

# A Cost-Benefit Analysis of Medical Scribes and Electronic Medical Record System in an Academic Urology Clinic

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## Abstract

**Introduction:** Electronic medical records have introduced an additional level of complexity to the patient-provider encounter and medical scribes may offer a solution. We examined how a medical scribe system could support an academic urology clinic. To assess the financial feasibility of this model, we analyzed the additional costs associated with adding medical scribes and we discuss the potential benefits of this system.

**Methods:** We measured total patient wait and interaction times with staff, and estimated the additional staff required to maintain an increased patient load if medical scribes were introduced. We then calculated the average revenue per patient during the most recent 9 months of data to estimate the minimum increase in the number of patient visits needed to offset the additional staffing needs.

**Results:** Mean  $\pm$  SD total wait time was 23 minutes 28 seconds  $\pm$  13 minutes 4 seconds. Average monthly expenses would increase by \$17,452.50 for 6 additional staff members, including 1 nursing assistant, 1 patient service specialist, 1 nurse and 3 scribes. There was an average of 666 monthly office visits and average net revenue to the department was \$107.78 per patient visit. The increase in the number of patient visits required to break even would be 162 additional patients per month, representing a 24.3% increase. Additional downstream revenue was considered.

**Conclusions:** A medical scribe system in the example of an academic urology clinic setting could increase patient flow and decrease the burden on medical providers by reducing computer charting. This model is only financially prudent if the increased expenses are offset by additional revenue from increased patient visits.

**Key Words:** urology, electronic health records, personnel staffing and scheduling, health information management, cost-benefit analysis

## Abbreviations and Acronyms

CNA = Certified Nursing Assistant

EMR = electronic medical record

PSS = patient service specialist

With the implementation of EMRs many advantages in patient care have been reported but additional expenses are also involved.<sup>1-4</sup> EMRs may add further stress to physicians who are already feeling the effects of time constraints, resulting in decreased physician satisfaction.<sup>5,6</sup> Although the benefits of EMRs are considered significant, computer use during the office visit has resulted in less patient centered interactions due to the

inability of physicians to personally communicate and use a computer simultaneously.<sup>7-9</sup> Furthermore, in 1 study increased wait times in the office combined with decreased time spent face to face with the physician corresponded to a significant decrease in patient satisfaction.<sup>10</sup>

A potential solution to overcome many of these issues is the introduction of physician scribes. In 1 study there was a significant reduction in the time spent charting while time for patient interaction increased.<sup>11</sup> This gain in time spent with patients coupled with decreased time for electronic documentation increased the satisfaction of patients and physicians.<sup>12</sup>

Adding scribes not only improves patient and physician satisfaction rates but also may support an increase in the number of patient visits.<sup>13</sup> Several studies demonstrated that patient encounters can increase by more than 50% per hour, followed

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by increase in average relative value units per hour as well as the average relative value units per patient under the scribe model.<sup>11</sup> In a study done in a cardiology outpatient clinic the average time required to complete a visit decreased by a third when the physician was assisted by a scribe.<sup>14</sup> Despite reduced physician time in the patient room the time spent in direct patient interaction increased fourfold during the scribe supported visits.<sup>14</sup>

There are numerous publications on the topic of increased patient and physician satisfaction. However, little has been reported on the cost-benefit balance of scribe performance from a long-term financial perspective. A study of reimbursements showed that scribe use led to increased per patient reimbursement as a result of increased level 4 and 5 billable office visits.<sup>15</sup> Also, in another study after adding scribes direct revenue increased by \$142 per additional visit with costs increased only \$25 per hour on a short-term basis.<sup>14</sup> That group leased scribe services on a short-term basis but did not further examine the long-term implications of additional nursing and staff support.

We focused on the financial implications of added staffing costs on top of the expense of scribes to support a day-to-day increase in patient load without negatively affecting patient flow in a urology clinic setting.

**Methods**

To estimate the need for additional staff in a urology clinic to successfully implement a medical scribe service we first assessed the current flow of patient visits through the clinic. To collect these data a second year medical student working as a summer intern followed patients through the entire visit in the clinic on 4 days (Monday through Thursday) and measured and recorded the time that each patient spent during each part of the visit. The visit was divided into identifiable segments, including check-in, triage, nursing documentation, provider visit, additional nursing documentation and checkout. By following the entire office visit of each patient and recording the time spent at each station we calculated patient wait times. From the data collected we identified where in the process patients were currently waiting and identified any current existing bottlenecks. This method permitted the observation of all clinic processes, including the patient-physician visit and the assessment of how the EMR and computer use affected the patient-physician interaction.

In addition to determining current bottlenecks in patient flow, we considered the need for additional staff at each step of the patient visit when using an efficient scribe system. To facilitate an increased patient flow without introducing new bottlenecks additional staff such as a PSS at the front desk, a CNA at the triage station and another nurse would be necessary. The increase in payroll costs for the added staff was estimated by the senior department administrator.

Lastly, we used the most recent 9 months of patient visit and reimbursement values to determine the average number of patient office visits per month and the average revenues from these claims. To do this we averaged the private insurance payment from the highest and the lowest payers, and used this value for private insurance patients. For all other carriers, ie

**Table 1.**

Measured times for total office visit by process and process wait times

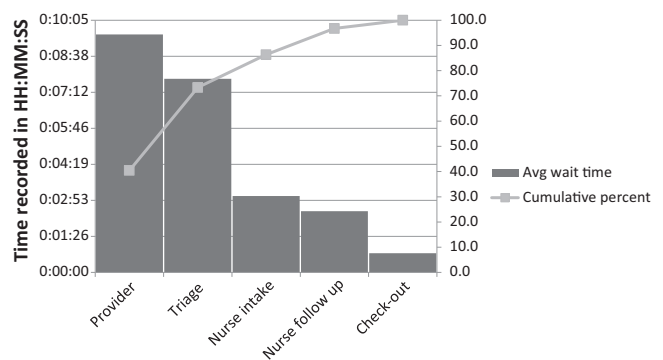
Process	Mean ± SD Time/Median (hrs:mins:secs)
Check-in	0:06:01 ± 0:02:15/0:05:10
Wait for triage	0:07:44 ± 0:07:29/0:05:21
Triage	0:08:14 ± 0:02:39/0:08:44
Wait for nurse	0:03:03 ± 0:03:44/0:01:53
Nurse intake	0:07:44 ± 0:04:29/0:06:47
Wait for provider	0:09:31 ± 0:07:03/0:05:36
Provider, including pts with 2 procedures	0:13:38 ± 0:11:48/0:08:53
Wait for followup	0:02:27 ± 0:04:00/0
Nurse followup	0:02:38 ± 0:04:00/0
Wait for checkout	0:00:49 ± 0:02:25/0
Checkout	0:05:41 ± 0:03:07/0:05:40
Totals:	
Wait	0:23:28 ± 0:13:04/0:19:21
Interaction	0:46:11 ± 0:18:07/0:41:15
Visit	1:09:39 ± 0:22:49/1:03:09

Medicare and Medicaid, we used actual reimbursement rates. Using these data we calculated the minimum increase in the number of patient visits required to meet the minimum break-even point.

**Results**

All time data are shown in the format hours:minutes:seconds (table 1). Three urologists were in the clinic on any given day. Mean ± SD total wait time during the entire clinic visit was 0:23:28 ± 0:13:04 (median 0:19:21). The longest time spent waiting by patients was for the provider visit (mean 0:05:36 ± 00:07:03, median 0:9:31) (see figure). The next longest waiting time was after check-in while waiting for a CNA to bring the patient to the triage station (average 0:07:44 ± 0:07:29, median 0:05:21). Mean time of the visits, including all wait times and interaction times at all steps in the visit, was 1:09:39 ± 0:22:49 (median 1:03:09). During the visit patients directly interacted with someone for a mean of 0:46:11 ± 0:18:07 (median 0:41:15). Patients spent a mean of 0:13:38 ± 0:11:48 (median 0:08:53) with a provider.

The increased cost estimated for 3 scribes, including 1 for each of 3 physicians in the clinic on any given workday, was \$115,830 per year plus the additional staffing needs of the clinic



**Figure.** Average patient wait times by office visit process. HH:MM:SS, hours:minutes:seconds.

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