

LV Prasad Eye Institute Interim Report

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Introductions

Ali Kamil

System Design & Management Fellow
Sloan School of Management
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Work Experience:

Deloitte Consulting LLP

MIT Student

Msc. in Management Studies
Sloan School of Management

Work Experience:

African Solar Rise
Citigroup Global Markets

Dmitriy Lyan

System Design & Management Fellow
Sloan School of Management
School of Engineering

Work Experience:

Primus Asset Management
Lehman Brothers

Nicole Yap

Msc. In Management Studies
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Work Experience:

Deloitte Consulting LLP

Executive Summary

- Visited 3 local hospitals in Boston to observe patient flow and operations
- Interviewed 4 hospital (operations) managers – understanding existing patient flow optimization practices
- Observed use of technology (dashboards) in managing patient flows
- Conducted a literary review of articles, research papers, and thoughtware associated with long wait times in hospitals and appropriate interventions that work in resource limited settings
- Developed action plan for time and motion study at LVPEI









Literature Review

- Observation through time and motion study is an effective tool to identify bottlenecks in the system¹
- Design effective queuing system to manage patient flow in a high utilization environment²
- Use Management Tools to reduce waste and improve the quality of care in patient delivery systems³
- Understand the supply and demand structure of patient systems in a low-resource setting⁴
- Technology is an enabler and not a solution to the problems in patient flow systems. Identify bottlenecks in the system and improve the process flow⁵

1. Finkler SA, Knickman JR, Hendrickson G, et al. A comparison of work-sampling and time-and-motion techniques for studies in health services research. Health Serv
2. Note on the Management of Queues
3. NHS Seven Ways to No Delays – Version 2.0, January 2010
4. 4. Waiting lists, waiting times, and admissions: an empirical analysis at hospital and general practice level.
5. Massachusetts General Hospital's Pre-Admission Testing Area (PATA) Kelsey McCarty, Jérémie Gallien, Retsef Levi

Massachusetts Eye and Ear Emergency Department (ED)

- All Patients are walk-ins – emergency room model
- Operates 24 hours, 7 days-a-week
- 2 physicians (+1 back-up physician at Comprehensive Ophthalmology Clinic)
- Experiences high patient volumes on holidays, Monday and Friday afternoon, and favorable-weather days
- Also serves MGH ED for patients with eye injuries
- Uses status screen in waiting room (sample below)

Name	Treatment	Stage	Status	
John Smith	Retina	Vitals and EKG		
Adam Jones	Cornea	Waiting Room		Legend  < 10 Minutes  10-15 Minutes  > 15 Minutes
Tiffany Kelly	Glaucoma	Waiting Room		
Ben Williams	Cornea	Physician Room		
Jane Doe	Retina	Waiting Room		

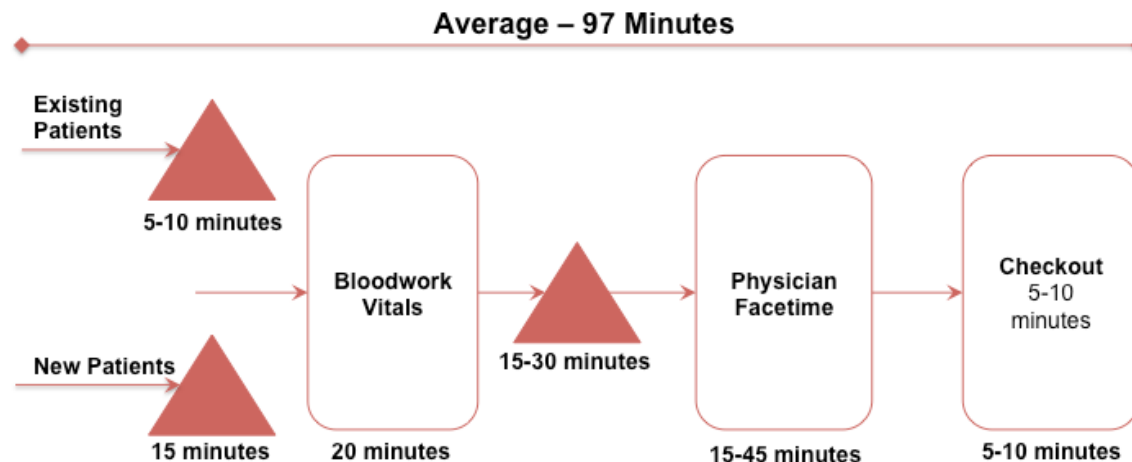
Massachusetts Eye and Ear Clinic and Operating Room (OR)

- Patients are categorized as “New Patient”, “Post-op” and “Follow-up”
- Almost all patients are OPS
- Ophthalmologists are always double or triple booked
- Stacks post-op patients in one day (because post-ops take less time and included in the insurance)
- Appointment is required. Walk-ins are rarely seen.
- All patients are assigned to a designated doctor
- Each clinic has its own lab technician
- Uses medical management software (*McKesson Paragon*) for patient flow management in OR

Massachusetts Eye and Ear Clinic and OR – Patient Pathway

Patient Pathway (97 minutes average check-in check-out time)

1. Patient Checks-In – reception logs in arrival time
 - a. If new patient – Patient is asked to fill out medical forms at reception (10 minutes)
2. Lab Technician (or nurse) puts patient in a queue
 - a. Basic tests and vitals performed (20 minutes)
3. Patients wait to see the Physician (15 – 30 minutes)
4. Physician face time with patient (15 – 45 minutes)
 - a. Physician provides prescription, discharge information, and a chart to bring back to the secretary
5. Payment, follow-up scheduling, and check-out (5-10 minutes)



Massachusetts General Hospital (MGH)

Pre-Admission Testing Area (PATA) Case Study

- PATA is an outpatient clinic responsible for completing the required tests and screenings for outpatients at the Mass General Hospital (MGH)
- Any patient scheduled for surgery at MGH is required to go through PATA for screening
- Operated with 12 exam rooms, 5 Registered Nurses, 7 Anesthesiologists, 2 Lab Technicians, and 2 Charge Nurses

MGH – PATA

Problems

- Average wait time – 3 hours and 15 minutes
- Variability in service rate – 40 minutes to 4 hours
- Patients arrived early in the day resulting in overutilization of nurses and MDs
- Unhappy patients - many walked out with no screening. Showed up on day of surgery causing delays and backlog on surgeon's schedule
- PATA was scheduled to run from 8am-3pm.
- Due to long-wait times, staff worked overtime until 7pm
- Overutilization increased error rate, resulting in adverse patient experience, and exhausted staff

□ **Long wait times, unpredictable service rate, and overutilization of staff led to unfavorable experience for patients**

MGH – PATA

Methodology

- Brought on external personnel (MIT Sloan MBA Students) for problem identification
- Conducted time and motion study
 - Shadowing providers, nurses, and staff
 - Following patient pathways
- Reviewed patient logs to identify wait times at step in the patient flow
- Reviewed provider logs to review utilization, tasks, and distribution of staff
- Conducted patient survey to gauge satisfaction and impression

□ **External input, time and motion studies, and heuristics used to identify source of problems at MGH-PATA**

MGH – PATA

Recommendations for Improvement

Immediate changes

- Establish shared responsibility for operations among the staff. Reduce burden on Charge Nurse
- Situate Lab Technicians close to front-desk to expedite EKG and Vitals
- Recommend having MDs and RNs use the same operating room

Long term changes

- Add 3 additional RNs to match the number of MDs
- Proactively display current wait times to patients in the waiting room

□ **Shared responsibility, effective use of space and resources, and managing patient expectations led to 40% reduction in wait time (1h50min from 3h10min)**

Mount Auburn Hospital

Patient Flow in Clinics

- Some slots allocated for “urgent care” (walk-ins) each day – filled in by patients calling in at the beginning to the day
 - Early triage done on the phone (patients directed to appropriate clinic)
 - Walk-ins who cannot be slotted are directed to the walk-in clinic
- Typical face time with patient: 15 minutes for follow-up, 30 minutes for full physical
- Up to 4 physicals each day, remaining are follow-up and/or “urgent care”
- Clinic operates with 3 doctors, 3 administrators, 2 medical assistants, and 1 office manager. Office manager can fill role of medical assistant if needed
- Referrals to other clinics are done directly by doctors via phone or e-mail (leverage personal links in the hospital)
- Electronic system used to communicate patients waiting in the room to providers and staff

Mount Auburn Hospital

Key Insights and Ideas to Reduce Variability

- Allocate resources specifically for walk-in patients
 - E.g. Walk-in clinic, dedicated practitioners, blocks of time for walk-ins only
- Early triage can prevent re-routing
 - E.g. Diagnosis done over phone, advising patient to proceed to another clinic or to ER
- “Paraskilling” to dynamically resolve bottlenecks
 - E.g. Cross-training medical assistants, office managers to take on other tasks as necessary

□ **Efficient resource allocation, early triage, and cross-training has helped remove bottlenecks keeping wait times low**

Appendix

Mass. Eye and Ear – OR

Paragon OR Management Case Tracker

Paragon Operating Room Management - Current User: [REDACTED] MASSACHUSETTS EYE AND EAR INFIRMARY

File Edit View List Options Window Help

Case Tracker - Patient Name: [REDACTED]

Search Criteria

Dates: 01/13/2013 - 03/06/2013 Case ID: [REDACTED]

Dept: SURGERY Visit ID: [REDACTED]

Surgeon: [REDACTED] Status: [REDACTED]

Service: [REDACTED] Room: [REDACTED]

Patient: [REDACTED] Procedures: [REDACTED]

Display Filter:

- Need Req Generation (0)
- Incomplete Tasks (37)
- Need Case Card Printing (562)
- Urgent Items (562)
- Need Charge Finalization (562)
- Include Cancelled Cases (82)
- Need Case Closed (0)
- Unresolved Past Cases (1600)
- Need Preference Cards (21)
- Lost Cases (0)

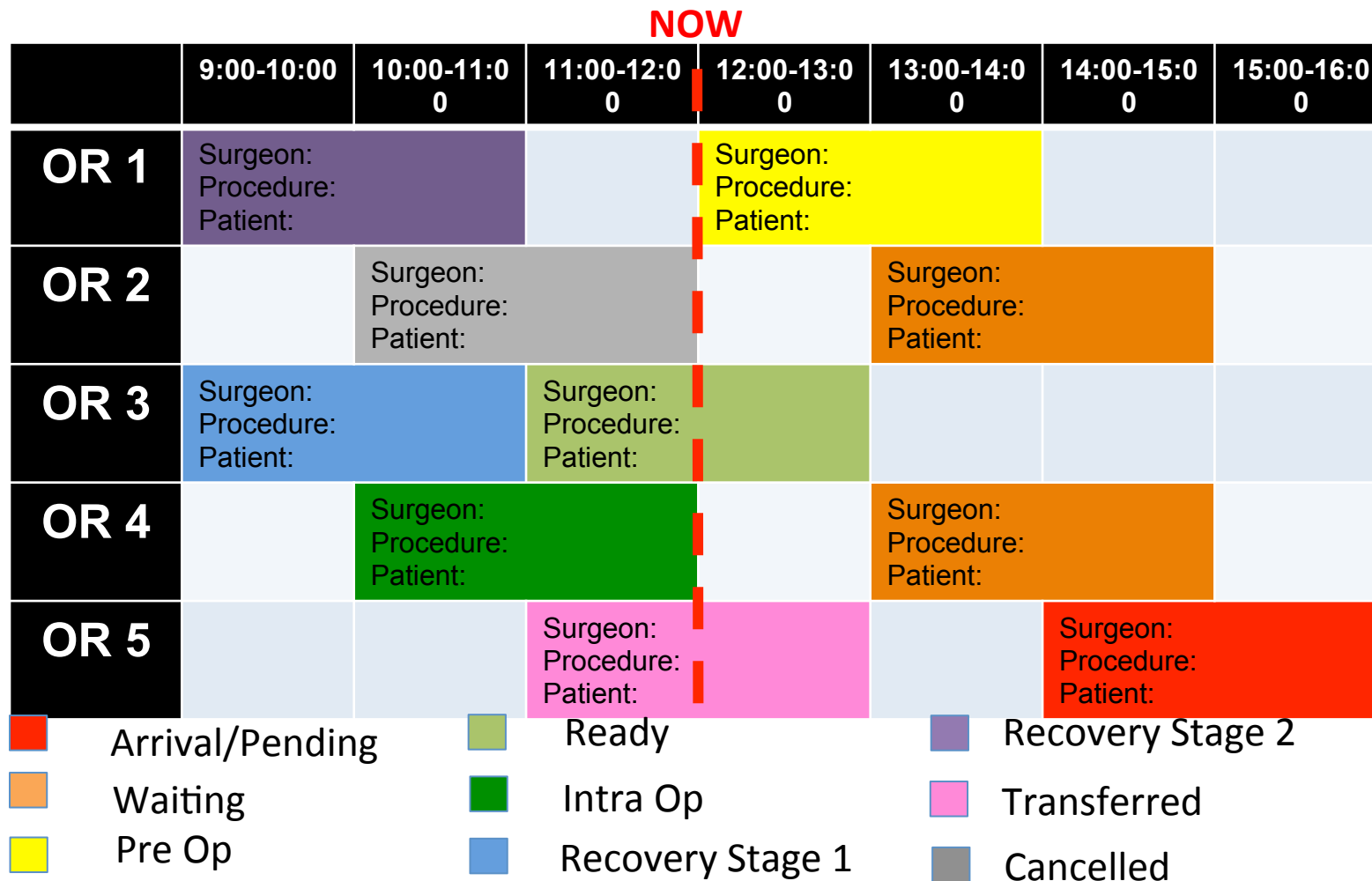
Start Time	Room	Procedure	Surgeon	Patient Name	Case ID	Case Status	Req	Card	Close	Chg	Task
02/28 11:00 Thu	OR 04	Endo Sinus Septa/Turb Reduction (Bilateral)	[REDACTED]	[REDACTED]	[REDACTED]	Waiting	[X]	[X]	[X]	[X]	[X]
02/28 13:00 Thu	OR 04	Endo Sinus Septa/Turb Reduction	[REDACTED]	[REDACTED]	[REDACTED]	Waiting	[X]	[X]	[X]	[X]	[X]
01/14 07:30 Mon	OR 03	Free Flap Neck Dissection (Bilateral)	[REDACTED]	[REDACTED]	[REDACTED]	Waiting	[X]	[X]	[X]	[X]	[X]
01/14 08:30 Mon	OR 06	Free Flap Glossectomy (Bilateral)	[REDACTED]	[REDACTED]	[REDACTED]	Waiting	[X]	[X]	[X]	[X]	[X]
01/30 10:30 Wed	OR 02	Tonsillectomy and Adenoidectomy (Bilateral)	[REDACTED]	[REDACTED]	[REDACTED]	Waiting	[X]	[X]	[X]	[X]	[X]
02/07 08:15 Thu	OR 02	Myringotomy and tubes (Bilateral)	[REDACTED]	[REDACTED]	[REDACTED]	Transferred	[X]	[X]	[X]	[X]	[X]
01/30 11:00 Wed	OR 07	Myringotomy and tubes (Bilateral)	[REDACTED]	[REDACTED]	[REDACTED]	Stage 2 Recover	[X]	[X]	[X]	[X]	[X]
01/30 11:15 Wed	OR 06	Myringotomy and tubes (Bilateral)	[REDACTED]	[REDACTED]	[REDACTED]	Stage 2 Recover	[X]	[X]	[X]	[X]	[X]
02/07 08:00 Thu	OR 03	Myringotomy and tubes (Bilateral)	[REDACTED]	[REDACTED]	[REDACTED]	Stage 2 Recover	[X]	[X]	[X]	[X]	[X]
01/30 10:30 Wed	OR 01	Tonsillectomy and Adenoidectomy (Bilateral)	[REDACTED]	[REDACTED]	[REDACTED]	Stage 1 Recover	[X]	[X]	[X]	[X]	[X]
02/07 07:30 Thu	OR 02	Tonsillectomy and Adenoidectomy (Bilateral)	[REDACTED]	[REDACTED]	[REDACTED]	Ready	[X]	[X]	[X]	[X]	[X]
02/07 07:30 Thu	OR 03	Tonsillectomy and Adenoidectomy (Bilateral)	[REDACTED]	[REDACTED]	[REDACTED]	Ready	[X]	[X]	[X]	[X]	[X]
02/14 08:15 Thu	OR 01	Repair Ruptured Globe (Left)	[REDACTED]	[REDACTED]	[REDACTED]	Ready	[X]	[X]	[X]	[X]	[X]
02/14 09:00 Thu	OR 01	Repair Ruptured Globe (Left)	[REDACTED]	[REDACTED]	[REDACTED]	Ready	[X]	[X]	[X]	[X]	[X]
02/28 09:30 Thu	OR 04	Septoplasty/Turb Reduction (Bilateral)	[REDACTED]	[REDACTED]	[REDACTED]	PreOp	[X]	[X]	[X]	[X]	[X]
02/13 07:30 Wed	OR 03	*Open Reduction Nasal Fx	[REDACTED]	[REDACTED]	[REDACTED]	Arrival Pending	[X]	[X]	[X]	[X]	[X]

Total Rows: 562

List of schedule and status in OR in any given day

Mass. Eye and Ear – OR

OR Big Board 3.1.0.3



OR Management Case Tracker is reflected on a big board for surgeons and nurses

Mass. Eye and Ear – OR Intra-Op Chart: Case Information

Patient
Name: [REDACTED] Weight: 52 kg Height: 127 cm MR#: [REDACTED]
Sex: FEMALE Age: 9Y Admit Wt: 52 kg DOB: [REDACTED] Visit #: [REDACTED]

Case
Case ID: [REDACTED] Anesthesia: GENERAL
Latex Allergy: No ASA Code: 1 Emergent
Status: Stage 1 Recovery Cancel Rsn: <Empty>
Transferred To: <Empty> Closed By: jeveryb

	Start / In	Finish / Out	Duration (min)
Patient In Room:	03/05/13 08:44	03/05/13 08:49	5
Anesthesia:	03/05/13 08:44	03/05/13 08:49	5

Procedure Note: T&A Pre-Op Dx: chronic tonsillitis Post-Op Dx: chronic tonsillitis

Procedure(s)
Primary: Tonsilectomy and Adenoidectomy Side: Bilateral
Room: OR 01 Start: 03/05/13 08:44
Surgeon: [REDACTED] Stop: 03/05/13 08:49

Delays

Procedure	Reason	Duration (min)	Note
Tonsilectomy and Adenoi	Patient to bathroom	15	

Complications

Procedure	Type	Note	Modifi
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Nurse pulls out patient information and logs in starting time and finishing time of the surgery

Massachusetts Eye and Ear Clinic and OR – Patient Pathway

Average – 97 Minutes



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