

# Malaysian orthopaedic surgeons' approach to venous thromboembolic disease prophylaxis: attitudes and practice

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## ABSTRACT

**Purpose.** To survey Malaysian orthopaedic surgeons' attitudes to and use of venous thromboembolic disease prophylaxis.

**Methods.** A total of 144 orthopaedic surgeons from various governmental and private institutions responded to a questionnaire.

**Results.** Only slightly more than half of these surgeons considered venous thromboembolic disease as common a problem in Malaysia as in western countries. The majority of surgeons (91.0%) reported using prophylaxis selectively for patients based on various indicators such as risk grading of surgery, obesity, and malignancy etc. Bleeding tendencies were cited as the greatest fear against the use of pharmacological prophylaxis. Low-molecular-weight heparin appeared to be the most commonly used pharmacological prophylaxis, used either singly or in

combination with other forms of prophylaxis. The majority of surgeons employed prophylaxis until their patients were mobile.

**Conclusion.** There should be greater awareness among surgeons in Malaysia of the need for protection against venous thromboembolic disease. Current practice needs to be reviewed and further recommendations made for existing protocols.

**Key words:** *low molecular weight heparin; pulmonary embolism; venous thrombosis*

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## INTRODUCTION

Venous thromboembolic disease (VTE) remains an enigma among health care professionals the world over. The problems of post-phlebotic syndrome and pulmonary embolism remain serious potential sequelae, especially among orthopaedic patients. In the

absence of prophylaxis, deep venous thrombosis (DVT) develops in up to 75% of patients following total knee arthroplasty, and 50% of patients following total hip arthroplasty.<sup>1,2</sup> The frequency of fatal pulmonary embolism among orthopaedic patients ranges from 0.1% to 7%, depending on the nature of the surgery performed.<sup>2</sup> The use of prophylaxis against VTE—often a combination of pharmacological and mechanical modes—is reported to reduce the risk among orthopaedic patients by 64%.<sup>3</sup> Recently, the rationale behind prophylaxis has come under scrutiny. It has been questioned whether the use of pharmacological prophylaxis achieves any major gain in reducing the incidence of symptomatic thrombosis and fatal pulmonary embolism.<sup>4</sup> This question remains unanswered, although the overall cost-effectiveness of prophylaxis for the prevention of VTE and its sequelae has clearly been shown.<sup>5-7</sup>

Despite the many studies and recommendations developed specifically to address the problem of VTE,<sup>2,5,7,8</sup> it is not known what influence these studies have had on the practice of Malaysian orthopaedic surgeons. This issue has been addressed elsewhere,<sup>1,9-11</sup> but such information is lacking in the local setting. Consequently, we decided to conduct a survey among Malaysian orthopaedic surgeons to determine their attitudes and practice with respect to VTE prophylaxis.

**METHOD**

A standard questionnaire was developed addressing aspects of a surgeon’s attitude towards and practice

of VTE prophylaxis. The surgeon’s use of prophylaxis, indications for usage, and reasons for not using prophylaxis were explored, as well as whether the surgeon used any protocol for prophylaxis. The questionnaire was given to the majority of orthopaedic surgeons in Malaysia during attendance at a scientific meeting.

**RESULTS**

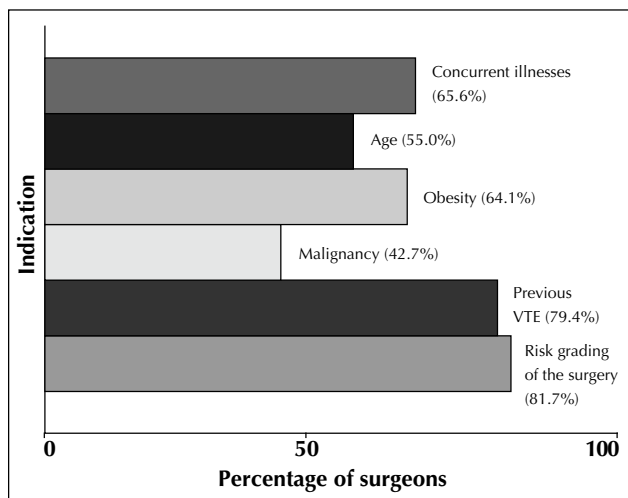
A total of 144 orthopaedic surgeons responded to the questionnaire. Of this number, 86 (59.7%) surgeons were from Ministry of Health hospitals, 31 (21.5%) were employed by university hospitals, and 27 (18.8%) were from private institutions. 83 (57.6%) of the respondents thought that VTE was as common in Malaysia as in western countries.

**Use of VTE prophylaxis**

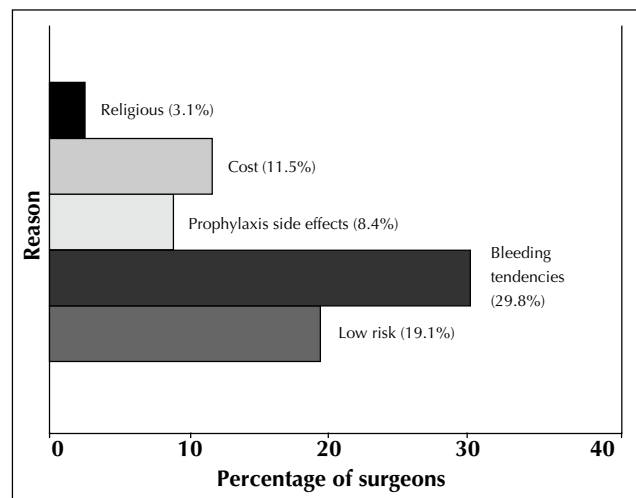
Seven (4.9%) surgeons used VTE prophylaxis for all their patients, while 4 (2.8%) used VTE prophylaxis sporadically. The majority of surgeons, i.e. 131 (91.0%), used VTE prophylaxis selectively. Prophylaxis against VTE was not used at all by 2 (1.4%) surgeons—a paediatric orthopaedic surgeon, and a surgeon specialised in microsurgery.

**Indications for VTE prophylaxis**

The responses of the 131 surgeons who used VTE prophylaxis selectively were further examined. Indications for selective use of VTE prophylaxis



**Figure 1** Indications for use of VTE prophylaxis.



**Figure 2** Reasons given for not instituting pharmacological prophylaxis.

are shown in Fig. 1. The majority of surgeons, i.e. 107 (81.7%), cited risk grading of the surgery as the main indicator. Risk grading was the perception of risk based on the nature of the surgery performed, and specific patient characteristics. Previous incidence of VTE in patients was another major indication among 104 (79.4%) surgeons, while 86 (65.6%) cited concurrent medical or surgical illnesses, and resultant pharmacotherapy, such as the use of steroids, as another reason for instituting VTE prophylaxis. Obesity was cited by 84 (64.1%) surgeons as an indication, while age and malignancy were cited by 72 (55.0%) and 56 (42.7%) surgeons, respectively.

### Reasons for not instituting VTE prophylaxis

The reasons given for not instituting pharmacological prophylaxis are shown in Fig. 2. Among the 131 surgeons who used VTE prophylaxis selectively, 25 (19.1%) did not use any prophylaxis when they believed the particular patient had a low risk of developing DVT, based on the nature of the surgery and the patient's characteristics. 39 (29.8%) surgeons did not use pharmacological prophylaxis when faced with the possibility of bleeding (either undesired or excessive) having a negative impact on the outcome of treatment. The cost of a particular prophylactic agent was a factor, particularly for the newer low-molecular-weight heparins (LMWH), with 15 (11.5%) surgeons not employing the said prophylaxis. However, for surgeons in private practice, cost was not a factor influencing use of pharmacological prophylaxis. 11 (8.4%) surgeons took the side effects of pharmacological agents into account when deciding not to institute VTE prophylaxis. Finally, religious practice of the patient was reported to have precluded the use of prophylaxis by 4 (3.1%) surgeons. This was particularly notable with respect to porcine-based agents and Muslim patients.

### Cases where VTE prophylaxis was used

A total of 104 (79.4%) surgeons used VTE prophylaxis when performing total knee arthroplasty, while 119 (90.8%) employed prophylaxis when total hip arthroplasty was performed. For spinal surgery, 47 (35.9%) surgeons selectively employed VTE prophylaxis. A further 42 (32.1%) surgeons administered VTE prophylaxis when their patients had concurrent medical or surgical conditions, such as varicose veins, ischaemic heart disease, cardiac failure, or prolonged immobilisation. When excising tumours, especially malignancies, 56 (42.7%) surgeons employed VTE prophylaxis, while 38 (29.0%) used prophylaxis when treating lower limb and pelvic conditions other than total knee and total hip arthroplasties.

### Type of prophylaxis used

The type of prophylaxis selected by surgeons is shown in the Table. Of the 131 surgeons questioned, the majority (90.8%; n=119) used LMWH, either alone (n=53) or in combination with mechanical prophylaxis (n=66). 48 (36.6%) surgeons used unfractionated heparin as prophylaxis, but of this number, only 3 surgeons used unfractionated heparin alone, that is, without other VTE prophylaxis. Warfarin treatment was used by 18 (13.7%) surgeons, and of this number, only 3 used warfarin treatment alone. Mechanical prophylaxis was combined with pharmacological prophylaxis by 46 (35.1%) surgeons. No surgeon used mechanical prophylaxis alone. Mechanical prophylaxis included foot pumps and graduated compression stockings. One surgeon (0.8%) used aspirin alone as prophylaxis against VTE.

### Protocols for VTE prophylaxis

73 (55.7%) surgeons reported that a VTE prophylaxis protocol existed in their establishment. The remaining

Table  
Types of prophylaxis used

Type of prophylaxis	Used alone	Used in combination
<b>Pharmacological</b>		
Low-molecular-weight heparins (n=119)	53	66
Unfractionated heparin (n=48)	3	45
Warfarin treatment (n=18)	3	15
Aspirin (n=1)	1	0
<b>Mechanical (n=46)</b>	0	46

58 (44.3%) surgeons stated they did not have a protocol for VTE prophylaxis in their place of work.

### Duration of VTE prophylaxis

90 (68.7%) surgeons started pharmacological prophylaxis preoperatively, while the remaining 41 (31.3%) started it postoperatively. The majority (67.2%; n=88) employed the chosen mode of prophylaxis until the patient was mobilised—usually by postoperative day 3 or 4, depending on the type, duration, and level of difficulty of the surgery. A further 18 (13.7%) used prophylaxis for a period of 2 to 3 days, while 10 (7.6%) surgeons used prophylaxis for 4 to 7 days. Both these latter groups of surgeons used the prophylaxis for the specified time period regardless of whether the patient had achieved full mobilisation. 14 (10.7%) surgeons used prophylaxis (either pharmacological or mechanical) for a single day only. One surgeon reported usually continuing with the chosen prophylaxis until the patient was discharged home.

### DISCUSSION

It is evident that there was great variation among Malaysian surgeons regarding what constituted proper prophylaxis—be it in the type of agent used, the timing and duration of the prophylaxis, or in the availability and adherence to a single, acceptable protocol. Although the majority of surgeons surveyed did employ one or more forms of prophylaxis against VTE, only slightly more than half agreed that the condition was at least as common as in western countries. It therefore raised the question of whether surgeons who did not believe the disease was as common as in the western population but employed prophylaxis, did so to adhere to some protocol or to prevent litigation. Dhillon et al.<sup>12</sup> have shown that the incidence of VTE and pulmonary embolism in Malaysian orthopaedic patients approaches that of western figures. With regard to the use of prophylaxis—either mechanical or pharmacological—the indications cited by Malaysian surgeons do not vary greatly from that of their western counterparts.<sup>9-11</sup> A limitation of this survey is that it did not explore every possible indication for prophylaxis use. However, the major indications were presented to surgeons for their response.

Excessive bleeding when instituting pharmacological prophylaxis was a major concern amongst surgeons, a finding that concurred with that of Rodgers et al.<sup>11</sup> It is feared that excessive bleeding not only places the patient at risk of exsanguination, it also predisposes the patient to excessive post-

operative haematoma, leading to wound infection and breakdown. A further concern is that bleeding while cementing an implant weakens the cement mantle, and places the whole construct at risk of failure.<sup>13</sup>

LMWHs appear to be the favoured form of pharmacological prophylaxis amongst Malaysian surgeons, as with British and New Zealand surgeons.<sup>9,11</sup> Because these drugs exhibit more consistent and predictable pharmacology, the problems of repeated laboratory estimations and multiple administrations of the drug are eradicated.<sup>14</sup> Furthermore, heparin-induced thrombocytopenia is not seen with these drugs.<sup>8</sup> However, it is important to realise that the multitude of available LMWHs on the market today have drug-specific properties, based on their molecular weights. They are therefore not interchangeable.<sup>14-16</sup> A number of papers have given these drugs due attention with regard to their efficacy, compared with other forms of prophylaxis.<sup>17,18</sup> However, since some of these studies may be linked to particular pharmaceutical enterprises, there is a potential for bias.<sup>13</sup> One must therefore practise due caution when interpreting results of efficacy studies and choose wisely. Additionally, several authors have elucidated the efficacy of LMWH when combined with mechanical prophylaxis as compared to LMWH alone. Moderate to high risk groups should therefore be managed with this combination.<sup>3,5,7</sup> Aspirin was the least commonly used pharmacological agent. Despite its low cost and easy administration, its efficacy against VTE remains doubtful.<sup>2,7,9</sup> In contrast to findings in Canada, warfarin treatment enjoys only limited popularity as VTE prophylaxis in Malaysia.<sup>1</sup> This may reflect the repeated laboratory investigations required of patients when warfarin is used.

Most studies on VTE prophylaxis focus on total knee and hip arthroplasties, and neck of femur fractures. This survey investigated the use of VTE prophylaxis in these conditions, but also in reference to spine, pelvis, and lower limb (including fracture) surgery, and surgery for tumour excision. Not surprisingly, prophylaxis is predominantly used in patients undergoing arthroplasty. This trend may have been influenced by the many studies on VTE prophylaxis and arthroplasty. Little information is available with regard to VTE prophylaxis in spine, pelvis, tumour, and trauma surgery. With regard to trauma surgery in particular, it has been shown that lower limb fracture itself plays an important role in thrombogenesis, in addition to the operative procedure.<sup>19</sup>

In keeping with a British survey,<sup>10</sup> the majority of surgeons in this study employ prophylaxis

preoperatively and extend its use until the patient is ambulatory. The trend towards early mobilisation and physiotherapy after surgery might explain why mechanical prophylaxis is not more frequently used in combination with pharmacological agents. Several studies have illustrated the importance of 'prolonging' prophylaxis since VTE may occur several months after discharge.<sup>5,18,20</sup> None of the surgeons in this study use prophylaxis after discharge. It is not known whether the surgeons regard the risk of VTE at this time as being very low, or whether patient compliance is seen as a factor. Clearly, the issue needs further clarification in the face of recent research evidence.

This survey is limited by the fact that not all registered orthopaedic surgeons in Malaysia participated. A larger number might have provided a different perspective. However, good representation of the orthopaedic community throughout the country has been achieved, and thus, overall trends noted are likely to be representative of common attitudes and practice. This survey did not determine the surgeons' perceptions on other probable causes of VTE, such as the use of acrylic cement,<sup>21</sup> supine versus lateral decubitus position of the patient on the operating table, use of a tourniquet, the role of general versus regional anaesthesia, and so on.<sup>8,22</sup>

Recently, the basis for the routine use of pharmacological prophylaxis against VTE has been questioned.<sup>13,19</sup> Reporting on a series of patients undergoing total knee arthroplasty without prophylaxis, Kim and Kim<sup>23</sup> found that patients who developed VTE eventually underwent resolution even in the absence of treatment, regardless of the size and site. Clearly, this study must be examined carefully, and if needed, reproduced, before pro-

phylaxis may be disregarded completely in this patient group. Prentice<sup>4</sup> has stated that even though lives may be saved through prophylaxis, the number is too small to make any major impact on the final outcome of surgery and hence does not justify its use. Other authors have suggested that for some patients undergoing surgery without prophylaxis, subsequent death did not reflect the lack of prophylaxis *per se* but was related to age and/or disease severity.<sup>13</sup> However, one should note that major trauma as a precipitant of VTE frequently affects younger patients, and that arthroplasty candidates are nowadays not as elderly and as debilitated as previously. This group of patients cannot be denied for prevention against this disease. It seems clear that the distinction between high, moderate, and low risk groups needs to be clarified. Protocols that are unique to the local population, addressing all the important issues, and that are acceptable to and adhered to by all surgeons need to be put in place. Only then can a concerted effort be made to preventing this condition.

## CONCLUSION

VTE and its complications remain a cause for concern, and the challenge to the surgeon today lies not only in preventing this condition but to understand whether the benefits of pharmacological prevention outweigh the problems associated with it. A myriad of choices exists with both newer and older drugs on the market. Choosing the right one for the right patient is crucial. It may even be that prevention is unnecessary<sup>13</sup>—only further research will shed more light. Until then, prevention is definitely better than cure.

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