Use and views of an electronic risk assessment tool for venous thromboembolism –
a case for user-centred design

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1. Introduction
Venous Thromboembolism (VTE) is reported to be the most common preventable cause of death in hospitals, resulting in approximately 5,000 deaths per year in Australia. There is now overwhelming evidence indicating that mechanical and pharmacological prophylaxis are extremely effective in reducing VTE risk but appropriate prophylaxis is not always prescribed and VTE remains a significant problem for hospitals. In 2010, the New South Wales (NSW) government issued a policy directive stating that all patients admitted to any NSW public hospital must be assessed for risk of VTE. Following dissemination of the directive, the study site, a teaching hospital in NSW, designed and implemented an electronic risk assessment tool (RAT), and revised their VTE prophylaxis policy to specify that patients must be individually assessed for their risk of VTE using the electronic tool within 24 hours of admission to hospital. Despite this requirement, previous audits at the hospital have shown that the electronic VTE RAT is rarely utilised. We set out to determine why this might be the case. In particular, we aimed to examine how the RAT was being used (i.e. if by the right clinician, at the right time, for the right purpose) and to identify factors influencing utilization of the RAT.

2. Method
2.1 Risk assessment tool
The on-line tool is located within the hospital's electronic medical record (EMR), adjacent to other patient assessments (e.g. Waterlow pressure injury assessment). All clinicians are able to view and use the VTE assessment but hospital policy stipulates that medical staff are responsible for completing the VTE risk assessments. Doctors must have knowledge of and voluntarily seek out the RAT. No reminders are presented and no alerts are triggered if an assessment is not performed. The tool was intended to be used in combination with a prescribing protocol available within the electronic prescribing system.

2.2 Part 1
To examine how the RAT was being used, a sample of electronic risk assessments was audited. Patients who were risk assessed for VTE were identified via the EMR on a weekly basis for 3 months. Electronic prescriptions and patient notes for a sample of 112 'risk-assessed' patients were reviewed and both 1) prophylaxis information (drug, dose, start date, prescriber,) and 2) risk assessment information (date of completion, clinician who completed risk assessment) were collected.

2.3 Part 2
To identify factors influencing completion of an electronic risk assessment, 12 prescribers were interviewed about the risk assessment tool and VTE prevention in general.

3. Results
3.1 Part 1
Of the 112 risk assessments reviewed, the RAT was used as intended in only 40 cases (35.7%) (i.e. the risk assessment was completed by a doctor within 24 hours of admission, prior to the prescription of prophylaxis). Only 50% (n=56) of all risk assessments were completed within 24 hours of admission, with average time between admission and completion of the RAT found to be 3.6 days. In 33 cases (29.5%), the risk assessment was completed after the prescription of prophylaxis, not before. Nurses completed 26.8% (n=30) of the risk assessments with the remaining assessments performed by only eight doctors. One doctor was responsible for completing 45 (40.2%) of all electronic risk assessments.

3.2. Part 2

Doctors were very consistent in their views of the electronic RAT and of VTE in general. Several factors influencing completion of an electronic risk assessment were identified, including 1) a belief that no formal risk assessment is needed, 2) a belief that RAT completion was the responsibility of other staff, 3) poor awareness of the risk assessment tool, 4) design of the RAT, including the location of the tool and usefulness of the tool output.

4. Discussion

Risk assessments, when completed, were generally performed without the use of the tool. Doctors explained that they systematically considered risk factors for each patient (without documenting risk) and subsequently prescribed VTE prophylaxis which they perceived to be appropriate for their patient’s risk level. Some doctors viewed the RAT as beneficial only because it forced them to think about VTE. It follows from this that providing doctors with a simple prompt (e.g. a computerised alert) to remind them to consider VTE prophylaxis would be sufficient to ensure patients are prescribed appropriate prophylaxis.

The location of the tool within the EMR hindered utilization of the RAT and the tool did not provide prescribers with useful information to guide them in the prescription of appropriate VTE prophylaxis. One of most robust findings that emerged from our interview phase was that ‘implementation’ of the RAT had not been successful. Although the tool was available to clinicians, its intended role in guiding the prescription of prophylaxis was not well understood.

Overall, the design, workflow and implementation issues we identified may have become apparent to the organisation had a user-centred approach been adopted. We learned a great deal from our audit and from our discussions with users. Seeking input from clinicians earlier on in the design and implementation process may have resulted in a more usable and useful RAT being developed.

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