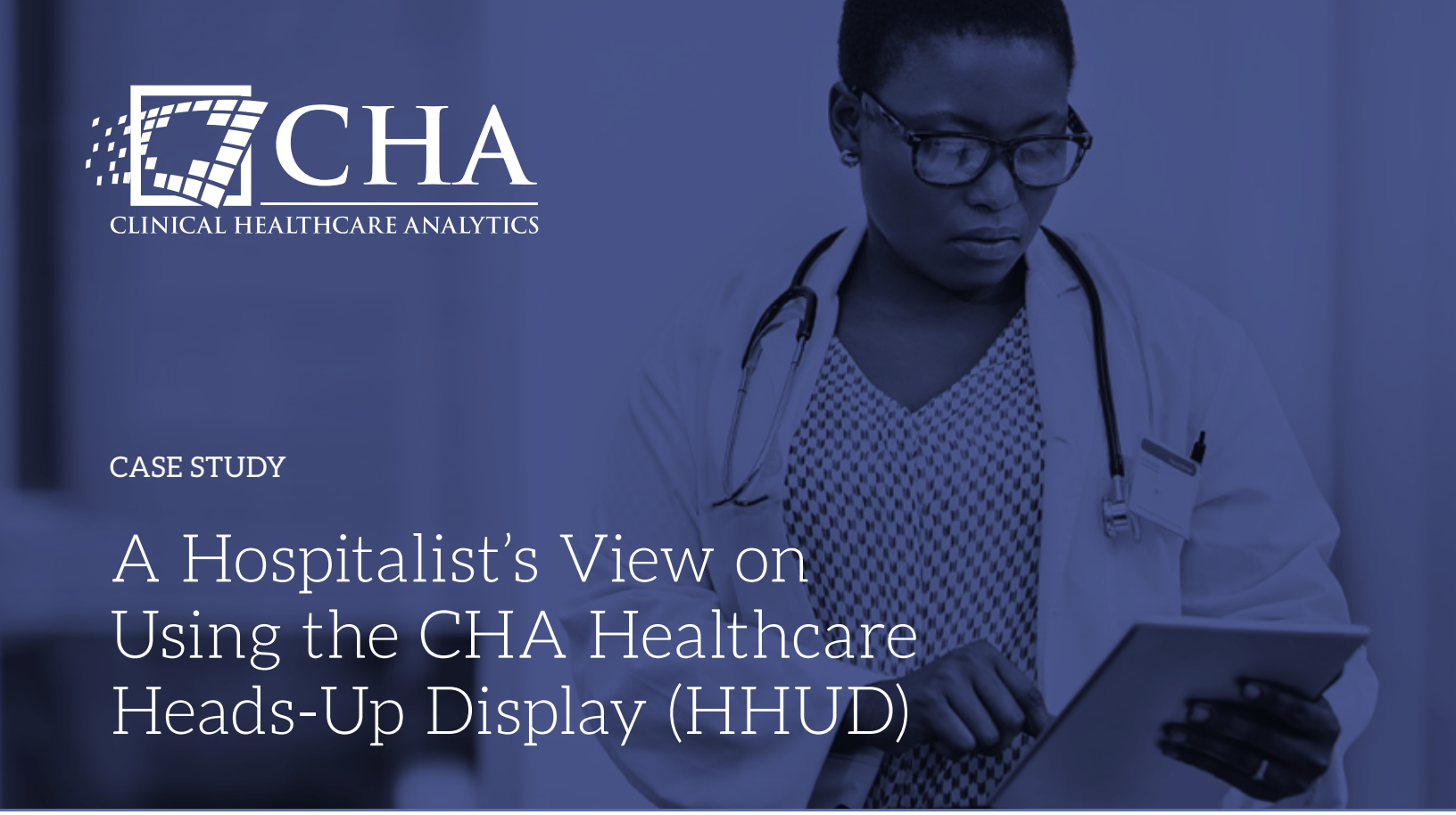

CLINICAL HEALTHCARE ANALYTICS

CASE STUDY

A Hospitalist's View on Using the CHA Healthcare Heads-Up Display (HHUD)

THE CHALLENGE

The value of well-implemented modern-day Electronic Health Record systems (EHRs) cannot be overstated. As medicine continues to advance, the delivery of healthcare becomes more complex, with overwhelming demand for information review, and adherence with guidelines and protocols. Electronic Health Record systems excel at collecting, storing and retrieving information for such tasks. However, presenting all that complex information in an intelligent and user-friendly way, as actionable knowledge, is another matter, in which EHRs do not excel.

> "EHR implementation... [has contributed] to dissatisfaction and burnout among healthcare providers. Physicians now spend more time entering data or attempting to review information concerning their patients.
>
> — Physician at a Medium-sized Hospital

The many stakeholders in healthcare all have different information needs but are mostly served by one system. Furthermore, the same stakeholder may require different views of different EHR data elements, depending on the task at hand. For example, a hospitalist is likely to require a view of his patient list that clearly highlights abnormal recent results, improving/worsening trends, at-risk factors, and pending orders and tasks, while a case manager may need to see a list of discharge statuses, late and at-risk planned discharges and their causes, and tasks to complete for pending discharges.

The accelerated adoption of EHRs over the last 15 years was promoted as a driver for improved care. While only partially meeting such expectations, EHR implementation resulted in major changes to work habits and contribute to dissatisfaction and burnout among healthcare providers. Physicians now spend more time entering data or attempting to review information concerning their patients.

THE SOLUTION

EHR developers recognized some of the deficiencies of their products and responded by offering dedicated screens or default "landing pages" that offer somewhat centralized access to

most of the information needs and, at times, can be customized to the specific user type. However, EHR developers who are preoccupied with meeting the regulatory requirements for certification and innovative revamping of the user interface lags behind.

Even when dedicated solutions exist within an EHR they usually do not cover order entry functionality and, oftentimes, users still have to navigate outside the landing page in order to review all pertinent information, losing focus and usability. Certain EHR vendors, usually large-scale enterprise and integrated networks solutions, offer real-time "hooks" into their system and integration capabilities that enable third-party developers to create significantly better tailored and user-friendly functionality without leaving the EHR environment. One of the few vendors to offer such functionality is Clinical Healthcare Analytics (CHA), a company with a unique skill set regarding Cerner EHR implementations and with deep understanding of the EHR's infrastructure as well as the EHR users' information needs. CHA capitalizes on some of the real-time, open architecture features that Cerner offers. As a result, CHA developed unique embedded pages, seamlessly integrated within Cerner's EHR, that provide focused functionality that improves the user's experience and productivity. The solution reduces time spent in the EHR towards time spent caring for patients with better knowledge. Two of CHA's embedded applications are the HHUD and RADAR.

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HHUD

HHUD stands for Healthcare Heads-Up Display. Seamlessly incorporated into Cerner, optionally as the default landing page, it integrates real-time information from a multitude of sources: physician and nursing documentation, results and orders, monitoring and alert systems, pharmacy and many other additional sources. HHUD is designed to perform three essential functions:

1. Offer a single comprehensive, yet easily legible, view of contextually pertinent patient information.
2. Perform real-time analytics in line with established protocols that highlights existing or emerging issues that require attention.
3. Offer actionable, guideline- and protocol-based, context-specific interventions.

INFORMATION DISPLAY (Fig. 1)

Using a combination of textual and iconographic features, utilizing easily recognizable schemes, a pre-analyzed, clean and non-overwhelming display is presented to the user, usually a hospitalist. Trends of essential labs and vitals are presented by default and abnormal results are highlighted. Pertinent summary of history and present illness, access to clinical notes, inpatient and home medication list, at-risk factors related to clinical protocols and patient discharge status are all accessible for further investigation by simple mouse click or hover actions from the same page, without ever needing to navigate to the other tabs or pages of the EHR.

REAL-TIME ANALYTICS (Fig. 2)

Well recognized and validated clinical protocols, such as acute kidney injury (AKIN), sepsis and alcohol withdrawal, are embedded in the HHUD. Discharge and throughput protocols for discharge readiness, readmission risk and level of care discrepancies are integrated as well. Any activated protocol is highlighted on the patient's HHUD page in an easily discernible but non-intrusive way. Additional protocols can be added and each protocol can be adjusted to the specific implementation requirements.

ACTIONABLE INTERVENTIONS (Fig.2, Fig. 3)

Each protocol, clinical or administrative, is accompanied by optional actions: custom order sets for clinical interventions, follow-up lab and imaging order sets, as well as consult requests. In anticipation of discharge or risk of readmission, HHUD evaluates the patient's disposition and presents additional interventions and tasks to mitigate the risk. General order entry and note taking, independent of protocols, is easily available as well.

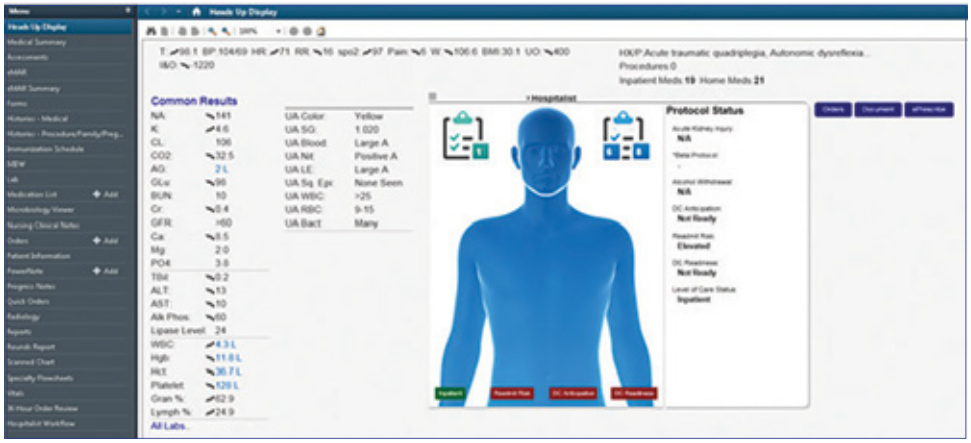

Figure 1 - Easy to use, high level information within workflow

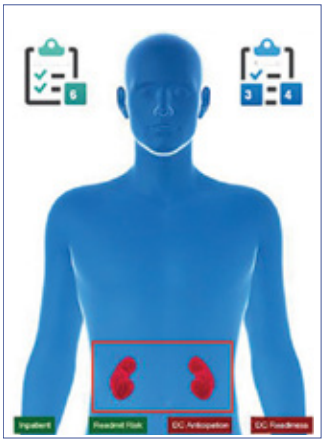

Figure 2 - Actionable

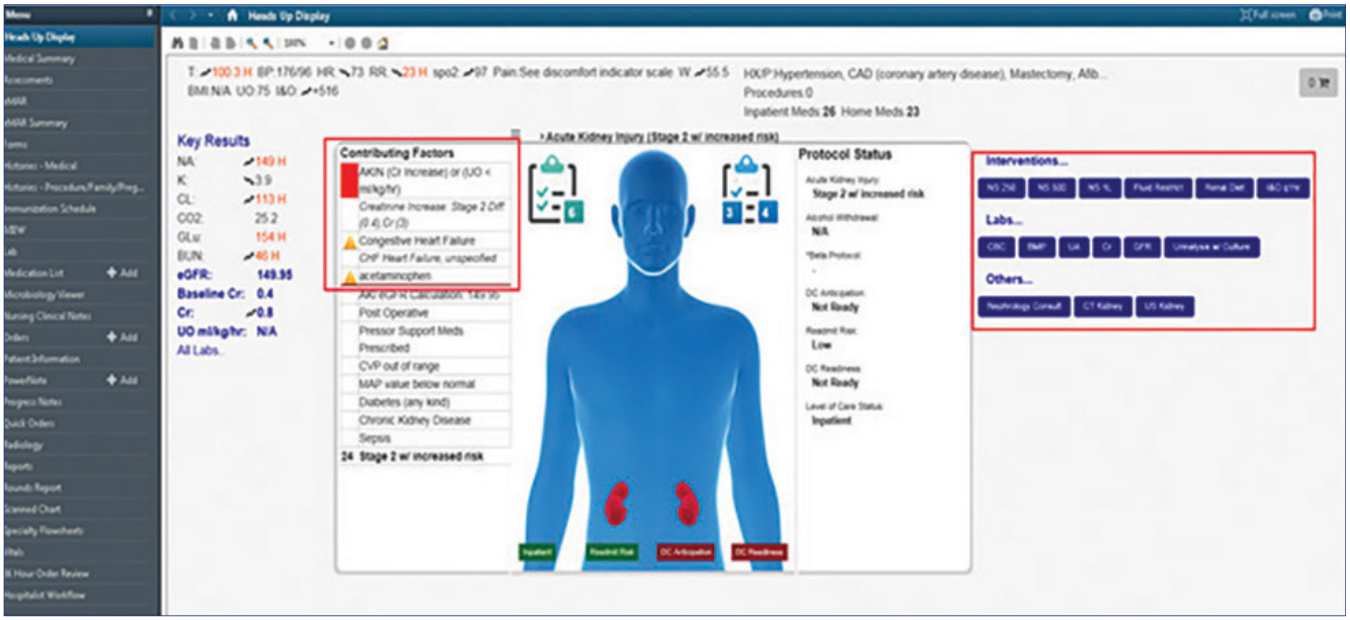

Figure 3

RADAR

RADAR is a Real-time Aid in Detecting At Risk patients (Fig. 4). Based, on the same infrastructure and capabilities of the HHUD, and integrated in a similar manner into the Cerner system, it offers a different view of the patients' status, readmit and discharge anticipation disposition and complicating factors in a centralized manner for physicians and case managers. As with HHUD, RADAR is an actionable view that allows the healthcare personnel to communicate with the rest of the care team in order to mitigate complicating factors and possible delays, and facilitate timely discharge at reduced risk. All information can be drilled-down, including readmission risk protocols (using LACE criteria: LOS, Acuity of admission, Co-morbidities, ED visits), directly from RADAR, to provide healthcare personnel with evidence-based contextual information. RADAR can be customized per facility and can also accommodate capture of at-risk revenue or lost revenue potential.

The HHUD and RADAR are complementary with each other. To facilitate optimal care and timely discharges, physicians, case managers and nurses can use RADAR to efficiently prioritize, at the beginning of their shifts, their rounding schedules based on a quick view of their patients list and highlighted emerging issues or discharge needs in RADAR. For patients requiring prioritized attention the providers can immediately switch and review an individual patient's information in the HHUD, all from within the EHR. When a care team collaborates on a patient, case managers may use RADAR as their default app and communicate directly from it with the provider, and other care team members.

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All this functionality is provided from within the EHR in an intuitive and non-disruptive data representation that minimizes mouse clicks and the need to open additional screens. Overall, the use of the HHUD and RADAR reduces the time healthcare personnel spends reviewing information in the EHR, time that now can be spent providing care to their patients.

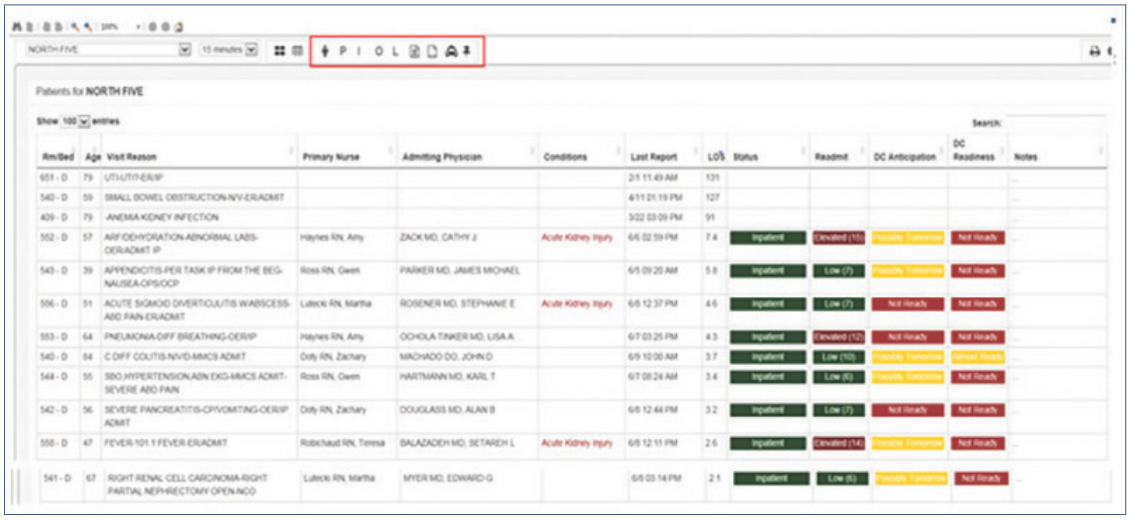

Figure 4 - Actionable

A Hospitalist's View of Using the HHUD

Dr. Ryan Boutin is a veteran Hospitalist that practices at a medium-sized hospital in the northeast. Dr. Boutin has been a power user and champion of the HHUD for over three years. The HHUD has been fully integrated with the hospital's Cerner *PowerChart*®, along with RADAR. As a hospitalist he appreciates the fact that when he starts his day and logs into *PowerChart* he lands on the HHUD landing page, where he can start working immediately.

Almost all of his patients' information he reviews on a daily basis is directly accessible from the HHUD. This is a functionality that is not currently available to Dr. Boutin in *PowerChart*. "I cannot review progress notes, Case Management Notes, H&Ps, etc. from Cerner's Medical Summary page" says Dr. Boutin, "the current Medical Summary page lacks many dynamic features that I can find on the HHUD."

"One of the major disadvantages of *PowerChart*'s current functionality is that you are jumping from screen to screen in order to simply review patient data in the AM prior to formal rounding." The HHUD enables Dr. Boutin to review patient data such as labs, vitals, progress notes, H&Ps, Discharge Summaries, specialty consults and Ancillary Consults such as PT, OT all from one screen. Selected documentation such as a progress note will open in a new window within the HHUD, rather than sending the user to another part of the chart. "I have found that the HHUD drastically reduces my number of clicks as well as limiting the visual disruption of bouncing from screen to screen" says Dr. Boutin.

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The HHUD creative use of dynamic iconography and display browser functionality contributes to its clean design and straight-forward presentation of complex information that otherwise would have been overwhelming and distracting. "One of my favorite features is the ability to hover over patient data and without any clicks, obtain a numerical

Time-Savings you can measure. Physician satisfaction you can feel.

In a recent study, conducted by Cerner and cited by Healio, the following metrics were observed:

- Across all specialties, physicians spend an average of 16 minutes per patient encounter using EHRs
- One-third of that time was dedicated to chart review, while documentation and ordering consumed 24 percent and 17 percent of the average 16-minute periods, respectively
- Primary care physicians were found to use EHRs the longest: nearly 20 minutes per patient encounter

*Note: The study did not examine the quality of time spent in the EHR. Further investigation is necessary to understand how much time is spent on unnecessary tasks, the impact of that time on the ongoing physician burnout crisis and ways in which scribes, assistants and administrators could alleviate some of the burden.

Significantly, company-tracked metrics demonstrate that **the CHA solution reduced the physician time spent in EHR charting by 20% in just six months** at one medium-sized facility in the Northeast US.

and graphical representation of the trend of this data. For example, I can simply hover over a patient's current temperature and immediately obtain a graphical representation of the trend of temperatures over the past several days."

Unlike many clinical alert systems that result in alert fatigue, Dr. Boutin's hospital implemented the early warning system for Acute Kidney Injury, sepsis and alcohol withdrawal available with the HHUD. When a patient is at risk for one of the conditions, Dr. Boutin is presented with a non-interruptive but "very obvious" warning on the HHUD, "which is quite helpful in highlighting those patients at risk for developing these conditions." All of the hospital's robust list of pathways and order sets within *PowerChart* can be accessed and ordered from the HHUD.

The HHUD "also makes recommendations for interventions such as IV fluid administration for Acute Kidney Injury which is quite helpful." In Dr. Boutin's hospital, RADAR is primarily used by case managers and as the primary tool for managing their patients. As a result, Dr. Boutin is affected by the use of RADAR on a daily basis, if not as a user. The RADAR has become a vital component of the case managers' daily workflow, and they have become dependent on it. Often, when discussing a patient with a case manager they will say "hold on, let me pull up the dashboard" (aka RADAR) according to Dr. Boutin. "The beauty of these two systems is that they are directly integrated into the EMR" says Dr. Boutin, "I have found this to be an invaluable part of my daily rounding and an exceptional tool." As a satisfied power user, Dr. Boutin also developed some innovative uses for the HHUD. One such example relies on the HHUD ability to graph results and display trends. Dr. Boutin uses the HHUD directly with patients, their caregivers and their families "to demonstrate trending hemoglobins, white blood cell counts, etc." This is "an unintended but quite useful tool for explaining the patient clinical improvement" he says.

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Overall, "Having all of this functionality on a single screen and at my fingertips has dramatically reduced my time spent within the chart, affording me more face-to-face time with my patients," continues Dr. Boutin. Together, both the HHUD and RADAR enable Dr. Boutin to spend more "time for what I enjoy the most, sitting and speaking with patients and their loved ones."

Learn more about the CHA HHUD at ClinicalHA.com.

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