Brief Report

An Electronic Medical Record Report Improves Identification of Hospitalized Patients With Heart Failure

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ABSTRACT

Background: Early identification of inpatients with heart failure (HF) may help to reduce readmissions. We found that many patients identified by our coding team as having a primary diagnosis of HF were not identified by our clinical team. We hypothesized that an electronic medical record (EMR)–based report would improve identification of hospitalized patients eventually diagnosed with HF.

Methods and Results: We constructed an automated EMR-based tool to allow our team to identify patients with HF more quickly and accurately. We selected criteria that could potentially identify the cohort as patients with an exacerbation of HF. We performed monthly reconciliations, comparing the list of patients identified by our coding team as having a primary diagnosis of HF versus the patients identified by our team as having HF. We reduced a baseline 17% discrepancy of patients coded as HF but not identified by our team to 9.5% in the year after implementation of our screening tool ($P = .006$), and to 5.4% in the next year ($P = .03$); 56% of patients that were identified as having HF by our CNS team were coded as having HF, versus 49% in the 2 years after implementation ($P = .15$). Thirty-day readmission rates to our hospital decreased from 16% to 11% ($P = .029$).

Conclusions: An EMR-based approach significantly improved identification of patients discharged with a primary diagnosis of HF. Future investigations should determine whether early identification of inpatients with HF can independently lower readmissions, and whether this strategy can successfully identify outpatients with HF. (*J Cardiac Fail 2016;22:402–405*)

Key Words: Electronic medical record, heart failure, cohort identification.

Heart failure (HF) is the leading cause of hospitalization among adults ≤65 years of age, with high readmission rates occurring within 30 days of discharge.[1] The Center for Medicare Services (CMS) instituted a financial penalty for hospitals with higher-than-expected readmission rates for patients discharged with a primary diagnosis of HF.[2] Our center undertook a multidisciplinary quality improvement project to reduce HF readmissions in 2011.

Early identification of inpatients with HF may help to reduce readmissions, because many interventions geared toward reducing HF readmissions are either performed or scheduled during or shortly after a patient's admission. Interventions aimed at reducing readmissions include early post-discharge telephone follow-up,[3] medication reconciliation, early post-discharge clinic follow-up,[4] and patient education with the use of teach-back. Patients are definitively identified as having a principal diagnosis of HF on discharge by our coding team only after discharge, and this process can take up to 7 days, effectively precluding use of our coding teams' identification of HF patients to deliver interventions.

Our center undertook an informatics-based effort to further reduce HF readmissions in late 2012. A significant proportion (17%) of the patients identified by the coding team as having a primary diagnosis of HF were not identified by our inpatient clinical nurse specialist (CNS) team, despite routine review of the electronic medical record (EMR).

Cohort identification at baseline was performed by 2 dedicated CNSs. They reviewed every newly admitted patient's

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EMR to determine whether they were admitted for a primary diagnosis of HF. This process would routinely take >1 hour daily and required reviewing 100–150 clinical narrative notes and discussion with the medical team caring for the patient. The EMR allows for documentation and tracking of discrete clinical diagnoses, which would allow for immediate identification and action for those with HF. Such charting was performed neither consistently nor early enough during admission to rely on this documentation for patient identification.

An EMR allows for informatics-based solutions, because data can be retrieved automatically based on specific criteria at a frequency that meets user needs. We hypothesized that an EMR-based report would improve early identification of hospitalized patients eventually diagnosed with a primary diagnosis of HF.

Methods

This study aimed to compare the accuracy of our clinical team in identifying, during hospital admission, all patients eventually coded as having a primary diagnosis of HF by our coding team (criterion standard). The intervention studied was an EMR-based report, and the outcome measured was percentage of patients with primary HF unidentified by our clinical team before (October 2012–February 2013) and after the intervention (March 2013–February 2015).

Our informatics-based solution to enhance cohort identification used an automated EMR-based tool to allow the nursing team to identify patients with HF more quickly and accurately; our institution uses the Epiccare Ambulatory Electronic Medical Record (Epic Systems Corporation, Verona, Wisconsin). The planning phase required weekly meetings between clinicians and the informatics team to develop a reliable process embedded in the EMR.

We selected multiple criteria that could potentially identify inpatients with a primary diagnosis of HF, including but not limited to most recent B-type natriuretic peptide (BNP) level within the past 10 days, most recent left ventricular ejection fraction (EF) measurement within the past 6 months, and chief complaint. In practice, we use a filter combining elevated BNP level and EF measurement to screen inpatients. When filters are combined, the patient list generated contains only patients who possess values for all of the filters chosen (ie, patients who have both a BNP level within the past 10 days and an EF measured in the past 6 months).

Filters can be added or removed as desired, producing a patient list used to screen patients for HF (Fig. 1). The patient list contains patient name, location, admitting medical team, and admitting diagnosis. To aid in screening patients, when a patient is selected from the report, pertinent information such as the admission note, BNP trend, and echocardiography report

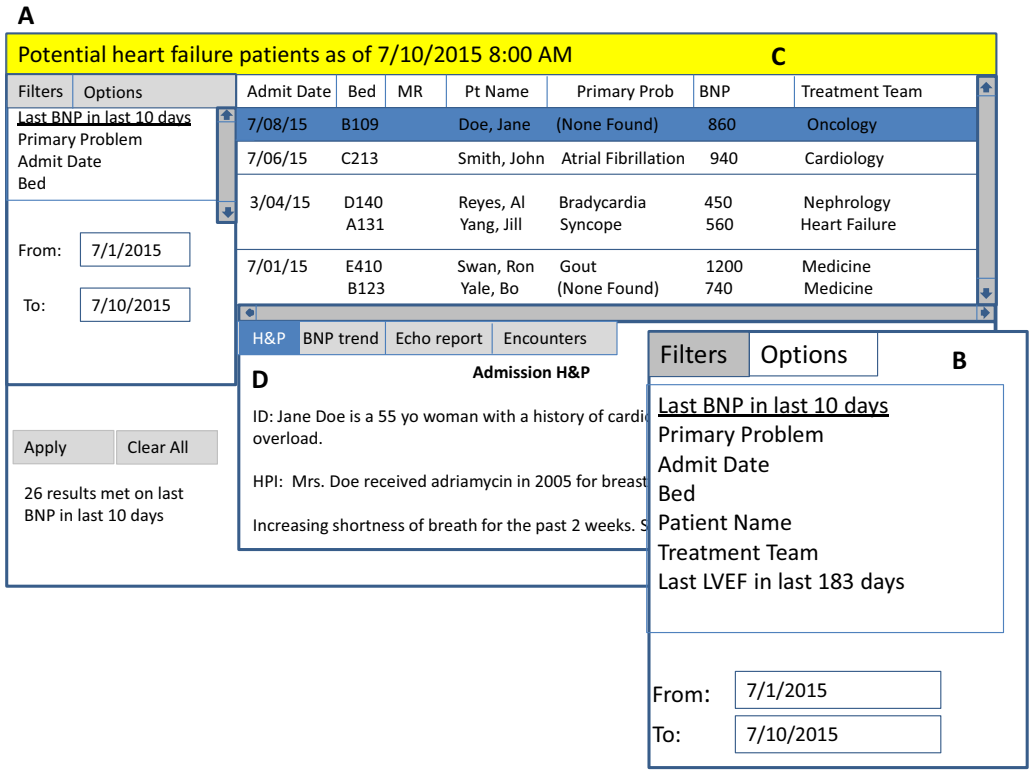

Fig. 1. The heart failure patient report. (A) The report compiles a list of inpatients who exhibit screening characteristics chosen by the clinician. (B) The "filters" tab (expanded from A) allows the clinician to choose the screening criteria; in this case, the clinician has chosen an elevated BNP level. (C) The list can be sorted by any of the criteria in the list header, and (D) the clinician can review pertinent information without having to enter the chart by selecting the information in the information tab.

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