

## 5 keys to creating a better EHR alert

JUL 26, 2019

Staff News Writer

---

Visual design and how it can improve assessing the prognosis of a deadly condition are the starting points for a study designed to shed light on an even bigger question. Researchers are using a collection of six presentational elements to make clinical alerts in electronic health records more broadly live up to their potential for efficiency and medical effectiveness.

Sepsis was selected as the clinical condition used to create four prototype visual displays. The condition can be challenging to assess, has an estimated mortality rate of more than 25%, and costs the U.S. health system billions of dollars a year.

While electronic alerts regarding sepsis are already in use, “there are serious shortcomings in existing health information technology for alerting providers in a meaningful way,” according to the authors of “Informatics and interaction: Applying human factors principles to optimize the design of clinical decision support for sepsis,” published in the *Health Informatics Journal*.

What physicians now typically encounter is “hunting and gathering in the EHR,” said the study’s principal investigator, Kristen E. Miller, DrPH, scientific director of the MedStar Health National Center for Human Factors in Healthcare, in Washington, D.C.

The AMA has worked with MedStar and the Pew Charitable Trusts on a previous EHR optimization project. Their report, “Ways to Improve Electronic Health Record Safety,” was released in 2018. AMA and the MedStar center also have collaborated on the “Everybody Has Responsibilities” campaign. That includes a website with videos of health professionals experiencing the risks and challenges faced when EHRs can’t be used efficiently.

Learn more about the AMA’s digital health leadership activities and get involved with AMA Physician Innovation Network, an online platform for digital health innovators.”

Back on the sepsis study, Miller said that traditional alerts are typically “very binary. ... What we're looking towards is more sophisticated decision support and not pop-up alerts.”

The complexities of sepsis lend themselves to the objective of the test, but Miller envisions the design principles, once proven, being used for decision support for a variety of conditions.

The four graphical display prototypes MedStar developed are each based on one of two standard sepsis assessment tools—the Sepsis Related Organ Failure Assessment, and Predisposition, Infection, Response, Organ Failure.

## 4 prototypes, 5 design decisions

Here are the five presentation elements used for the prototypes described in the article.

**Physically organize the information by placing it into bordered blocks.** The text-containing boxes—and the background space separating them—provide the primary organizational structure for information. Patient demographic information, for example, appears in one box with clinical summary and severity information in another.

**Be consistent with visual clues.** To ensure rapid understanding, elements like typeface fonts and colors used to indicate information should be used the same way in all instances.

**Use typeface font size and “weight” to help organize and emphasize information.** How large the lettering used and its weight—the thickness of the characters—are fundamental elements to enhance understanding, for example, to emphasize salient information. Fonts should also be selected based on readability.

**Apply color to the boxes used to organize the information.** A select list of easy to distinguish, contrasting colors used within boxes and in a consistent manner—for example, the researchers used dark red to indicate alarm—aids in clarity and understanding of an alert.

**Consider use of three-dimensional effects.** One of the uses to accommodate the needs of users who are color blind.

Usability evaluation testing by 100 physicians and 100 nurses is now being completed. Analysis, including eye-tracking data, will focus on factors such as preference, performance and usability.

The goal of Miller and her fellow researchers on the project is to “make it easier for clinicians to do their jobs,” she said. “We're trying to figure out the best way to do that without completely

overwhelming them with an avalanche of data.”