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A daily huddle facilitates patient transports from a neonatal intensive care unit

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Abstract

To improve hospital access for expectant women and newborns in the state of Maryland, a quality improvement team reviewed the patient flow characteristics of our neonatal intensive care unit. We identified inefficiencies in patient discharges, including delays in patient transports. Several patient transport delays were caused by late preparation and delivery of the patient transfer summary.

Baseline data collection revealed that transfer summaries were prepared on-time by the resident or nurse practitioner only 41% of the time on average, while the same transfer summaries were signed on-time by the neonatologist 5% of the time on average. Our aim was to improve the rate of on-time transfer summaries to 50% over a four month time period.

We performed two PDSA cycles based on feedback from our quality improvement team. In the first cycle, we instituted a daily huddle to increase opportunities for communication about patient transports. In the second cycle, we increased computer access for residents and nurse practitioners preparing the transfer summaries. The on-time summary preparation by residents/nurse practitioners improved to an average of 72% over a nine month period. The same summaries were signed on-time by a neonatologist 26% of the time on average over a nine month period.

In conclusion, institution of a daily huddle combined with augmented computer resources significantly increased the percentage of on-time transfer summaries. Current data show a trend toward improved ability to accept patient referrals. Further data collection and analysis is needed to determine the impact of these interventions on access to hospital care for expectant women and newborns in our state.

Problem

At an urban level IV neonatal intensive care unit (NICU) in Maryland, USA, we experienced a high daily census that was steadily rising. The annual average daily census increased from 34.5 patients in 2008 to 39.1 patients in 2012, while the total NICU patient capacity was 40 patients. During 2012, 47% of all days had a census greater than our planned capacity. Operating at this capacity strained resources and limited access to care for expectant women and neonates from surrounding hospitals in the state. Given that our institution is one of two level IV NICUs in the state, and the only perinatal center to provide invasive fetal therapy, it is crucial to maintain the availability of our services. Issues with access to care and admitting above census capability persisted into the year 2013.

In August of 2013 a multi-disciplinary quality improvement team was organized to evaluate the processes related to patient flow from the NICU with a mission of improving access to care for expectant women and neonates in our state.

Background

From April to August of 2013 there were an average of 48 patients who left our NICU per month. Patients were discharged through one of the following three routes: discharge to home (50%), transfer to another unit within the hospital (27%), or transport to an intermediate care facility (19%). Using process flow and fish-bone diagrams, our quality improvement team determined that the process for patient transport to an intermediate care facility held the most opportunity for improvement because it is a simple and stable process regardless of seasonality and condition of the patient at discharge. Therefore, we focused our improvement effort on this process.

Patient transport to intermediate care facilities requires coordination between several groups and institutions; Figure 1 describes this process in detail. We found several instances where there was a delay of transport or missed opportunity for transport because the transfer summary was not readily available to the transport team. As noted upon review of the process flow diagram, the preparation of the transport summary is the only portion of the patient transport process that was completely controlled by our institution. Consequently, we narrowed the scope of our interventions to those that could improve the timeliness of the transfer summary.

Baseline measurement

The primary outcome measure was the percentage of on-time transfer summaries per month. This was defined as the percent of summaries that were signed by a neonatologist at or before 9:30 am. We chose the 9:30 am cut-off because the neonatologists are involved with patient rounds after this time, which appeared be a barrier to signature provision. The mean percentage of on-time

transfer summaries at baseline was 5%, with a maximum upper control limit of 20% (see figure 2a).

As neonatologists expressed concern that they were not receiving the electronic summary from the resident or nurse practitioner (NP) in a timely fashion, we also measured the percentage of transfer summaries that were transmitted from the resident or NP to the attending before 9:30 am. The mean percentage of summaries prepared on-time by the resident or NP at baseline was 41%, with a maximum upper control limit of 71% (see figure 2b).

See supplementary file: ds3500.pdf - “BMJ figures”

Design

Upon review of the process flow diagram for transport summary preparation (figure 3) two barriers were identified. First, residents/NPs and neonatologists needed knowledge of the transport schedule to anticipate a deadline for completion of the transfer summary. Secondly, computer access was instrumental to generate, review, and sign the transfer summary. An intervention to improve both awareness of the transport schedule and access to computers was essential.

To optimize communication related to the timing of patient transports, we initiated a multi-disciplinary huddle. The "huddle" is a concept that encourages team communication, a culture of teamwork, and helps to identify problems early and efficiently.(1) The use of a huddle as a tool for communication is highlighted by the Institute for Healthcare Improvement.(2) Recent quality improvement reports from both an intensive care unit and a pediatric surgical unit successfully incorporated a huddle as a strategy to improve patient flow and improve access to care.(3,4) We hypothesized that a daily huddle in our NICU would increase the percent of on-time transfer summaries by providing more opportunities to coordinate care for patients in need of transport. Our primary aim was to increase the percentage of on-time transfer summaries to 50% by December 2013.

In order to address the technical aspects of preparing the transfer summary, early efforts were made to increase computer accessibility in the NICU.

Strategy

Phase I: staff awareness

During a July 2013 divisional meeting, we disseminated and promoted staff awareness of the high census and delayed patient transports, described the QI team's mission and aim, and introduced the concept of the daily huddle. We sent huddle reminders via email to neonatologists at the start of their service duty period.

Phase II: change implementation

PDSA cycle 1: On August 14, 2013 the daily huddle was initiated. The huddle included a physician, case manager, social worker, and/or charge nurse. It occurred Mondays through Fridays, with the exception of Tuesdays when a larger multi-disciplinary group met to discuss patients in greater detail (known as multi-disciplinary rounds). The huddle occurred with consistency over an eight week period. We saw an initial immediate increase in the percent of on-time transfer summaries. However, feedback from the NPs identified insufficient computer access as a limitation to preparing transfer summaries.

PDSA cycle 2: On October 13th, 2013 computer access was improved by re-configuring several existing computers in the clinical areas, thereby increasing the number of computer stations available for preparing transfer summaries.

Throughout both cycles, baseline and post-intervention data were displayed prospectively in several locations of the administrative offices, clinical offices, and presented at our monthly quality assurance/quality improvement conferences.

Post-measurement

The divisional data manager provided a monthly list of all patients who were transported from our NICU to an intermediate care facility. Metrics related to the transfer summary were collected from the electronic time stamp in the medical records of transported patients. In addition to process measures, we evaluated one outcome measure which was the number of "in-network" patient referrals that were declined each month.

There were a total of five to 16 patients transported per month during the baseline and post-intervention period. Data were plotted and analyzed using a control chart.

Following initiation of the daily huddle, residents and NPs prepared the transfer summary in a more timely manner. The percent of summaries that were prepared on-time rose from a mean of 41% (baseline) to 72% (post-intervention). Performance improvement was sustained above baseline measures over a nine month time period (see figure 4a).

Similarly, there was an improvement in the percent of on-time transfer summaries following initiation of the huddle; neonatologists signed the summaries on-time at a rate of 26% (post-intervention) compared with 5% (baseline). Notably, performance during every month was sustained above baseline measures over a nine month time period (see figure 4b).

The expected time commitment imposed by a daily huddle was estimated to be roughly 15 minutes per day, with the exception of Tuesdays when a larger multi-disciplinary group met to discuss patients. This was known as multi-disciplinary rounds (MDR). Though we had no baseline data at the initiation of this project, our anecdotal experience was that these rounds took approximately two hours or more to complete. Given the length of these MDR, we were concerned that additional time spent in a daily huddle would be burdensome for staff. However, we hypothesized that the daily huddle would reduce the time spent in MDR since most members of

the MDR team were also part of the huddle team, and updates in MDR were expected to take less time. In October 2013, we monitored the length of MDR to determine the impact, as a counter-measure. The duration of rounds ranged from 60 to 90 minutes during the month of October (figure 5). Given these data and the general feeling that MDR were significantly shorter since initiation of the project, we reduced data collection to random spot checks, which have remained consistent with October data.

We also evaluated the number of transfer referrals that we "declined" due to high census during the period of study, since this can result from inefficient discharge/transfers out of our unit. This is shown in figure 6, and we can see that the frequency of declined admissions declined overall throughout the course of this project.

Lessons and limitations

Although we did not achieve our stated goal (50% of transfer summaries delivered on-time) we showed significant improvement that was sustained following our interventions. The daily huddle created routine opportunity to communicate patient information in a multi-disciplinary setting and had the potential to facilitate coordination of patient transports. Given the additional time commitment that a huddle imposed on the NICU team, we were uncertain whether the intervention could be maintained in our busy ICU environment, especially in view of a prior quality report citing this difficulty.(3) The engagement of the NICU case managers and social workers on the QI team was an essential component of generating enthusiasm for the huddle. Case managers and social workers inherently became responsible for gathering key individuals for huddle each day. Their commitment helped maintain the huddle over the first eight weeks. Eventually, neonatologists came to value the experience and demonstrated commitment to the process as well. Currently we continue to huddle and, at the request of the neonatologists, are considering replacing the weekly MDR in favor of a huddle. Limited data collection has shown that any concern for unintended consequences of the huddle (long MDR times) was unfounded, and MDR times may have been positively impacted by the huddle. As an unexpected benefit of the huddle, the neonatologists report improved opportunity to discuss patients within a multi-disciplinary context while eliminating the need for the weekly MDR. The ongoing effort to replace MDR with a huddle suggests a feeling of increased efficiency of NICU multi-disciplinary care in our unit since its initiation.

Prior to commencement of the QI project, there was initial concern on the part of the neonatologists that that the transfer summaries were not prepared by the NP/resident in a timely manner. Neonatologists cited this as a barrier to having the transfer summaries signed and delivered before 9:30 am. Therefore, our team felt that it was important to include the summary preparation as a quality metric. By doing this, we were able to provide objective data to the neonatologists about summary preparation and also engage the NP/resident group in this project. Two NPs joined our QI team and were instrumental in identifying computer access issues that impeded summary preparation.

Limitations of this project relate mainly to the sample size of patient transports and of neonatologists. December and January demonstrated a low volume of patient transports, which may have contributed to lower performance relative to earlier post-intervention months. Another explanation for this observation is that the attending neonatologists rotate service duties every three weeks. It is possible that one or two of the seventeen neonatologists were responsible for lower performance during those months. Despite the temporary decline, there was an improvement in the following months and performance for all months remained above the baseline mean, demonstrating a significant change in the post-intervention period. Data trends over the next year may help to determine additional causes of variation in performance. The small sample of patient transports and the short time period between the first and second PDSA cycle made it difficult to determine the effect of either intervention alone. Regardless, the QI team believed that limited computer access was a significant barrier that deserved early resolution. An additional limitation of our project is that the provision of the neonatologist's signature is not the final step in the process of completing a transfer summary. Once signed, the summary must be delivered by the neonatologist or ward clerk to the medical record. Delays in this final step would be missed by utilizing our current metric.

Improving access to care for women and newborns was the original mission of the QI team. We are prospectively tracking our ability to accept newborns from our referral hospitals on a monthly basis. Figure 6 demonstrates the number of declined referrals to our NICU from "in-network" hospitals. This would largely represent patients who were not admitted to our institution because of census limitations. We have observed a trend showing less "in-network" patients being diverted to competing facilities since initiating this project. We suspect that this could be directly related to efficiency in patient outflow; however, the number of observations are small at this point. We will continue to incorporate this as an outcome measure to look for sustainability of this trend. Of great interest to us is that we have not lost any patient transport opportunities related to unprepared transfer summaries since the initiation of this project, which was an un-quantified problem reported in the past. Certainly, an unexpected transport cancellation would be a patient and family dissatisfier and we are continuing to monitor for such events.

An institutional change occurred during the project period which may have impacted performance in February 2014. During this time the hospital increased the size of the NICU, expanding the census capacity to 48 patients. We wonder whether this additional capacity reduced the perceived urgency for timely patient transports and contributed to the lower performance. We expect that any reduction in such perception will be limited as we continue to operate at a high capacity. The project team continues to emphasize the need for appropriate patient transport planning and performance has increased since February (figure 4b).

The increased census created an additional challenge by increasing the number of medical teams involved in the daily huddle. The QI team restructured the huddle schedule to accommodate the additional medical team. In this situation, the efforts of the case managers and social workers in maintaining the consistency of the

huddle was invaluable.

Conclusion

Our NICU struggled with a high patient census and inefficient mechanisms for discharging patients. Improving the readiness of the transfer summary was an obvious opportunity to avoid delays in transporting patients from our unit. PDSA cycles that focused on improving communication and technology significantly improved the percent of on-time transfer summaries from 5 to 26 percent over a nine month time period. Staff dedication to the huddle was an important aspect of maintaining our intervention over time, particularly when major institutional decisions changed the practice environment. Although we did not reach our goal of 50% on-time transfer summaries, we are showing a reduction in the number of newborns who are unable to access our institution and have not experienced any missed opportunities for patient transports away from our unit since the project began. Expanding the aims of the QI team to decrease inefficiencies in discharges to home is another means to support our mission in the future.

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Declaration of interests

Nothing to declare.

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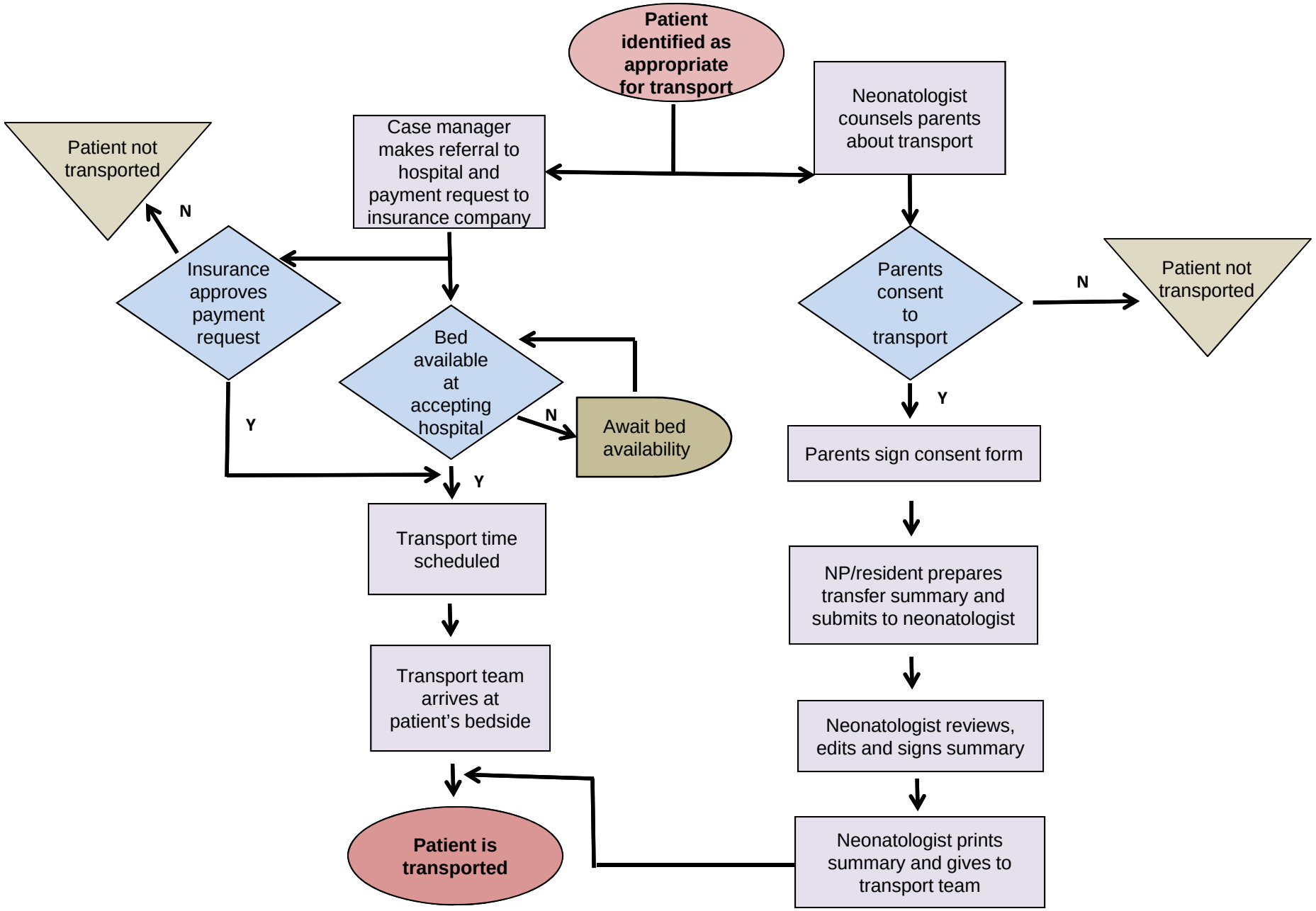
Figure 1. Patient Transport Process



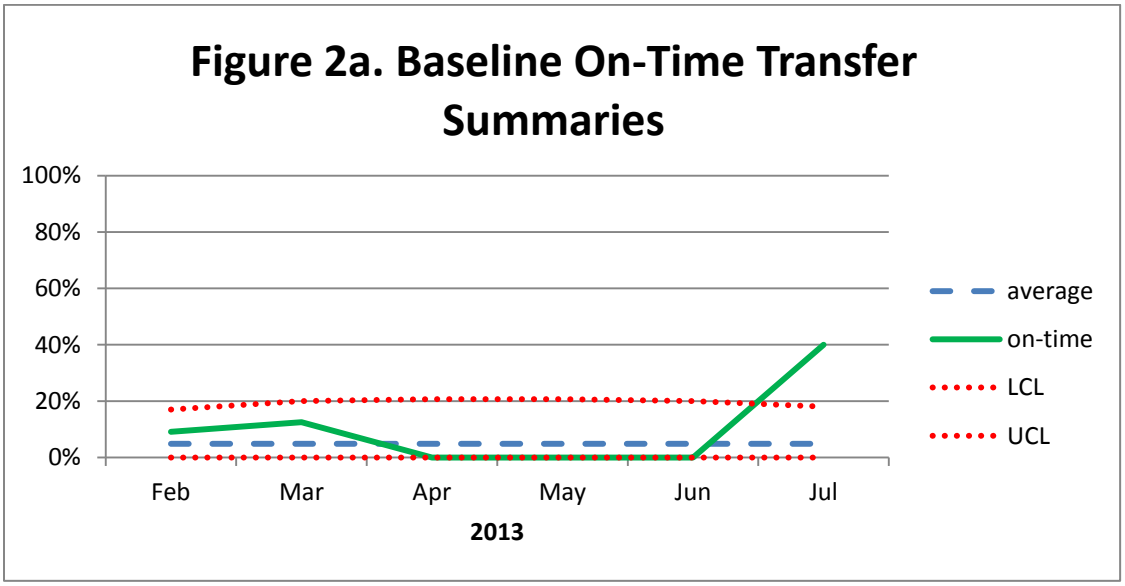


Figure 2a. Baseline On-Time Transfer Summaries
100%
80%
60%
40%
20%
0%
Feb
Mar
Apr
May
Jun
Jul
2013
average
on-time
LCL
UCL

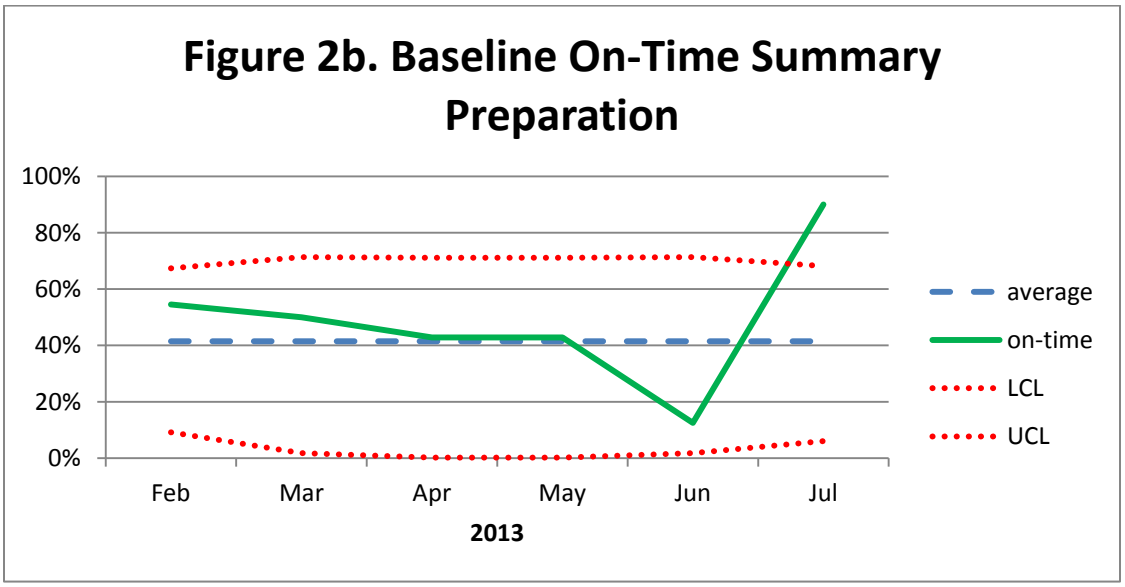


Figure 2b. Baseline On-Time Summary Preparation
100%
80%
60%
40%
20%
0%
Feb
Mar
Apr
May
Jun
Jul
2013
average
on-time
LCL
UCL

Figure 3. Discharge Summary Preparation

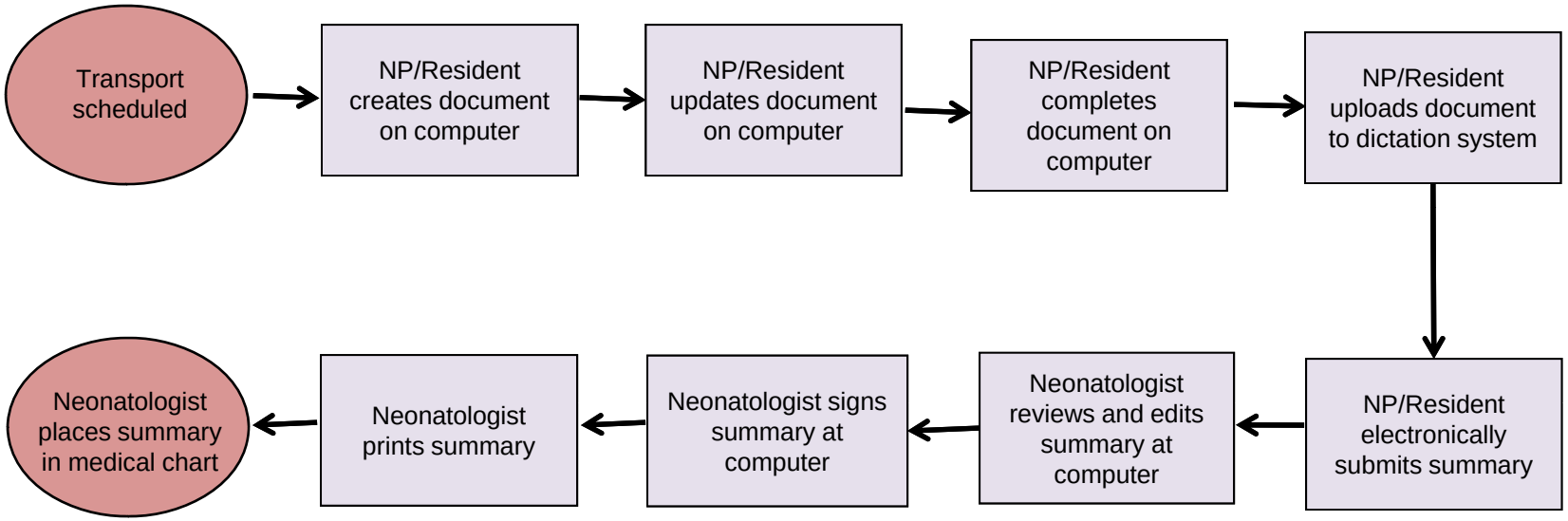


Fig. 4a On-time Summary Preparation

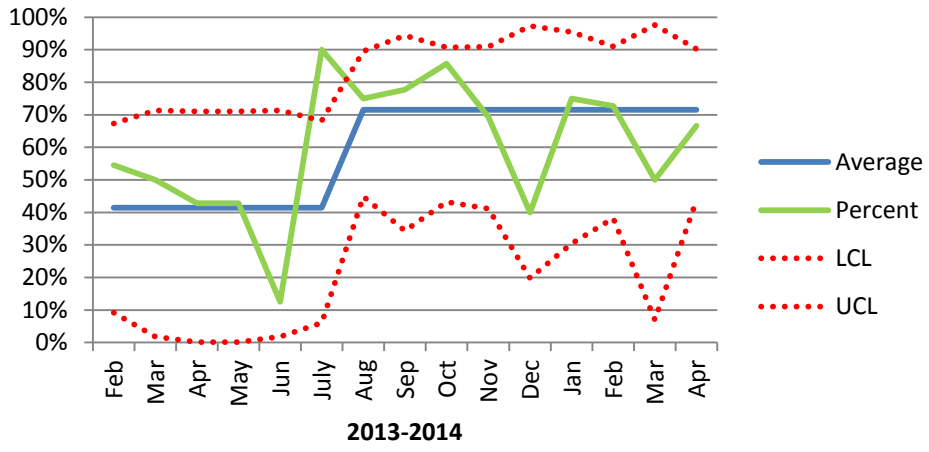
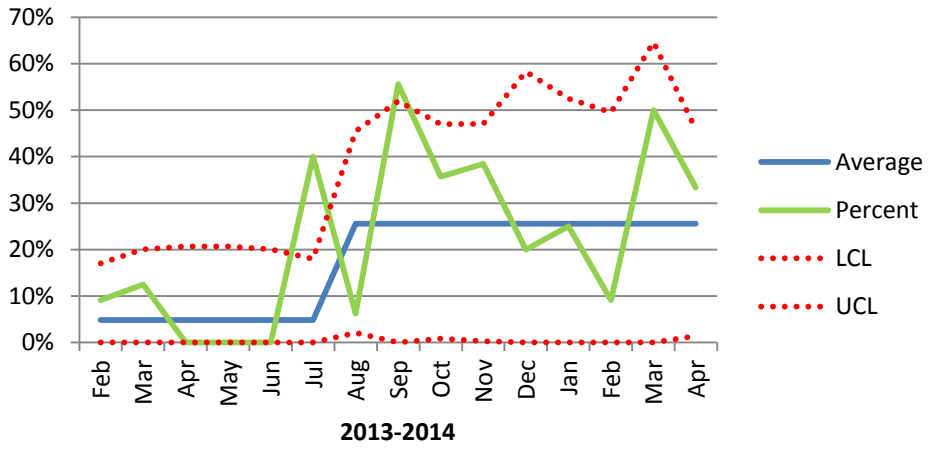


Fig. 4b On-time Transfer Sumamries



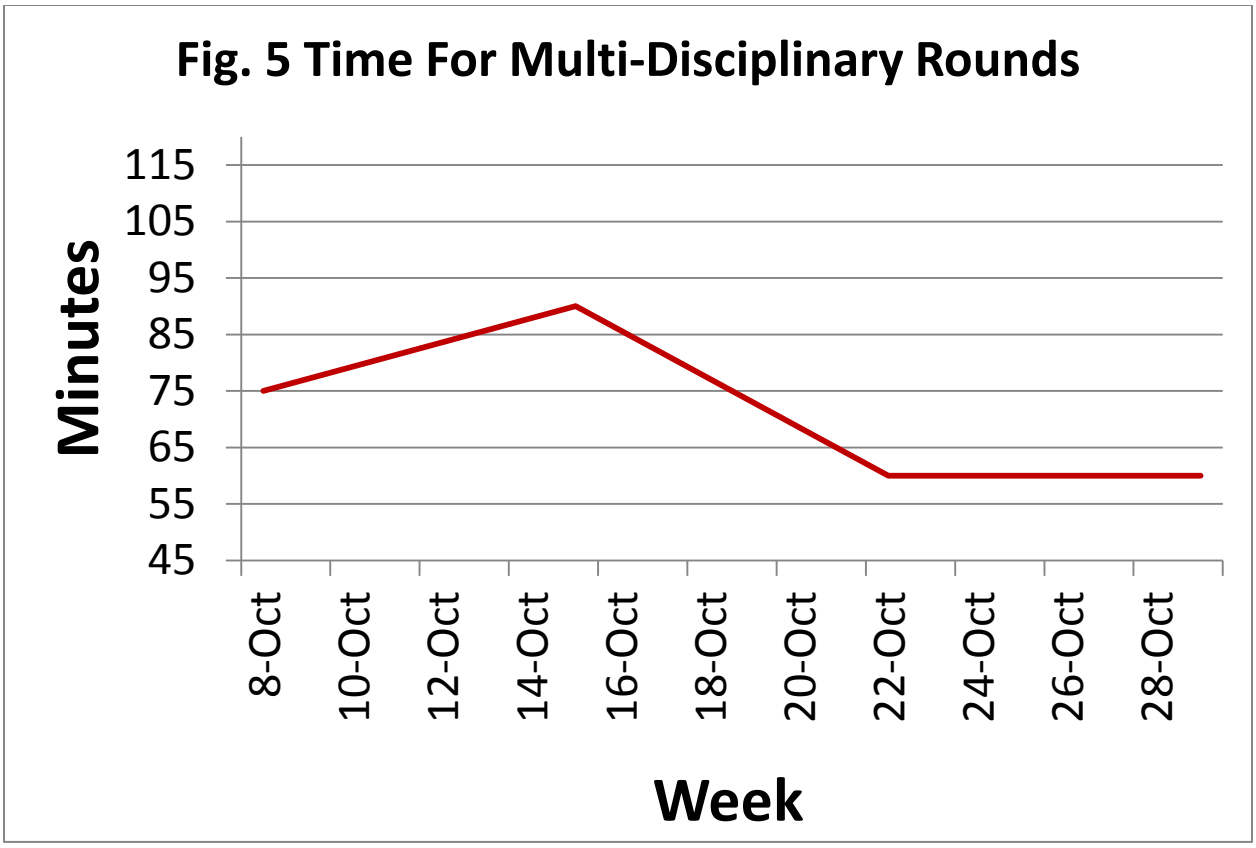


Fig. 5 Time For Multi-Disciplinary Rounds
Minutes
115
105
95
85
75
65
55
45
8-Oct
10-Oct
12-Oct
14-Oct
16-Oct
18-Oct
20-Oct
22-Oct
24-Oct
26-Oct
28-Oct
Week

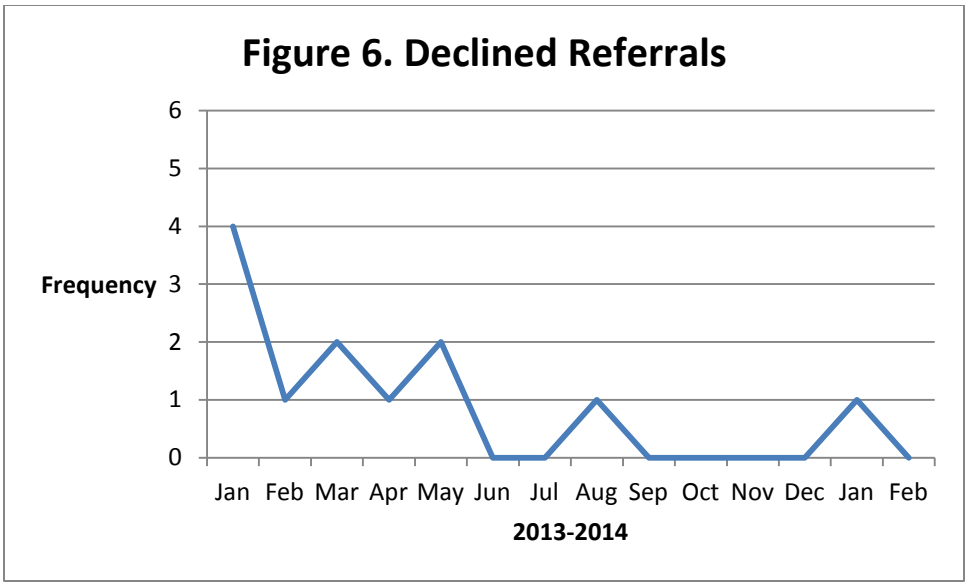


Figure 6. Declined Referrals
Frequency
6
5
4
3
2
1
0
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb
2013-2014