

Inpatient Electronic Health Record Optimization and Standardization

Introduction

The Military Health System selected Essentris® to be the enterprise Inpatient Electronic Health Record (EHR) Solution in March 2009. At the time, the Emergency Department (ED) at Naval Medical Center San Diego (NMCS D) had additional needs that were not met by the existing Essentris ED notes. To address the deficiencies, NMCS D considered remaining a paper-based system, acquiring a best-of-breed ED system, or reconfiguring the Essentris ED module by working with the vendor. The decision was eventually made to reconfigure the Essentris ED module using a multi-phased approach.

The reconfigured Essentris ED module (ED module) is now an integrated software solution that helps clinical users work more efficiently while also delivering better patient care. The module seamlessly provides information from the military's legacy Composite Health Care System (CHCS) electronic health record (EHR) connecting it to the inpatient EHR. The ED module was configured within Essentris and gives providers their patient's key information when patients check into the emergency department.

With a team that has grown to over 250 multi-disciplinary members, the ED Module has been deployed successfully to five Tri Service Military Treatment Facilities (MTF). With an initial investment of just under 300k, the Military Health System has seen a savings of over \$2.5 million in dictation deductions alone in approximately 3 years at NMCS D. The program has also improved Navy Medicine's ability to capture RVUs resulting in an increased annual recovery of over \$127k at one facility alone. The project has also allowed Navy MTF's to save 9 full time equivalents in manpower by leveraging technology to enhance workflow efficiencies.

The ED module was a key in improving the way our service members' health care is documented in the emergency department and its flow, as necessary, into the inpatient encounter. Recognizing the success of the ED Module, the Navy Deputy Surgeon General (DSG) chartered the Essentris Optimization Team in April 2011 to address deployment issues and standardization opportunities. Together, members of the Navy, Army and Air Force are now collaborating in clinically-driven, multi-disciplinary Content Advisory Groups (CAGs) to build a standardized EHR solution for the Enterprise.

Methods

The project team followed a cutting-edge software development methodology called Agile Software Design. Using Agile, incremental improvements are made to the software in smaller, faster, and more manageable projects called, "sprints." To date, 25 sprints have been completed by the ED team with additional sprints mapped to deliver enhancements to further aid our staff and patients.

The ED module's phase 1 established patient registration as the foundation followed by phase 2 which automated chart creation and population with patient data. During this phase 2, an interface called "ICE" was developed. ICE, the (I) Interface between the (C) Composite Health Care System and (E) Essentris, has been critical in populating key patient clinical and administrative data from CHCS into Essentris. During Phase 3 nursing notes, flowsheets, tracking boards, workflows and integrated dashboards were developed and implemented to

address nursing staff documentation needs. Phase 4 saw provider documentation integrated. Later sprints introduced a new engine called the Melder, which pre-populated new emergency department encounters for returning patients with significant patient information from prior encounters. Aftercare patient instructions and Computerized Provider Order Entry have also been implemented as well as enhancements for coding and billing requirements, and dashboards and reporting functions that track data including real-time reporting on our wounded, ill and injured patients who come to the emergency department.

Results

By activating the ED module and its interfaces, hospital-based caregivers now have access to the critical information they need at the point-of-care when time is of the essence. Prior to the development of ED module, staff had to re-enter all the patient demographic, allergy, medication, visit information, etc. (e.g. marital status, sex, date of birth, address) into the EHR even though it was already available in CHCS. This was a huge productivity and data quality issue for the emergency department. However, information is now automatically transferred to the EHR from CHCS and AHLTA and can be instantly viewed by providers. This helps improved patient safety by giving providers a much more comprehensive picture of the patient while eliminating the potential errors associated with manually re-keying information.

To quantify the impact of the ED module's implementation at NMCS D, Institutional Review Board studies were conducted. Despite year-over-year patient volume increases, it was found that there was:

- Approximately 30% productivity increase for clerical and clinical staff allowing for workload redistribution
 - -3.5 FTEs (-28%) Clerks: JAN08 vs. JAN11
 - -5.4 FTEs (-31%) Corpsmen : JAN08 vs. JAN11
- Improved workload (RVU) capture
 - +1% NMCS D: FY07 vs FY11
 - +6% NHB: OCT09-JUN10 vs JUN10-DEC10

Finally, by virtually eliminating the use of transcription, the NMCS D ED has also realized approximately \$2.5 million in saving in less than 3 years--approximately 905% ROI.

Conclusion

The ED module not only realized significant operational efficiencies, it is being replicated and expanded to standardize and bring improved workflow to the rest of the MHS. ED module is currently deployed at Navy Medical Center San Diego, Madigan Army Medical Center, David Grant Medical Center, Naval Hospital Bremerton, and Wright-Patterson Medical Center. Ultimately it will be deployed at all 50 MTF's with ED's.

The ED community has been able to leverage technology and the agile development methodology to create and implement best practice based tools and within a Tri Service

standardized module in Essentris. The ED effort provided proof of concept that this methodology was viable and has subsequently been tapped to provide the blueprint for building further standardized modules across other clinical specialties including, e.g. medical/surgical wards, perinatal, perioperative, patient admin, and ancillary services. Since the Essentris Optimization Team was chartered in April 2011, the project has grown to include over 382 members (146 Navy, 106 Army, 88 AF) from the various clinical disciplines and specialties. Over the course of the past 7 months, these teams have:

- Created the change management infrastructure critical to address the rapidly changing healthcare landscape of our \$50B enterprise;
- Implemented Enhanced Computerized Physician Order Entry (CPOE) in the ED at NMCS D;
- Launched the standardized perinatal module at Naval Hospital Bremerton and Michael O'Callaghan Federal Hospital at Nellis Air Force Base;
- Created a laboratory module to address patient safety considerations and increase clinical usability; and
- Implemented new standardized Chaplain Care documentation at Dwight D Eisenhower Army Medical Center and Walter Reed National Military Medical Center.

The ED Project has served as the foundational model that is currently being replicated to standardize and optimize our inpatient healthcare in this unprecedented endeavor to gain cost efficiencies while simultaneously improving the healthcare we deliver to our warriors and beneficiaries across the globe.