Electronic alerts, comparative practitioner metrics, and education effect on thromboprophylaxis and thrombosis in community hospitals

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Background: We previously reported an intervention to improve appropriate venous thromboembolism (VTE) chemoprophylaxis and reduce VTE in tertiary care teaching hospitals [Woller SC Am J Med 2016]. Yet, VTE chemoprophylaxis remains underutilized and lower rates have been reported in community hospitals [Kahn SR Thromb Res 2007]. We now report the performance of this intervention in community hospitals.

Aims: Our three aims are to report the rate of appropriate thromboprophylaxis, thrombosis, and bleeding among medical patients hospitalized in community hospitals before and after implementation of a multifaceted VTE reduction intervention (Table).

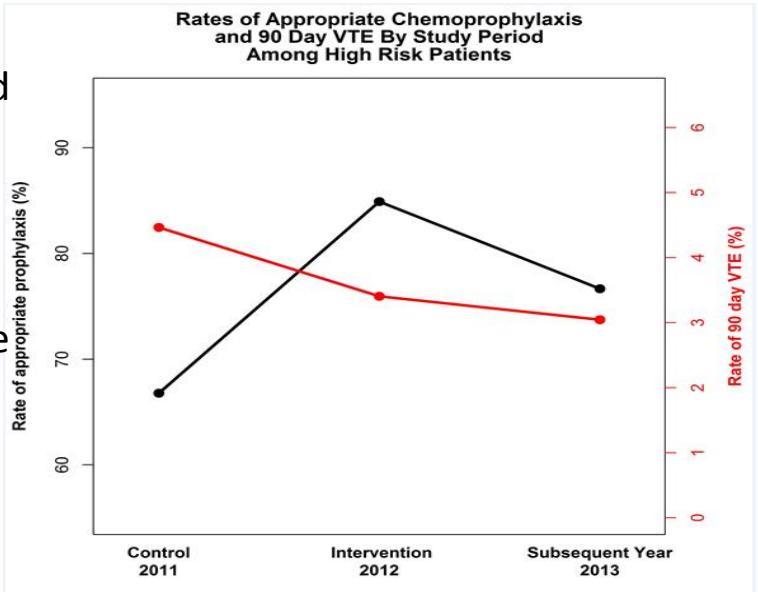
Components of the venous thromboembolism reduction intervention applied in community hospitals
An EMR chart interrogation tool generated a daily VTE risk score, and classified each patient as being at high risk for VTE or not, based on a validated VTE risk assessment tool^
A second EMR electronic tool interrogated the MAR daily for whether guideline recommended# chemoprophylaxis or therapeutic anticoagulation was being administered
If the patient was at high risk for VTE and appropriate chemoprophylaxis was not ordered, then a text alert was sent to the hospitalist of record
A monthly audit and feedback performance report was provided to each hospitalist
A proprietary targeted online CME activity tailored to each hospitalist' performance was sent monthly

LEGEND: EMR: electronic medical record; VTE: venous thromboembolism; CME: continuing medical education ^Kucher N, etal. N Engl J Med 2005; 352:969977 #Kahn SR etal. Chest 2012; 141:e195Se226S

Methods: We prospectively enrolled sequential medical patients admitted to one of 3 hospitals from 2011-2013. Patients were members of the "control" (2011), "intervention" (2012), or "maintenance" (2013) group. Beginning in the intervention period, if a patient was high risk and not receiving chemoprophylaxis, then a text alert was sent to their hospitalist. Hospitalists were credited with applying appropriate chemoprophylaxis if within 36 hours of an alert they prescribed appropriate chemoprophylaxis or identified a contraindication in the EMR. Anonymous comparative physician performance was communicated monthly along with educational content tailored to each physician's performance.

Results: 27,778 patients (35% high risk) constituted a total of 95,236 patient days. The rate of appropriate chemoprophylaxis among high risk patients was significantly higher during the intervention and maintenance periods compared with the control period, however increased then declined (67% control vs. 85% intervention vs. 77% maintenance; p< 0.001). 90 day symptomatic VTE was reduced (4.5% control period, 3.4% intervention period, 3.0% maintenance period ; p=0.008; Figure).

No difference in major bleeding was seen (0.72% control, 0.84% intervention, 0.59% maintenance; p=0.61).



Conclusions: Appropriate chemoprophylaxis among high risk patients improved comparing the intervention and maintenance periods with the control period, but declined during the maintenance period. Patient outcomes improved, but the proportion of the improvement that resulted from the intervention is uncertain.