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Attitude of Iranian physicians and nurses toward a clinical decision support system for pulmonary embolism and deep vein thrombosis

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ABSTRACT

This research project sought to design and implement a computerized clinical decision support system (CDSS) that was able to identify patients who were at risk of pulmonary embolism (PE) and deep vein thrombosis (DVT), as well as produce reminders for prophylactic action for these diseases. The main purpose of the CDSS was to attempt to reduce the morbidity and mortality caused by embolism and thrombosis in patients admitted to hospitals. After implementation of this system in one of the large educational hospitals of Iran, a standard questionnaire was used, and interviews were conducted with physicians and nurses to evaluate the performance of the designed system for reducing the incidence of pulmonary embolism and thrombosis. From physicians and nurses' point of view, a system which assists the medical staff in making better decisions regarding patient care, and also reminds pulmonary embolism and thrombosis preventive procedures with timely warnings, can influence patient care quality improvement and lead to the improved performance of the medical staff in preventing the incidence of pulmonary embolism and thrombosis.

1. Introduction

One of the most important advances in healthcare industry in the past 25 years has been the developments in information and communication technology [1]. The performance quality improvement of healthcare institutes through the application of clinical decision support systems is the result of the widespread application of information technology in healthcare, which, if employed properly, will

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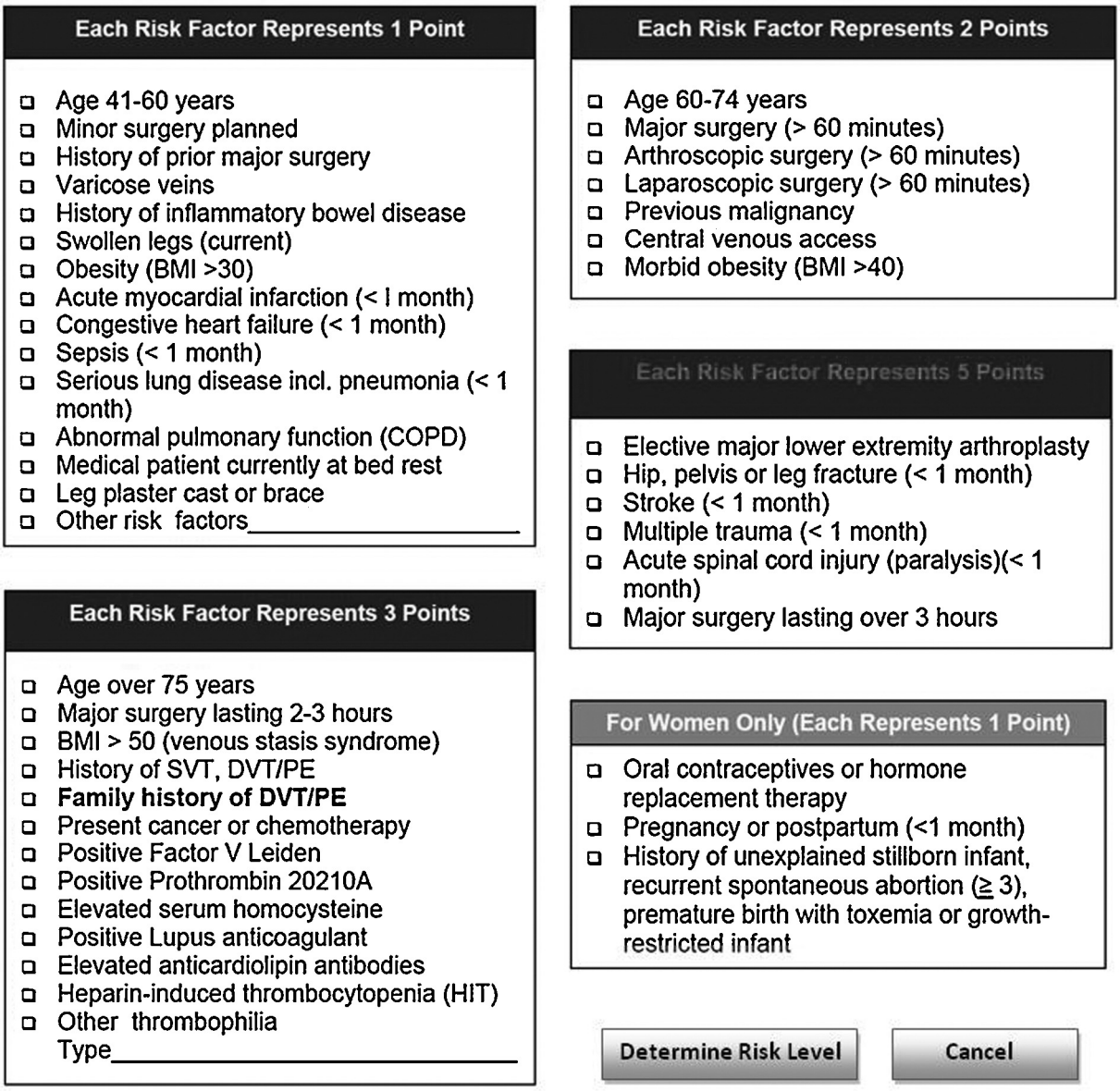

Fig. 1 – Classification of pulmonary embolism and deep vein thrombosis risk factors.

bring major advantages such as improved planning, reduced costs, reduced medical errors, and improved service quality [2]. The Institute of Medicine (IOM) has recommended the application of IT-based systems, including clinical decision support systems, as a solution for healthcare quality problems in healthcare environments [3].

CDSS is, in fact, an application which provides information for a safe patient care. The information includes evidence-based standards and guidelines, procedures and protocols, regulations and suggestions for care, drug references, calculation instruments, and links to the library database as well as digital and Internet references. The CDSS reminds the user to employ care standards (e.g. preventive care for pre-labor RH, administration of preventive aspirin for patients with coronary artery disease, subcutaneous influenza and heparin vaccination), or otherwise, provides him/her with warnings concerning possible risks such as allergies and tests of platelet count [4–7]. The most important point of CDSS is to help clinicians with patient care. This would happen through inserting the required data and information into the system and, then, extracting the decision support tool formulated within the programming of the system [8–10]. The new methodology of these systems is comprised of a combination of the user's knowledge and the stored knowledge in the system's database to upgrade and improve decision making and patient care. Clinical decision support systems pave the way for a quicker and more localized diagnosis, and increase the efficacy of medication prescription; they, furthermore, lessen the need for specialist consultation, and thus, reduce medical expenses [6,11].

Pulmonary embolism is the third most common cause of mortality in all age groups, with more prevalence in adults. Despite the advances in the medical diagnosis and treatment, the rate of the diagnosed cases is indeed much less than