Ocelot: A modularized and interactive tool for visual understanding of patient state

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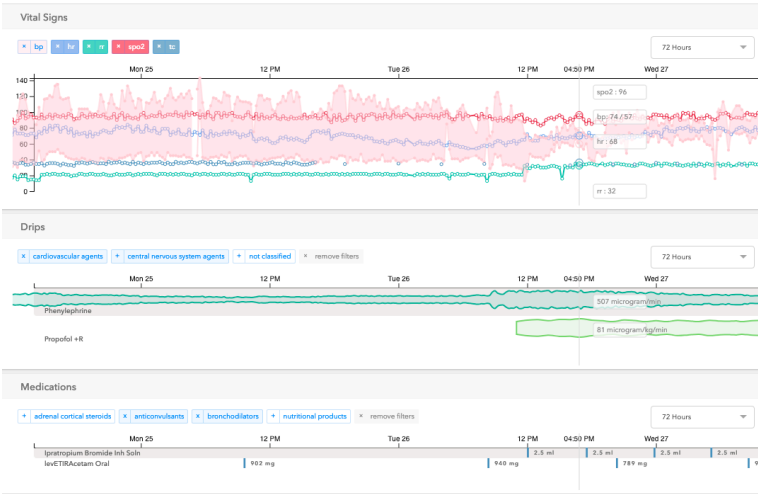
Introduction

Following principles outlined by an international working group for bedside multimodal monitoring[1] we designed a tool to display physiological and clinical data called Ocelot: Overview of Clinical ELements and Observations Timeline. Ocelot presents temporally-dependent heterogeneous physiologic variables together on one screen to help clinicians visually identify patterns, detect anomalies, and quickly draw inferences. The timeline view shows physiologic data in context with fluid status and medication administration data, including individual doses and continuous infusions.

Methods

The program is data source-agnostic and created entirely with open source tools such as the D3 JavaScript library, in order to promote portability. Ocelot development began in October 2017 and was placed into production in May 2018. There was no significant marketing campaign; users learned about the software through word-of-mouth.

Ocelot is a real-time live tool that visualizes vital signs, drips, medication, and ins & outs data (not shown) (Figure 1). The current version presents vital signs from nurse-validated flowsheet entries.



Results

In January 2019, Ocelot had 251 unique users. 60% of the users were physicians. Users viewed 425 patients and interacted with the application 1,019 times. Among the physicians, the most common user specialties were internal medicine (25%), pediatrics (20%), and surgery (10%).

Figure 1. A screenshot of the Ocelot application. The user is able to hover over the line graphs to see individual recordings, filter out particular data elements, and collapse individual data types. A 24-hour summary of all vital signs is also displayed in a separate panel (not shown).

Conclusion

In future work we will supplement the current set of displayed flowsheet metrics with vital sign data drawn directly from bedside monitors. We will also iterate on the design of the application through qualitative and quantitative user feedback. As we are logging application clicks and not just page views, we will identify which modules provide the most utility for different specialties and personalize the application based on the user. Finally, given the modular design of the application which can display data in a temporal and interactive format, we believe that Ocelot paves the way to display many types of medical record data and potentially even external data in a clinically useful manner.

References

1. Grinspan ZM, Eldar YC, Gopher D, Gottlieb A, et al. Guiding Principles for a Pediatric Neurology ICU (neuroPICU) Bedside Multimodal Monitor. Appl. Clin. Inform. 2016;7:380-398.