

Missing Prenatal Records at a Birth Center: A Communication Problem Quantified

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Abstract

Objectives: To quantify the extent of missing prenatal records at the time of patient presentation to a birth center, to document the age of the information in those records, and to discover how quickly missing records were retrieved.

Method: A survey form was completed over a three-month period for each patient presenting for care.

Results: Prenatal records were unavailable 37% of the time at initial presentation. Records were never obtained for 20% of patients. The median age of the prenatal record was 30 days for those records that were immediately available, and the median age was 5 days for those records that were retrieved later. It took a median of 1.4 hours to retrieve a missing record.

Conclusion: Prenatal records are frequently missing at the point-of-care, and even when records are available or retrieved, the information contained within them is likely to be outdated. Further research is needed to quantify both the clinical and economic impact of this problem.

Background

Prenatal care is an intensive eight-month period of care for two connected, but distinct patients, during a time of marked physiologic changes for both with the potential for adverse outcomes that can lead to fatal or lifelong consequences. Prenatal care also inevitably leads to care by many providers at several locations such as offices or clinics, hospitals, birth centers, or emergency rooms. Almost nowhere else in clinical medicine is the availability of an outpatient medical record as essential as it is with pregnant patients, and it is equally important that the information at hand is current.

Because generalized medical records are not sufficient to easily document, organize, and make available prenatal information, separate and standalone prenatal record forms have evolved over decades. These three to five page paper prenatal record forms are the predominant method of conveying prenatal information in the United States with electronic versions of the same being a rare exception and gener-

ally limited to academic or large health organizations. In spite of the common-sense requirement for access to up-to-date and complete prenatal care information by clinicians at the final perinatal point-of-care, e.g. hospital or birth center, it is common-knowledge among prenatal care providers across the United States that prenatal records are often, and routinely, missing when pregnant patients present for care.

In an attempt to make paper prenatal records available at a birth center or hospital, it has become a standard practice that, as a minimum, a copy of a patient's prenatal record is transferred to the hospital by a patient's 36th week of gestation¹. This policy means that with a patient's very next prenatal visit, phone call, or testing result, the copy of the record residing at the point-of-care is outdated and may be missing emergent information. Further, if practitioners only follow the minimal guideline, it is guaranteed that prenatal records will be entirely absent if a patient presents before 36 weeks of gestation. In 2002, the number of patients that delivered prematurely (less than 37 weeks gestation) was about one out of every eight births². Minimum guideline adherence can result in hundreds of thousands of high-risk patients every year presenting and being initially managed without prenatal information.

The lack of prenatal information at a birth center is not usually a critical problem during regular office hours as the prenatal record can be faxed or hand-delivered to the point-of-care. However, outside of office-hours on nights and weekends, prenatal records for the highest risk patients, i.e. those threatening to deliver prematurely, are routinely inaccessible and unavailable to clinicians.

Missing clinical information has been reported in the context of individual information items that were missing and perceived to adversely impact care^{2,3}. In these studies, pieces of information perceived as being needed for clinical decisions were missing 13.6%³ and 81%² of the time. Both studies focused on only information missing when some clinical information was available, although Tang² reported that entire charts were absent 5% of the time.

Despite widespread anecdotal observations that pre-

natal records are frequently unavailable to providers at hospitals or birth centers when patients present, we could find no examples in the literature that focused on the magnitude of this commonly-perceived problem. In anticipation of the implementation of an electronic prenatal record system for a subset of clinicians practicing obstetrics at the study hospital, we undertook this research to determine the magnitude of the problem of unavailable prenatal records at birth center presentation, to document the outdated nature of the records that were available, and to determine how quickly absent records were retrieved.

Materials and Methods

As patients presented to the Labor and Delivery (L&D) unit at Saint Luke's Hospital, Kansas City, Missouri from March 4, 2002 to June 6, 2002 the Labor and Delivery staff was asked to attach a survey form to each patient's hospital chart and then complete the survey at the appropriate events during the patient encounter. The survey form was developed to document a patient's presentation to the Labor and Delivery unit for evaluation and to document the availability, retrieval method, and age of the prenatal record. The form documented the date/time of each encounter process event (presentation, admission, transfer, discharge, record retrieval) along with the patient's EDD and the clinical reason(s) for her presentation. No other patient-identifying information was requested. The form specifically queried if the prenatal record was "immediately" available to the caregivers in the form of a Yes/No question. The staff was educated to understand that "immediately" meant that the prenatal record was already available to them immediately prior to the patient's presentation.

The survey endpoint for each patient was either when she 1) delivered, 2) was discharged home, or 3) was transferred undelivered from the evaluation unit to the antepartum unit. These endpoints were chosen to limit the required time to track the survey form as many patient evaluations could conceivably last days and the form could be lost in the process with multiple staff persons completing portions of the form. Also, the actual decision-making need for information collected during prenatal visits would certainly fall dramatically once the patient delivered, went home, or was transferred to another unit. At the endpoint event, the staff was additionally asked to answer a final confirming Yes/No question as to whether the record was available, regardless of previous documentation.

The data in the survey was then entered into a database (Access by Microsoft Corporation) for analysis.

By manual review of the data, we additionally identified and marked each encounter record to indicate whether the patient received prenatal care locally (and should therefore be expected to have a record available) as opposed to either receiving no prenatal care anywhere, or being a transferred patient who had never intended to deliver at the study hospital. The survey form and the survey process were both approved by the Institutional Review Board.

On December 6, 2002 a commercially-available Internet-based prenatal record system⁵ was implemented in two prenatal care clinics operated by Saint Luke's Hospital with access in L&D and throughout the hospital intranet. By August 2003, the records for all patients receiving prenatal care at those clinics were available online to clinicians and L&D staff.

Results

Saint Luke's Hospital of Kansas City is a community-based hospital with 28 clinicians (24 physicians, 4 midwives) who have obstetric privileges and approximately 2600 deliveries per year. All prenatal care providers who deliver at the hospital have offices within an eighth-mile radius of the hospital.

Surveys from 564 patient encounters were collected during the study period. Of this total, 548 (97%) patients had received prenatal care somewhere, and 16 (3%) had either not received prenatal care or the existence of any previous care could not be determined. After manually reviewing the results including text comments, 536 (95%) of the patients had received prenatal care from local providers and these patients were the source group for all other analyses in this study.

Prenatal records were initially unavailable 37% (197) of the time and were never available 20% (105) of the time when patients presented to the labor and delivery unit (n = 536). Table 1 shows the numbers of immediately available and eventually available prenatal records stratified by gestational ages. As could be expected for scheduled or spontaneous presentations, most presentations (67%) occurred after the 36th week of gestation with declining percentages the more remote the patients were from term. Patients presenting near term (greater than 36 weeks gestation) were more likely to have a prenatal record available (78%), then patients presenting early (less than 24 weeks) in gestation (18%). For those patients where the record was eventually retrieved, there was again an increasing percentage of record availability with increasing gestational age. In both cases, we would interpret these results to mean that there is more effort to retrieve the prenatal record both before

Table 1 Patient Encounters by Gestational Age at Presentation and the Availability of the Prenatal Record

Gestational Age Range (days)	Encounters (n = 525)	Prenatal record immediately available (n = 334)	Prenatal record eventually available (n = 426)
36+ Weeks (> 251)	351 (67)	275 (78)	324 (92)
32-36 Weeks (224-251)	59 (11)	26 (44)	41 (70)
28-32 Weeks (196-223)	43 (8)	16 (37)	28 (65)
24-28 Weeks (168-195)	32 (6)	10 (31)	19 (59)
< 24 Weeks(< 168)	40 (8)	7 (18)	14 (35)

Data are n (%)

and after the presentation as the patient approaches term.

The median age of the information in the prenatal record calculated from the date of the patient's last recorded prenatal visit was 30 ± 31 days (0-205) for those records that were immediately available at the time of presentation (n = 273), and the median age was 5 ± 19 days (0-127) for those records that were retrieved sometime after the patient presented (n = 67). Table 2 lists the encounters for both the records that were immediately available, and those that were eventually retrieved, grouped by the age of the record. For those records that were immediately available, the largest percentage (39%) were over six weeks old and many (22%) were between two to four weeks old. The median age of the records that were immediately available indicate that these records were probably transferred to the hospital well in advance of any patient presentation. It is also likely that documentation of subsequent prenatal visits was not included in these aged records. For the records that were retrieved after patient presentation, the age of the records (74% were less than two weeks old) reflected the fact that the records retrieved contained the most recent prenatal visits. In fact, the age of these retrieved records can serve as a proxy for how

Table 2 Prenatal Record Availability Categorized by the Age* of the Information in the Record

Age of the information in the prenatal record	Prenatal record immediately available (n = 273)	Prenatal record eventually available (n = 67)
< 7 days old	43 (16)	41 (61)
7-13 days old	26 (10)	9 (13)
14-27 days old	60 (22)	10 (15)
28-41 days old	37 (14)	5 (7)
>41 days old	107 (39)	2 (3)

Data are n (%)

* Age is calculated as the number of elapsed days since the last recorded prenatal visit.

“old” even the most up-to-date record can be.

When the prenatal record was not immediately available and then was subsequently retrieved before the survey endpoint (n = 83), it took a median of 1.4 ± 12.1 hours (0.25-80 hours) to obtain the record. Table 3 lists time intervals and how many records were obtained in those ranges. Most records (57%) were retrieved within two hours of patient presentation, although for 25% of the records it took over six hours to retrieve them.

Table 3 Prenatal Record Retrievals by the Time Required to Retrieve Record

Time required to retrieve prenatal record if not immediately available	Prenatal record retrievals (n = 83)
< 1 Hour	34 (41)
1-2 hours	13 (16)
2-6 hours	15 (18)
> 6 hours	21 (25)

Data are n (%)

For those records that were retrieved when the record was not immediately available and a retrieval method was documented (n = 89), 9 (10%) were delivered by office staff, 23 (26%) were retrieved personally by the prenatal care provider, and 57 (64%) of the records were obtained by facsimile transmission.

For the subset of presentations where the patients received care at either of the two clinics where implementation of an electronic prenatal record was planned (n = 121), 56% (n = 68) of the records were immediately available when the patient presented. Of this same group, 73% (n = 88) of the prenatal records were eventually available. Conversely, 44% of the time prenatal records were immediately unavailable when this subset of patients presented, and 27% of the time, no prenatal records were ever recovered.

Between August 1, 2003 and March 31, 2004, 566 patients delivered at Saint Luke's Hospital who were

under the care of providers at either of the two clinics with a functional electronic prenatal record system. Of those 566 patients, 12 patients had not received any prenatal care and therefore no prenatal records of any type were available. Of the remaining 554 delivered patients, their current prenatal records were, without exception, always immediately available to providers in L&D at any gestational age.

Discussion

Prenatal records are much more than forms to fill out. Like any type of medical record, they are tools that can simultaneously aid in communication between providers, promote consistent care, and document both care interventions and the thought processes behind them. Again, like any other medical record, the effectiveness of prenatal records are dependent on their accuracy, completeness, legibility, whether they are up-to-date, and most importantly, their availability at the time when clinical decisions are made.

Although the data in this study is limited to a single community hospital, we believe that this study confirms and quantifies what many clinicians across the United States involved with prenatal care already know — that pregnant women are frequently evaluated and managed without the benefit of any of the data that has been collected remote from the birth center. And even when a prenatal record is available, this study corroborates the intuitive belief held by many clinicians that prenatal records are often outdated, sometimes by months.

Particularly worrisome for those in clinical quality improvement roles are the extremes found in this study. One out of five obstetric patients were managed without the benefit of any information collected during their prenatal care. Even when prenatal records were immediately available to clinicians the information contained within those records was over six weeks old in about two out of five cases. When records were missing, most were retrieved within two hours, while at least one record took 80 hours to finally obtain. Anecdotally, when some of these results were discussed with L&D staff many stated these figures were actually better than they would have guessed.

Miscommunication, and particularly total failure in communicating crucial information found in a typical prenatal record (e.g. previous surgery details, immune status, screening results, recent fetal surveillance, etc.) places pregnant patients and their offspring at risk for both immediate and long-term adverse outcomes. For example, patients who do not receive antibiotics in labor after testing positive for

Group B Streptococcal (GBS) infections are at great risk of passing the potentially fatal infection to their newborn. Infants of mothers who are Hepatitis B carriers who do not receive immune globulin and vaccination immediately after birth are at risk of acquiring lifelong chronic hepatitis. A documented concern raised and evaluated at the office or clinic about fetal well-being may not be conveyed to labor and delivery staff and covering physicians if the prenatal record is not available or outdated. This lack of information at the time of decision-making may result in delayed care, errors of omission with untoward inaction when extended surveillance is needed, or errors of commission when needless, possibly invasive, procedures are performed placing the patient at risk.

There are also economic consequences to missing records in the Labor & Delivery suite that effect various stakeholders including payers, hospitals, private practices, and liability carriers. A prenatal record that is not available frequently leads to repeated laboratory panels, blood type testing, genital cultures, hepatitis B evaluations, ultrasounds, fetal surveillance testing, etc., even when the results or evaluations exist but are inaccessible to the healthcare team. Added to the economic burden of duplicative testing are the costs incurred from the non-productive activities of nursing staff looking for absent records or reconciling incomplete records. Each missing or incomplete record creates a cascade of labor-intensive activities (manual searching, phone calls to the provider's office, phone calls to the laboratory, etc.) for the staff that may extend over many hours as found in this study. Further, even when a prenatal record is initially available or following its retrieval, it is sometimes necessary for the nursing staff to expend even more effort trying to locate incomplete information in retrieved records, or to confirm information that may be illegible either from faint facsimile transmissions, or more often, undecipherable handwriting on these paper forms.

Besides the healthcare and economic implications of absent communication or miscommunication, there are also professional liability consequences for clinicians. Making clinical decisions with outdated or no information at all is indefensible when the necessary information is available but locked up miles or minutes away. Resultant adverse outcomes may result in malpractice litigation that, besides demanding time away from patient care or family, also may result in professional liability premium increases or even denial of coverage.

Just as paper prenatal records have been used for

decades, so too have alternatives such as electronic prenatal records been available^{6,7}. These alternatives address the issue of missing records with instant availability of the most current patient information. While these early computerized prenatal records systems were often limited to specific computers, departments, or local area networks and not accessible beyond those confines, other more recent electronic prenatal record alternatives^{5,8,9,10}, have leveraged the global access capabilities of the Internet to provide even greater availability. As demonstrated in this study, after implementation of an electronic prenatal record, the problem of missing prenatal records at the birth center was effectively eliminated.

A case can be made that an electronic prenatal record should be the very first area of clinical automation¹¹ in many practices because of the much greater need for information exchange during a finite period of time in obstetrics compared to other clinical areas. Such a prenatal system could complement existing generic paper record systems and also coexist with generic electronic systems that are currently implemented or will be implemented in the future. That was exactly the case in the study clinics where one clinic remained paper-based for all other clinical services, and the other clinic used both paper and electronic record systems.

Although this study was limited to quantifying the problem of missing prenatal records at birth center presentation at just one hospital, it is likely that similar studies could be repeated at hospitals across the United States with similar results. What remains unanswered and worthy of further study and research are questions regarding the impact of missing prenatal records on clinical outcomes, and any quantifiable economic consequences of those missing records.

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