Interfacing of Vital Signs Monitoring with the Electronic Medical Record

For over a year, a multi-disciplinary system-wide team has been meeting regarding the issue of medical device connectivity. Medical device connectivity in part refers to the integration of medical devices with the electronic medical record (EMR), taking physiologic data measured by the devices and electronically placing it into the record without having to be read by a caregiver, written on a piece of paper, then entered manually at a keyboard.

The team consisted of representatives from The Patient Care Division, Information Services, Clinical Engineering, and Materiel Management. The team discussed several medical device connectivity issues such as automatic communication of data from devices to the caregivers at the point of care, interfacing of various instruments with the EMR and requisite workflows, use of proprietary interfaces versus multi-vendor third-party interfaces. The team also listened to numerous presentations from many vendors regarding their products which in some way could support medical device connectivity. A consensus was reached to interface vital signs monitors (VSMs) with the EMR as the first project for monitoring medical device interfacing with the EMR.

VSMs measure some basic physiologic parameters such as heart rate, temperature, $SpO_2$, and NIBP, or “the vitals.” They are used throughout the health system in various settings, but one of the primary uses is in the general med/surg areas. The medical equipment inventory has approximately 170 existing devices listed. The average life of a unit is about 7 years. The workflow for use in med/surg areas is very similar from one unit to another compared with other monitoring processes and is relatively straightforward. Therefore, this application lends itself well to the first interfacing of monitoring with the EMR. It is sometimes called “spot monitoring” of the vitals as it provides a snapshot of these parameters as opposed to continuous monitoring. The team further came to a consensus of using a proprietary solution for the interface, being Welch Allyn.

The advantages of the Welch Allyn Connex® Vitals Management system includes the following:

- A solution that requires no additional hardware at the point of care.
- A superior method of ensuring that the data associated with a particular patient is the data being stored in the EMR (ADT interface and bar code scanning).
- Utilizes good authentication and encryption methods for protection of ePHI, WPA2/AES PSK.
- Operates on our existing wireless network.
- Caches data during network downtime for later transmission, so may be used normally during network downtime.
- Fits within the existing workflow of spot vital signs monitoring.
- Received the highest rating of all Vital Signs Monitoring Connectivity Systems evaluated by a highly credible organization.
Additionally, the Connex® Vital Signs Monitor (Connex VSM), was evaluated and rated very highly by Patient Care and Clinical Engineering staff members. It utilizes a touchscreen, is configurable to manually enter additional data, such as height and weight. Comes with built-in wireless capability, and barcode scanners, utilizes either Nellcor® or Masimo® pulse oximetry technology and sensors. The benefits of interfacing spot vitals to the EMR include:

- Improves accuracy of patient data. It replaces the current process (making rounds, measuring the vitals, jotting down values and room numbers, and then later manually entering data into the patient record) with a process where data is measured, validated and sent directly to the patient record at the point of care.

- Improves care giver efficiency by virtue of the same change of process. Data are validated and sent with the press of a button at the point of care.

- Improves the timeliness of data availability in the patient record. Data are sent immediately at the point of care rather than collected until the care giver (sometimes at the end of the shift) enters the data. This will prevent the scenario of physicians looking for data in the record which has been taken, but not yet recorded.

- Can help DCH qualify for HITECH incentives. To demonstrate meaningful use hospitals are required to record and chart changes in vital signs such as height, weight, and blood pressure in the EMR. Stage 3 of Meaningful Use will require medical device connectivity.