

INTRODUCTION

An EMR (electronic medical record) system refers to the software utilized by medical practitioners to reduce the use of hard-copy files, and improve the documentation, storage, and retrieval of patient information. EMR systems are designed to enhance efficiency and increase security through the implementation of restrictive measures such as passwords and biometric scanners. Additionally, some EMR systems send out automatic alerts to remind providers when patients are due for certain preventive tests or meet the criteria for various screening measures.¹

In 2014, 75% of physicians responding to the National Physician Survey were using EMRs. Of those physicians surveyed, 65% indicated patient care improved under an EMR whereas less than 5% indicated it had a negative impact on quality of care. Several other studies have shown disease outcomes can improve with EMR use. For example, a randomized clinical trial involving 21 practices showed a reduction in blood pressure for patients receiving advice and screening through EMR intervention.² Centricity and EPIC are two examples of commonly used EMR systems within clinical practice. In September of 2021, the UT-Family Medicine Jackson clinic switched from Centricity to EPIC, which has the additional benefit of providing physicians with notifications to prevent lapses in patient care. The primary goal of this study was to measure whether there is any improvement in screening rates after implementing the new EMR system.

PURPOSE AND RESEARCH QUESTIONS

Purpose

To determine the difference of routine health screening rates for patients between the ages of 45 and 64 in the Centricity EMR system and the new EPIC EMR system used at UT Family Medicine-Jackson.

Research Questions

1. Between EMR systems was there a difference in:

- Colorectal screening⁶
- Hypertension screening in adults⁹
- HIV screening⁸
- Cervical cancer screening⁴
- Syphilis testing¹³
- Screening for diabetes and pre-diabetes¹¹
- Screening for chlamydia and gonorrhea⁵
- Screening for lung cancer¹⁰
- Drug screening¹⁵
- Hepatitis C screening⁷
- Statin use for preventative measures¹²
- Breast cancer screening³
- Recommendations for tobacco cessation for adults¹⁴

METHODS

Chart Review was done and steps were taken to obtain a patient population:

- A list of patients greater than 44 and less than 65 in the EPIC system seen between May 8, 2022 and June 8, 2022 by physicians at UT Family Medicine-Jackson was generated
- Of the 610 patients seen, 100 patients were selected using a random number generator in Excel with patients seen only for a COVID test being excluded
- A list of patients greater than 44 and less than 65 in the Centricity EMR system seen between October 1, 2020 and January 1, 2021 by physicians at UT Family Medicine- Jackson was generated
- Of the 904 patients seen, 100 patients were selected using a random number generator in Excel with patients seen only for a COVID test being excluded
- The USPSTF Grade A and B guidelines for adults were used to analyze patient charts
- Information was extracted from each of the patients charts and was entered into the SPSS Statistical Software System
- Data was analyzed using SPSS Chi-Square Tests

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Comparison of Routine Health Screening Rates Between Two EMR Systems

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RESULTS

TABLE 1. Demographics of UTM-J Patients

	EPIC		Centricity	
Race	White	52%	White	55%
	Black	48%	Black	45%
Sex	Male	41%	Male	35%
	Female	59%	Female	65%

The sample of patients from the EPIC and Centricity EMR systems had demographics representative of the UTM-J. After analysis of the collected data there was no statistical significance in overall screening rates between different races and sexes.

TABLE 2. Chi-Square Likelihood Ratios of Comparison Between EMR Systems

	Comparison of Screening Rates Between EMR Systems
Colorectal Screening	0.479
HTN Screening	N/A
HIV Screening	0.877
Cervical Cancer Screening	0.064
Syphilis Testing	0.173
Diabetes Screening	0.198
STD Testing	0.638
Lung Cancer Screening	0.685
Drug Screening	0.055
Hepatitis C Screening	0.349
Breast Cancer Screening	0.655
Tobacco Screening	0.095
Statin Use	0.570

* Denotes statistical significance

TABLE 3. Chi-Square Likelihood Ratios of Comparison Between Different Sexes

	Comparison of Screening Rates Between Sexes
Colorectal Screening	0.588
HTN Screening	N/A
HIV Screening	0.271
Cervical Cancer Screening	N/A
Syphilis Testing	0.106
Diabetes Screening	0.369
STD Testing	N/A
Lung Cancer Screening	0.621*
Drug Screening	0.015*
Hepatitis C Screening	0.908
Breast Cancer Screening	N/A
Tobacco Screening	0.048*
Statin Use	0.001*

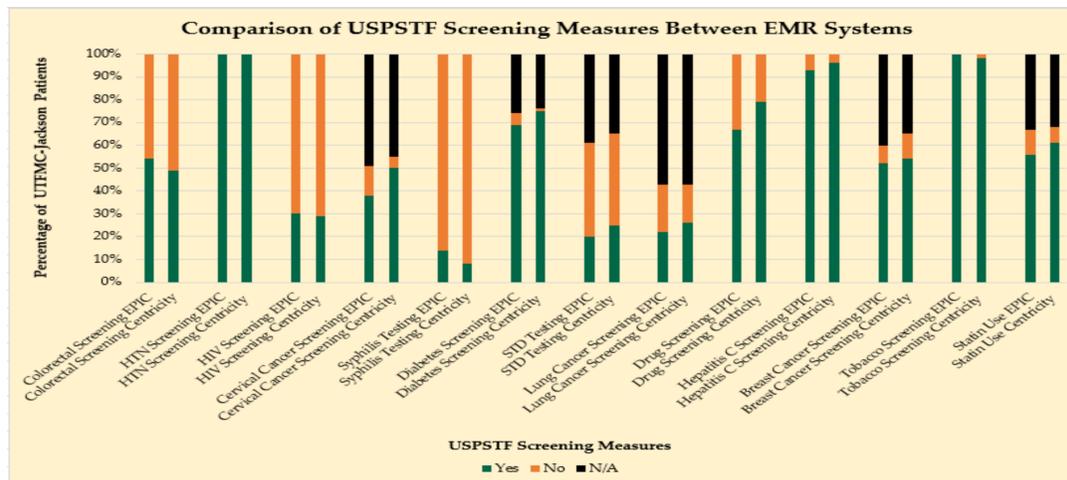
* Denotes statistical significance

TABLE 4. Chi-Square Likelihood Ratios of Comparison Between Different Races

	Comparison of Screening Rates Between Races
Colorectal Screening	0.411
HTN Screening	N/A
HIV Screening	0.268
Cervical Cancer Screening	0.250
Syphilis Testing	0.030*
Diabetes Screening	0.911
STD Testing	0.001*
Lung Cancer Screening	0.035*
Drug Screening	0.319
Hepatitis C Screening	0.070
Breast Cancer Screening	0.172
Tobacco Screening	0.921
Statin Use	0.900

* Denotes statistical significance

FIGURE 1. USPSTF Comparison Between EMR Systems



Data analysis showed minor differences in screening rates in various USPSTF advised screening measures between EMR systems. However, these minor differences did not show any statistical significance in screening rates between the EMR systems.

DISCUSSION

The SPSS statistical software was used to analyze the USPSTF screening rates of a random sample of 100 UTM-Jackson patients from the old EMR system, Centricity, and newly adopted EMR system, EPIC. Each patient selected from the randomized sample pool met the following criteria: seen for 2 years or greater, had 4 or more clinic visits, and older than 44 and younger than 65 years of age. Overall, chi-square analysis of the data (displayed in Table 2) revealed no statistical significance upon comparison of thirteen USPSTF screening measures between the two EMR systems. Similarly, chi-square analysis to assess potential differences in the screening rates between sex (Table 3) and race (Table 4) showed no over-arching statistical significance. However, further analysis of each screening measure independently showed statistical significance pertaining to three of the thirteen USPSTF screens when comparing sex (male vs. female). For example, drug screening, tobacco screening, and statin use rates between males and females showed likelihood ratios of 0.015, 0.048, and 0.001 respectively. The women sampled in this study had 16% more drug screening, 3% more tobacco screening, and 18% more statin use in comparison to the men's sample population. Additional analysis of each screening measure independently, showed statistical significance between race (black vs. white) for three of the thirteen USPSTF screens. For instance, chi-square analysis of syphilis testing, STD testing, and lung cancer screening rates between black and white patients showed likelihood ratios of 0.030, 0.001, and 0.035 respectively. The black patient population had 10% more syphilis screening and 33% more STD screening, whereas white patients had 28% more lung cancer screening. Conclusions to explain the statistical significance for certain screening measures regarding race and sex, cannot be drawn based on the data at this time. Future research including but not limited to patient compliance, provider biases, and population risk, may be useful in providing further insight to explain the statistical significance of this data.

RECOMMENDATIONS

Recommendations:

Since the switch from Centricity to EPIC was relatively recent at UTM-Jackson, it would be interesting to repeat the study once EPIC has been implemented longer and the providers have a chance to fully familiarize themselves with the intricacies of the new system. EPIC has been used at UTM-Jackson for less than a year, which is likely not an adequate amount of time for the automated care gap alerts to have much statistical effect. Lastly, we recommend a further study reviewing the potential differences in screening rates for patients with male versus female primary care providers.

Limitations:

As previously discussed, the short time frame pertaining to the implementation of EPIC at UTM-Jackson was likely the greatest limitation in this study. Furthermore, disorganization within both EMR systems made data collection relatively difficult. Finally, the seamless transfer of patients' records from the old EMR system to the new EMR system was not done and likely resulted in missed data.

REFERENCES

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*See attached sheet for more references