

## Original Article

# Venous thromboembolism in the emergency department: A survey of current best practice awareness in physicians and nurses in China

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**BACKGROUND:** For emergency department (ED) patients, risk assessment, prophylaxis, early diagnosis and appropriate treatment of venous thromboembolism (VTE) are essential for preventing morbidity and mortality. This study aims to investigate knowledge amongst emergency medical staff in the management of VTE.

**METHODS:** We designed a questionnaire based on multiple scales. The questionnaire was distributed to the medical and nursing clinical staff in the large urban ED of a medical center in Northern China. Data was described with percentages and the Kruskal-Wallis test was used to compare ranked data between different groups. The statistical analysis was done using the SPSS 22.0 software.

**RESULTS:** In this survey, 180 questionnaires were distributed and 174 valid responses (response rate of 96.67%) were collected and analyzed. In scores of VTE knowledge, no significant differences were found with respect to job (doctor vs. nurse), the number of years working in clinical medicine, education level, and current position, previous hospital experience and nurses' current work location within the ED. However, in pair wise comparison, we found participants who worked in ED for more than 5 years ( $n=83$ ) scored significantly higher on the questionnaire than those under 5 years ( $n=91$ ) (95.75 vs. 79.97,  $P=0.039$ ). There was a significant difference in some questions based on gender, age, job, and nurse work location, number of working years, education level, and different ED working lifetime.

**CONCLUSION:** Our survey has shown deficiencies among ED medical staff in knowledge and awareness of the management of VTE. We recommend several changes be considered, such as the introduction of an interdisciplinary workshop for medical staff; the introduction of a standardized VTE protocol; a mandatory study module on VTE for new physicians and nurses; the introduction of a mandatory reporting system for adverse events (including VTE).

**KEY WORDS:** Emergency; Venous thromboembolism; Staff knowledge; Emergency doctor; Emergency nurse

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## INTRODUCTION

Venous thromboembolism (VTE) is a common complication and important cause of death in emergency department (ED) patients.<sup>[1]</sup> VTE consists of two forms:

deep vein thrombosis (DVT) and pulmonary embolism (PE), which are different manifestations of the same disease. The incidence of patients presenting to the ED with VTE has steadily risen over the years.<sup>[2-4]</sup> VTE is

challenging to emergency medicine (EM) practitioners due to ambiguous clinical signs and symptoms as well as high mortality and morbidity if left untreated.

For ED patients, risk assessment, prophylaxis, early diagnosis and appropriate treatment of VTE are essential for preventing morbidity and mortality. To achieve this, medical personnel, both physicians and nursing staff, must be knowledgeable of VTE and fully aware of the appropriate management of VTE.

We performed a survey of ED staff to investigate knowledge of VTE risk assessment, prophylaxis, diagnosis and treatment.

## METHODS

A validated questionnaire was completed by 180 physicians and nurses working in the emergency department of a medical center in Northern China in April 2016. Staff that met the following criteria were included: (1) full-time ED physicians and nurses; (2) part-time ED physicians and nurses; (3) physicians in training (fellows and residents) on rotation in the ED. Informed consent was obtained from all participants.

### Design

Based on multiple scales (including Autar,<sup>[5]</sup> Kucher,<sup>[6]</sup> JFK,<sup>[7]</sup> Caprini,<sup>[8]</sup> and Padua<sup>[9]</sup>), as well as the 2015 edition of the “Chinese Medical Experts on the Prevention of Venous Thromboembolism in Hospitalized Patients” consensus guidelines,<sup>[10]</sup> we designed a questionnaire entitled “A survey on knowledge amongst emergency medical staff in the management of VTE” (see attachment). The questionnaire included: (1) staff demographics including gender, age, current position, the number of years working since graduation, education and training, the number of years working in emergency medicine and previous employment record; (2) knowledge of venous thromboembolism such as risk assessment, thrombosis sites, clinical features and physical examination techniques, prophylaxis (mechanical and chemical), and contraindications to anticoagulation. There were 21 total questions on the knowledge section, and each question had four to ten items. Participants were assessed via a multiple-choice question exam (MCQ) with one point awarded for each correct answer, one point deducted for each incorrect answer, and no points for unanswered questions. The total score was 75 points. To facilitate final statistical calculation, the score was converted into a percentage. A validated finalized version was previously completed

through pilot testing and feedback from participants and five senior clinicians in the field of emergency medicine. The content-related validity of this questionnaire was established at 0.93, and the internal consistency using Cronbach's  $\alpha$  reliability was found to be 0.78.<sup>[11]</sup>

### Data collection

The questionnaire was distributed to the medical and nursing clinical staff in the large urban ED (~500 patients/day, ~180,000 patients/year) of a medical center in Northern China from April 1 to 10, 2016. Assessors were trained together and provided with identical instructions. The questionnaires were filled out on the spot by the participants anonymously and collected by two registered nurses immediately after completion. The two assessors ensured that there was no cheating among participants. We invited 185 staff in the ED, and 180 agreed to participate in our survey.

### Analysis

Data was described with percentages and the Kruskal-Wallis test was used to compare ranked data between different groups including age, job, gender, working lives, educational status, professional title, working lifetime in the ED, hospital condition, and nurse's workspace. The statistical analysis was done using the SPSS 22.0 software (IBM Corp., Armonk, NY, USA). The statistical analysis was performed as a mean or percentile. If the difference was statistically significant, pair-wise comparison analysis within groups was then performed. Differences were deemed statistically significant if the  $P$ -value was less than 0.05.

## RESULTS

A total of 185 ED staff were approached, and 180 questionnaires were accepted and returned. Out of the 180 questionnaires returned, six were not filled in completely and were therefore excluded. The remaining 174 completed questionnaires (response rate of 96.67%) were then analyzed. The demographics of the respondents are illustrated in Table 1. There were 54 doctors, and 120 nurses.

Participants did not score highly on the questionnaire. As shown in the Table 2, the overall mean score was  $60.10 \pm 16.53$ ; 14 scores were in the range of 20 to 29 points (mean  $\pm$  SD  $24.95 \pm 2.978$ ); 52 in the range of 40 to 49 points (mean  $\pm$  SD  $45.15 \pm 3.169$ ); and 54 in the range of 50 to 59 points (mean  $\pm$  SD  $55.01 \pm 2.816$ ). Most scores were between 40–59. With a pass score of 60, the pass

rate was low. There were no significant differences in scores with respect to job (doctor vs. nurse), the number of years working in clinical medicine, education level, and current position, previous hospital experience and nurses' current work location within the ED.

Although participants recognized the potential severe consequences of VTE, their knowledge of the disease was not very high. This suggests that current education and training in VTE management is not enough for emergency medical staff.

As shown in Table 2, most participants did not score highly on the questionnaire with the range of 21 to 71 and a mean score of 49.43. Only one participant scored

within the 70 to 79 range, and only 21% scored 60 points or above. Total scores by most participant characteristics did not vary significantly (Table 3), but scores did vary based on the number of years working in the ED. When a pair-wise comparison was performed, the number of years worked in the ED was a significant factor for score ( $P<0.05$ ). Participants who worked in ED for more than 5 years ( $n=83$ ) scored significantly higher on the questionnaire than those under 5 years ( $n=91$ ) (95.75 vs. 79.97,  $P=0.039$ ).

As shown in Table 3, there was a significant difference in some questions based on gender, age, job, and nurse work location, number of working years, education level, and different ED working lifetime.

**Table 1.** Characteristics of respondents

Distinguish category	Specific categories	Number (%)
Age	20–25 years	34 (20)
	26–30 years	53 (30)
	31–35 years	44 (25)
	36–40 years	27 (16)
	>40 years	16 (9)
Occupation	Doctor	54 (31)
	Nurse	120 (69)
Gender	Male	43 (25)
	Female	131 (75)
Work duration	<1 year	21 (12)
	1–2 years	20 (11)
	3–5 years	41 (24)
	6–9 years	25 (14)
	10–19 years	51 (29)
	20–30 years	15 (9)
	>30 years	11 (1)
Educational status	Technical secondary school	3 (2)
	College-equivalent degree	32 (18)
	Undergraduate degree	95 (55)
	Graduate degree	29 (17)
	Master's degree or above	15 (8)
Professional title	Primary title	115 (66)
	Intermediate title	53 (30)
	Senior title	6 (4)
Work duration ER	<3 months	21 (12)
	3–6 months	6 (3)
	6 months to 1 year	14 (8)
	1 year	4 (2)
	2 years	16 (9)
	3–5 years	30 (17)
	>5 years	83 (49)
Hospital condition	Peking Union Medical College Hospital	143 (82)
	Other tertiary-level hospitals in Beijing	7 (4)
	Second-level hospitals in Beijing	4 (2)
	Tertiary-level hospitals outside Beijing	11 (7)
	Second-level hospitals outside Beijing	2 (1)
	Other hospitals	7 (4)
	Nurse's workspace	Office treatment
International ER	11 (9)	
Observation area	18 (15)	
West courtyard ER	10 (8)	
Triage area	7 (6)	
General ward	20 (17)	
EICU	20 (17)	
Resuscitation room	16 (13)	

ER: Emergency Room; EICU: emergency intensive care unit.

## DISCUSSION

Venous thromboembolism is a potentially serious complication and a leading cause of death in hospitalized patients.<sup>[10]</sup> Despite this, national guidelines for the prevention and treatment of VTE have been introduced only very recently in China (in 2009 for surgical patients<sup>[12]</sup> and 2015 for medical patients).<sup>[10]</sup> Since 2011, the management of VTE has been regarded as a key indicator of a hospital's best practices,<sup>[13]</sup> but we notice there is still not enough emphasis on VTE or awareness of guidelines among ED staff taking our survey.

Participants who worked in the ED for less than five years were normally distributed ( $P=0.155$ ) while those working more than five years were non-uniformly distributed ( $P=0.039$ ); therefore, a nonparametric test was performed for the scores from those with more than five years of experience with a result of  $P=0.039$ . The two groups were significantly different (as shown in Table 3).

We found that participants with the lowest scores were the ones who had worked for less than five years in the ED. In the first few years working in the ED, the training of medical staff focuses on resuscitation skills, triage, hemodynamic monitoring, and emergency procedures (e.g., intubation, chest tube insertion). In the authors' experience, scant attention is paid to VTE awareness or training in the early years of ED work.

The ED nurses had set up a VTE group in 2014 to promote awareness and training of VTE guidelines. In addition, ED nurses also had a reporting system for VTE adverse events. However, there was no uniform assessment scale or training and participation was voluntary, which may explain why staff generally still scored lower on knowledge and awareness of VTE in our

survey.

Participants generally scored poorly on the pathology and anatomy of VTE as well as risk factor assessment. Thrombosis not only needs to be prevented, but also be promptly diagnosed and treated. For example, mechanical prophylaxis is contraindicated after DVT has already occurred, so the diagnosis of DVT should be excluded before the use of elastic or compressive devices. From our questionnaire, participants generally showed inadequate knowledge of this issue. Therefore, greater emphasis should be placed on indications and contraindications for VTE prophylaxis.

Apart from those who worked in the ED for five years or more, there were no significant differences in knowledge among the various groups. This suggests that comprehensive training (both theoretical and practical) is needed for all medical staff to improve their management of VTE.

Both female staff and nursing staff scored higher in knowledge of mechanical prophylaxis against VTE. In the ED, most nurses are women, which may explain the correlation between the two groups. As previously mentioned, the nurses had a VTE group to promote awareness of VTE. This may explain the discrepancy in scoring between doctors and nurses.

Older participants scored higher than younger participants, especially in pathology, anatomy and risk assessment questions. Perhaps additional years of experience in the ED have given staff greater appreciation and knowledge of VTE.

Doctors scored higher than nurses on knowledge of anticoagulation therapy. This is not surprising, as doctors are the ones that prescribe anticoagulation in the clinical setting. Due to caring for more critically ill patients, nurses working in the intensive care areas of the ED seemed to acquire more knowledge about the risks and

**Table 2.** Score distribution of emergency medical staff

Score section	20–29	30–39	40–49	50–59	60–69	70–79	Total
Mean±SD	24.95±2.978	34.22±2.587	45.15±3.169	55.01±2.816	64.19±2.508	70.67±0	60.10±16.53
Number	14	18	52	54	35	1	174

SD: standard deviation.

**Table 3.** Classification of emergency medical staff and questionnaire score

Category	Specific groups	Percentage score (mean±SD)	Bonferroni correction	P value
Occupation	Doctor	50.07±12.131	0.05	0.636
	Nurse	49.14±11.883		
Work duration	<1 year	46.03±12.115	0.002	0.287
	1–2	46.67±11.847		
	3–5	48.68±14.453		
	6–9	48.64±9.118		
	10–19	51.27±11.099		
	20–30	54.84±10.252		
	>30	52.00±0		
Educational status	Technical secondary school	51.56±2.037	0.005	0.696
	College degree	48.29±13.693		
	Undergraduate degree	49.47±11.603		
	Graduate degree	48.32±13.869		
	Master’s degree or above	53.33±5.702		
Professional title	Primary title	48.14±12.245	0.016	0.104
	Intermediate title	51.57±11.204		
	Senior title	55.33±8.631		
Work duration ER	<3 months	47.43±8.729	0.002	0.044
	3–6 months	37.11±19.712		
	6 months to 1 year	47.81±13.434		
	1 year	45.67±14.902		
	2 years	45.17±11.281		
	3–5 years	51.24±12.348		
	>5 years	51.45±11.048		
Hospital condition	Peking Union Medical College Hospital	49.14±11.942	0.003	0.877
	Other tertiary-level hospitals in Beijing	53.52±6.904		
	Second-level hospital in Beijing	54.00±5.812		
	Tertiary-level hospital outside Beijing	48.12±13.432		
	Second-level hospitals outside Beijing	48.00±16.971		
	Other hospitals	51.24±16.562		
Nurse’s workspace	Office treatment	51.73±14.377	0.005	0.110
	International ER	43.11±9.450		
	Observation area	47.76±8.408		
	West courtyard ER	46.59±12.250		
	Triage area	54.80±6.724		
	General ward	52.00±12.244		
	EICU	52.80±12.908		
	Resuscitation room	47.17±11.530		

SD: standard deviation; ER: emergency room; EICU: emergency intensive care unit.

prevention of thrombosis than nurses working in other ED areas.

A review of the current literature shows that a lack of awareness and knowledge of VTE prophylaxis and management is not limited to any location or medical specialty. Tang et al<sup>[14]</sup> in 2015 carried out a self-administered questionnaire of 1,861 intensive care unit (ICU) staff in 23 tertiary hospitals in China and found that only 36.5% of physicians and 22% of nurses knew about the national VTE guidelines. Tang recognized that their study was only focused on one medical specialty which could have led to sample bias. Elsewhere in Asia, Al-Dorzi et al<sup>[15]</sup> in 2014 conducted a single center self-administered questionnaire in Saudi Arabia, on 72 medical staff (physicians and nurses) from internal medicine, emergency medicine, surgery and obstetrics and gynecology who attended a VTE awareness day before and after lectures on VTE guidelines. They also found that “knowledge of appropriate anticoagulant administration in specific clinical situations was frequently inadequate, with approximately two-thirds of participants failing to adjust low-molecular-weight heparin dosing in patients with renal failure”. However, unlike in our study, the authors found no significant difference ( $P=0.67$ ) between physicians and nurses on knowledge of VTE. The authors acknowledged that limitations to their study included low sample size, a single center study and only focusing on knowledge but not actual compliance with guidelines. In addition, there could be self-selection sample bias in that participants who chose to attend a VTE awareness session had some prior knowledge of VTE. In Africa, Ekwere et al<sup>[16]</sup> in 2015 carried out a self-administered questionnaire on 52 physicians and 33 surgeons in a tertiary hospital in Nigeria and found that only 18.8% of doctors followed VTE guidelines. Among the remaining 81.2% that did not follow guidelines, 30.8% of them stated lack of knowledge as the key reason.

In Europe, Schaden et al<sup>[17]</sup> in 2010 carried out a one-day nationwide snapshot survey on 325 inpatients in ICUs throughout Austria and found that VTE guideline adherence was only 40%. Again, the authors conceded that although numerically large, their study was only a snapshot of one day and focused only on one medical specialty.

In North America, Lee et al<sup>[18]</sup> in 2014 found that lack of knowledge was again a key factor in poor adherence to VTE guidelines. The authors carried out a survey on 221 nursing staff in multiple departments in two hospitals in California, USA. They found that 30%

of nurses reported their overall knowledge of VTE risk assessment was fair or poor and 31% reported that they seldom completed VTE risk assessment on their patients. Lee acknowledged that their study was only focused on nurses and that survey participation was voluntary introducing the possibly of self-selection bias.

Although limitations to our study include using only one form of assessment (MCQs with negative marking) and focusing on only one department (hence our study sample, although large numerically, might be limited in breadth), our study does agree with the existing literature and highlights the persistence of the relative lack of knowledge and awareness among medical staff in VTE prophylaxis and management.

## CONCLUSION

Our survey has shown deficiencies among ED medical staff in knowledge and awareness of the management of VTE according to national guidelines. Based on our study, we recommend several changes be considered. First, the introduction of an interdisciplinary workshop for medical staff to address deficiencies in VTE knowledge. Second, the introduction of a standardized VTE protocol based on national guidelines, for all patients in the ED to be completed at the time of admission decision by the medical and nursing team. Third, a mandatory study module on VTE for new physicians and nurses starting work in the ED. Finally, the introduction of a mandatory reporting system for adverse events (including VTE), adoption of a “no-blame” culture and monthly transparent review in a “Mortality & Morbidity” meeting.

After implementation of these recommendations, a regular re-audit with a broader sample of participants should be carried out to assess whether staff knowledge, awareness and performance have improved in line with best practice guidelines and whether further recommendations are needed.

Delayed or missed diagnosis of VTE can lead to serious morbidity and mortality and therefore a high degree of vigilance needs to be exercised by clinicians when assessing all patients admitted to the ED.

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**Conflicts of interest:** The authors declare that there are no conflicts of interest regarding the publication of this paper.

**Contributors:** WZ was in charge of the topic idea, designing

the questionnaire, logging data, and working on the manuscript. JH was in charge of searching the English-language literature, statistical data analysis, and drafting the English-language paper. JH and WZ contributed the same amount to this paper. XL and LT oversaw the issuing and retrieval of the questionnaires. SG and JW were involved in the preparation the manuscript, including the data interpretation and language editing. HZ and XY oversaw the study design and interpretation of data. YL oversaw study design, finalizing the questionnaire, revising the paper and drafting the final version of the manuscript.

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## Attachment

### A survey on knowledge amongst emergency medical staff in the management of VTE

Dear colleagues:

Thank you very much for spending time to fill out this questionnaire.

Venous thromboembolism (VTE) is a common complication and important cause of death in emergency department (ED) patients. VTE's are challenging to emergency medicine (EM) practitioners due to ambiguous clinical signs and symptoms as well as high mortality and morbidity if left untreated. For ED patients, risk assessment, prophylaxis, early diagnosis and appropriate treatment of VTE are essential for preventing morbidity and mortality. To achieve this, medical personnel, both physicians and nursing staff, must be well knowledgeable of VTE and fully aware of the appropriate management of VTE. This questionnaire aims to investigate knowledge of VTE risk assessment, prophylaxis, diagnosis and treatment in ED staff from Peking Union Medical College Hospital.

The questionnaire will be provided anonymously and the results will be kept confidential. Please seal the envelope before returning. Thank you for your contribution to our study!

To answer questions, please fill in the appropriate box with a check-mark “√”.

**Part one:** Personal information

1. Sex:  Male  Female
2. Age:  20–25 years  26–30 years  31–35 years  
 36–40 years  >40years
3. Occupation:  Doctor  Nurse
4. Work duration:  <1 year  1–2 years  3–5 years  6–9 years  
 10–19 years  20–30 years  >30 years
5. Educational status:  Secondary specialized school  Junior college  Undergraduate degree  
 Master’s degree  Above master’s degree
6. Professional status:  Primary  Intermediate  pre-Senior  Senior
7. Work duration in the ER:  <3 months  3–6 months  6 months–1 year  
 1 year  2 years  3–5 years  >5 years
8. Hospital:  Peking Union Medical College Hospital  
 Other tertiary-level hospitals in Beijing (except PUMCH)  
 Second-level hospital in Beijing  
 Tertiary-level hospital outside Beijing  
 Second-level hospitals outside Beijing  
 Other hospitals

**Part two:** Deep vein thrombosis-related knowledge (multiple choice)

1. DVT refers to abnormal coagulation in the deep venous system, which occurs in ( )  
A. Lower limbs deep vein B. Femoral vein  
C. Popliteal vein D. Intermuscular vein
2. The main symptoms of DVT include ( )  
A. Asymptomatic B. Local pain  
C. Tenderness D. Distal limb edema
3. PE refers to a thrombus obstruction of the pulmonary artery or its branches from the venous system or the right heart, which can lead to respiratory and circulatory dysfunction. This is often characterized as ( )  
A. Dyspnea B. Chest distress C. Chest pain D. Headache
4. The age at which the patient is most likely to develop a thrombus ( )  
A. 20–30 years B. 30–40 years C. 40–50 years  
D. 51–60 years E. 61–70 years F. 71 years above
5. Vein thrombosis often occurs in patients with a body mass index (BMI) ( )  
A. Low-body weight 16–18 B. Middleweight 20–25  
C. Overweight 26–30 D. Obesity 31–40 E. Very obese >41
6. In what activity level of patients will DVT most likely occur? ( )  
A. Free activity B. Use walking tool by self  
C. Need help from others D. Absolute bed rest
7. Which disease is high risk for thrombosis? ( )  
A. Inflammatory bowel disease B. Polycythemia  
C. Malignant tumor D. Acute myocardial infarction (AMI)  
E. Cerebrovascular disease F. History of venous thrombosis  
G. Diabetes H. Chronic heart disease  
I. Heparin associated thrombocytopenia J. fracture of lower limb
8. Which special risk factors are prone to blood thrombosis? ( )  
A. Oral contraceptive 20–35 years  
B. Oral contraceptive 35 years above  
C. Hormonotherapy D. Pregnancy / stegmonth  
E. Thrombogenesis F. Recently received hemostatic drugs

9. What are the physical methods commonly used to prevent vein thrombosis? ( )  
A. Sole vein pump                      B. Venous pressure device  
C. Antithrombotic pressure belt    D. Stretch socks
10. When is the physical prevention of thrombosis prohibited? ( )  
A. Congestive heart failure        B. Pulmonary edema  
C. Lower limbs severe edema    D. Lower limb ischemic diseases  
E. Deep vein thrombosis  
F. Pulmonary embolism            G. Varicosity
11. What are the basic preventive measures for venous thrombosis? ( )  
A. Operate softly                      B. Regulate use of a tourniquet  
C. Promote the limb backflow    D. Get out of bed as early as possible  
E. Avoid dehydration                F. Oral more fluids
12. What are the common drugs used for preventing vein thrombosis? ( )  
A. Unfractionated heparin (UFH)    B. Low-molecular heparin  
C. Factor inhibitor                    D. Vitamin K antagonist
13. High-risk factors for thrombosis ( )  
A. Orthopedic surgery (THR, TKR, HFS)  
B. General surgery operation    C. Severe trauma  
D. Spinal injury                        E. Plaster immobilization  
F. Family history of thrombosis    G. Hip/knee joint replacement
14. Moderate-risk factors for thrombus ( )  
A. Central venous indwelling catheter    B. Chemotherapy  
C. Chronic heart failure or respiratory failure  
D. Hormone replacement therapy        E. Middle-late malignant tumor  
F. Take the pill    G. Ischemic stroke    H. Stegmonth  
I. VTE medical history                    J. Thrombophilia
15. Low-risk factors for thrombus ( )  
A. Arthroscopic surgery    B. Stay in bed >3 days  
C. Travel (such as long time on a bus or plane)  
D. Advanced age                        E. Laparoscopic surgery  
F. Obesity                                G. Pregnant woman  
H. Varicose vein of lower limb    I. Early malignant tumor
16. What are the best ways to diagnose venous thrombosis? ( )  
A. Ultrasound                        B. CT check                            C. Venography  
D. Blood test D-dimer    E. Arteriography
17. When selecting sequential compression devices (SCDs) for preventing venous thrombosis, the best choice is: ( )  
A. Over-the-knee length stretch hose    B. Knee stretch hose  
C. Knee-high leg sleeve                    D. Lower knee leg sleeve
18. When using low-molecular heparin to prevent thrombosis, subcutaneous injection once/day, for how many ( ) days should the platelet count be monitored?  
A. Every day    B. Every 2–3 days    C. Every 4–5 days    D. Every 6–7 days
19. When patients have a thrombus, low-molecular heparin should be prescribed for 24 hours followed by an oral anticoagulant (e.g. 3–5 mg/day of warfarin). What do you need to be aware of during this time? ( )  
A. Warfarin must overlap for 4–5 days with low-molecular heparin  
B. Continuous INR measurements for 2 days. When INR is greater than 2.0, low-molecular heparin can be stopped, and just take warfarin alone.  
C. Before treatment, INR should be monitored daily, and then every 2 weeks thereafter until INR stability is assured.  
D. If considering long-term treatment, check INR every 4–8 weeks, and adjust the warfarin dose accordingly.



20. When evaluating venous thrombosis, in addition to using a special thrombus assessment scale, what should you pay attention to? ( )

- A. Bleeding risk factor assessment
- B. Pulmonary embolism Wells rating scale
- C. Daily life scale
- D. Thrombosis risk level assessment

21. What contraindications need to be considered before anticoagulant therapy begins: ( )

- A. Active bleeding
- B. Coagulant function abnormality
- C. Recent surgery
- D. Recent central nervous system hemorrhage
- E. Uncontrolled hypertension