Multiple Sclerosis Database Integrated with the Electronic Health Record Promotes Dissemination of Clinical Picture Across Teams and Saves Time

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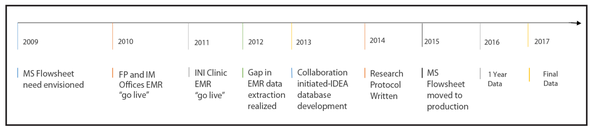
BACKGROUND

The multiple sclerosis (MS) patient has a very personalized clinical story. Disease onset, treatment tolerability, relapse history, imaging results and assessments can vary between patients. The question arises as how to facilitate retrieval of this individualized profile from the medical chart. Although input of this specific data in electronic health records (EHRs) is possible, it can be a challenge for clinicians to retrieve it efficiently at future patient encounters. Pertinent MS history is often buried within the EHR resulting in lengthy manual reviews. Delays in disease modifying therapy (DMT) prior authorizations and wasted provider/staff time searching the chart is a threat. The OSF HealthCare Illinois Neurological Institute MS Clinic created an EHR-integrated MS database to overcome this challenge.



OBJECTIVES

Primary:

Faster Disease Modifying Therapy (DMT) access by expediting the prior authorization process.

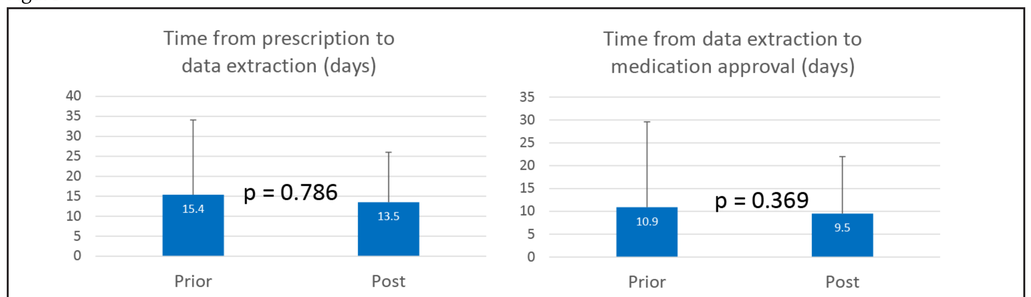
Secondary:

1. Decrease relapse rates
2. Decreased MS hospitalizations
3. Time savings for Provider/Staff

METHODS

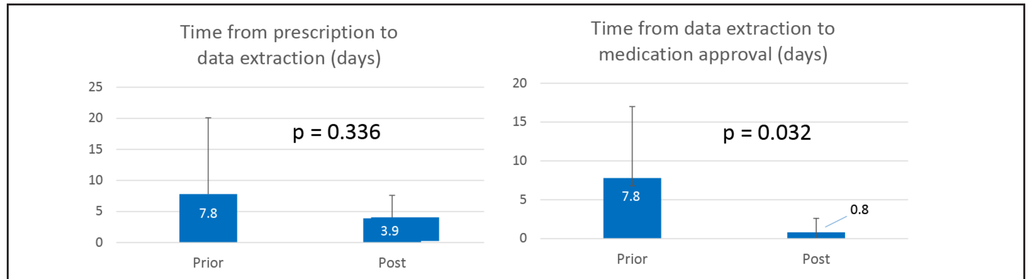
A retrospective review was performed 1 year prior- and post-database (MS-Flowsheet) implementation. Times to data extraction and medication approval were examined by multivariable generalized linear regression models controlling for age, gender, race and Charlson comorbidity index. A McNemar's test compared the relapse rate and the hospitalization rate pre- and post-implementation. A paired t-test compared staff time for retrieving information from the EHR (EPIC) to that from the database. A sub-analysis in a new provider compared provider time versus times to data extraction and medication approval pre- and post-implementation.

Figure 1



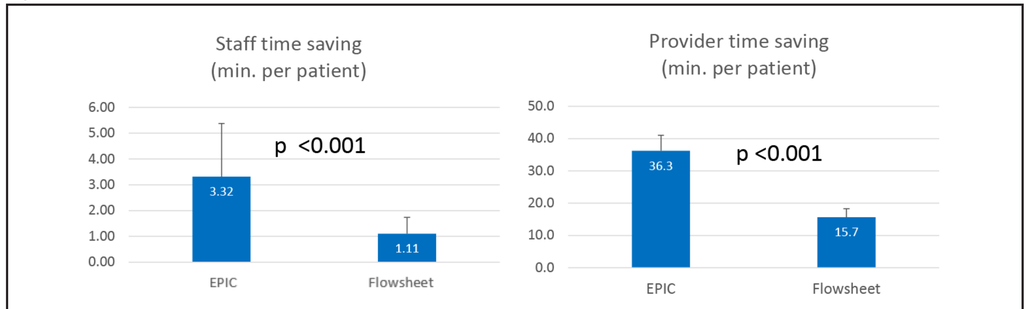
Time from data extraction to medication approval was similar between pre- and post-implementation in the initial analysis.

Figure 2

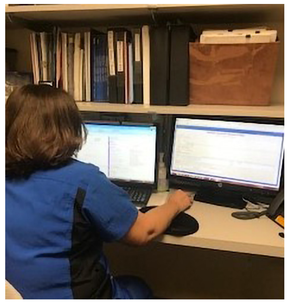


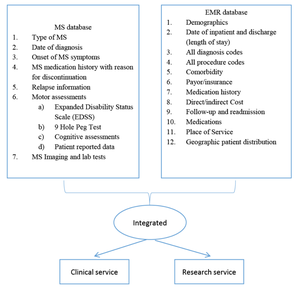
Time from data extraction to medication approval in the sub-analysis had a significant reduction post database use after 5 patients were excluded with newly FDA-approved drugs or no documentation.

Figure 3



Provider and staff time in the EHR was significantly longer than that from the MS database





INI MS Nurse, Vicky Schwegmann, pictured above, reviews MS Database (right) and EHR (left)

RESULTS

1224 total patients were included. 74% were female, the average age was 50.9 years with a standard deviation (SD) of 12.9 years. The reduction of time from prescription to data extraction was not significant for the initial and sub-analysis ($p>0.05$ for all). The relapse rate was 12.3% and 11.0% in 1 year pre- and post-implementation, respectively ($p=0.302$). Furthermore, the hospitalization rate was significantly reduced after database implementation (1.4% vs. 0.4%, $p=0.012$). See figure 1 and 2 for DMT data extraction times on initial and sub-analysis and figure 3 for provider/staff time saving.

CONCLUSIONS

Although the MS Database did not speed the DMT approval process or decrease relapse rates, significant provider and staff time saving was demonstrated. Many factors beyond the clinic's control could have influenced the DMT approval process (e.g. insurance protocols, patient compliance, prior wash-out, pre-testing, and new FDA approved DMTs) making it difficult to study the database's influence on this outcome. MS related hospitalization rate was reduced post database creation, but additional research is needed to claim the database impacted this since a reduction in relapse rates was not significant.

Future work could include focus group data collection to qualitatively study the database's value to the MS Team (e.g. provider/staff satisfaction, patient satisfaction, local research opportunity and value outcome reporting).

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