ABX Ninja

Computer Integrated Surgery II
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Introduction

- We created a web-based application to promote the safe and healthy use of antibiotics
- This application is designed to be used by healthcare providers when diagnosing patients experiencing symptoms of infection in order to standardize the prescription of antibiotics
- Standard antibiotic prescriptions that are readily accessible to healthcare providers will decrease the amount of antibiotics prescribed in the United States

The Problem

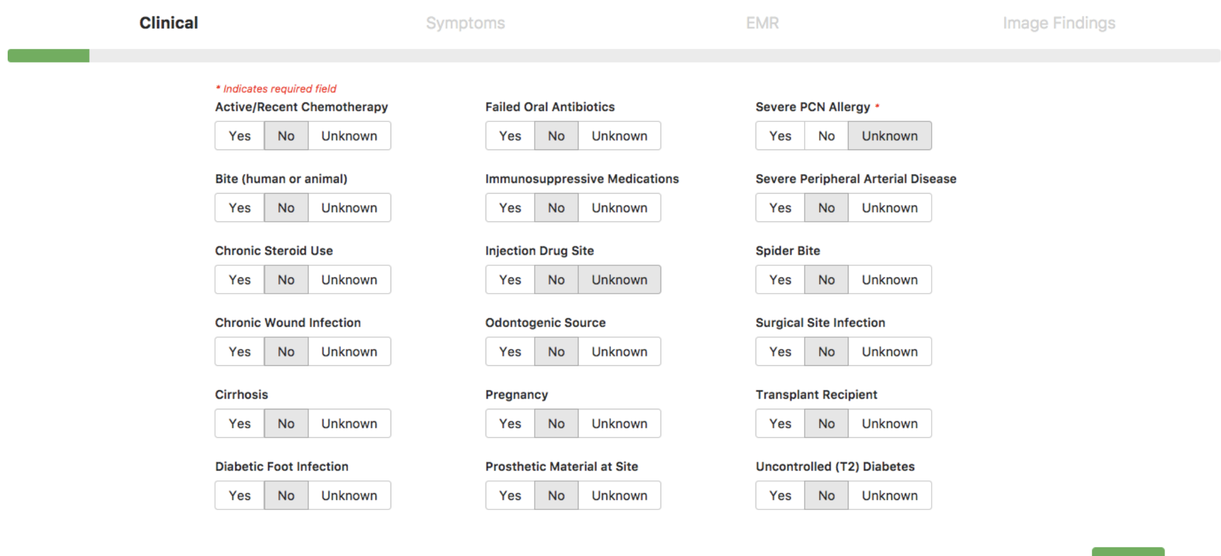
- 50% of antibiotics prescribed in the United States are unnecessary or ineffective
- Antimicrobial Stewardship Programs have attempted to mitigate the over-prescription of antibiotics through standard guidelines
- At Johns Hopkins Hospital, these guidelines are not convenient for use in the clinical setting, and there are multiple barriers to use
- To be adopted into the clinical workflow, an electronic support system is needed that provides an assessment based on the patient's symptoms and a recommendation based on the antibiotic guidelines

The Solution

- The Stack
- Users
  - Healthcare providers: Enter patient information to receive an assessment and antibiotic recommendation
  - Administrators: Edit antibiotic recommendations to hospital specifications and view usage data
  - Developers: Edit user permissions and view API documentation
- Decision Trees
  - Decision trees for each infection were developed by Dr. Jenny Townsend and derived from Johns Hopkins antibiotics guidelines and IDSA guidelines
  - Encoded into the database using a relation-mapped schema
- Determining Antibiotic Recommendation
  - Gather patient information
  - Evaluate outcome at each step in the decision tree
  - Provide assessment and recommendation

Results

- We created a minimum viable product (MVP) for testing at Johns Hopkins Bayview Medical Center
- Core Features are complete:
  - Physicians can obtain an assessment and antibiotic recommendation given patient input
  - Administrators can edit recommendations based on local antibiotic availability
  - Administrators can view application usage data to validate decision trees
  - Developers can validate trees to obtain FDA approval
- User Interface updated after feedback from project mentors and other physicians



Future Work

- Both Allie and Katie are graduating this year
- Planned work: provide additional support through graduation and coordinate with another undergraduate student who will independently continue the project

Lessons Learned

- How to prioritize functionality and features for a minimum viable product that serves its purpose and has potential for expansion
- The importance of communication!

Credits

- Allie: Decision tree encoding, backend and frontend development
- Katie: Backend and frontend development, testing

Citations

- CDC. Antibiotic Resistance Threats in the United States, 2013. Vol CS239559-B. Atlanta, GA 2013:114.

Acknowledgements

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