Development of a MS Registry to Bridge the Gap Between EHR Functionality and Clinical Information Needs: A Next Generation MS Documentation System

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I. Background:

Electronic Health Records (EHRs) contain a myriad of information and it can be a challenge for healthcare providers/caregivers to access pertinent information quickly. In May 2015, the INI MS Clinic created a MS Database that integrated with the institution's EHR in an effort to bridge the gap in clinical information needs. [Figure 10] This database is currently used in conjunction with the EHR to care for MS patients, as well as, collect data for local research opportunities. A study was designed just prior to database implementation and continues through July 2017 in an effort to show the tool's benefit.

II. Objectives:

Primary objective:

- Faster disease modifying therapy (DMT) access through expediting the prior authorization process.

Secondary objectives:

- Decrease relapses
- Decrease MS hospitalizations
- Improved staff satisfaction
- Increase in number of investigator initiated studies
- Provider/staff time saving

Through preventing delay of DMT access

III. Methods:

A retrospective review was performed 1 year prior and post registry implementation. Investigator initiated studies 5 years prior and 2 years post was tracked. Times to data extraction and medication approval were examined by multivariable generalized linear regression models controlling for age, gender, race and Charlson Comorbidity Index (CCI). A McNemar's test was used to compare the relapse rate and the hospitalization rate between pre-and post-implementation. A paired t-test was employed to compare the staff time for retrieving information from the EHR to that from the registry. Additional data for times of DMT data extraction and approval were collected with the onboarding of a new MS Provider 4 months prior to the MD's use of the database in his daily practice and 6 months post use. A two month post use interim analysis is included with these results. The Clinical Information System Implementation Evaluation Scale (CISIES) pre and post surveys were used to assess staff satisfaction with the new electronic tool.

IV. Results:

- Among 1224 patients, 74% were female, the average age was 50.9 years with a standard deviation (SD) of 12.9 years. Race and CCI distribution are shown in [Figures 1-2]
- Speed of DMT access not improved significantly. [Figures 3-4]
- Relapse rate not decreased significantly. [Figure 5]
- Staff and provider time saving significantly improved. [Figure 6-7]
- Hospitalization rate reduced. [Figure 8]
- Increase in number of investigator initiated projects. [Figure 9]
- Average score of staff satisfaction for using database was 4.05 (SD 0.7) in a scale range of 1-6. p=0.003

Figure 3. Time from prescription to data extraction (days)

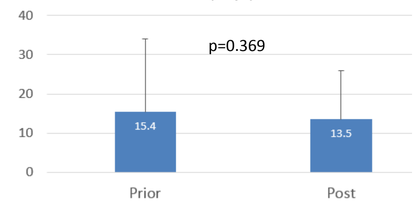


Figure 4. Time from data extraction to medication approval (days)

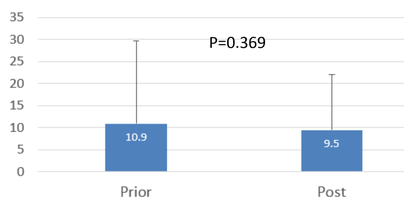


Figure 1. RACE

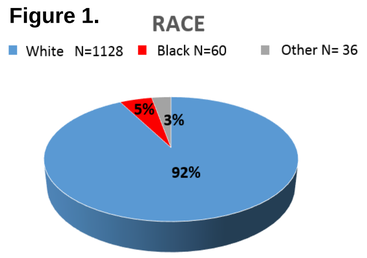


Figure 5. Relapse rate

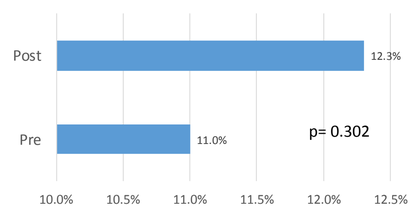


Figure 2. Charlson Comorbidity in MS population (%)

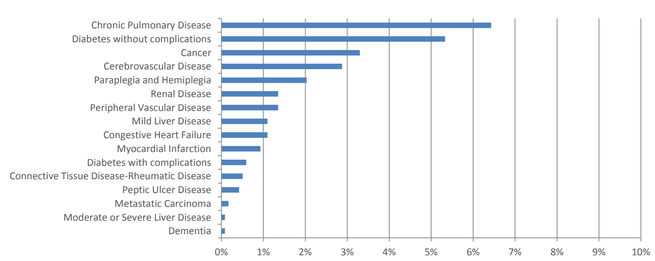


Figure 6. Staff time saving (minutes per patient)

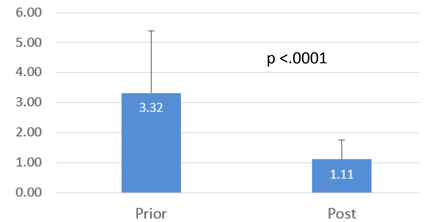


Figure 7. Physician time saving (minutes per patient)

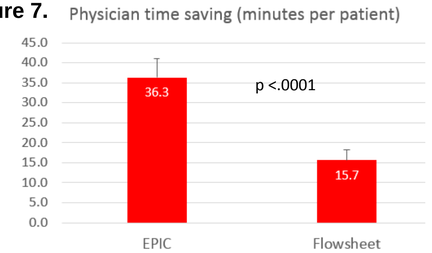


Figure 8. Hospitalization rate

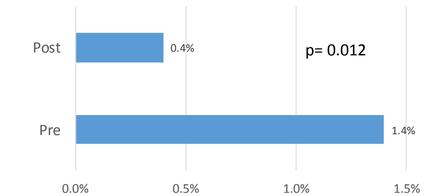
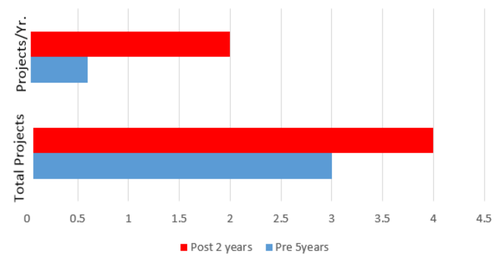


Figure 9. Number of Local Investigator Initiated Studies

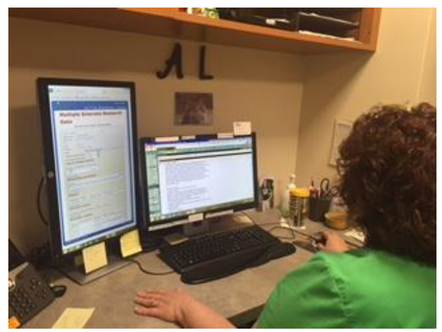


V. Limitations:

- External factors beyond the clinic's control can impact the speed of DMT access (ex. initial insurance denials causing appeals and patient compliance providing necessary information).
- Staff buy-in with implementing the database into their daily clinical routine was initially slow. Immediate impact may have not been seen.

VI. Conclusions:

Although our primary objective was not met, the INI MS Clinic and Research Team feel the MS database has a positive place in management of MS patients and local research opportunities. Extended time reviewing the EHR can now be dedicated to direct patient care. Local investigator initiated research is on the rise and future collaborations with other research facilities will be feasible because of this next generation MS Documentation System.



INI MS Nurse, Ann Hadley, pictured above reviews MS Database (left) and EHR (right). **Figure 10.**

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