The Impact of Electronic Medical Records on Workflow and Patient Satisfaction in an Academic Rhinology Practice

Anthony G. Del Signore Pharm D, MD1, Mohamed Tomoum MD1,2, Brent A. Senior MD1
1University of North Carolina at Chapel Hill, 2Tanta University

ABSTRACT

Objectives
Despite the ubiquity of computers in today’s office practices, the adoption and conversion to electronic medical records (EMR) has been seen as a challenging undertaking, posing issues with workflow and patient perception. To date, there is little information on its impact on these issues in a busy academic practice.

Methods
A total of 367 adult patients seen for scheduled visits were evaluated. Visits were broken down into specific physician work-flow areas and a total visit time was recorded with and without resident/fellow assistance. A non-validated patient questionnaire was distributed examining three patient satisfaction domains: 1) satisfaction with visit components, 2) comprehension of the visit, and 3) perceptions of the physician use of the computer.

Results
Patient total visit times within the post-implementation period were significantly higher than the pre-EMR period with (p=0.01) and without (p<0.01) resident/fellow assistance. Patient satisfaction was significantly decreased in the post-EMR when there was no resident/fellow assistance (p=0.01), but no significant difference was noted with assistance, (p=0.55). Furthermore, the domains with a significant decrease in scores were seen with 1) perceptions of physician use of the computer and 2) satisfaction with visit components.

Conclusions
Introduction of an EMR into a busy academic practice can acutely lead to prolongation of appointment times. The negative effects were mitigated by the presence of an assistant.

INTRODUCTION

Electronic medical record (EMR) implementation is estimated to be near 90%1

Conversion has been challenging

- Workflow issues
- Patient perception
- Lower physician satisfaction
- Decreased rapport with patients
- Negative effect on the patient / physician relationship

Study objectives:
1) Document physician workflow in the use of EMR with and without assistance
2) Assess patient attitudes toward the clinic visit and physician both prior to implementation and after 2 months of use.

METHODS AND MATERIALS

- Comprehensive longitudinal assessment
- Physician work flow
- Patient satisfaction

Setting: High volume rhinology clinic of a large academic health system

Timing: 2 months prior to and 2 months after implementation of the EMR.

Data collection:
- All patient visits timed
- Total visit times were tabulated for each encounter
- Data of all patient visits timed
- Clinic visit components timed separately
- Total visit times were tabulated for each encounter
- With and without resident/fellow assistance.

A non-validated patient questionnaire assessed patient attitudes
- 16 questions
- 5 point Likert scale: 0 (totally disagree) to 5 (totally agree)

Table 1: Patient demographics

<table>
<thead>
<tr>
<th></th>
<th>Pre EMR</th>
<th>Post EMR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average time</td>
<td>6.5</td>
<td>10.6</td>
</tr>
<tr>
<td>p-value</td>
<td>0.001</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

Table 2: Physician work-flow before and after EMR implementation

<table>
<thead>
<tr>
<th></th>
<th>Pre EMR</th>
<th>Post EMR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average time</td>
<td>7.9±1.6</td>
<td>11.6±2.6</td>
</tr>
<tr>
<td>p-value</td>
<td>0.002</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

Figure 1: Patient satisfaction survey adapted from Hsu et al.

RESULTS

- A total of 368 adult patients were evaluated.

Table 3: Patient satisfaction scores prior to and after EMR implementation

<table>
<thead>
<tr>
<th></th>
<th>Pre EMR</th>
<th>Post EMR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean score (p-value)</td>
<td>1.08</td>
<td>1.08</td>
</tr>
</tbody>
</table>

Table 4: Mean scores vs. p-values

DISCUSSION

- With EMR implementation, others have reported
  - Transcription services decreased by 14%
  - Time maintaining the EMR chart and ensuring integrity of the medical record increased by 20%
  - To maintain productivity, physicians adapt with use of technicians / scribes for chart completion
  - We have found a significant difference in work efficiency in the post-EMR period:
    - 18% overall increase in patient visit times
    - When assistance was not available, mean visit times doubled
  - Patient satisfaction scores most affected were:
    - “Visit components”
    - “Perception of physician computer use”
  - No difference noted in the “comprehension of the visit” scores

Conclusions
- Patients seen without assistance after EMR implementation experienced
  - Doubling in visit time
  - Decreased visit satisfaction scores

The negative effects were mitigated by the presence of an assistant.

Further research needed to:
- Elucidate specific components to help improve the patient-physician relationship
- Increase physician efficiency
- Observe changes occurring in the long term following implementation.

REFERENCES