

# Introduction of a Venous Thromboembolism Prophylaxis Protocol for Older Adult Psychiatric Patients.

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## Abstract

Hospital-Acquired venous thromboembolism (VTE) is a common cause of morbidity and mortality in older adults. In psychiatric patients these risks are increased due to multiple factors including poor mobility, restraint, catatonia, sedation, and conventional antipsychotic use. Diagnosis and treatment of psychiatric patients presenting with signs and symptoms of a VTE can be delayed due to a patient's communication difficulties, non-compliance, or attribution of symptoms to a psychosomatic cause.

However, despite the increased risk, approved VTE prophylaxis protocols are infrequently used on Psychiatric wards. On one Older Adult Psychiatric Ward, two patients presented with VTE (a fatal pulmonary embolism and a symptomatic deep vein thrombosis) over a 6 month period demonstrating the necessity for prophylactic assessment. A baseline audit over 3 months showed that 63-83% of patients on the ward had received no assessment of VTE risk, on any given week, although this improved slightly following the critical incidents.

A VTE prophylaxis protocol, based on NICE guidance for VTE risk assessment in Medical and Surgical patients, was developed with consideration given to additional Psychiatric risk factors. This took the form of a pro-forma with a tick-box design that included mobility assessment, VTE risk factors, bleeding risk factors, and guidance on prescribing decisions. This was implemented on an Older Adult Psychiatric ward and prophylaxis was provided to those meeting the threshold.

Weekly audit of all pro-formas (including assessments completed within 48 hours of admission and prophylaxis prescription) was conducted after the pro-forma introduction from 1st February 2013 to 24th May 2013. Frequency of assessments increased after protocol implementation with between 36% and 85% of all patients being assessed for VTE risk post intervention. Fluctuations in numbers assessed may have related to ward pressures, staff changes, and practicalities of pro-forma use.

After completion of the PDSA cycles the initiative was handed over to a specialist registrar for implementation across the other trust Older Adult Psychiatry wards, and further audit was planned to be conducted via junior doctors and established Quality Assurance systems. Discussion of integration of a condensed pro-forma into the trust electronic notes system is ongoing.

## Problem

VTE risk assessments are performed infrequently by junior Psychiatry trainees on the Older Age Psychiatric wards studied in North London. This is possibly due to lack of formalised guidance and prioritisation of mental health issues over those pertaining to physical health.

VTE is a potentially fatal condition but one that is easily preventable if the relevant risk assessment is conducted and appropriate prophylaxis considered. The authors therefore hypothesised that implementing a VTE risk assessment protocol would increase the frequency of patients assessed and subsequently minimise the risk of this potentially fatal medical complication occurring in the Older Adult Psychiatric inpatient environment.

## Background

Venous Thromboembolism (VTE) carries a significant risk of morbidity and mortality. An estimated 25,000 patients die of hospital-

acquired venous thromboembolism (VTE) annually in the UK. (2) Additionally, treatment of non-fatal symptomatic VTE and related morbidities is associated with a significant cost to the health service. (1) Medical and surgical inpatient environments have well established methods for risk-assessing, preventing, and managing VTE amongst their cohort of patients based on NICE guidelines. (1)

Psychiatric inpatients are at increased risk of VTE due to multiple factors (3) including poor mobility (1), physical restraint (4-7), catatonia (8-12), poor fluid intake, fever, and rhabdomyolysis that occurs in neuromuscular syndrome (13). There is also an established association between conventional antipsychotic (14-18) or clozapine use (19,20) and the development of VTE. Elderly patients are at further increased risk due to age and the increased likelihood of possessing other associated risk factors such as multiple medical co-morbidities, dehydration, and malignancy.

VTE diagnosis may be delayed or not considered in psychiatric patients due to difficulty in communicating symptoms (10) or erroneous attribution of symptoms to a psychosomatic cause (3,4). Treatment can be difficult due to the patient's mental state, lack of

capacity, or non-compliance (21).

Although there is a good body of evidence detailing the increased risk of VTE in Psychiatric patients, research on effectiveness of thromboprophylactic medication in VTE Prevention in Psychiatric patients is limited (21). Specific protocols for use in this area are not established and validated (22). In a study of Psychiatric patients in conditions of seclusion and on antipsychotic medication, Hert and colleagues demonstrated the effectiveness of thromboprophylactic medication in preventing DVT (21). In 2008 a scoring system and for prevention of venous thromboembolism in hospitalised Psychiatric patients was developed in the Czech Republic. This was based upon established VTE risk assessment guidelines for Medical and Surgical inpatients with addition of risk factors specific to Psychiatric inpatients (22).

## Baseline measurement

A retrospective audit of all patients on the Older Adult Psychiatric ward each week was completed between between 16th November 2012 and 1st February 2013 by manually searching the electronic notes (RiO system) to provide a baseline number and percentage of patients who had been assessed for requirement for VTE prophylaxis or treatment. All of the locations in the electronic notes where this information may have been recorded were examined. This included the progress notes, core assessment, initial clerking, and physical examination sections. The terms DVT, VTE, and PE were also searched for using the electronic search function. These dates were chosen as a fatal pulmonary embolism occurred on the ward 16th November 2012 and the VTE prophylaxis proforma was introduced on 1st February 2013.

The results were looked at on a week by week basis. Rates of VTE assessments for the baseline audit period were low, with 63% to 86% of patients receiving no assessment at all for any given week, 0% to 12.5% receiving prophylactic assessments, and 1% to 18% assessed as having clinical symptoms indicative of VTE. The percentage of patients assessed over time did increase from 6% on 16th November 2012 to 37% on 1st February 2013; this is likely a result of increased awareness following the occurrence of a fatal pulmonary embolism on the ward.

See supplementary file: ds5139.pdf - "Proforma for use in assessing VTE risk and guiding subsequent prophylactic treatment in Older Adult Psychiatric patients."

## Design

A VTE prophylaxis pro-forma based on NICE guidance for VTE risk assessment in medical and surgical patients that included psychiatric risk factors was developed. The pro-forma was rolled out across an Older Adult Psychiatric ward, following initial review of available literature and discussion with stakeholders (ward managers, nurse consultant, psychiatric consultant, medical consultant, psychiatry trainees, nursing staff, ward pharmacist, and physiotherapist).

The pro-forma utilised a simple tick-box design to sequentially guide the doctor through a mobility assessment, balance risks of VTE versus risks of bleeding, and to then inform prescribing decisions in line with NICE guidelines.

The following guidelines were given:

- VTE risk assessment should be conducted using a VTE Risk Assessment Pro-forma which will be available on the ward and found within these guidelines.
- The Pro-forma outlines relevant medical and psychiatric risk factors, includes an initial mobility assessment, outlines suggested prophylactic measures based on risk, outlines contraindications to prophylaxis, and highlights issues of capacity and consent should prophylaxis be required.
- The first part of the form is a mobility assessment; this asks if the patient's mobility has been significantly reduced for 3 or more days.

- If no, then no further action is required unless their mobility changes.

- If yes, then proceed to main risk assessment.

- The next section includes a list of VTE risk factors in the left hand column and a list of bleeding risk factors in the right hand column.

- If the patient has any VTE risk factors and no bleeding risk factors then they should be prescribed 40mg Enoxaparin administered subcutaneously once daily and Thromboembolic Deterrent Stockings (TEDS).

- If the patient has any bleeding risk factors then they should not be prescribed Enoxaparin and their case should be discussed with the local on-call medical team. A list of contraindications to TEDS has also been included.

- The final section includes questions regarding physiotherapy, capacity and consent to prophylaxis and prescription and administration of the medication if indicated.
- The form should then be signed, dated, and the assessing doctor's name and grade should be printed.
- The form should be attached to the back of the patient's drug chart.
- When the patient's drug chart needs to be re-written, the form should be transferred to the new drug chart.

Pro-forma completion and VTE risk assessment were designated as mandatory at junior doctors ward induction with guidance on pro-forma completion provided. Further details and teaching were provided a multi-disciplinary teaching session covering VTE.

The pro-forma was attached to each patient's drug chart with an aim for it to be completed and the necessary actions taken within 48 hours of the patient's admission. This role would fall to the on-call or duty doctor or the team ward doctor, depending on who was first to

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assess the patient. If there was a change in the patient's condition that relates to VTE risk factors during their admission (e.g. there is a significant decrease in their mobility) then it was stipulated that they should be re-assessed for VTE risk at this time.

Completion of the pro-forma was monitored by the ward pharmacist, the nursing staff, and via discussion at the daily multidisciplinary team meeting. Weekly audit of pro-forma completion, with weekly email feedback to the team was maintained for 4 months. This facilitated trouble shooting which in turn enabled necessary adjustments to the intervention to be actioned. Initial difficulties using the pro-forma and potential solutions to these difficulties were brainstormed within the first few weeks of its introduction. This included issues with availability of Enoxaparin and the appropriate dosage being available in pre-filled vials, as well as of anti-embolism stocking availability.

Following the 4 monthly auditing and trouble-shooting period the project was presented to the local Dementia and Cognitive Impairment meeting for consideration of sustainability. It was agreed that the intervention would be implemented across the three Older Age Psychiatric wards at Chase Farm hospital with auditing of completion carried out by the junior doctors in the first instance and later more formally by the in-house audit department. Discussions are ongoing regarding addition of the VTE prophylaxis pro-forma into the trust electronic note system.

## Strategy

First PDSA cycle.

In the 'Plan' phase the primary objective was to develop an effective and practicable clinical protocol for prophylactic VTE assessment, applicable to Older Adult Psychiatric inpatients and which could be routinely used on the ward by junior doctors, with the wider aim of reducing pathology related to VTE. Initial ideas were discussed at a stakeholder meeting (ward managers, nurse consultant, psychiatric consultant, medical consultant, psychiatry trainees, nursing staff, ward pharmacist) to aid intervention design.

In the 'Do' phase the new protocol was implemented on the ward on 1st February 2013. This was just prior to the new intake of junior doctors (so the intervention would be up and running by the time started). The pro-forma was introduced as mandatory in the junior doctors induction meeting on the ward on 8th February 2013, details of its use was discussed, and a copy of the pro-forma was emailed to the team for printing out and attaching to each patient's drug chart before completion.

In the 'Study' phase completion of the protocol was monitored via weekly audit of all patients on the ward by one of the junior doctor representatives implementing the project. Feedback was emailed to the team on the following Monday. The team were given a grace period of two weeks before audit commenced to catch-up with assessments. Initial audit from 15th February 2013 to 1st March 2013 indicated that completion of VTE assessment had increased since implementation of the protocol, but that not all patients were being assessed and many not within the 48 hour target.

In the 'Act' phase it was thought that a further teaching session delivered to the whole multi-disciplinary team covering information relating to VTE and use of the protocol may increase frequency of VTE assessments. It was also planned for the number of completed pro-formas to be monitored in the daily multi-disciplinary meetings and further checked by the ward pharmacist who could then feedback the results to the team doctors.

Second PDSA Cycle (Audit and discussion)

The 'Plan' stage of the cycle aimed to improve use of the pro-forma and to think about barriers to completion. Changes described in the 'Act' cycle of the first PDSA cycle were implemented. During the teaching sessions, barriers to completion of the protocol were also discussed. In the 'Study' phase weekly audit of pro-forma completion with email feedback to the team was continued. The number of completed assessments remained increased relative to baseline, but with variations. The team noted anecdotally that assessment numbers may decrease when other clinical duties may be prioritised, for example in times of staff shortage or increased clinical need on the ward. This was evident when assessments decreased over the bank holiday period (when staffing levels are lower and doctors are only available via the out-of-hours on-call system). The junior doctors also requested that maintaining a stock of pro-formas on the ward be continued by the administrative staff to reduce time required to attach the forms to the drug chart.

In the 'Act' phase it was thought that requesting that the ward secretary maintain the supply of pro-formas may increase pro-forma completion and improve sustainability. The intervention and progress made at this point were to be discussed at the local Dementia and Cognitive Impairment (DCI) service line meeting for consideration of rolling out the intervention across other Older Adult wards at Chase Farm hospital. The project was also discussed at the local Drugs and Therapeutics Committee (DTC) meeting to consider the possibility of integrating a shorter pro-forma into the Trust drug chart to remove the need for the additional paper pro-forma.

Third PDSA cycle.

The 'Plan' stage of the cycle aimed to widen use of the intervention across the three Older Adult Psychiatric wards at Chase Farm Hospital. Changes described in the 'Act' cycle of the first PDSA cycle were implemented. It was decided at the DCI meeting that a Specialist Registrar in Older Adult Psychiatry would roll out the intervention across the three Old Age Psychiatry wards at Chase Farm hospital, and so in the 'Do' phase of the cycle the junior doctor team implementing the intervention liaised with the Specialist Registrar and communicated the relevant to facilitate this process. It was felt that it may be helpful to integrate the VTE assessment protocol into the electronic notes system and discussion regarding this are ongoing.

## Results

The results from the baseline audit showed that from 63% to 90% of the patients on the Older Adult ward were not assessed for VTE risk

either prophylactically or due to clinical symptoms prior to implementation of the intervention on a weekly basis over a three month period. There was a clear change in that all assessments after the intervention was implemented were performed prophylactically and none were undertaken due to symptoms of VTE being identified. This difference was constant through the study.

During PDSA cycle 1 an audit showed that there was an increase in the number of patients assessed prophylactically and also within 48 hours of admission from 15th February 2013 to 1st March 2013. There was also an increase in prescription of prophylactic medication over this period.

This increase was maintained after the teaching session in PDSA cycle 2. However there was a decrease in assessments one week before and three weeks after the bank holiday, which the ward doctors felt was related to increased work load around this time. There was also a decrease in assessments from 3rd May 2013 onwards as the doctors did not have time to replenish the charts. This highlighted the proactive role that junior doctors had to take in initiating this change and prompted discussion regarding how to embed it within ward culture and how to sustain the project in the longer term. This prompted the decision to involve the administrative staff and assessments again increased after the secretaries replenished supplies of the pro-forma routinely. It is evident from the run chart (graph 1) that, despite the small variations described, there was a sustained increase in prophylactic assessments.

See supplementary file: ds5065.doc - "Weekly audit of assessment for VTE prophylaxis. "

## Lessons and limitations

A key lesson learnt from this project is the importance of engaging stakeholders early in the 'Plan' stage of a Quality Improvement Project. Involvement of the consultant, nurse manager, pharmacist, junior doctors, and nurses on the Older Adult Psychiatric ward was integral to the success of the project, not just in the case of needing to motivate stakeholders to use the proforma in the short term, but to embed it in the culture of the ward and enhance the sustainability of the project in the long term. Additionally, support from hospital management, in the wake of a critical incident, was felt to be an important factor in initiating change.

The importance of 'bottom-up' change is also highlighted; as the pro-forma and guidelines for its use were planned and implemented by junior doctors therefore ensuring that it could be applied in a clinically appropriate and practical way. It is however important to ensure that feedback is sought from those junior doctors continuing to use the protocol on a daily basis to ensure that any difficulties in daily use of the protocol are highlighted and rectified.

Strategies for project sustainability are important as it was not practical for the junior doctors running the initiative to continue auditing use of the protocol indefinitely and to roll out the initiative across other Older Adult wards after they rotated to another

placement. In the first instance supportive liaison with the member of staff appointed to roll out the initiative across other wards was helpful to ensure lessons learnt are not lost. Continued support by stakeholders such as ward managers and consultants helps to promote sustainability in the short term, but integration of the protocol into written trust guidelines may improve sustainability in the longer term.

The main limitations of this project are related to the collection of outcome data via audit. For practical reasons the baseline audit data collected from 16th November 2012 to 1st February 2013 was collected retrospectively by manually searching through patient electronic notes, whereas audit during the PDSA cycles was conducted using the paper pro-formas. These did not include a tick box to specify whether or not the patient was symptomatic so this may have skewed the audit results.

It is also difficult to give an estimation of the actual reduction in morbidity and mortality as a result of the intervention, due to the low frequency of such critical events. One can only compare to anecdotal evidence from the ward doctors that one symptomatic deep vein thrombosis and one fatal pulmonary embolism occurred on the ward in the 6 months prior to the intervention being introduced. The study period was therefore too short to compare these figures directly. Audit was also not completed over the bank holiday period.

The authors chose to perform a snapshot audit each week of all the patients on the ward. This ensured that VTE pro-formas were kept with the patients' drug charts, that those not completed were subsequently completed after feedback, and established if any patients had required re-assessment. However, due to the fact that admissions on the Older Adult Unit are often prolonged, patient numbers audited in total did not exceed 29 over the study period.

The junior doctors implementing the project audited and fed back to the team any errors regarding omissions on pro-formas. These were subsequently completed for the purpose of learning, but were not tabulated as these were incomplete. Troubleshooting was performed ad-hoc in PDSA cycle 1 by the junior doctors on the ward implementing the protocol and in PDSA cycle 2 at the teaching session and via email feedback. It may have been helpful to run a structured focus group to reinforce this information.

This pro-active nature in of the junior doctors running the initiative may have initially facilitated use of the proforma, but also masked difficulties in day-to-day practicalities of it's use and possibly delayed discussion of solutions. For example, it became evident that the ward doctors felt they did not have time to replenish the pro-formas after the junior doctor running the initiative stopped replenishing them. This highlights the importance of achieving a balance of providing support to start-up an initiative and also ensuring in-house sustainability through involvement of the whole team with both 'bottom-up' ownership by the ward staff and also and 'top-down' directions and incentives such as protocol development and critical incident reviews.

## Conclusion

It is clear that VTE prophylactic assessment is an important part of the physical care of Older Adult Psychiatric inpatients, due to increased risks in this patient group and the significant morbidity and mortality associated with the development of VTE. Prior to the intervention the majority of patients on an Older Adult ward at Chase Farm hospital were not assessed for requirement of VTE prophylaxis and this was not widely considered as an important part of the admission process. Overall the results have shown that introduction of a VTE prophylaxis assessment protocol on an Older Adult Psychiatric ward has increased the number of patients that received a VTE risk assessment. The ward staff found the protocol practicable in general. Some changes were made to the intervention during all PDSA cycles to increase uptake of the initiative, although some variation in assessment rates persisted.

This introduction of this protocol has led to the initiative being handed over to a Specialist Registrar to implement across the remaining Older Adult wards in the hospital. It is planned that audit of VTE risk assessment will be undertaken by junior doctors working on each ward in the first instance, and will later be managed by the Mental Health Trust's internal audit department to ensure sustainability. Sustained audit with a target of 100% completion of assessments may reduce fluctuations in assessment rates and subsequently increase patient safety and minimise the risk of VTE occurrences. Discussions are in progress regarding integration of the protocol into the trust electronic notes system and making details of the protocol available to all staff on the trust intranet.

Should the protocol be successfully implemented on all Older Adult Inpatient Units then consideration could be made to extending the initiative to all inpatient wards within the entire trust.

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## Declaration of interests

Nothing to declare.

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## Ethical approval

Ethical approval was not required for this project as per the Medical Research Council Health Research Authority research decision tool guidance.