which individuals adopt innovations and organizations change (Labarere et al, 2007; Michota, 2007; Geerts et al, 2008). The model in *Figure 1* results from a systematic assessment of the peer-reviewed literature and summarizes the exemplary process of venous thromboembolism prophylaxis delivery. Central to the process is a risk stratification process. It is well documented that the introduction of risk assessment models have a positive effect on prescription rates for venous thromboembolism prophylaxis and importantly patient outcomes (Stinnett et al, 2005; Tooher et al, 2005; Cohn et al, 2006; Agency for Healthcare Research and Quality, 2008).

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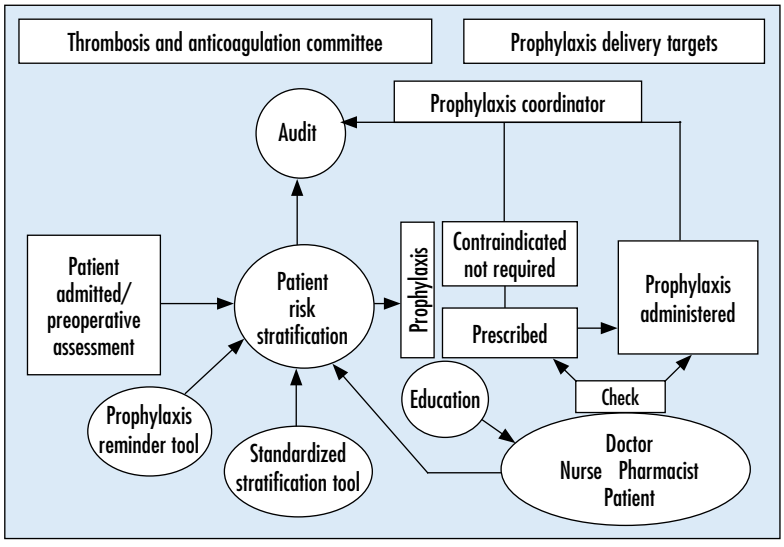

Figure 1. Venous thromboembolism prophylaxis delivery model.

Targets

Although targets alone are insufficient to drive quality improvement, they can be used as an incentive to organizations. Targets together with close performance monitoring have been used effectively to improve infection control (National Audit Office, 2009). Primary care trusts are using commissioning to improve outcomes resulting in the introduction of Commissioning for Quality and Innovation targets. This flexible payment framework links a percentage of the income received by the provider to the achievement of previously agreed goals relating to quality and innovation (National Audit Office, 2009) with disincentives for substandard performance (All-Party Parliamentary Thrombosis Group, 2009a). Venous thromboembolism risk assessment for all adult admissions is a national Commissioning for Quality and Innovation target.

Thrombosis and anticoagulation committees: guidelines and expert advice

The House of Commons Health Committee (2007) recommended that each trust should have a thrombosis and anticoagulation committee. This should include multiprofessional trust-wide membership with primary care trust and patient representatives. This body is responsible for implementation of a venous thromboembolism policy, and is accountable to the executive board.

The authors' model relies on clinical champions with time allocated to the project. This need not be a medically qualified practitioner although a clinical background is essential. They will coordinate implementation of strategies including raising awareness, training of staff and patients, and addressing areas of poor performance. The process relies on at least one expert who is familiar with the evidence base. They will help to translate the multiple guidelines (Scottish Intercollegiate Guidelines Network, 2005; Geerts et al, 2008; National Institute for Health and Clinical Excellence, 2010) into documentation that is workable at a local level. They can also advise on patients requiring complex care (elderly, obstetric, obese patients) (Frederiksen et al, 2003; De Minno and Tufano, 2004; Royal College of Obstetricians and Gynaecologists, 2004).

The committee ensures that a standardized risk stratification process is embedded within the Clinical Negligence Scheme for Trusts, as recommended by the venous thromboembolism expert group (Department of Health, 2007). In addition, compulsory reporting of hospital-acquired venous thromboembolism through the trust's patient safety incident reporting system allows root cause analysis to identify system failures.

Reminder tool

The majority of venous thromboembolism prophylaxis improvement studies reported in the literature have combined education with reminders and decision support. It is clear that guidelines alone (passive dissemination) do not ensure ongoing compliance (Tooher et al, 2005; Michota, 2007; Geerts et al, 2008). Actively reminding clinicians using a combination of strategies (Tooher et al, 2005; Cohn et al, 2006; Labarere et al, 2007; Michota, 2007) is more effective in safeguarding the knowledge increased by educational interventions.

Computer-based clinical-decision support systems are the most effective strategies for improving prescription practice (Durieux et al, 2000; Schunemann et al, 2004; Tooher et al, 2005; Cohn et al, 2006). Where these systems are not available other strategies include pre-printed prescription charts, pocket cards, screensavers and posters.

Education

Educational interventions significantly improve adherence to the hospital guidelines (Schunemann et al, 2004; Stinnett et al, 2005; Labarere et al, 2007; Michota, 2007; Le Sage et al, 2008). Increasing the knowledge and awareness of venous thromboembolism and its prevention should be a starting point of any quality improvement initiative targeting undergraduates, patients and the general public in addition to hospital staff.

Thrombosis and anticoagulation committees should support educational programmes for medical, nursing, pharmacy and managerial staff. Mandatory education sessions enable NHS organizations to reach all staff, even in areas of high turnover, and the individual's knowledge can be incorporated into new routines and standards within the organization.

Patient education improves the processes of care (Khan et al, 2004; Schunemann et al, 2004; Le Sage et al, 2008). Patients who are more knowledgeable about their disease and treatment adhere better to their therapy (Khan et al, 2004). Media coverage has highlighted the dangers of hospital-acquired infections and the risk of venous thromboembolism associated with long haul flights (House of Commons Health Committee, 2007). The risk of venous thromboembolism associated with hospital admission is considerably higher than both of these, but available evidence suggests low levels of public

awareness. A cross-sectional survey reported that one fifth of participants had never heard of deep vein thrombosis or pulmonary embolism. Of those who had, almost half of them could not provide any information on either condition (Le Sage et al, 2008).

National Institute for Health and Clinical Excellence (2010) guidelines recommend that verbal and written information on venous thromboembolism prophylaxis should be offered to all inpatients. Information leaflets and posters encourage patients to ask about their venous thromboembolism risk, providing a safety net to help increase delivery of appropriate prophylaxis (All-Party Parliamentary Thrombosis Group, 2009b). Strategies need to be developed to raise public awareness both on a local and national level. This might include advertising within hospitals and promoting National Thrombosis Week (All-Party Parliamentary Thrombosis Group, 2009a).

Audit

Regular audit is an essential component of the proposed delivery model, enabling organizations to track their progress and provide commissioners with information on achieving targets. The authors suggest that the process of audit should be managed by a 'prophylaxis delivery coordinator' who would collect, analyse and present the key metrics identified at local and national level, and would report to the thrombosis and anticoagulation committee to track performance over time. Data collection can be time consuming and expensive. Therefore it is important to focus on improvement rather than one-off measurements. Tracking performance regularly by auditing 20 randomly selected patient charts per clinical area per month can be statistically appropriate and attainable (Agency for Healthcare Research and Quality, 2008), giving a team just enough data to ascertain whether changes are leading to improvement.

Multiprofessional responsibility

Ensuring appropriate venous thromboembolism prophylaxis prescription and delivery is the responsibility of the multidisciplinary team, although organizations may devolve individual responsibilities in the risk assessment process to different professional groups. However, each individual must know exactly what his/her role is, be it performing the risk assessment, prescribing, reminding or education. Indeed, a number of studies have demonstrated that expanding the role of nurses and clinical pharmacists beyond traditional activities improves prophylaxis delivery (Labarere et al, 2007; Michota, 2007; Le Sage et al, 2008; National Institute for Health and Clinical Excellence, 2010). Nursing staff also play a central role in educating patients about venous thromboembolism prophylaxis either through actively communicating the benefits (Le Sage et al, 2008) or by distribution of education leaflets on patient admission (National Institute for Health and Clinical Excellence, 2010). Providing information to patients could encourage their involvement in their care by increasing self-reporting of symptoms during their hospital stay and following discharge (Le Sage et al, 2008).

Discussion

Safe and effective methods of prevention of venous thromboembolism have been known for many years but until recently the scale of venous thromboembolism as a public health and patient safety issue has remained largely unrecognized (All-Party Parliamentary Thrombosis Group, 2009a). The concept of venous thromboembolism prophylaxis delivery may appear simple; however, ensuring systematic and equitable delivery is complex. Coordination of care across multiple locations by multiple professionals is required to translate evidence into practice and improve the quality of care delivery. Until recently, strategies related to venous thromboembolism prophylaxis have been managed at a local level, often in an ad-hoc manner achieving only local and temporary improvements. Now, health-care organizations are required to provide enduring, organization-wide improvements.

Mounting political pressure and a growth in media and public interest in venous thromboembolism prophylaxis has prompted a number of influential government bodies to address this issue as a high priority. The Department of Health has created dedicated support structures and used multiple tactics at a national level resulting in considerable improvement. The most recent strategy involves the introduction of Commissioning for Quality and Innovation targets intended to incentivize the local NHS organizations as well as clarify their roles and responsibilities in thrombosis prevention in the UK (Department of Health, 2009). Although these targets are a starting point in driving this process, venous thromboembolism prophylaxis delivery remains the responsibility of local organizations. Exemplar centres are a success but to repeat their success elsewhere, a mechanism is needed that is applicable and transferable to any health-care organization and will facilitate reaching any targets set. The delivery model framework set out in this article aims to address this gap in ability to deliver a comprehensive service at a local level. It is composed of clearly defined interventions with several interacting components necessary to avoid rate-limiting steps highlighted in the literature. The effectiveness, sustainability and cost of the model are currently being assessed.

The authors envisage that this model supported by the national targets and mandatory surveillance will ultimately lead to a perceptible change in leadership, performance, management and clinical practice of venous thromboembolism prophylaxis delivery. Although efforts need to focus on increasing the prophylaxis prescription rates the ultimate endpoint is a reduction in the number of hospital-acquired thromboses. Without robust, up-to-date data on the extent of venous thromboembolism, it is difficult to envisage how the Department of Health,

strategic health authorities and NHS trusts can target their activity and resources to the best effect. At present, there is no comprehensive national aggregate data on the incidence of hospital-acquired venous thromboembolism and the numbers currently cited in the literature can only be estimated because of the decreasing number of post-mortems (Tooher et al, 2005). Compulsory reporting to the agencies such as Venous Thromboembolism Registry (VERITY) of all venous thromboembolism events or introduction of a national surveillance system by the National Audit Office may be required to quantify venous thromboembolism events.

To succeed, patient safety initiatives must be designed and executed in a way that is sustainable, and will ultimately lead to any process being embedded within the organization and daily clinical practice. An evidence-based thromboprophylaxis delivery model to provide a framework for organizations to use will aid this process. **BJHM**

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KEY POINTS

- Venous thromboembolism prophylaxis delivery continues to be a major international patient safety issue.
- Although Commissioning for Quality and Innovation targets will drive the quality improvement process, individual organizations still need a mechanism to achieve these targets.
- Coordination of care across multiple locations by multiple professionals is essential to bridge the gap between evidence and practice.
- A robust, evidence-based mechanism that is applicable and transferable to any health-care organization is required to achieve this.