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March 19, 2013 · 2:15 am

## First Time and Motion Study at Retina Clinic

At the narrow corridor on the 2<sup>nd</sup> floor of L.V. Prasad Eye Institute (LVPEI), the head ophthalmologist of Retina Clinic, Dr. Rajeev Reddy, quickly went through the stacks of patient folders that freshly arrived from the registration this morning. Immediately entering the corridor, three of his optometrists conducted work-ups on three examinations room, while further down the corridor two fellows assisted him in diagnosing his patients.

We have chosen Dr. Reddy's clinic as a starting point of our time and motion study because we had been told that his clinic was well-streamlined compared to others, allowing us to get accustomed to the clinic, patient flow, and different interaction points between ophthalmologists, optometrists and clinicians in a relatively controlled environment. By the end of the day, we managed to collect data on 57 patients who have visited Dr. Reddy's Retina Clinic on March 19<sup>th</sup>. For each patient, we tracked the following information:

### Basic Patient Information

- Patient's folder number
- Check-in time
- Appointment time
- Patient's plan (Non-paying, General, Supporter, Sight Savors)
- New or returning patient
- Walk-in or appointment-based
- Clinic name
- Doctor's name
- Date

### Clinic (pre-diagnostic)

- Folder arrival time
- Work-up starting time
- Work-up completion time
- Patient check-out time or departure time for diagnostic if required

### Diagnostic (if required)

- Folder arrival time
- Diagnostic starting time
- Diagnostic completion time

### Clinic (post-diagnostic)

- Folder arrival time
- Patient check-out time

At his clinic, we observed that Dr. Reddy was able to see his patients in just below 3 hours on average, including 15 minutes that the optometrists spent on work-ups. One success factor behind his clinic was the way Dr. Reddy managed the influx of patients, who were visiting the clinic with different needs and often appearing at the clinic with significant deviation to their appointment times. In an effort to adhere to the appointment-system, Dr. Reddy has categorized his patient folder into six piles: “On-time”, “Late”, “Investigation”, “Cross-consultation”, “Dilation”, “Dilation-late”. By doing so, he was able to give priorities to patients who were on time, and penalize late patients (he allowed 15 minutes buffer for late patients) by making them wait until another slot became available on his appointment template. According to Dr. Reddy, his returning patients began to appear on time as a result of this self-invented system.

Dr. Reddy has also developed a smart scheduling system. In the morning, Dr. Reddy combined new patients and one-week follow up patients so that he can get through the follow-ups while the new patients were in the work-ups. In the afternoon, Dr. Reddy reserved specific slots in his appointment template for post-diagnostic consultation and cross-consultation, as they required little time for consultation. By bundling the short and simple consultations and stacking them all in the afternoon, Dr. Reddy was able to follow the appointment template that was created in the morning with little disturbance.

Another driver behind his efficiency was the fact that Dr. Reddy had two experienced fellows assisting him. Dr. Reddy has authorized his two fellows to see his patients without his supervision, requiring him to see the patients for few minutes at the end of the consultation. Not all ophthalmologists are assisted by fellows who are experienced. As a teaching hospital, LVPEI trains fellows and optometrists at different stages of their learning curve and depending on their experience, they can add or decrease capacity to the clinic. In the case of Dr. Reddy, having autonomous fellows allowed him to reduce face time with patients and spend more time managing and coaching his optometrists.

Our first trial of time and motion study at Dr. Reddy’s Retina Clinic alluded to some of the best practice of managing patient flow that can be standardized throughout the clinics at LVPEI. We are excited to conduct time and motion study in other clinics with more complex process and more patient volume so that we can deep dive into the heart of the patient waiting time problem at LVPEI.

March 21, 2013 · 11:52 pm

## **Meeting at the Indian School of Business (ISB)**

In 2011, Indian School of Business (ISB) partnered with LV Prasad on a research project to understand major contributors to patient waiting times and coming up with recommendations to reduce them. When we found out about this partnership, we were very curious to learn about the research that has been done. We were also concerned that the work that we will be doing could have overlaps with the work already done by ISB professors. These concerns were shared with

our clients at LV Prasad who wanted to focus our project around development of dynamic dashboard that would capture patient waiting times dynamically, as opposed to looking to use the data to identify the main contributing factors to prolonged waiting times.

Prior to our arrival to Hyderabad, we arranged a meeting with ISB professors involved in the LVPEI research. Because we had little information about what their research entailed or what results they have been able to derive from their research, we were excited to talk to them to find out about their findings.



ISB's main building

We arrived to ISB on Wednesday afternoon and were instantly impressed by the campus. It looked really well maintained, sprawling several hundred acres of territory in the suburb of Hyderabad. ISB is an internationally recognized business school ranked first in the country and in the top 50 world wide. After meeting and catching up with our mentor, Janet, we were greeted by Professor Deo's secretary and led to the conference room where we met Professor Deo and his associate Professor Jain. They were very forthcoming with their research work and preliminary findings.

Their research was based on a 6 month dataset of patient records that included:

- Check-in times
- Check-out times
- Types of the appointments
- Package type: i.e. paying vs. non-paying

However, the ISB research did not have data on any of the intermediate steps in the patient flow, i.e. workup times, diagnostic testing times, capacity/resourcing information, etc. This was one of the main areas where we realized our research could add real value to LVPEI.

With this data, the professors have mainly done regression-based analysis with a goal of identifying factors that contribute to the patient wait times and what can be done to improve them. A couple of the working findings and recommendations that came out of their work included:

- Looking into the patient mix that comes into the clinics each day. There is a correlation between the type of the patient and the amount of time he or she spends in the clinic.
- There is a correlation between the time of the appointment and the expected waiting time. Earlier appointments tended to have longer waiting times, which challenged the intuition that drove most patients to show up early in the day.

It became evident that there were certainly opportunities for our work to complement theirs, but we acknowledged that it might be premature to work together, as both of us were still in the process of collecting and synthesizing data. As a team, we left the meeting feeling validated that our work would be truly meaningful to LVPEI, and with a renewed commitment to driving practical and actionable recommendations.

March 23, 2013 · 1:04 pm

## **Conducting Surveys at the Walk-in Clinic**

LV Prasad's vision is rooted in the belief that no patient looking for care should be turned away. One of the ways this vision is realized is through their walk-in counter. Patients without prior appointments can come to the hospital, see a counselor, and be given an appointment with a doctor on the spot. This process is known to take a very long time (sometimes a full day), and as a result many patients show up very early in the day (before the counter opens at 7:00am). Doctors schedules always include slots for walk-in patients, but it is almost always the case that

these spots are quickly filled. As a result, they are often overbooked with patients who are incorrectly scheduled by administrators.

To better understand the motivations of people who choose the walk-in counter, we decided to conduct a patient survey with the help of a translator. At 7:30am on Saturday, we spoke with the patients waiting to see a counselor, and asked the following questions:

1. What time did you arrive today?
2. How long do you expect to spend at LV Prasad today?
3. Did you try to make an appointment before coming?
4. If yes, how did you try to make your appointment?
5. If yes, why were you unable to do so?
6. If no, why not?

After compiling our survey results, we found that many patients (nearly half) had not tried to make an appointment because they were unaware that it was even an option. Many of these patients were also new to the hospital. It turned out to be a good exercise for our host, who then had the opportunity to educate these patients on their options for booking an appointment ahead of time. For the rest of the people who had tried to make an appointment, many had opted for walk-in because the time they were offered was too far into the future.

Their survey made it clear that there was low awareness among patients about the appointment option was a driver for increased volumes of walk-ins. It also supported our hypothesis that many patients were willing to sacrifice a day waiting to see their doctor so that they did not have to wait for the next available appointment, which could be anywhere from 2 weeks to 6 months.

In response to these findings, we hypothesized that the following changes could help to decrease and/or regulate the number of walk-ins.

1. Raise awareness of appointment options, especially among new patients
2. Dedicate medical staff to walk-ins specifically

By making it more clear, for example in marketing materials, that patients can choose to make an appointment, many might choose that option rather than wait for hours to see a doctor. Dedicating medical staff would serve not only to remove the added stress from a doctor's appointment schedule, but also to have walk-in patients be seen sooner. It might also discourage patients from using the walk-in option, if they know that it means they will not get to see their own doctor that day.



Patients speaking with a counselor at the walk-in counter

## Time and Motion Study #4

We conducted our fourth and final Time and Motion Study at Dr. Pravin's cornea clinic. Dr. Pravin's Monday clinic was famous in the hospital for its exceptionally large patient volume that often exceeds 100 patients, not to mention that Mondays, in general, tend to invite more patients than the rest of the week because the hospital is closed on Sundays. We thus arrived mentally prepared for a very long day at the cornea clinic.

Dr. Pravin runs three cornea clinics per week based on the kinds of patients he sees. On Mondays, he sees patients with pathology or patients who require multiple investigations, while on Wednesdays and Thursdays, he only sees patients who require lasik and cataract. The very nature of his specialty and the types of patients he sees on Monday attributes to a longer service time per patient than other two days.

When we arrived at the clinic, Dr. Pravin openly told us that he does not follow the appointment template very rigorously beyond using the appointment time to sort the patient folders. Instead, he gave a general guideline to his head optometrist on how he wanted to see his patients and

whom to give priority in the waiting list. One guiding principle he upheld in his clinic was prioritizing the vulnerable patients, such as children, elderly, and patients with special needs (e.g. patients with diabetes, patients who need to catch a train at a certain time, etc). It was also very interesting to observe that he prioritized family members of staffs and patients who required refractive surgeries. Like the rest of the doctors we have shadowed, Dr. Pravin was also subject to the hospital's guideline to prioritize patients on premium packages, such as Supporters, who pay double, and Sight Savors, who pay triple for the service. Allowing certain patients to short cut the waiting line created a backlog and indirectly penalized patients who had arrived on time for their appointment, giving us the impression that everyone suffered as a result of trying to please everyone.

By the end of the day, Dr. Pravin had seen over 120 patients. He saw his last patient at 20:15, despite the fact that the check-in desk closed at 17:30. Our legs became sore from standing at the clinic and crunching data for over 10 hours. One can only imagine how exhausted Dr. Pravin, his fellows and his optometrists might be, reinforcing the need for a better management of patient volume at LVPEI

March 25, 2013 · 6:33 pm

## **Time and Motion Study #2**

Our second day was also spent conducting a time and motion study at another retina clinic at LV Prasad. This time we were warned to expect that the clinic would be slightly more chaotic than Dr. Reddy's. As it turns out, "slightly" would turn out to be an understatement.

Dr. S is a retina doctor with a special focus on pediatric patients. She cares deeply about her patients. As examples, she makes it a point to introduce herself to new patients before their work-up with the optometrists, and will see her patients in the pediatric centre on another floor if it eases the experience for the child and the family. In fact, she splits her two clinic days between the two locations, and tries to see as many of her pediatric patients as possible on the same day. All of these subtle adjustments can (and do) add to patient wait times, but are also a reflection of the pride she takes in her work.

From the start of the day we observed other noticeable differences in the way Dr. S conducts her clinic. Patient folders arrive in roughly 10-minute intervals and are added to the bottom of the pile. Rather than order them by appointment time, she has them ordered by check-in time. This potentially means that patients who come earlier in the day will be seen sooner, even if their appointment is much later in the day. Late patients are also left unpenalized. To her, appointment time is only a way to try to distribute patient arrival times at the clinic. Dr. Reddy, in comparison, orders his patients by appointment time. He enforces the rule that his patients will not be seen any earlier, and also punishes late patients by putting them aside until slots are available, however much later they may be.

In terms of room layout, Dr. S has 3 work-up rooms available for 4 optometrists, including the head optometrist, who is responsible for overseeing the work-up process. The rooms are scattered at opposite walls of the clinic room, with the 3 ophthalmologist rooms in the middle.

She has 1 fellow who is permitted to see patients, but cannot discharge them. The waiting lounge for patients is down a crowded corridor. This was a sharp contrast with Dr. Reddy's clinic, where the waiting lounge was right next to the clinic, and the 3 pre-work rooms were on the right side of the corridor, and the 2 ophthalmologist rooms were on the left. It was hard to ignore how the layout of the room contributed to the chaos.

It was clear that Dr. S was a highly sought-after doctor by the number of external requests, such as cross-consultations, that came to her over the day. She essentially dealt with these requests on a "first come, first serve" basis. People who came to her and could get her attention would be helped. We contrasted this again with Dr. Reddy, who put aside blocks of time over the course of the day to dedicate to external requests.

Over the course of the day, Dr. S saw 94 patients, including appointments and walk-ins. This was an increase of nearly 30 patients over Dr. Reddy's count from the day before. As the day went on, the stacks of patient files in queue grew steadily. On at least two occasions, we observed Dr. S sift through the folders herself, and "pre-diagnose" those who needed work-up by the optometrists, to decrease their time with the patient. Late in the afternoon she even moved a filtered stack of folders to the next step of the process without work-up, clearly irritated at how many were still in queue. While this was effective in speeding up the process, it was not in line with the standard operating procedure at LV Prasad.

By the end of the day we could see clearly that Dr. S cared a great deal about her patients, and wanted each of them (and as many of them as possible) to have a good experience with her. But we also noticed a much more chaotic atmosphere, an increasing backlog of patients as the day progresses, and the use of shortcuts. We wondered, what was the tradeoff to be made between streamlining the patient flow and delivering quality health care? What were the perceptions of these two doctors by their patients? And what insights could be applied from Dr. Reddy clinic, without compromising Dr. S' relentless focus on building a relationship with her patients?

## **Eye examination with Dr. Praveen**

As a small token of appreciation for our work, Dr. Praveen kindly offered to get our eyes examined during one of his retina clinics. We were excited to get our patient folders made, which will be permanently shelved at LVPEI for us to get our eyes checked anytime when we visit Hyderabad in the future. In the morning, we got our eyes dilated by the optometrist. Once our eyes were dilated, we lost our vision for few hours. We were hardly able to walk outside without sunglasses. In the afternoon, we were taken to Dr. Praveen's office where he took us one by one and examined our eyes. Luckily, we had no problems with our eyes! It was a great way to experience patient pathway.







March 28, 2013 · 3:43 pm

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## Dr. GC

We had spoken with Dr. GC, the Director of LVPEI, only once before arriving in Hyderabad. So when the opportunity came to meet him in-person, we weren't sure what to expect. We were excited but a little intimidated – after all, this man had done amazing things!

We walked into his grand office and sat at the table in front of us while he finished an e-mail. When he turned to join us, we were face-to-face with a small, older man with kind eyes and a warm smile. He welcomed us to LVPEI, asked how our flight had been, and made sure we had everything we needed. Then he asked about our work, what we were hoping to accomplish while we were in Hyderabad, and how he could be of help.

After we told him about our plan, we asked if there was anything in particular he thought we should be focusing on. He took a moment to think before telling us that he felt it would be better if we approached the situation without biases, including his own. Each person we would see during our time there would have his or her own thoughts about where to place to blame (and it

would never be on themselves), and the benefit of having us there would be to provide an unbiased view of what was happening. It was refreshing, motivating and humbling to meet a man who was so invested in his work, but was still looking for new perspectives to improve the quality of service in his hospital.



After dinner with Dr. GC and his wife

We walked away from our first meeting with Dr. GC with a renewed confidence and appreciation for the work we were doing at LVPEI. We had several more opportunities to spend time with him over the two weeks, including a delicious dinner with his wife at their favorite restaurant in the city. He openly and candidly shared his life with us over beers and chapati, and tried his hardest to get us to appreciate paan (not all of us could be won over, unfortunately). When we asked about the sustainability of relying on donations for funding, he looked each of us in the eyes and told us firmly that he believed the future would depend on the willingness of the next generation of leaders (us) to be a part of something bigger than themselves. While this may have been an argument begging to be contested by a typical business-minded student, we were content, and quite frankly inspired to be those leaders. There was nothing left to ask.

At the end of our trip we met one last time with Dr. GC, shared some of our initial hypotheses, and discussed the work that would be done once we returned to MIT. We presented him with the MIT Sloan Global Health Lab glass globe, shook hands, and made plans to meet again when he

visited MIT in early May. It was a wonder that it had taken so long for LVPEI to come up as a Global Health Lab project, but we were sure that this was the start of great relationship.

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