



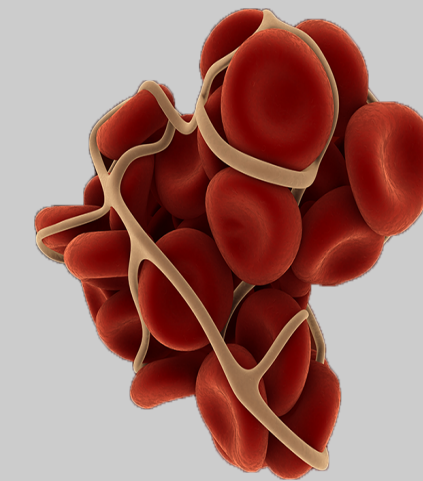
Automated VTE Prophylaxis Surveillance and Quality Assurance Tool



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Computer Integrated Surgery II, Spring 2015

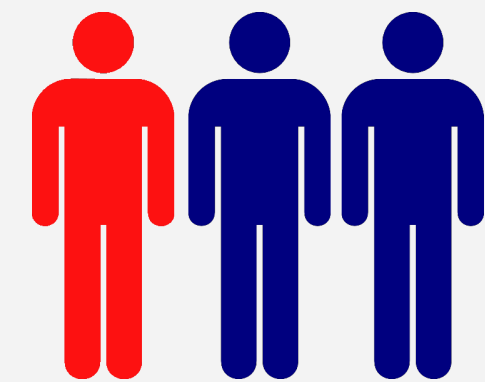
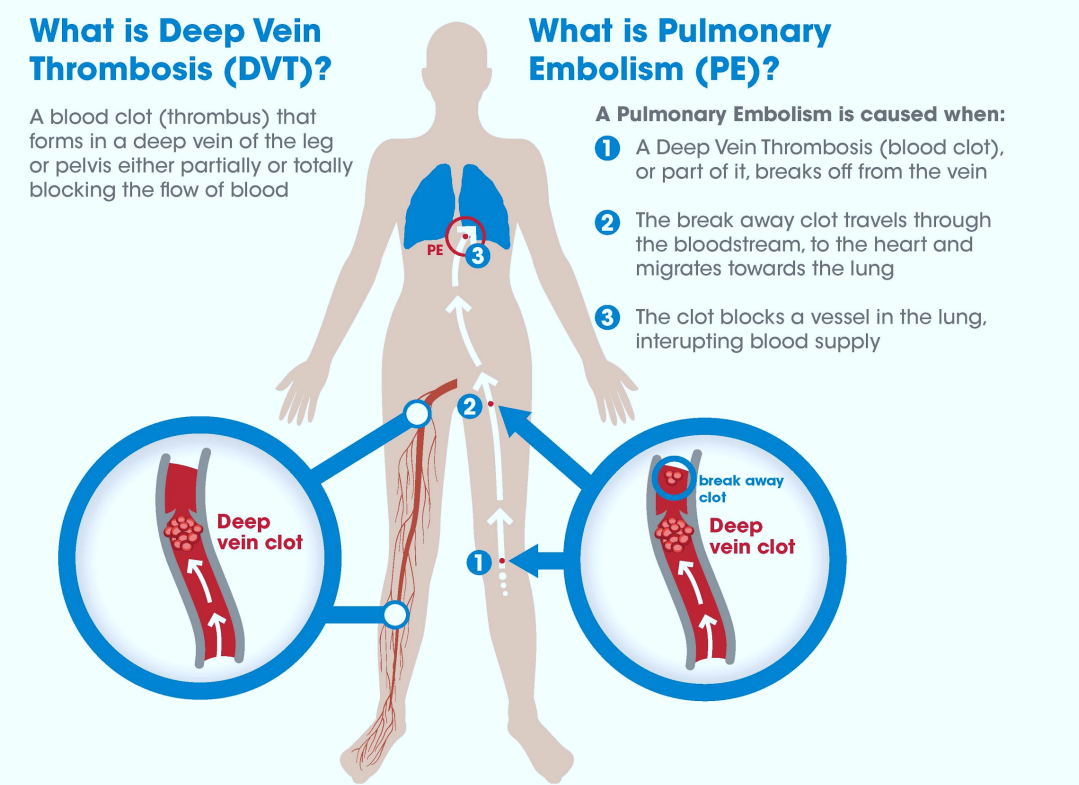
Introduction

We are an informatics project, dealing with the way **Venous Thromboembolism (VTE)** is treated. VTE is a disease process that occurs frequently during hospitalizations: blood clots often form due to immobility and the patient's weakened state. A contributing factor is that clinical providers frequently prescribe the incorrect prophylaxis (preventative treatment) for at-risk patients. To improve this, efforts have been made to develop a "smart order set," a way of automating prophylaxis prescription. However, the compliance for such tools have been historically low due to the lack of accountability for the providers.



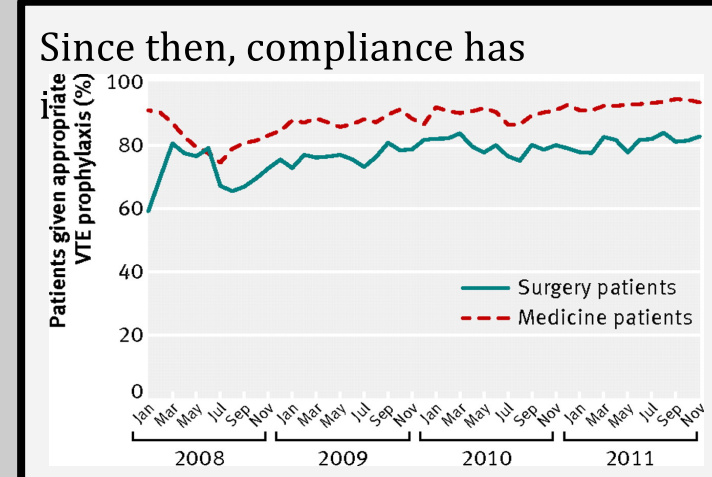
We address this problem by developing a VTE prophylaxis compliance tool that increases provider accountability for their patient prescriptions. This tool hosts several historical views of patient outcomes, giving providers a concrete way to view their individual and cohort progress, improving helping them improve the compliance rate of risk-appropriate VTE prophylaxis.

The Problem



1/3 of patients with DVT get PE
responsible for almost
800,000
deaths worldwide

In 2005 at the Johns Hopkins Hospital, only **33%** of 322 patients received appropriate VTE prophylaxis

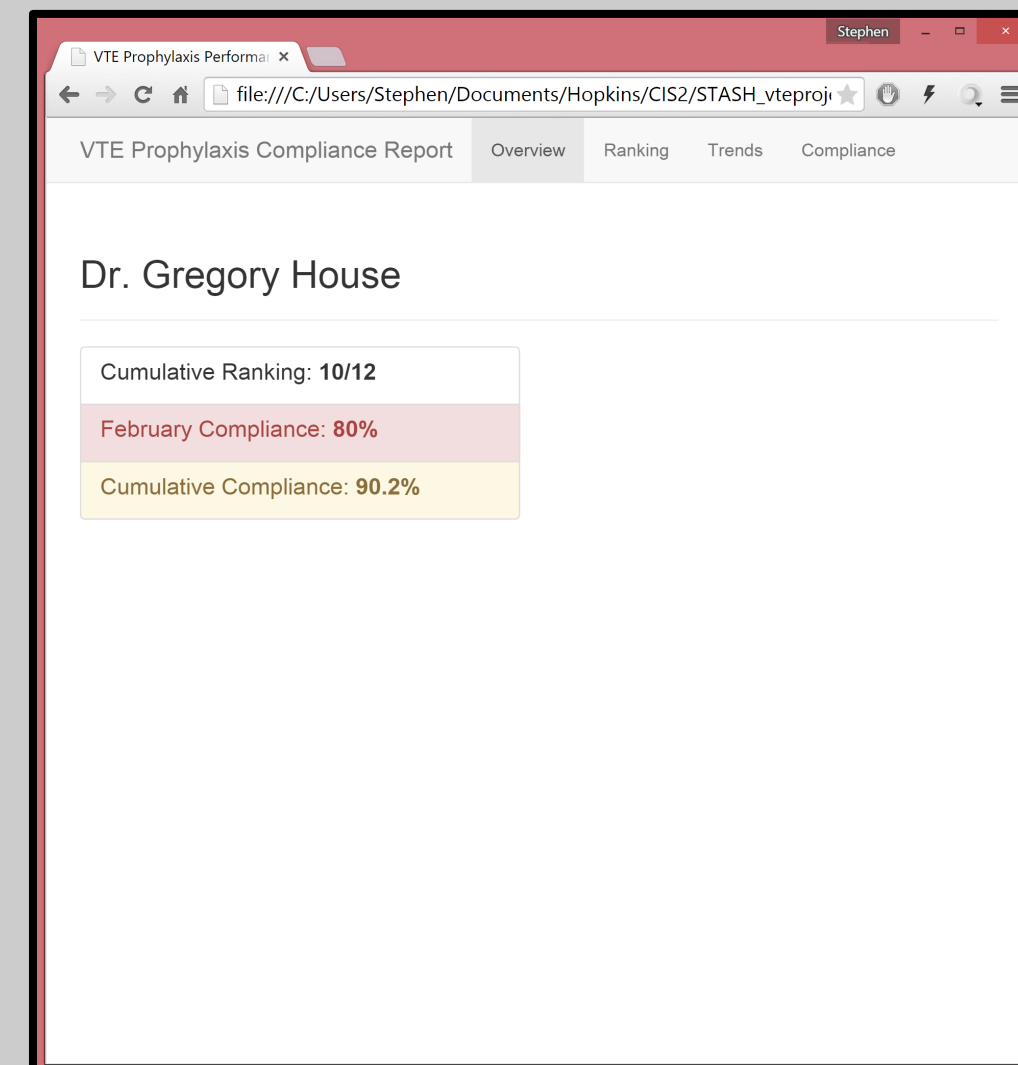


However, rates are still not optimal

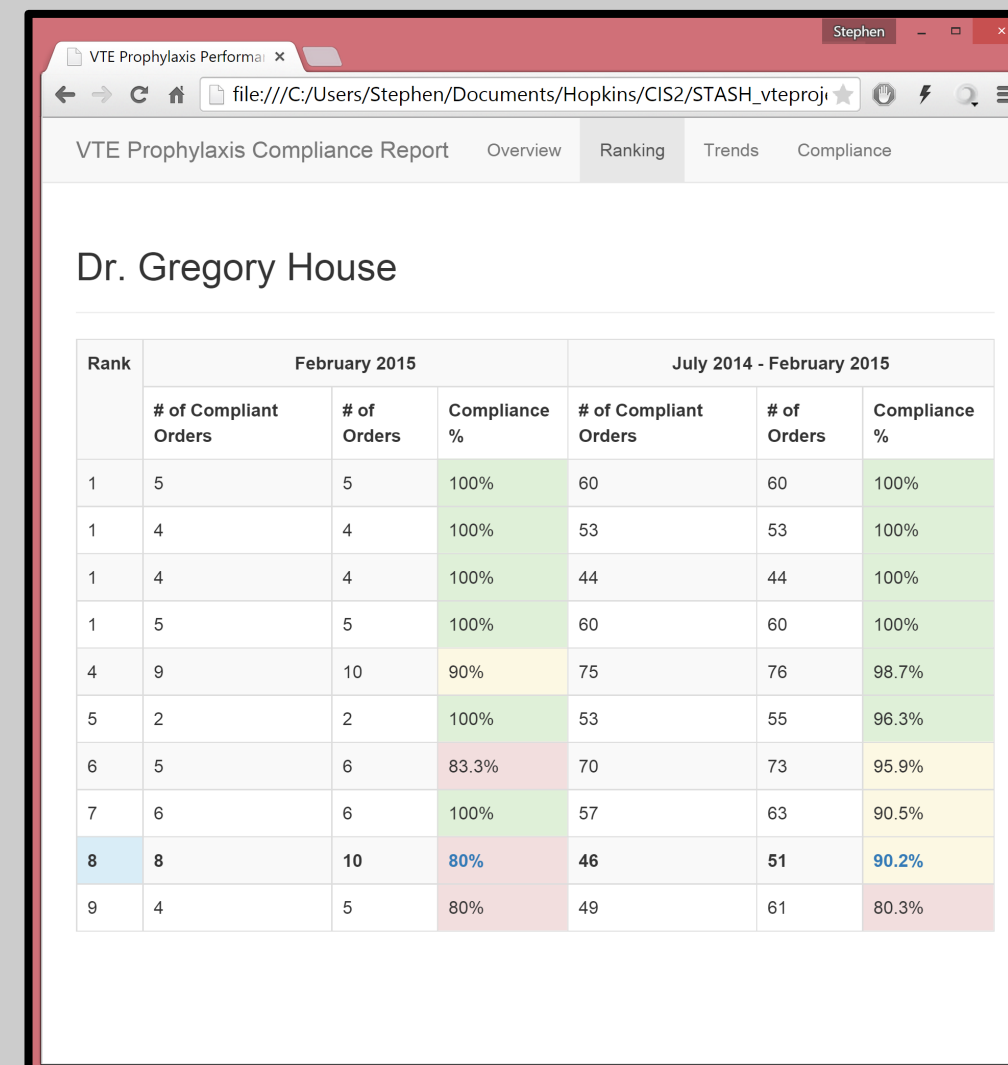
The Solution

- Develop a clinician review tool that keeps track of suggested versus prescribed prophylaxis treatment
- Rank clinician adherence to risk-appropriate prophylaxis prescription
- Provide automated continuous tracking of clinician's treatment procedures on a monthly and annual basis
- **Purpose: Improve prescribed risk-appropriate VTE prophylaxis compliance to prevent VTE onset.**

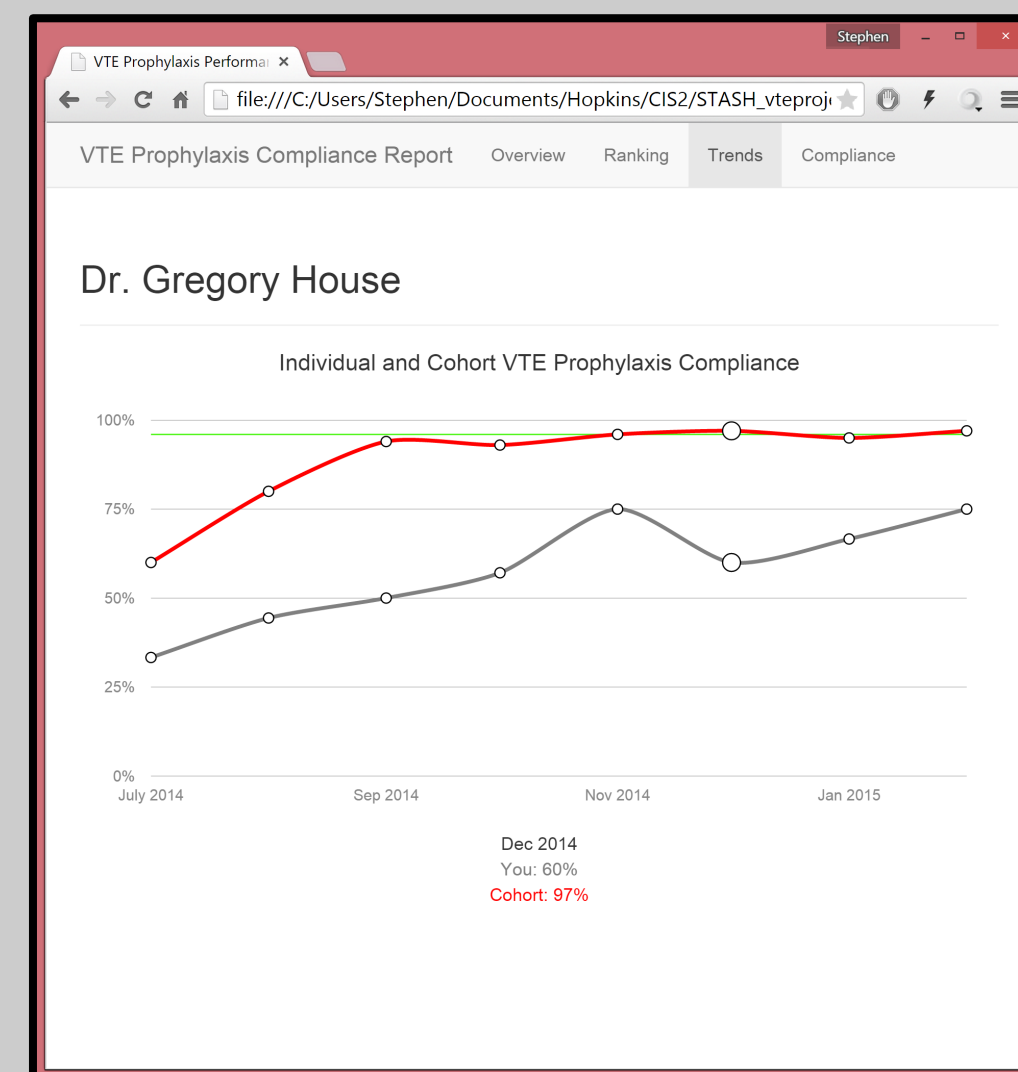
Proof of Concept



The Overview screen provides an initial summary of the Provider's performance



The Ranking screen provides an anonymous ranking of the Provider amongst their cohort



The Trends screen provides a visual comparison of the Provider's overall compliance in the recent months to the cohort's overall compliance

The Compliance screen provides in-depth feedback on each patient's visit and the result of the prophylaxis treatment (only showing cases where the patient was either OVER- or UNDER-prophylaxed)

Conclusion

We met our expected deliverable of creating a web tool that ranks clinical provider compliance and incorporates some advanced features. Our tool compares the compliance history of the provider with the overall compliance of the cohort. By tracking the recent compliance trends the tool provides tangible feedback to the provider that incentivizes them to prescribe risk-appropriate prophylaxis.

Our maximum deliverable of creating achievements for a positive reinforcement system was not reached--this was partly due to further discussion with our mentors concluding that it would be not effective.

Through this project we learned the necessary skill set for sophisticated web server development with Ruby on Rails. A major challenge we faced was fulfilling all of the developmental dependencies for Rails.

In the end, we consider our project a success in the primary goal of developing an effective Surveillance and Quality Assurance Tool.

Continued Work & Further Extensions

With a Go-Live! date set for June 1st, we have a couple more steps left before our final launch:

1. Automate VTE Prophylaxis data acquisition
2. Incorporate administrator view/account
3. Monitor Provider traffic for administrator feedback
4. Implement security via user login authentication

Credits

Stephen was in charge of the front-end application, developing in Bootstrap and managing the HTML. Vamsi was in charge of the back-end server, building the Rails platform that interfaced with the SQL database. The ultimate product was a result of our combined efforts.

Acknowledgements

Gorkem Sevinc (JHM TIC Manager), Dr. Paul Nagy (JHM TIC Director), Brandyn Lau (JHM VTE Expert), Michael Cohen (JHM TIC Senior Engineer), and Dr. Elliot Haut (JHU Surgeon & leading VTE researcher)

Publications

- Lau BD, Haider AH, Streiff MB, et al. Eliminating Health Care Disparities With Mandatory Clinical Decision Support: The Venous Thromboembolism (VTE) Example. *Med Care.* 2015;53(1):18-24.
- Streiff MB, Carolan HT, Hobson DB, et al. Lessons from the Johns Hopkins Multi-Disciplinary Venous Thromboembolism (VTE) Prevention Collaborative. *BMJ.* 2012;344:e3935.
- Office of the Surgeon General (US); National Heart, Lung, and Blood Institute (US). The Surgeon General's Call to Action to Prevent Deep Vein Thrombosis and Pulmonary Embolism. Rockville (MD): Office of the Surgeon General (US); 2008. Available from: <http://www.ncbi.nlm.nih.gov/books/NBK44178/>

