**Introduction**

NCH Healthcare is an alliance of more than 500 independent physicians and medical facilities throughout Collier County and southwest Florida. The two Naples, Fla., hospitals, NCH Downtown Naples Hospital and NCH North Naples Hospital, provide personalized care for over 30,000 patients each year. NCH Healthcare is consistently ranked as a top organization in many specialties by independent rating organizations, and was recently recognized by U.S. News and World Report as the Best Regional Hospital in four specialties.

**Implementation Overview**

In April 2012, NCH’s North Naples Hospital began using Cerner’s CareAware VitalsLink™ to provide electronic transmission of vital sign data into the electronic health record (EHR) from the point of care. The solution enables clinicians to take and chart patient vital signs at the bedside using a mobile vitals collection device, eliminating the need for manual transcription. “We’ve had the ability in the critical care arena to have the vital signs automatically downloaded,” says Michele Thoman, Chief Nursing Office for NCH. “But to be able to do it in a Med-Surg environment is unique.”

Clinicians at NCH simply associate the patient to the device through barcode scanning, take the patient’s vitals, view the results and electronically sign them into the EHR via a touch-screen display. This simplified workflow removes the need for manual transcription and also greatly reduces any latency in time between when vitals are taken and when they are documented into the EHR. “It’s as though it’s an extension of PowerChart® right there on the screen,” explains Thoman.

**Workflow Analysis**

In order to evaluate the impact of the CareAware VitalsLink technology on clinical workflows at NCH, data was collected before and after the project go-live. On the units observed at North Naples Hospital, patient vital signs are taken every 4 or 8 hours, depending on patient acuity. The nurses on the floors take patient vital signs at the beginning of the shift as part of the morning rounds. Following the morning vitals rounds, patient care technicians complete the mid-day and afternoon rounds.

**Pre-Implementation**

Prior to implementing CareAware VitalsLink, the majority of nurses and care technicians at NCH were taking patient vital signs at the bedside...
using mobile vitals equipment, recording the vital sign data on paper, and moving to the next patient room to complete the same process again. Once the vital signs for all patients under that clinician’s care were taken, the nurse or patient care technician would enter all the data into the EHR from a computer workstation. This manual transcription workflow subjected NCH clinicians to an inefficient process of duplicating documentation for each patient.

Across the units observed, nurses and patient care technicians spent an average of 1 minute and 42 seconds documenting vital signs. For nurses with the typical five patients, this was an average of over eight minutes spent solely on documenting patient vital sign data for one vitals round. The inefficiencies extrapolated with the patient care technicians, who were required to complete vital sign assessments for a larger volume of patients in a single round. In one observation onsite, a patient care technician was subjected to over 22 minutes of vital sign documentation for the 11 patients under her care.

Conceivably more important than the documentation inefficiencies was the significant gap in time between when patient vital signs were taken and when they were actually charted into the EHR. The majority of nurses and patient care technicians at NCH completed vitals assessments for all patients under their care prior to documenting in the EHR. Additionally, clinicians would often fulfill patient requests after taking vitals, further delaying the actual charting of the data. When the clinicians were ready to batch chart all the vital sign data into the EHR, a significant gap in time had elapsed. This latency created a knowledge gap for providers making care decisions based on clinical data.

In the observation previously mentioned, the patient care technician waited until all the vital sign data had been taken for all 11 patients under her care before documenting. For those 11 vitals sessions, the average gap in time between when vital signs were taken and when they were charted was over 75 minutes, with the first set of patient vitals data charted 95 minutes after it was originally captured. For all of the clinical observations witnessed, there was a 46 minute average gap in time between vital sign capture and charting into the EHR.

**Post-Implementation**

After the implementation of CareAware VitalsLink at NCH, nurses and patient care technicians are now using the integrated technology to take and chart patient vital signs at the bedside. Workflows are optimized as the clinicians are no longer required to complete manual documentation into the EHR. Patient safety and data integrity has also improved, as vital sign data is charted into the EHR immediately after being taken, virtually eliminating data latency.

Since conversion, nurses and patient care technicians are now spending an average of only 18 seconds per patient on vital sign documentation (defined as the time spent making modifications and pressing “Save” on the face of the vital sign device). Additionally, the latency gap in time between when vital signs are taken and when they are charted in the EHR is now averaging only 27 seconds per vitals session.

**Benefits Analysis**

The average time spent documenting patient vital signs for nurses and patient care technicians at NCH has been reduced from an average of 1 minute and 42 seconds to an average of 18 seconds. This equates to a time savings of 1 minute and 24 seconds per vitals session, and represents an 82 percent efficiency...
Benefits Achieved:
- 14 minutes saved per clinician per vitals round
- 82% efficiency gain in charting patient vitals
- 99% improvement in data latency

In addition to the efficiency gains realized with CareAware VitalsLink, the solution has also enabled clinicians to have access to the most correct and up-to-date patient information, improving care decisions. Thoman explains, “No longer are vital signs written on paper towels or on the pant leg of [nurses’] scrubs, but automatically transcribed directly into PowerChart, which gives that much more power to the clinicians at the bedside to see real-time data. That certainly was a win for us.”

Looking Forward
NCH Healthcare System in Naples, Fla. is using Cerner’s CareAware VitalsLink to optimize patient vital sign capture and documentation in a non-ICU setting. The solution provides electronic transmission of vital sign data into the EHR in real-time, eliminating the need for manual documentation. The implementation of CareAware VitalsLink was the first phase in the multi-solution Cerner Smart Room™ project at NCH. The CareAware® platform has been leveraged to implement other workflow-enabling solutions native to the architecture, providing true system interoperability and enabling the best possible patient outcomes.